A CONCEPTUAL BASIS FOR AN INDUSTRIAL STRATEGY

by ALBERT BRETON

1974

ECONOMIC COUNCIL OF CANADA

A CONCEPTUAL BASIS FOR AN INDUSTRIAL STRATEGY

by

Albert Breton

Economic Council of Canada
1974

Although published under the auspices of the Economic Council of Canada, this Study does not necessarily represent the views of the Council.

Available by mail from Information Canada, Ottawa, K1A 0S9
and at the following Information Canada bookshops:

HALIFAX
1683 Barrington Street

MONTREAL
640 St. Catherine Street West

OTTAWA
171 Slater Street

TORONTO
221 Yonge Street

WINNIPEG
393 Portage Avenue

VANCOUVER
800 Granville Street

or through your bookseller

Price: $1.50 Catalogue No. EC22-2074

Price subject to change without notice

Information Canada
Ottawa, 1974

CONTENTS

	Page
1. INTRODUCTION	1
2. DEFINITION OF INDUSTRIAL STRATEGY	1
3. THE NATURE OF THE GAP BETWEEN $\bar{M}$ AND M*	5
4. POLICY OPTIONS	14
5. THE SOCIAL OPTIMUM	21
6. A SECOND-BEST POLITICAL CONSIDERATION	22
7. CONCLUSION	24

1. INTRODUCTION

Though it is acknowledged that Canada, like many other countries, has for many years had an industrial policy -- or an industrial strategy, as it has become fashionable to call such a policy in an age that is greatly influenced by military technology and military jargon -- the meaning and conceptual basis of such a policy are far from obvious. Consequently, the next section of this Paper offers a definition of industrial strategy on which to build the concepts needed to examine the meaning of the term.

Section 3 examines in some detail the factors or conditions that can provide a rationale for an industrial strategy. Each of these is related to the definition adopted and is analysed in terms that, hopefully, will make the discussion applicable to concrete cases.

Section 4 deals with the problems of selecting the instruments required to implement an industrial policy. It is at this point that "practical men" usually begin discussing the subject. Since it is difficult (one would think impossible) for "practical men", or anyone else, to discuss these instruments in a meaningful way without knowing what they are meant to achieve, the discussion in Section 3 is clearly a prerequisite to the examination of policy options.

The latter is followed by a statement of the conditions necessary for a socially optimal industrial policy and, in Section 6, by examination of a problem in what could be called "the politics of the second-best".

2. DEFINITION OF INDUSTRIAL STRATEGY

As implied in Section 1, it is impossible, from looking at the official and nonofficial literature on the subject, to know what is meant by "industrial strategy". It is therefore imperative, if debate is to be meaningful, that a definition be agreed upon. The following is suggested.

Consider an economy in which all intermediate and final goods and services can be divided into a finite number of broad conceptual classes -- e.g., agricultural (A),

resource (R), services (S), industrial (M), etc., so that the flow of output per unit of time is identified as agricultural output, (natural) resource output, service output, industrial output, etc. If Q represents the total flow of output per unit of time at any one time, then

$$Q \equiv A + R + S + M + \ldots \tag{1}$$

where total output, as well as each class of output, is valued either in terms of a preselected *numéraire* or in constant dollars.

For some problems, or within a given framework of analysis, it may be useful to distinguish between various types of M-output (or A-, R-, S-, output, etc.) so that, in effect:

$$\begin{aligned} M &= M_1 + M_2 + \ldots \\ A &= A_1 + A_2 + \ldots, \text{ etc.} \end{aligned} \tag{2}$$

where M_1 could be highly processed manufactured goods; M_2 could be high-technology M-goods, etc.; and A_1 could be milk and milk products, while A_2 was No. 1 durum wheat, etc.[1] The difficulties of assigning the total flow of output to various classes are not reduced by introducing such subclasses.

Having established a system of output classification, we next define the level of total output $\bar{Q}$, which is the level of current output for any given period of time. Similarly, we define a level of current A-output, $\bar{A}$; a level of current R-output, $\bar{R}$, so that

$$\bar{Q} = \bar{A} + \bar{R} + \bar{S} + \bar{M} + \ldots \tag{3}$$

$\bar{Q}$ corresponds to the figures contained in the National Accounts of countries, and $\bar{A}$, $\bar{R}$, etc., could, in principle, be derived from input-output tables of the same economies. Obviously, these barred numbers do not describe socially optimal flows of goods and services.

---

[1] It is easy to extend the definition to take location of output into account by breaking equation (2) still further; thus

$$M_1 = M_{1r_1} + M_{1r_2} + M_{1r_3} + \ldots \tag{2a}$$

where the subscripts r_1, r_2, etc., define different regions or areas.

Assume finally that some socially optimal level of Q -- and of its various component classes -- can be defined; thus

$$Q^* = A^* + R^* + S^* + M^* + \ldots \qquad (4)$$

These starred magnitudes can be seen as those that would obtain in a world where all preference and production sets were convex, so that competition would exist in all markets, and where all externalities had been internalized either through Coasian "bargaining"[2] or by judicious use of taxes and subsidies.[3]

Given these concepts, we can now provide a definition of industrial strategy and compare it with other, largely implicit, definitions that have been used at one time or another. An industrial strategy is an attempt to reduce the gap assumed to exist between the actual output of M-goods and the socially optimal level (i.e., between $\bar{M}$ and M^*). The prevalent view seems to be that $\bar{M} < M^*$, but such an assumption is premature at this stage, since we do not know why a gap exists (if, in fact, it does).

