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Government Intervention in International Technology Transfer: More or Less?

*by D.G. McFetridge**

I. INTRODUCTION

Governments intervene in the international technology transfer process in a variety of ways. Intervention may involve some or all of:

- alteration of the scope and magnitude of domestic intellectual property rights;
- participation in the negotiation of international technology transfer arrangements;
- subsidization of technology acquisition and complementary activities;
- alteration of the competitive environment by changing trade policy or other means.

This paper examines the types of intervention in which the governments of Canada and other countries have engaged. Policies relating to intellectual property are discussed in Section II. Intervention in the technology transfer process itself is examined in Section III. The subsidization of technology transfer and related activities is the subject of Section IV. A brief discussion of the role of trade policy appears in Section V and Section VI contains some concluding observations.

The principal finding of this paper is that international criticism of compulsory licensing and the Foreign Investment Review Agency notwithstanding, Canadian intervention in the process of international technology transfer has not been extensive by international standards. Moreover, the form of this intervention appears to have shifted from a focus on individual technology transfers to an emphasis on the maintenance of a general competitive environment conducive to technology transfer. This shift of emphasis should be continued.

II. THE ALTERATION OF DOMESTIC INTELLECTUAL PROPERTY RIGHTS

Some technology importing countries have attempted to improve the terms upon which they are able to acquire technology from abroad by reducing the scope and duration of intellectual property rights. Among the means by which this is achieved are limiting the use of so-called re-

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strictive clauses in license agreements, and providing for compulsory licenses at concessionary royalty rates.

The UNCTAD Code, upon which the national technology transfer laws of a number of less developed countries have been based, prohibits a wide variety of restrictive (from the licensee's point of view) clauses in license agreements.¹ Among the clauses prohibited are:

- Restrictions on field of use;
- Restrictions on the acquisition and use of competing technologies (tie-outs);
- Tie-ins which oblige the licensee to purchase specified inputs from the licensor;
- Volume restrictions;
- Territorial and distributional restrictions;
- Grantbacks which give the licensor the right to make use of the licensee's improvements in the technology.

Canadian patent and competition law imposes fewer limitations on the rights of the licensor than is the case in most countries. In their recent assessment of Canadian law relating to technology transfer, Palmer and Aiello concluded that: The law in Canada permits in general any sort of restrictive provision in a license except resale price maintenance.²

Restrictive clauses which have the effect of extending the patent monopoly beyond its intended scope and duration might be held to contravene § 29 of the Combines Investigation Act.³ Under this section the Federal Court can declare void any patent or license which lessens competition unduly and in a manner not contemplated in the international conventions to which Canada adheres.

There are only two § 29 cases in the public record. They are related and both were settled before they reached trial. The first involved licenses granted by Union Carbide for the production of a patented polyethylene film. The Director of Investigation alleged that two provisions of these licenses were in violation of § 29. The first required that licensees pay a higher royalty to Union Carbide in lieu of purchasing an unpatented domestically produced resin from Union Carbide as a raw material in the production of the patented film. The second involved the continuation of the restrictions imposed on the licensees by Union Carbide after the expiry of the underlying patents. Under the terms of the settlement Union Carbide eliminated the tying arrangement and undertook to provide royalty-free licenses (two of the three underlying patents

¹ For a thorough discussion of the UNCTAD Code see J. Palmer and R. Aiello, *International Technology Exchange: An Economic Analysis of Legal Proposals* (Paper prepared for the Royal Commission of the Economic Union and Development Prospects for Canada).

² *Id.* at 29.

