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**Department of Foreign Affairs
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POLICY STAFF PAPER

NO. 94/24

**The Impact of Exports:
An Input-Output Analysis of Canadian Trade**

by

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December 1994

Dept. of External Affairs
Min. des Affaires extérieures

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An Input-Output Analysis of Canadian Trade**

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Executive Summary

Trade development centres on the identification of domestic industries that will provide domestic economic gains from trade and the identification of expanding, or potentially expanding, export markets. This Paper uses the 1990 version of the Statistics Canada National Input-Output (I-O) model to analyze Canadian exports by industry so as to assist in identifying the industries that are "best suited" to export. The industries considered best suited to export are those that provide the maximum domestic gains from trade through increased GDP, increased employment at relatively high average wages and increased economic activity in a number of domestic intermediate input industries in a chain reaction effect on production.

For Canada, international trade represents a significant share of national income, and is often held up as an important source of economic growth and well-being. Trade data suggest that merchandise exports represent about 26% of Canadian GDP, higher than any other G-7 country. The I-O model is able to identify the share of imported intermediate inputs used in the production of Canadian exports. By extracting that import share, which represents about 16% of the value of exports, one can determine the Canadian content -- or Canadian value-added -- of exports. When imported inputs are removed, the Canadian content of merchandise exports represents about 22% of GDP.

A similar exercise can determine the Canadian value-added of exports to particular markets. By extracting the import content of intermediate inputs used in the production of Canadian exports and extracting the Canadian content of intermediate inputs used by other countries in the production of their exports to Canada, a type of "Canadian value-added balance" can be calculated. Following this approach, this Paper estimates that Canada's 1993 trade surplus of \$19.7 billion with the U.S. can be transformed into a value-added deficit of approximately \$4 billion. The Canadian export sector relies much more on imported intermediate inputs than that of the U.S., indicating that trade statistics can be misleading in terms of the contribution of trade to the domestic economy.

In terms of employment, the I-O reveals that in 1990, 1,708,580 Canadian workers were engaged either directly or indirectly in the production of exports. In other words, in 1990 \$1 billion worth of exports supported 11,658 total jobs in Canada. Nearly 10% of all export related jobs are in the Transportation Equipment Industries, which include aircraft industries and motor vehicles and parts industries.

In analyzing the I-O model's industry results in some detail, and keeping in mind

the fundamental economic objectives of international trade (being higher national income and economic well-being), industries are judged to be best suited to export if, in response to a positive merchandise export shock to the model, they:

- have a low propensity to import intermediate inputs;
- export most of their output;
- have a high domestic value-added content of exports;
- create a significant number of jobs relative to domestic value-added in the production of exports; and
- create jobs with relatively high average salaries.

The overarching principle that guides the above criteria is that, all other things being equal, the higher the degree of input transformation that takes place domestically, the greater the domestic economic impact of exports. Simply put, internationally competitive exports that rely more on an extensive and competitive domestic input transformation process will stimulate greater production and employment in domestic supplier industries. This Paper is careful, however, not to suggest that internationally integrated industries (i.e., those that rely extensively on imported inputs in order to remain internationally competitive) are any less important to the development of a competitive export sector, nor that there should be a domestic content requirement for such industries, nor that there is a lack of obvious or significant employment or GDP gains associated with exports from internationally integrated industries. With a relatively small domestic market, Canada cannot become a world-class competitor in all inputs and all product lines. Imported inputs will remain central to the competitive survival of several export industries.

This said, the resource industries perform better than any other group of industries with respect to their export suitability as defined above. Agriculture & Related Services Industries, Mining Industries and Crude Petroleum & Natural Gas Industries -- all significant exporters -- do particularly well. The only drawbacks in the resource sector are that some industries' output is used primarily as intermediate inputs in other export industries (i.e., some resource industries do not export most of their output), and some resource industries do not create as much employment as industries in other export sectors.

In addition to the resource extraction industries, manufacturing industries that export processed resources are also identified by the I-O as excellent export industries. Together, the food, tobacco, wood and paper industries account for nearly 17% of Canada's exports, and their heavy reliance on domestic resources causes the type of chain reaction effect on domestic production that is one of the keys to extending the positive domestic economic impact of exports.

Beyond the resource processing industries, the other manufacturing industries' results are mixed. As a group, other manufacturers rely much more on imported intermediate inputs in the production of exports, and are roughly split between industries that create a significant number of jobs relative to domestic value-added in the production of exports and industries that create relatively high-paying jobs.

For all the attention that high-tech industries typically receive whenever the formulation of trade policy or industrial policy is debated, they are not much different than other manufacturing industries in terms of export suitability. In fact, high-tech industries appear to operate in relative isolation from the domestic economy, since their output is largely exported and their intermediate inputs are often imported. Like other manufacturers, high-tech exporters are split between those that pay well and those that create more jobs.

The I-O approach is admittedly limited in that it does not capture the nonquantifiable spill-overs that result from high-tech production. It is often argued that high-tech industries cause other industries located nearby to become more productive and competitive through technology transfers and other spill-overs. Although that might be the case, and the spill-overs might be sufficient to justify high-tech export initiatives, the I-O results should at least temper high-tech enthusiasm. In terms of measurable domestic economic gains, such as increases in employment or GDP, high-tech industries are not an obvious choice for the targeting of export initiatives.