Clearly, this definition has implications not only for industrial or M-output, but also for A- and/or R- and/or S-output, etc. Indeed, it is absolutely correct to say that an industrial policy is indirectly an agricultural, or a resource, or a service, or some other, policy. Once full employment is assumed -- as it is throughout this Study unless otherwise specified[4] --

[2] The "bargaining" referred to is that assumed in R. H. Coase, "The Problem of Social Cost", *Journal of Law and Economics* (October 1960).

[3] On the concept of the social optimum, see, for example, K. J. Arrow, "Political and Economic Evaluation of Social Effects and Externalities", in J. Margolis, ed., *The Analysis of Public Output* (New York: National Bureau of Economic Research, 1970).

[4] Why should full employment be assumed? Simply because when there are truly unemployed resources in an economy, the cost of achieving any policy objective is zero. For example, it would be possible in such circumstances for the government to increase M-output without inducing any other substantial changes in the economy. If this is the meaning given to industrial strategy, there is nothing to the subject (since we would only be discussing an employment policy problem in a different and more slippery language) unless, of course, we ask, why M-output, why not total output? We must assume full employment to be able to discuss the question we are asking ourselves in the first place!

an increase or a reduction in $\bar{M}$ towards M^* implies a reduction or an increase in one or more of the other classes of outputs.

This is a point of some importance on which it will be useful to dwell for a moment, although a complete discussion would imply that the factors that generate a gap between $\bar{M}$ and M^* are known -- a problem we do not examine until the next section. To illustrate the proposition, suppose that the economy can be broken down into two sectors only -- an *M*-sector and an *R*-sector. Assume further that the *M*-sector is fully monopolized while the *R*-sector is competitive. As a result, the *M*-sector is smaller, and the *R*-sector larger, than they would be if both sectors were competitive. A policy aimed at reducing the degree of monopoly in *M* would lead to a contraction of *R* and to an expansion of *M*. Although the combined output of the two sectors might *not* be larger, the utility or welfare that consumers would derive from that combined output would be larger, since the excess burden of monopoly would have been reduced or even eliminated.[5] A similar argument can be made for any of the factors that lead to a gap between $\bar{M}$ and M^*.

It is sometimes argued that output can be increased by removing sources of inefficiency at no cost, as it were, in terms of the size of a given sector of the economy. This view is wrong. While it is often possible to increase total output by removing inefficiencies, this can never be achieved without increasing the size of one sector and reducing that of another.[6] It is therefore important to remember that whether industrial strategy is defined in terms of total output or in terms of the size of a class of output, it is always implicitly defined in terms of output composition or the relative size of sectors.

---

[5] On the concept of excess burden or dead-weight loss, see, among others, A. C. Harberger, "Taxation, Resource Allocation and Welfare", in *The Role of Direct and Indirect Taxes in the Federal Revenue System* (Princeton: National Bureau of Economic Research, 1964).

[6] The argument of this and of the previous paragraph is neither static nor dynamic and can easily be accommodated to both static and dynamic models. It is simply the working-out of an implication of the definition adopted in this Paper.

3. THE NATURE OF THE GAP BETWEEN $\bar{M}$ AND M^*

To examine the nature of the gap between $\bar{M}$ and M^* as well as some of the properties of the contributing factors, all factors are grouped into two broad classes. These could be called economic factors and political factors, although it is imperative to keep in mind that no factor is purely economic or purely political, since, as a rule, both classes require public intervention for their solution. The first class of factors includes: (a) externalities, (b) risk, (c) private monopoly and oligopoly, and (d) past government intervention. The second class is comprised of two large subgroups of factors: (a) nationalism, and (b) mercantilism or neo-mercantilism. These are not always easy to distinguish. The remainder of this section examines the specific contribution of each factor or group of factors to the gap between $\bar{M}$ and M^*.

Economic factors -- Let us begin with externalities. Following Pigou, Meade, and more recent writers such as Coase, Buchanan and Mishan,[7] we can define an externality as the nonmarketed contribution, whether positive or negative, of the consumption of a particular commodity by individual i to the consumption or welfare of individual j and/or to the production and profits of firm k or, again, as the nonmarketed contribution (positive or negative) of the production of a given commodity by firm k to the production and profits of firm j and/or to the consumption and welfare of individual i, so long as such contributions are captured by individuals or by firms without being valued in real markets and without being transacted at market prices.

How could externalities so defined contribute to the gap between $\bar{M}$ and M^*? Clearly, they could do so if the production and/or consumption of M-output contributed to the production, consumption, and welfare of other individuals or firms in ways not captured by markets. This argument appears in economic literature. For example,

---

[7] A. C. Pigou, *The Economics of Welfare* (London: Macmillan, 1952); J. Meade, "External Economies and Diseconomies in a Competitive Situation", *Economic Journal* (March 1952); R. H. Coase, "The Problem of Social Cost", *Journal of Law and Economics* (October 1960); E. J. Mishan, *Welfare Economics: An Assessment* (Amsterdam: North Holland Publishing Co., 1969); and J. M. Buchanan and W. C. Stubblebine, "Externality", *Economica* (November 1962).

since List and Veblen,[8] some have asserted that the production of industrial output develops, in those who engage in it, skills and virtues that cannot be acquired by the production of other commodities. It should be pointed out that both List and Veblen assumed the alternative to industrial output to be agricultural output -- an assump ion that probably conformed to the facts of the time.