³ Combines Investigation Act, R.S.C., ch. C-23, § 29 (1970).

had expired).⁴

The second case involved licenses granted by Union Carbide for a patented process which facilitated printing on polyethylene sheets. The Director of Investigation alleged that a number of provisions included: (a) royalty rates which decreased with volume; (b) field of use restrictions forbidding licensees from printing on sheets thicker than stipulated by Union Carbide; (c) a no challenge clause restricting licensees from challenging the validity of the underlying patent and; (d) a provision that the terms of the licenses continue to hold after the expiry of the patent. The apparent basis of the Director's objection to these clauses was not that they were offensive but that they discriminated among competing licensees. Under the terms of the settlement the volume related royalty rates, the field of use restrictions, the extension of license restrictions beyond the term of the patent and the challenge clause were eliminated by Union Carbide.⁵

Most observers agree that these two settlements provide relatively little insight as to the nature of the license arrangements which might be expected to contravene Canadian competition law.⁶ It can be argued that either because they have been upheld by Canadian courts or have not been challenged, many restrictive clauses which have been prohibited elsewhere are allowable in Canada.

Among the examples that might be cited are, first, no challenge clauses (licensee estoppel). These clauses continue to be upheld in Canadian courts although they have been unenforceable in the United States since 1969.⁷

Second, tying arrangements and package licensing are, under most circumstances, illegal both in the United States and in the European Economic Community.⁸ In Canada, tying arrangements have been a reviewable practice under § 31.4 of the Combines Investigation Act since 1976. One prohibition order has been issued since that time which did not involve a licensing arrangement.⁹ It is unlikely that any tie that did not result in a significant foreclosure of the market for the tied product would be seen as a violation under the terms of § 31.4.

Third, while European and United States law relating to tie-outs

⁴ Szibbo, *The Canadian Antitrust Interface with Technology Agreements*, 1985 Tech. Agreements 4.2.06 (Materials prepared for a Continuing Legal Education Seminar, Vancouver, B.C.); DEP'T OF CONSUMER AND CORP. AFFAIRS, REPORT OF THE DIRECTOR OF INVESTIGATION AND RESEARCH, COMBINES INVESTIGATION ACT 29 (Ottawa, 1970), [hereinafter, REPORT OF THE DIRECTOR OF INVESTIGATIONS AND RESEARCH.]

⁵ Szibbo, *supra* note 4, at 4.2.06.

⁶ *Id.*

⁷ H. Fox, *THE CANADIAN LAW AND PRACTICE RELATING TO LETTERS PATENT FOR INVENTIONS*, 318-23 (4th ed., 1969); French, *The Basics of Licensing Agreements*, Tech. Agreements. FIKENTSCHER, *THE DRAFT INT'L CODE OF CONDUCT ON THE TRANSFER OF TECHNOLOGY* (1981) at 83.

⁸ Fikentscher, *supra* note 7, at 96-8.

⁹ REPORT OF THE DIRECTOR OF INVESTIGATIONS AND RESEARCH, *supra* note 4, at 51-54.

(restrictions on the use of competing technologies) is not clear cut, one scholar assesses the approach in these jurisdictions as one of forbidding tie-outs in general, and allowing them in particular cases where they can be shown to be beneficial to the market.¹⁰ In Canada, tie-outs would again be covered as a reviewable practice (exclusive dealing) under § 31.4. One case involving an exclusive dealing clause in a franchise contract has been reviewed under this section since 1976.¹¹ This arrangement was found to be acceptable. Any tie-out that does not significantly foreclose the market to other potential licensors would probably also be acceptable.

More examples could be provided. The essential point is that technology licensors have had a relatively free hand in Canada. The question remains as to whether this is appropriate. Economic analysis starts from the proposition that most features of a contractual arrangement are for the mutual benefit of the contracting parties. Prohibition of some provisions such as grantbacks or market restrictions could result in their replacement by other terms, such as high royalties, which licensees might find more burdensome. Of course, many jurisdictions would also forbid this type of substitution leaving the licensor with a choice of either a reduced yield or no transaction. Whether this expropriation of foreign licensors' rents is also in the long-term national interest will be discussed at the end of this section.