Without adjudicating whether the external benefits of industrial output are larger than those of agricultural output, one should keep in mind that, in most developed countries today, the relevant alternative is not agriculture, but rather some other kind of output, such as resources or services. Thus the presence of external economies, such as those visualized by List or Veblen, is not sufficient to build a case for an industrial strategy. For such a case, one must compare external benefits and external costs in *M*-output with those elsewhere. Specifically, the sufficient condition is that

$$(B_M - C_M) - (B_i - C_i) > 0 \qquad (5)$$

where B_M and B_i are the external benefits from the output of the M and i (= A, S, R, etc.) industries respectively, and C_M and C_i refer to external costs or damages.

A number of versions of the List-Veblen argument are still proposed although they are given a new twist. In today's world, it is argued, the only kind of production capable of employing a large number of engineers and (natural) scientists[10] is industrial production and, given

---

[8] F. List, *The National System of Political Economy* (London: Longmans, Green and Co., 1916); and T. Veblen, *The Instinct of Workmanship* (New York: Viking Press, 1914).

[9] To List and Veblen, although they are not too explicit about it, the difference in the external benefits of *M*-output, compared with *A*-output, is assumed to outweigh the difference in the external damages from these two sources. To be specific, the difference in the acquisition of skills, know-how, and a way of thinking logically -- the alleged external benefits of engaging in the production of *M*-output -- is assumed to outweigh the difference in smoke, waste, and other forms of pollution from *M*-output compared with *A*-output.

[10] It is not clear what the expression "a large number of engineers and scientists" means. It does not appear to refer to the number supplied to the market each year in excess of what is demanded without increased intervention. In that case, the externalities argument would be closely related to the past-government-policies argument discussed below.

the external benefits that accrue to society from their presence, governments should formulate an industrial strategy that would make it possible to achieve a larger level of industrial output. This argument, which need not necessarily be wrong for having been formulated and put forward by engineers and scientists, is, as the reader will have noticed, in the same general class as the List-Veblen argument. The difference with the historical version comes from the fact that externalities are not generated by the activity of producing the *M*-output. Rather, they are said to be generated by the engineers and scientists themselves, who can be active members of a society only if industrial output is produced.

Assuming that industrial output is required to sustain engineers and scientists, the sufficiency condition to justify an industrial strategy is similar to the one given above:

$$(B_E - C_E) - (B_j - C_j) > 0 \qquad (6)$$

where B_E are the external benefits generated by engineers and scientists, and B_j are those generated by the j individuals who would be alternatives or substitutes to the engineers and scientists, while C_E and C_j are the external costs from these two groups. Assuming, as seems reasonable, that $C_E = C_j$, the sufficiency condition becomes

$$B_E - B_j > 0. \qquad (7)$$

This is a nice and simple condition and, although engineers and scientists no doubt assume that it generally holds, other individuals in society may beg to differ!

It is imperative, it would seem, that these problems be examined empirically, because if (7) does not hold, a decision to increase industrial output above some existing level amounts to reducing the level of welfare (or psychic or real utility income) of society, since an increase in industrial output, although it could be accompanied by an increase in total output, would necessarily reduce the output of some other sector or class in the economy and, hence, would reduce the number of individuals who are "alternatives" to engineers and scientists.

The argument of the last two paragraphs rests, as indicated, on the assumption that units of industrial output require a certain number of engineers and scientists.

Admittedly, the assumption does not say that this ratio must hold for each and every component of *M*-output, but that it must hold on the average. Furthermore, the proportion need not be fixed, but must be positive. It must be stressed that this is an empirical assumption and, as a consequence, can only be established by careful empirical work based on time-series and/or cross-sectional data for a number of countries. Should the assumption not hold, the neo-Listian argument for an industrial strategy would vanish.

A number of other arguments used to justify an industrial strategy are seen as more or less distantly related to the List argument. They all revolve around some hypothesis about the superiority of increases in industrial output or of some parts of industrial output (recall equation (2) above) over other kinds of output in inducing productivity improvements (i.e., skills, knowledge, experience, etc.). Such arguments, like those of List and Veblen, could constitute a legitimate case for an industrial policy if, by shifting resources from other classes of output towards industrial output, one could capture social savings in excess of private savings through the exploitation of these allegedly nonexploited externalities. The real question in this alternative version of the argument is also an empirical one: namely, can one find activities in which the skills, knowledge, experience, etc., and hence productivity of factors, would be enhanced and their earnings increased, which are not now exploited? Can one identify activities with a higher social than private yield in terms of skills, training, etc., which are not now sufficiently exploited? These are the questions that must be answered in order to formulate an industrial policy.

The second economic factor that could contribute to the existence of a gap between $\bar{M}$ and M^* is the presence of risk and uncertainty. To be more specific, a gap between $\bar{M}$ and M^* could exist because of the presence of more uninsurable risk in the *M*-output sector than in the other output sector of the economy.

The main reason why the presence of excess uninsurable risk would lead to a gap between actual and optimal *M*-output is that, in the absence of insurance, risk-averse entrepreneurs would have to carry risk, which, if they could do otherwise, they would sell to an insurer to whom they would pay a premium. Decisions about the flow

of output would therefore be adversely affected by considerations of risk and uncertainty. Since an optimal allocation of resources requires that all individuals and institutions in society carry no more risk than they wish to assume, the absence of insurance markets, though not a presumption that $\bar{M} \lesseqgtr M^*$, is, however, a ground for investigation and interrogation.[11]

The absence of insurance markets for a large class of commodities does not constitute grounds for believing that $\bar{M} \lesseqgtr M^*$ because, as stated above, it is differential risk that matters; in other words, it is the difference in the level of uninsurable risk in the various classes of output in the economy that is relevant. In addition, the absence of insurance markets cannot be taken as reflecting differential risk, because there exist a larger number of institutions and mechanisms that operate to mitigate either risk itself or its effects. Among these, to illustrate, is the diversification of production and the issuance of common stocks, both of which reduce the risk to producers.[12] As a consequence, if there are fewer opportunities in the M-sector for diversification, common stock financing, etc., than in the other sectors *relative to* the total risks that exist in all sectors, the M-sector would be disadvantaged and a rationale for an industrial strategy could be provided by appealing to considerations of risk. Otherwise, an industrial strategy cannot be based on those grounds.