As is the case in a number of other jurisdictions, Canadian patent law provides for compulsory licenses of patents which have not been worked domestically.¹² Opinion is divided as to whether "use it or lose it" requirements are potentially beneficial to technology importing countries. The view that prevails among economists is that the patentee has an interest in working the patent in the lowest cost locations. Forcing high cost local exploitation is not in the national interest, unless there is a significant learning effect which is not taken into account in the locational decision. Even here there are generally better ways to induce patentees to take account of the skills and experience imparted to domestic workers and firms as a consequence of local working. Of course the excess cost of local working may be borne entirely by the patentee. In this case a local working requirement is simply another means of expropriating the patentee's rents. The merits of this strategy are discussed at the end of this section.

Compulsory licenses for local working have not been widely used in Canada or anywhere else. In Canada there have been approximately 90

¹⁰ Fikentscher, *supra* note 7, at 86.

¹¹ REPORT OF THE DIRECTOR OF INVESTIGATIONS AND RESEARCH, *supra* note 4 at 12-13.

¹² Patent Act, R.S.C., ch P-4 § 67 (1970). Other countries with "use it or lose it" provisions are France, Switzerland, Germany, Japan and the United Kingdom. See Palmer and Aiello, *supra* note 1, at 11, and THE REPORT OF THE COMMISSION OF INQUIRY ON THE PHARMACEUTICAL INDUSTRY 4 (1985) [hereinafter REPORT ON THE PHARMACEUTICAL INDUSTRY].

applications for licenses under § 67, and 11 have been awarded.¹³

The principal limitation on the use of compulsory licenses is that the patentee cannot be obliged to provide licensees with the ancillary technological information necessary to work the patent. This limits the use of these licenses to fields in which most of the requisite production information is revealed in the patent. According to recent studies, these conditions do not generally prevail in fields other than organic chemicals and simple mechanical equipment.¹⁴

Canadian patent law has also provided for compulsory licenses for domestic manufacturing of pharmaceuticals using patented processes since 1923. Between 1935 and 1969, 22 such licenses were issued.¹⁵

In 1969, the Patent Act was amended to allow for compulsory licenses to import pharmaceuticals made under patent processes.¹⁶ As of January 1985, 306 such licenses had been granted, although perhaps only one-third of these are actually being used.¹⁷ The patentee receives a royalty of 4% of the net selling price of the drug in its final dosage form.¹⁸

It is estimated that the price reductions which have resulted from compulsory licensing, together with the imposition by provincial governments of mandatory substitution rules which effectively require pharmacists to dispense the lowest priced brand, saved Canadian consumers in excess of \$211 million in 1983.¹⁹ A significant generic pharmaceutical industry has also developed in Canada.²⁰

The generic producers typically import their active ingredients from countries with weak patent protection such as Israel, Hungary or Brazil. To a considerable extent they free ride on the research, development, testing and other regulatory compliance expenditures of the patentee.

A Commission of Inquiry concluded in 1985 that the period of exclusivity allowed and the royalties awarded the patentee under the present system of compulsory licensing are both inadequate. The Commission recommended a four year period of exclusivity during which no compulsory licenses could be issued and a 14% royalty rate. The full 14% would be received, however, only if the patentee's Canadian R&D intensity was equal to the industry average.²¹

The government has not yet acted on these recommendations. If they were to be adopted, Canadians would effectively be paying a *pro rata*

¹³ REPORT ON THE PHARMACEUTICAL INDUSTRY, *supra*, note 12 at 4.

¹⁴ R. Levin, A New Look at the Patent System (Dept. of Econ., Yale University 1985) (unpublished manuscript).

¹⁵ REPORT ON THE PHARMACEUTICAL INDUSTRY, *supra*, note 12 at 4.

¹⁶ Patent Act, R.S.C., ch. P-4, § 41(4) (1970).

¹⁷ P. Gorecki, The Importance of Being First, 5 (Economic Council of Canada 1985) (unpublished manuscript).

¹⁸ REPORT ON THE PHARMACEUTICAL INDUSTRY, *supra*, note 12, at 1-2.

¹⁹ *Id.* at 315-16.

²⁰ *Id.* at 157-58. See also Gorecki, *supra* note 17, at 4-9.