The discussion of the preceding paragraphs serves to introduce the third factor that could account for the presence of a gap between $\bar{M}$ and M^* -- namely, monopoly and oligopoly. The reason for linking differential risk to monopoly is that, in trying to reduce the level of risk they face, firms *may*, through diversification of production or other mechanisms, expand to a relatively large size and thus acquire market power. Diversification of production will serve as an illustration to analyse how this phenomenon operates. It is possible to reduce risk

---

[11] On this proposition, see K. J. Arrow, *Essays in the Theory of Risk-Bearing* (Chicago: Markham Publishing Co., 1971), esp. Chapters 4-7. See also H. Demsetz, "Information and Efficiency: Another Viewpoint", *Journal of Law and Economics* (April 1969); and B. S. Yamey, "Monopoly, Competition and the Incentive to Invent: A Comment", *Journal of Law and Economics* (April 1970).

[12] See Arrow, *op. cit.*

by diversification only if the profits resulting from the addition of new product lines are less than perfectly correlated to the profits of the product lines already exploited by the firm; that is, if the correlation coefficients between profit streams from selling different products are less than one, the addition of a new product line will reduce total variance and, if we measure risk by variance, will reduce the total risk that attaches to total profit. However, by adding product lines, the size of the firm will increase perhaps even relative to that of other firms in the industry, if they do not all have the same possibilities (i.e., the same comparative advantage) of adding product lines with less than perfectly correlated profit streams. The equilibrium amount of risk that an entrepreneur seeks may, in some instances, be reached only when the industry is a monopoly or an oligopoly.

Obviously, the addition of product lines with less than perfectly correlated profit streams is not the only source of monopolistic and oligopolistic structures. Monopoly and oligopoly can result from properties of the technology that can be most efficiently used to produce certain products -- that is,from technologies whose minimum efficient size relative to the market (i.e., to demand) is large -- what is called "economies of scale". Monopoly may exist also simply because of the desire of some entrepreneurs to acquire market power and because of their success in doing so.

Whatever the source of monopolization -- except when government is the source, as discussed further on -- it will undoubtedly lead to a difference between $\bar{M}$ and M^*. Furthermore, as with externalities and risk, only if we have differential monopoly can we base an industrial policy on this point; that is, only if the degree of monopoly is larger in the M-sector than in the other sectors of the economy, can we formulate an industrial strategy based on this argument. Finally, since monopoly leads to a smaller output than that resulting from a competitive structure, it follows that an industrial policy based on excess monopoly in the M-sector (or any other sector) will lead to a reduction in the size of the competitive sector and to an increase in that of the monopolized one.

The final economic factor is past government intervention. The empirical analysis of this factor is always complicated. Since, however, there is no reason to believe

that it is unimportant, one must certainly try to investigate its effects. The first and most important distinction to make is between the consequences of policy that are desired and directly engineered and those that are undesired but appear as a by-product or unwanted result of the pursuit of a desired objective. For example, a government may desire to promote industrial production and, to that effect, may implement a full program of tariff barriers. Such a program may have been chosen as a policy instrument because of real restrictions on the choice of other instruments or because it was believed, and presumably could be documented, that the dead-weight loss from the existing pattern of excise and sales taxes was such that a tariff structure would reduce, if not eliminate, these losses. Or, use may have been made of a tariff because decision-makers were ignorant of the existence of other instruments or simply because tariffs were a discreet way to distribute patronage.

Whatever the reason for selecting tariffs as an instrument with which to pursue an industrial policy, let us assume that such a selection leads to a larger industrial output, thus enabling the objective of the policy to be totally or partially achieved. However, we would expect that the use of tariffs would promote foreign investment and would lead to the multiplication of relatively inefficient firms -- a situation that decision-makers might deplore but could not avoid in certain contexts.

Alternatively, it is easy to visualize that a decision by the government to reduce foreign investment or to rationalize the production of enterprises might lead to a reduction in the flow of industrial output. Such conflicts between the intended and the unintended should not be minimized because they are characteristic of every public policy. Only in a purely *laissez-faire* world where externalities, risk, and monopolistic elements did not exist, would this problem not arise. *A priori*, there is therefore no reason to believe that most public policies, from regional balance to pollution control, to housing, to education, to health and welfare, do not produce a gap between $\bar{M}$ and M^*.

Political factors -- Before investigating the various policy instruments that could be used to close the gap between $\bar{M}$ and M^*, we must devote some attention to the political factors that could lead to a gap between the actual and the desired level of industrial (and other) output. It suffices to recall that the political factors

are nationalism and neo-mercantilism to note that they enter the argument by operating on the level of industrial output demanded and not on the supply side of the market, as in the case of the economic factors. We shall discuss nationalism first and then move on to neo-mercantilism.

The best way to rationalize a nationalistic demand for industrial output in excess of the level that would be produced in its absence is to assume that some citizens, whom we refer to as nationalists, derive satisfaction either from industrial production *per se* or from a particular bundle of industrial output. In both cases, this satisfaction must be assumed to be in excess of that received from the consumption of the industrial products themselves.[13] For example, an individual travelling by air from point A to point B will derive utility that at the margin, may be considered at least as large as the price paid for the travel, but he may derive surplus utility[14] from the knowledge that the aircraft in which he is travelling belongs to the collectivity of which he is a member. The illustration may be more convincing if we think of an individual who does not travel by air but derives satisfaction from the fact that the airline company or companies operating in his country are owned by nationals of his country.

If individuals derive utility or satisfaction from the level of industrial production in addition to the utility they get from consuming industrial products directly as final products or indirectly as components of final products, this may lead to a gap between $\bar{M}$ and M^*. Put differently, if some individuals derive utility from industrial production *per se* and are willing to allocate resources to the production of industrial output that they will not directly consume, the level of actual output $\bar{M}$ will fall short of the level of desired output M^* and a reduction in the size of the gap will lead to an increase in real (psychic or utility) income.

---

[13] This way of looking at the problem was first suggested by Harry Johnson in "An Economic Theory of Protectionism, Tariff Bargaining, and the Formation of Customs Unions", *Journal of Political Economy* (June 1965).

[14] This surplus utility is not to be confused with the consumer surplus he receives from air travel; it is additional to consumer surplus.

Finally, a nationalistic demand for an industrial policy may originate in a country's desire to produce import-competing industrial goods to reduce its dependence on one or on all other countries. This is a demand for partial or total autarky. Interestingly, an industrial strategy based on this type of demand can also be rationalized by a desire to reduce one group's dependence on another within the same country. If these groups are distinguished by religion, language, or colour, such an industrial policy would be discriminatory, although it would still give rise to a gap between $\bar{M}$ and M^*.

It must be stressed that the increase in real income consequent on the reduction in the difference between $\bar{M}$ and M^* resulting from nationalism may, and generally will, lead to a reduction in real output so that an industrial policy introduces a wedge between psychic or utility income and output. The reason for the appearance of the wedge is that all the policy instruments leading to the creation of nationalistic surplus utility are costly to use -- that is, they absorb some amount of real resources.

The second political factor that could create a gap between $\bar{M}$ and M^* has been labelled neo-mercantilism because, even if the modern form of this phenomenon presents some differences with classical mercantilism, the resemblances are also very striking. Neo-mercantilists do not appear to derive any satisfaction from the amount of precious metals in a country's possession, nor do they appear to care about the level of international monetary reserves. The arguments they put forward to justify an increase in the level of a country's exports are consequently not usually based on the amount of precious metals or on the amount of international reserves in the country, but rather on the number of jobs that exports of manufactured goods can create and, hence, on the absolute population size considered to be desirable.

It is for this reason that the label "neo-mercantilism" is used here, for it appears that the absolute size of the population was an important consideration for classical mercantilists. This preoccupation originated from a desire to acquire both military and political power and consequently may have differed from what one observes today, although a number of policies implemented in France during the earlier years of the Fifth Republic appeared to have some distinct resemblance to classical mercantilism.

However that may be, justification for an industrial policy -- that is, for a policy of what is currently produced -- based on the absolute size of the population or on the absolute number of jobs that can be offered in a country would, according to the nomenclature of this Paper, have to be called neo-mercantilist. If some members of society wish to increase the absolute size of the population by altering the composition of production and, in particular, by developing the production of industrial commodities, they will want to increase the level of M-output and, consequently, a gap will exist between $\bar{M}$ and M^* before such a policy can be implemented.

A neo-mercantilistic industrial strategy would also exist, if the justification for increasing the level of M-output were a particular distribution of the population. In other words, an industrial strategy could be rationalized on the ground that some spatial distributions of a given population are superior to others. The arguments in this case are usually stated in terms of the superiority of some industrial mix over others. If the income redistribution aspects are put aside, an industrial strategy based on this argument would be justified if, and only if, the costs of achieving a particular spatial distribution of the population were less with that policy than with others.

The argument of this section can be summarized as follows: a gap or difference between the observed or actual (M) and the desired (M^*) levels of industrial production in a country can result from the p esence of (1) differential externalities; (2) differential risk; (3) differential monopoly and oligopoly; and (4) past differential government intervention. In addition, a gap may exist because of a surplus demand, which may be nationalistic and/or neo-mercantilistic in nature. As we shall see in the next section, this may be reduced or closed by using policy instruments that are apposite to each cause. Whether it should be reduced, and by how much, will also be examined.

4. POLICY OPTIONS

In this section, for each of the six factors that can lead to a difference between $\bar{M}$ and M^*, we discuss the best policy instruments that can be used to reduce the gap.

The policy prescriptions are in most cases fairly simple. First of all, however, it must be emphasized that we cannot have a blanket industrial strategy that is unrelated to the cause of the gap between $\bar{M}$ and M^*. Indeed, that is the main reason why we have analysed in such detail the factors that may lead to a gap.

This point will become clearer as we proceed, but it is an exceedingly important one. The absence of a theory in this area has led a large number of concerned individuals to suggest that one particular policy instrument could be used to achieve any desired goal. Such a recommendation would apply if, and only if, the policy instrument were apposite to the source of the gap. Put differently, if externalities caused the gap between $\bar{M}$ and M^*, the policy instrument that should be used would *not* be the same as the policy instrument that should be applied if the gap were caused by risk, monopoly, or some other factor.