²¹ *Id.* at xx-xxi.

share of the worldwide research and development costs of the pharmaceutical industry. About \$31 million of the \$211 million savings attributed to compulsory licensing in 1983 would be transferred back to the patentees.²²

The question remains as to whether compulsory licensing, altered as the Commission has suggested, is in Canada's long-term national interest. Arguments to the effect that it will delay introduction of new drugs in Canada, discourage domestic R&D or cause the collapse of the international patent system are not persuasive. Its principal disadvantage lies in the possibility that it will provoke retaliation. As a major trading nation Canada is vulnerable to retaliation on many fronts. The United States will surely insist that compulsory licensing be "on the table" in any bilateral trade negotiations.

Alternatives to compulsory licensing which are less aggravating to Canada's trading partners may exist. There may be merit in seeking them out in that a return to the situation which existed prior to 1969 may not be particularly palatable to Canadians. As citizens of a developed country, Canadians may be prepared to bear a disproportionate share of the worldwide R&D costs of the pharmaceuticals industry; that is, to pay higher prices than do residents of less developed countries. It is less clear that Canadians would or should adhere to a system under which they are obliged to pay higher prices than those prevailing in other developed countries.

In the absence of compulsory licensing, prices of patent pharmaceuticals might be kept at levels prevailing in western Europe by the more active use of § 67 of the Patent Act. This would involve defining the charging of prices significantly in excess of those prevailing in Australia or western Europe, as an abuse of the patent. An alternative is to stipulate that the importation of patented items into Canada from a non-infringing foreign source does not constitute an infringement of the Canadian patent. The parallel importation facilitated by this exhaustion of the patent right after the first sale of the patented item might also help to keep Canadian prices in line with other developed countries.²³

III. INTERVENTION IN THE NEGOTIATION OF INTERNATIONAL TECHNOLOGY TRANSFER ARRANGEMENTS

Most national governments exercise some form of control over local investment by foreigners. This control may take the form of closing certain "key" sectors to foreign investment. Often it is associated with the existence of foreign exchange control. In some cases it involves reviewing or screening foreign investments in an attempt to secure greater national

²² REPORT ON THE PHARMACEUTICAL INDUSTRY, *supra*, note 12, at xx-xxi.

²³ For a discussion of the concept of exhaustion and its uses see DEP'T OF CONSUMER AND CORP. AFFAIRS, PAPER ON PATENT LAW REVISION 141-42 (Ottawa, 1970).

economic advantage.²⁴ The latter is generally interpreted as involving a greater amount of domestic value-adding activity.

Among the developed countries which have screened foreign investment on a systematic basis are Australia, Canada, France, Japan and Sweden. The Canadian review process has involved the extraction of commitments from foreign investors regarding employment levels, sourcing of material inputs, access to foreign markets, investment in plant and equipment, domestic R&D and domestic equity participation.

As a condition for the approval of their investments some investors have agreed to import new technologies to Canada while others have undertaken to increase local R&D activity. The public record contains three examples which may be illustrative. First, in order to secure approval of its acquisition of Peoples Department Stores, the British firm Marks and Spencer agreed, among other things, to use its textile technology and industrial management expertise in the development of Canadian-made St. Michael (a Marks and Spencer brand) merchandise, and to spend at least \$100,000 annually for three years on Canadian research and development in textile and clothing technology.²⁵

Second, the acquisition of Nacan Products Limited by the British firm Unilever involved a commitment by the latter to the Foreign Investment Review Agency to “. . . create a new Canadian research facility in Ontario which will be the focal point for research within Unilever in certain areas of particular interest to Canada.”²⁶

Third, approval of the acquisition by Datapoint Corporation of San Antonio of a business carried on by TRW Canada was conditional upon (among many other things) the commitment by the former to “its own research and development program and to expend in each of the first five years, a percentage of the CBE’s (Canadian business enterprise’s) gross revenues generated in Canada on application software research and development (a percentage greater than that expended by the applicant in the USA) and to employ between three and six individuals dedicated to software development.”²⁷

A number of questions have been raised regarding the benefits obtained by this type of intervention. These include:

- Are investors actually induced to engage in domestic activities they would not otherwise contemplate?
- Are the resources used in these additional activities drawn from

²⁴ Discussions of alternative techniques of control and their international incidence can be found in A. SAFARIAN, *GOVERNMENTS AND MULTINATIONALS: POLICIES IN THE DEVELOPED COUNTRIES* (British North American Committee 1983) and U.S. Dep’t of Commerce, *THE USE OF INVESTMENT INCENTIVES AND PERFORMANCE REQUIREMENTS BY FOREIGN GOVERNMENTS* (Office of Int’l Investment 1981).

²⁵ Byron, *The Canadian Experience of Marks and Spencer*, 1978 FOREIGN INVESTMENT REV. 1, 4-6 (Summer).

²⁶ SAFARIAN, *supra* note 24, at 101.

²⁷ *Id.* at 101-02.

lower valued uses (i.e., is employment "created" or merely redistributed)?

— Is the cost of fulfilling commitments to the Foreign Investment Review Agency subtracted from the price foreigners are willing to pay for Canadian assets or is it borne by the foreign investors?

— To the extent that the cost of fulfilling commitments to FIRA is borne by foreign investors, to what extent will it either discourage investment and rationalization or invoke retaliation?

The answers to the first three if not all of these questions are now known. There have been some individual cases documented in which the intervention of the Foreign Investment Review Agency was clearly counter-productive. Crookell's description of the consequences of intervention by FIRA in the major appliance industry is particularly illustrative. It had the effect of forcing the sale of at least one firm to an inappropriate, albeit Canadian, buyer. It frustrated the rationalization process and, ironically, did not ultimately increase Canadian ownership.²⁸

Perhaps perceiving that the costs of screening individual foreign investments exceed the benefits, the government of Canada has recently reduced the scope of its investment screening activities. Under the Investment Canada Act, investments in new businesses are no longer reviewable. Acquisitions of Canadian businesses which are already foreign-controlled are no longer reviewable if the value of the Canadian business is either less than \$50 million or less than 50% of the value of the transaction.²⁹

Canada has never reviewed technology transactions that have not involved the acquisition of control by foreigners. This type of review is common in less developed countries and has been practiced in Japan especially before 1970.³⁰ Its purpose is generally to secure more favorable terms and/or a larger role for the domestic participant. Specifically, this often involves securing lower royalty rates, shorter agreements and fewer export or sourcing restrictions for domestic licensees.

The general experience with this type of intervention appears to be that while it is sometimes ineffective in that licensors can extract compensation in forms not subject to control and it sometimes discourages or postpones transfers, it can be effective in decreasing the rents accruing to foreign licensors and in changing the transfer arrangement to increase

²⁸ Crookell, *The Impact of Government Intervention on the Major Appliance Industry in Canada* in *CANADIAN INDUSTRIAL POLICY IN ACTION* 490-574 (D. McFetridge ed. 1985); See also J. Teece, *THE MULTINATIONAL CORPORATION AND THE RESOURCE COST OF INTERNATIONAL TECHNOLOGY TRANSFER* 104 (1976). (Multinationals that take on a local partner can increase the cost of technology transfer).

²⁹ Investment Canada Act, R.S.C., ch. 20, § 14 (1970).

³⁰ F. CONTRACTOR, *INTERNATIONAL TECHNOLOGY LICENSING* 3-9 (1981) and Peck & Tamura, *Technology*, in *ASIA'S NEW GIANT: HOW THE JAPANESE ECONOMY WORKS* 529-672 (H. Patrick & H. Rosovsky eds. 1976).

domestic participation.³¹

An important qualification to this conclusion is that government intervention on behalf of domestic licensees tends to be most effective in cases involving mature, well-known technologies with alternative suppliers, and where the domestic market itself is attractive.³² As a small country interested in the latest technologies, Canada might have significantly less leverage.