Let us therefore ask which is the best policy instrument to use if the source of the difference between $\bar{M}$ and M^* is the presence of externalities. It must be re-emphasized that the shortfall in the level of skills, productivity, or savoir-faire, which is covered by the word "externality", represents a shortfall in skills, productivity, and savoir-faire that are deemed to be socially necessary and in addition to those "acquired" by individuals. As a consequence, we need only be concerned with the skills, knowledge, savoir-faire, and training that is not profitable for individuals to acquire on a purely private basis.

The remedy is simple. In the case of all externalities that are assumed, for one reason or another,[15] not to elicit a private response, the most obvious solution consists in subsidizing the activity that generates the external economy. In our context, this implies that *ad valorem* subsidies should be paid to those industrial activities that are capable of generating a level of skills, or of improving productivity beyond the level that is profitably achieved on a private basis. The taxes required to pay the subsidies should be levied on the nonindustrial activities in the economy -- namely,

---

[15] Economists usually lump all impediments to private reaction or response under the heading of transaction costs. See Coase, *op. cit.*

on those activities that are necessarily overextended. The combination of taxes levied and subsidies spent, as indicated above, will attenuate the imbalance in the mix of production in the economy and will reduce the gap between $\bar{M}$ and M^*.

It need not be stressed that if there are externalities of the kinds described above in all sectors of the economy, though not of equal magnitude in all sectors, the above prescription still applies, *mutatis mutandis*. If, however, externalities of equal strength exist in all sectors of the economy, the best policy is one of non-intervention, since, in that case, a gap between $\bar{M}$ and M^* will not exist in the first place.

Finally, no other policy instrument is superior to subsidies for dealing with externality-generating activities. Tariffs have often been advocated to deal with one version or another of the industrial externalities argument (see List, for example). However, they are less efficient because a tariff entails a consumption cost, in addition to the production cost,[16] which is absent from subsidization, and because a tariff presupposes that the externalities are located in the import-competing industries and not in the export industries -- a presupposition that does not seem reasonable.

If the source of the discrepancy between the actual and desired levels of industrial output -- that is, between $\bar{M}$ and M^* -- is the presence of risk, against which private individuals would like to insure but cannot, either because of "excessive" loading charges (i.e., the administrative and other costs of calculating probabilities and collecting premiums) or because of the presence of moral hazards (i.e., the capacity of the insurance purchaser to affect the "state of the world") in the industrial sector in excess of what exists elsewhere in the economy, the government may wish to intervene in order to close the gap. In this case, the best policy is for the government to share the risk. The optimal method of doing this is not to allow deductions from income or profits or losses incurred as a result of engaging in risky activities, such as research in the development of new processes, new

---

[16] H. G. Johnson, "Optimal Trade Intervention in the Presence of Domestic Distortions", in R. E. Baldwin *et al.*, *Trade Growth and the Balance of Payments* (Amsterdam: North-Holland Publishing Co., 1965).

products or new organizational techniques, since new firms or firms that are currently nonprofitable cannot be covered by the available loss offsets. The optimal policy is to share in all the losses from risky ventures with a system of subsidization or by supplementing loss offsets by subsidies if the tax system is deemed to be the best administrative method available.

One of the risks of engaging in some economic activities is that of not being able to capture the stream of income that may result from research activity. This risk may be present even if copyright and patent legislation exists, because such legislation confers to an individual or a company the right to exploit a given invention, but that right may be difficult to enforce. In this case, loss offsets imbedded in the tax system and supplemented by subsidy schemes will not be efficient unless we can evaluate correctly the risk of not being able to appropriate the benefits of the research. Since this is basically an impossible task, another way of dealing with the problem must be found.

One solution might be to separate the research and inventive activities from other activities of organizations and to reward the individuals engaged in the former by paying sums unrelated to the short-run profitability of these activities. Whether the yield from research could or could not be appropriated by the researchers would then have less bearing on their desire to produce. The separation of research and inventive activities from other activities of the firms is to some extent already done in the economy, but it could be further extended.

If the gap between $\bar{M}$ and M^* is caused by the existence of monopoly, it is important in formulating the optimal policy to ascertain the exact origin of the monopolization. To illustrate, monopoly caused by the existence of technological economies of scale that produce substantial social savings differs from monopoly resulting from the purchase by one firm of competing firms solely to eliminate competition, where, as a consequence, social savings from monopolization are negative. The prescription in the latter case would be to dismantle the monopoly, while, in the first case, one should deal with it either by regulation or by public take-over.

Expressed differently, to deal with a gap between $\bar{M}$ and M^* that originates from monopolization, a competition policy is required, although not a blanket policy, since

various problems have to be taken into account when making decisions about the extent of the costs of monopolization and about the best way to deal with it, such as problems of exploiting economies of scale (rationalization), those that arise in dealing with risk, the problems posed by trading in international markets dominated by foreign government-sponsored monopoly organizations and other more or less similar difficulties.

It is not possible to develop within the framework of this Paper a proposal for so complex a matter as competition,[17] but it should be observed that the oft-stated argument that an industrial policy must be co-ordinated with a competition policy is one that assumes that the gap between $\bar{M}$ and M^* is caused by monopolization. The main policy questions, as stated previously, are whether monopoly is an important source of social savings because it permits the exploitation of economies of scale, of special knowledge that would otherwise remain unexploited, of certain specific qualities in very short supply, and other similar sources of savings; whether it exists because of the need for a countervailing power, especially in foreign markets; whether domestic firms may be facing government-sponsored cartels; or whether monopoly is a dead weight on society.