To summarize, since 1973, Canada has reviewed foreign direct investment proposals and has, in some cases, required foreign investors to make certain commitments with respect to technology imports and, apparently more often, domestic R&D. The productivity of this intervention is open to question, particularly in the light of the speed with which circumstances change and decisions must be made in technology-oriented sectors. In any event Canada began to move away from this approach in 1985. There has been no intervention in the negotiation of individual technology transactions and none is seriously contemplated.

IV. SUBSIDIZATION OF TECHNOLOGY TRANSFER AND RELATED ACTIVITIES

Government intervention in the technology transfer process can also take the form of subsidizing either the acquisition of technology from abroad or related activities.

A number of national governments subsidize, directly or indirectly, the collection and local dissemination of information regarding technological developments abroad. Germany makes use of science counsellors and commercial attaches at its foreign embassies, as well as its Society for Information and Documentation which was set up in 1978 for this purpose.³³

In France the two government agencies responsible for the domestic diffusion of foreign technologies are the Agence Nationale de la Valorization de la Recherche and the Centre Nationale de la Recherche Scientifique. These two agencies, particularly the latter, station representatives abroad and maintain a continuing liaison with domestic firms. A technological databank is also maintained and assistance is provided in establishing links with foreign firms.³⁴

Japan's national technology acquisition efforts has been widely documented.³⁵ It is managed by the Agency of Industrial Science and Tech-

³¹ *Id.* at 94-96; Reynolds, *The Pinched Shoe Effect of International Joint Ventures*, 1984 COLUM. J. WORLD BUS. 19, 23-29 (Summer).

³² F. CONTRACTOR, *supra* note 30, at 95; Reynolds, *supra* note 31, at 24.

³³ ONTARIO MINISTRY OF INDUSTRY AND TRADE TECHNOLOGY TRANSFER MECHANISMS: AN INT'L PERSPECTIVE 26-27 (1984) (A Background Research Report prepared for the Innovation and Technology Div.).

³⁴ *Id.* at 29-31 and *Report of the Royal Comm'n on the Economic Union and Development Prospects in Canada* 161-67 (1985) [hereinafter *Royal Comm'n*].

³⁵ Peck & Tamura, *supra* note 30.

nology which has been involved in virtually all aspects of the technology transfer process and has served as a model for the technology acquisition efforts of such emerging industrial powers as Korea.³⁶

In Canada, the National Research Council assists domestic firms in acquiring new technologies through its Industrial Research Assistance Program (IRAP) and its Technical Information Service. During 1984, a field staff of 121 technology advisors was employed and 2540 projects were supported.³⁷ The National Research Council also maintains a science and technology databank (Canada Institute for Scientific and Technical Information, CISTI) which is the busiest lending library in Canada. Some 50% of the requests for information come from the business sector.³⁸

The federal and provincial governments support numerous other institutions dedicated to the diffusion of new technology to Canadian business. The Nielsen Task Force counted 330 technology centres in operation in Canada in 1985 and concluded that this represented an enormous duplication of service.³⁹ The Canadian Manufacturers Association which presumably represents the beneficiaries of these technology centres, recently argued that the problem faced by its members is not a lack of awareness of new technologies but an inability to finance their acquisition. Technology centres do not, in its view, serve industry's needs so much as they serve political needs.⁴⁰

It has long been asserted that information had special properties which justified government involvement in its collection and dissemination. It is difficult to induce individuals to pay for information the precise nature of which has not been revealed. It is also difficult to require individuals to pay for information once it has been revealed. In addition, information can be "re-used" so that the incremental cost of broader diffusion is low relative to the cost of collection. This presents some problems in designing and enforcing a pricing system. These problems are far from insurmountable and it is not necessarily the case that a technological information system must run at a loss, or that government involvement is essential over the longer term. In this regard recommendations in favor of fewer technology centres and a greater degree of cost recovery seem well-taken.

Governments also subsidize the technology acquisition activities of firms. This may occur in a number of ways. First, R&D expenditures may be subsidized and/or treated relatively favorably for tax purposes.

³⁶ *Royal Comm'n*, *supra* note 34, at 166.