One need not stress that the gap between $\bar{M}$ and M^* may originate from the presence of monopoly in the resource industries, in the service industries, in agriculture, etc. If this is the case, the application of a competition policy to these sectors will close or reduce the gap. As in the situation that prevailed when monopoly existed in the industrial sector, it may be impossible to close the gap completely because it may not be desirable, from a social point of view, to forgo the savings that some degree of monopolization in some of these industries makes possible.

If the gap between $\bar{M}$ and M^* is caused by the implementation of past government policies, a new set of questions is posed. These questions are not easily answered because each of them implies a re-examination of the policy objectives and of the efficiency of the

---

[17] Furthermore, this has been done to a remarkable extent in the Economic Council's *Interim Report on Competition Policy* (Ottawa: Queen's Printer, 1969) and is imbedded in Bill C-256, which was presented to Parliament in 1972.

past policies in achieving their objectives. To illustrate, let us suppose that the gap between $\bar{M}$ and M^* can be imputed to the existence of an excess of money wages over the value of the marginal product of labour in a given area and that this excess is the by-product of a policy that consists in fixing money wage rates through centralized collective bargaining without taking into account differences in marginal productivities and/or product prices in the various areas. The real policy question is whether the centralized collective bargaining leading to the gap is to be maintained or abandoned. This example is illustrative of a large class of public policies that may indeed lead to a gap between $\bar{M}$ and M^*.

In none of these cases can the prescription be to eliminate all policies or to neutralize them; therefore the difficulty facing the policy-maker is essentially a classical problem in the economic theory of second-best. We need only think of the various ways in which governments intervene in a modern economy -- from tariffs and other instruments of commercial policy to purchasing and selling policies, to incentive policies in agriculture, natural resources, manufacturing, exports, etc. -- to realize how complicated the problem is.

There is indeed no simple prescription in these cases, as the economics of second-best makes abundantly clear.[18] In every instance, it must be decided whether the policy objective pursued in the past is still desirable. If it is, analysis must be made of the *negative* impact on this objective of the particular method used in the past to attain the other policy goals. A choice must then be made whether to change the policy instrument used in the past or simply correct its bad effects.

To illustrate, suppose that, in the past, the desire for a more equitable distribution of economic activity over regions had led the government to implement a system of industrial incentive grants that in turn led to a fragmentation of the industrial base, to a multiplication of product lines, and hence to a poor international competitive posture. Let us assume that this produced a

---

[18] J. E. Meade, *Trade and Welfare* (London: Oxford University Press, 1955). R. G. Lipsey and K. Lancaster, "The General Theory of Second Best", *Review of Economic Studies*, vol. 24 (1956-57). O. A. Davis and A. Whinston, "Welfare Economics and the Theory of Second Best", *Review of Economic Studies*, vol. 32 (1965).

situation where the level of industrial output fell short of the level desired. Such a situation, which is not untypical of second-best problems, should cause the decision-maker to re-examine the policy objective of a more equitable regional distribution of economic activity and to ask whether that objective is still desired; then he should ask whether the objective, if still desired, should be achieved by the use of industrial incentive grants. Only then would he be in a position to formulate an industrial strategy that takes all these factors into account.

It is clear that the task of formulating an industrial strategy in this particular case is complicated. It must be added that these complications are compounded by the fact that past policies may not be easily changed because special interests have become vested in them. Moreover, the essential difficulty in formulating an industrial policy in an environment in which second-best considerations have to dominate can be an occasion for special-interest groups to use an essentially unclear and difficult context to further their own advantage at the expense of society at large. This aspect of the problem is aggravated by the fact that these groups may have special allies in the governmental bureaucracy in the sense that those who implement and administer the policies may find it in their own interest to "prove" to their superiors that past policies are essential and that no other way of achieving the desired goal is possible.

In summary, it must be recognized that it is easy to exaggerate the negative effects of past government policies just as it is easy to exaggerate their positive effects, especially in formulating an industrial policy. Indeed, it must be recalled that past public policies will only lead to a gap between $\bar{M}$ and M^* if the effects of policies in the industrial sector are not "compensated" or "balanced off" by the effects of other policies operating in the agricultural, resource, and service,sectors, etc., because if they are, a gap will not appear. This means that a policy that appears to be distorting the allocation of resources in the industrial sector may not be doing so because it is already "compensated" by the "distorting" effect of other policies in other sectors.

A gap between $\bar{M}$ and M^* originating from neo-mercantilism or nationalism can be dealt with as though no difference exists in the nature of the gap regardless

of which phenomenon obtains. The reason for this is that, in the absence of empirical knowledge, we are incapable of specifying beforehand the meaning of these policies. For the same reason, it is impossible to say *a priori* which is the best instrument to use in implementing an industrial strategy based on these grounds.

Indeed, even though it can be argued that nationalists and neo-mercantilists would use such policy instruments as tariffs, subsidies, quotas, nationalization, etc., in trying to achieve their goals, it is impossible to say which would be the best instrument to use, except after a careful analysis of the particular nature of the nationalistic or neo-mercantilistic desire.

Suppose that a nationalist wanted to promote an industrial policy because he wished to reduce his country's dependence on industrial imports from foreign countries -- that is, because he wanted to promote industrial autarky. The optimal policy instrument to achieve that goal would differ greatly from the measure that would be required if he based his attitude on the belief or knowledge that the population of the country wants a larger output of industrial production because the satisfaction derived from industrial production exceeds the satisfaction received merely from consuming industrial products. In the first case, the best policy instrument to use would be a tariff; in the second, it would be a subsidy to production.[19]

Having determined the nationalistic or neo-mercantilistic objective, a simple analysis of the welfare costs of policy instruments would in all cases dictate the best one to use. As the example above shows, the most efficient instrument by which to achieve a prescribed goal would depend on the goal chosen.