³⁷ *Id.* at 95.

³⁸ TASK FORCE ON PROGRAM REVIEW, SERVICES AND SUBSIDIES TO BUSINESS 469-73 (1986). (Available from Supply and Services Canada, Ottawa).

³⁹ *Id.* at 418-21.

⁴⁰ Canadian Manufacturer's Ass'n, *Improving Our Industrial Competitiveness: A Science Policy for Canada* 11-12 (1986) (unpublished manuscript).

This is certainly true in Canada.⁴¹ Since the R&D cost of innovations based on externally acquired technology amounts, on average, to approximately 45% of the cost of the project, the subsidization of R&D indirectly subsidizes technology acquisition. Since the R&D component of innovations based on technology developed in-house amounts, on average, to 63% of project cost, the subsidization of R&D may bias firms toward “reinventing the wheel”; that is, developing new technologies internally when they could be acquired more cheaply (on a before-tax basis) off the shelf.⁴²

Second, capital investment may be subsidized and/or treated relatively favorable for tax purposes. To the extent that new capital investment embodies the latest technological developments, the subsidization of investment indirectly subsidizes technology acquisition.

In Canada, capital costs are treated more favorable than labor costs for tax purposes.⁴³ As a consequence firms may be induced to use relatively more capital and, perhaps, to replace it more quickly than would otherwise be the case. Capital costs are treated less favorably for tax purposes than R&D costs. This could induce some firms to substitute technological improvement based on inhouse R&D for those embodied in new capital goods.⁴⁴ Again, this substitution would not be cost-effective on a before-tax basis.

Third, industrial development subsidy programs may have components which are oriented primarily to technology acquisition. One example is the program of modernization grants administered by the Canadian Industrial Renewal Board (CIRB). These grants were intended to facilitate the acquisition of the latest technologies by firms in the textile clothing and footwear industries.⁴⁵

A second example is the Machinery Duty Remission Program administered by the Department of Regional Industrial Expansion (DRIE). This program provides for remission of import duties on machinery not produced in Canada. While this program facilitates acquisition of new foreign technologies embodied in imported machinery, it is motivated principally by Canadian obligations regarding average tariff rates (including remissions) under the General Agreement on Tariffs and Trade.⁴⁶

A third example is the modernization component of the Industrial and Regional Development Program (IRDP) administered by DRIE.

⁴¹ D. MCFETRIDGE & J. WARDS, *CANADIAN R&D INCENTIVES: THEIR ADEQUACY AND THEIR IMPACT* (1983).

⁴² McFetridge & Corvari, *Technology Diffusion: A Survey of Canadian Evidence and Public Policy Issues in TECHNOLOGY CHANGE IN CANADIAN INDUSTRY* 216-17 (D. McFetridge ed. 1985).

⁴³ The recently announced repeal of the Investment Tax Credit will reduce this difference. See DEP'T OF FINANCE BUDGET PAPERS 28-30 (Feb. 26, 1986).

⁴⁴ D. MCFETRIDGE & J. WARDS, *supra* note 41, at 42-44.

⁴⁵ TASK FORCE ON PROGRAM REVIEW, *supra* note 38, at 139-43.

⁴⁶ *Id.* at 122-27.

This program provides subsidies for the modernization and expansion of existing manufacturing and processing operation.⁴⁷ Technology acquisition is also facilitated on occasion by IRDP subsidies to new plants. The \$275 million subsidy provided to Bell Helicopter Textron Inc. to induce it to manufacture helicopters at Mirable, Quebec is a case in point. A substantial fraction of this subsidy is thought to be a payment for existing Bell technology.⁴⁸

Industrial development subsidies of a similar nature are found in many other developed economics.⁴⁹ Whether Canada should maintain the array of programs it has in place is another question. The Nielsen Task Force has recently recommended that expenditures in this area be reduced.⁵⁰ Moreover these subsidies are also likely to be "on the table" when trade liberalization between the United States and Canada is discussed.