5. THE SOCIAL OPTIMUM

Although the preceding section dealt with finding the best policy instrument by which to pursue a given industrial policy, at no point was the question of the socially optimal strategy raised. In other words, we

[19] J. Bhagwati and V. K. Ramaswami, "Domestic Distortions, Tariffs, and the Theory of Optimum Subsidy", *Journal of Political Economy* (February 1963).

did not ask whether the gap between $\bar{M}$ and M^* should be closed, or what should be the socially optimal gap between $\bar{M}$ and M^*.

In a way, the assertion in the last paragraph of Section 4 is not completely exact because, in most cases, the costs imputed to alternative policy instruments are not independent of the level at which the policy objective is set; however, it is largely correct, since, for any predetermined level of the objective, a best policy instrument can be found. In any case, the question of what constitutes the socially optimal industrial strategy must be asked.

The answer is fairly simple. It states that the optimal size of the gap between $\bar{M}$ and M^* is that which occurs when the marginal benefits from reducing its size are equal to the marginal benefits of the last dollar that can be obtained by allocating resources elsewhere in the economy. If the cost of public intervention and/or private adjustments resulting from reactions to externalities, risk, etc., were zero, the equality of marginal benefits for the last dollar spent in all directions would eliminate the gap between $\bar{M}$ and M^*. Since the cost is not zero, the gap itself will not be eliminated; it will be proportional to the cost of intervention.

The socially optimal industrial strategy is therefore one that economizes on all resources, including those used for the purpose of intervention. Given the size of externalities, risk, monopolization, etc., and given that the best policies are selected to achieve the desired end, the socially optimal strategy is that which equates the marginal benefits from public intervention and private adjustments to the marginal costs of these two variables.

6. A SECOND-BEST POLITICAL CONSIDERATION

In discussing the best policy instruments by which to achieve a preselected level of industrial output, it turned out that the economic prescription was often to use subsidies; that is, the rule was that the government should subsidize activities that seemed to deserve encouragement. Such a policy would be efficient on purely economic grounds, but its application poses a political, or politico-economic, problem: in order to administer the payment of

subsidies and to prevent economic agents from over-exploiting the opportunity created by the subsidies, governments appear to be forced to shift from framework-policy intervention to operation-by-operation intervention.

Let us examine these two administrative methods of intervention to determine if one is likely to be more efficient than the other. Framework policies are designed to alter the constraints that help determine the responses of economic agents to change, while operation-by-operation intervention or, more simply, direct intervention, refers to policies aimed at controlling the responses of economic agents directly, one by one as it were. Framework policies, as the phrase implies, modify the context, environment, or framework of decision-making, without intervening in the decision-making process itself. Thus their purpose is to make it profitable for economic agents responding to a different framework to engage in actions deemed by the public to be socially more desirable than those that would be undertaken if the framework were not altered. Direct intervention takes place at the decision-making level itself and, therefore, must occur when and where the economic agents decide to act.

It would seem that, in reality, the payment of subsidies has a tendency to transform itself from a framework into a direct kind of intervention. This, it would appear, results from the fact that actual and potential recipients of subsidies find it to their advantage to adopt certain strategic behaviours that make it difficult, if not impossible, for the donor to know whether the subsidy should or should not be paid. To overcome the difficulties posed by the presence of strategic behaviour, donors tend to adopt control measures that in effect become very direct kinds of intervention, and eventually private decision-making is replaced by bureaucratic decision-making within the confines of the private institutions.

This substitution of bureaucratic for private decision-making initially takes the fairly innocuous form of specifying the conditions under which subsidies can be obtained. Since these conditions only define the context in which strategic behaviour manifests itself and cannot be expected to eliminate that kind of behaviour, inevitably, with the passage of time, more detailed conditions are specified, until finally bureaucratic views about the best combinations of factor inputs and product mix become determinant.

The extreme form of substitution is the creation of Crown corporations, through which public subsidies are paid to those activities the government wishes to encourage.[20] There is no easy solution to this problem, which is of concern to public administrators rather than economists. But, in the implementation of an industrial strategy, it must be faced squarely and kept in mind, if subsidies paid out of public funds are not to become incentives to the expansion of activities that must not be encouraged at the expense of others that should be promoted.

7. CONCLUSION

In this Paper, we have suggested a general definition of the conditions that warrant the formulation and implementation of an industrial strategy. We have also examined the best policy to be used in shaping an industrial strategy, in all those cases where it is *a priori* possible to do so. In the other cases, we have indicated the nature of the empirical exercises required to arrive at the correct policy. Then, having defined the socially optimal level of industrial output, we have stressed one particular problem that is likely to be encountered in the implementation of some aspects of an industrial strategy.

To the extent that the conditions calling for an industrial strategy are correctly specified in this Paper, and that the list of these conditions is complete, other arguments brought forward to justify an industrial strategy must be assumed to be rationalizations of some hidden special private interests. This danger is always present in government intervention, but it is not peculiar to an industrial strategy. It is the real nature of this danger that has induced me to devote so much space to the conceptual foundations of a socially advantageous industrial strategy.

---

[20] On this point, see Albert Breton, "Crown Corporations as an Alternative to Industrial Incentive Grants", in *Challenge* (Winnipeg: Manitoba Economic Development Advisory Board, 1971).

Canada.
s for an
gy.

A Conceptual Basis for an Industrial Strategy by Albert Breton *Economic Council of Canada*