On the conceptual level the question is whether, left to themselves, individual firms will acquire too little new technology too slowly from a social point of view. While there may be a rationale for the subsidization of information collection and discrimination, the argument for subsidizing firms to act on this information is less persuasive. One recent study concludes that, if faced with a choice between the subsidization of domestic R&D and the subsidization of technology transfer, public policy should tilt in the direction of the former.⁵¹ Others argue that so-called modernization subsidies will continue to have a rationale as compensation to the victims of trade liberalization. According to this view, subsidies of this nature are necessary to placate political opposition to trade liberalization. They are efficient in the sense that, without them, the broad efficiency gains resulting from trade liberalization could not be realized.

V. TRADE AND TECHNOLOGY TRANSFER⁵²

It has been argued that, by international standards, Canadian firms are slow in adopting new technologies. The source of this diffusion lag is thought to lie in the relatively small size of the Canadian market and in the lack of domestic competition. According to this view, Canadian firms are too small to take advantage of the latest technologies and are, in any case, under no competitive pressure to introduce them. Existing evidence provides some, but by no means conclusive, support for this view.

To the extent that the problem is one of scale and competition, trade

⁴⁷ *Id.* at 104-12.

⁴⁸ McQuaig, *Taxpayers Bear Much of Risk in Bell Helicopter Venture*, *The Globe and Mail Report on Bus.*, Jan. 31, 1985.

⁴⁹ Office of Int'l Inv., U.S. Dep't of Commerce *supra*, note 24, Table 1.

⁵⁰ TASK FORCE ON PROGRAM REVIEW, *supra*, note 38, at 109-11.

⁵¹ R. HARRIS, *TRADE INDUS. POLICY AND INT'L COMPETITION* 107-09 (1985).

⁵² For a more extensive discussion of this issue, along with references, see McFetridge & Corvari, *supra* note 42, at 217-24.

liberalization provides a solution. The expectation is that trade liberalization will result in both more competition and a rationalization of production in domestic markets. Canadian producers will be more specialized but will, of necessity, operate at world scale. They will thus be in a position to adopt the latest production technologies as they become available.

These "dynamic benefits" of freer trade are largely hypothetical although they do have an intuitive appeal. They are often adduced in support of proposals for trade liberalization.

VI. CONCLUSION

Four sets of public policies relating to international technology transfer have been discussed in this paper. They are:

- alteration of the scope and duration of domestic intellectual property rights;
- participation in the negotiation of technology transfer arrangements;
- subsidization of technology transfer and activities relating thereto;
- alteration of the competitive environment and the structure of domestic industry.

With the exception of pharmaceuticals, the protection accorded owners of intellectual property in Canada is relatively strong. Canada has benefitted from the compulsory licensing of pharmaceutical patents, but this benefit has come at the expense of foreign patentees and is unlikely to be sustainable in the light of international pressure.

To the extent that the acquisition or formation of a Canadian business by foreigners has involved at least a potential technology transfer, the government of Canada has involved itself in the negotiation of technology transfer arrangements. This practice has been of dubious benefit to Canada, and has been curtailed significantly in the recent amendments to the foreign investment review legislation.

Canada, like most other countries, subsidizes the collection and domestic dissemination of international technology intelligence. Recent years have seen a considerable expansion of the Canadian effort in this field. Questions have been raised to the effect that both the magnitude of the effort and the subsidy involved are excessive. Canada also subsidizes the technology acquisition activities of firms, though generally in an indirect way. To the extent that this subsidization is associated either with the support of domestic R&D or payments to victims of trade liberalization, there appears to be a continuing justification for it.

It has been suggested that more timely domestic adoption of new foreign technologies would be a consequence of trade liberalization. This proposition has been among the arguments adduced in favor of recent Canadian efforts in this direction.

Although the situation is not without ambiguity, it can be concluded that the nature of Canadian public policies toward technology transfer has changed in recent years. There is less emphasis on participation in individual transfers or sets of transfers, and more emphasis on the maintenance of a general economic framework conducive to technology transfer. This change in emphasis is to be commended.