By analyzing exports on an industry-by-industry basis, the I-O provides a number of lessons in terms of the appropriate approach to designing and implementing policies and programs that focus on enhancing Canada's export performance. Those lessons include:

- Achieving a perpetual trade surplus, or increasing the Canadian share of a particular foreign market, or participating in the globalization process are not -- and should not be -- the ultimate goals of trade policy in general and export initiatives in particular. At the most fundamental level, trade is undertaken in

order to increase domestic economic well-being, and its success is eventually measured in terms of gains in national income. DFAIT trade programs must be based primarily on achieving domestic gains from trade.

- The development of export initiatives must begin at home. Trade officials need an excellent understanding of the structure of Canadian industries in order to direct successfully their export initiatives and foreign market assessments to those industries that can deliver the maximum domestic economic gains from trade.
- The industries that, according to the I-O, deliver the maximum domestic economic gains from trade are the resource industries and the resource processing industries. They must not be overlooked in terms of government export initiatives. Manufacturing industries, including high-tech industries, need to be very carefully analyzed in the context of specific economic goals before they can be recommended for particular export development initiatives.
- The identification of foreign markets to which the best suited Canadian industries can potentially increase their exports should be the last step in DFAIT led export initiatives. Only after the appropriate domestic industries are identified should the search for new markets for their products begin.
- The I-O reveals that there is a tradeoff between industries whose exports create a large number of direct jobs and industries whose exports create jobs that pay well. There are not many industries that generate a large number of well paying jobs in their production of a given level of exports. Trade policy officials must be aware of the employment effects of trade. It is imperative that export initiatives are consistent with, and fully integrated with, other government economic policy priorities, including those with respect to employment.

By running the I-O model four separate times for exports to the U.S., the EU, APEC countries (minus the U.S.) and the rest of the world, this Paper was able to specifically analyze Canadian exports, by industry, to those regions. No single market emerged as the "best" export destination. The limited contribution of I-O analysis in the selection of export markets emphasizes the fact that there are a number of approaches and analytical techniques that are required in the formulation of a comprehensive government export development program. The I-O is only one analytical tool that, if used properly, can contribute to a better understanding of the export sector, and ultimately the delivery of more effective government export initiatives.

Résumé

Le développement du commerce consiste principalement à repérer les industries canadiennes dont les échanges commerciaux procureront des gains économiques au pays, ainsi que les marchés d'exportation en croissance ou offrant un potentiel de croissance. Le présent document se fonde sur la version de 1990 du modèle national des intrants-extrants de Statistique Canada pour analyser les exportations canadiennes par industrie, afin de repérer les "meilleures" industries exportatrices. Ces industries sont celles dont le commerce sera le plus profitable au pays en termes d'accroissement du PIB, de création d'emplois relativement bien rémunérés et de progression de l'activité économique dans un certain nombre d'industries intérieures produisant des intrants intermédiaires, par un effet de réaction en chaîne sur la production.

Le commerce international représente une large part du revenu national du Canada et est souvent considéré comme une importante source de croissance économique et de bien-être. Les données sur le commerce indiquent que les exportations de marchandises représentent environ 26 % du PIB canadien, une proportion supérieure à celle de tout autre pays du G-7. Le modèle des intrants-extrants permet de déterminer la part d'intrants intermédiaires importés qui entrent dans la production des exportations canadiennes. En retranchant cette proportion, soit environ 16 % de la valeur des exportations, on peut déterminer le contenu canadien -- ou la valeur ajoutée canadienne -- des exportations. Les intrants importés étant exclus, le contenu canadien des exportations de marchandises représente environ 22 % du PIB.

Il est possible, de la même façon, de déterminer la valeur ajoutée canadienne des exportations vers des marchés particuliers. En retranchant la part des produits intermédiaires importés qui entrent dans la production des exportations canadiennes, et en excluant les intrants intermédiaires canadiens utilisés par d'autres pays dans la production de leurs exportations destinées au Canada, on peut calculer une sorte de « balance de la valeur ajoutée canadienne ». Selon cette méthode, il a été estimé aux fins du présent document que l'excédent commercial de 19,7 milliards de dollars du Canada avec les États-Unis en 1993 peut être transformé en un déficit de la valeur ajoutée d'environ 4 milliards de dollars. Le secteur canadien des exportations dépend beaucoup plus des intrants intermédiaires importés que celui des États-Unis, ce qui prouve que les statistiques du commerce peuvent être trompeuses quand vient le temps d'évaluer la contribution du commerce à l'économie intérieure.

En termes d'emploi, le modèle des intrants-extrants révèle qu'en 1990, 1 708 580 travailleurs canadiens participaient directement ou indirectement à la production de biens d'exportation. Autrement dit, 11 658 emplois canadiens au total étaient soutenus par chaque milliard de dollars d'exportations. Près de 10 % de tous les emplois liés aux exportations se trouvent dans les industries du matériel de transport, qui comprennent les industries aéronautiques ainsi que les industries des véhicules et pièces automobiles.

En analysant les détails des résultats du modèle des intrants-extrants par industrie, tout en gardant à l'esprit les objectifs économiques fondamentaux du commerce international (accroissement du revenu national et du bien-être économique), on peut repérer les "meilleures" industries exportatrices, c'est-à-dire celles qui, lorsqu'on soumet le modèle à un choc positif en termes d'exportation de marchandises :

- ont une faible propension à importer des intrants intermédiaires;
- exportent la majorité de leur production;
- ont des exportations à forte valeur ajoutée canadienne;
- créent un nombre élevé d'emplois par rapport à la valeur ajoutée canadienne dans la production des exportations; et
- créent des emplois dont les salaires moyens sont relativement élevés.

Le principe essentiel à la base des critères ci-dessus est le suivant : toutes choses étant égales par ailleurs, plus le degré de transformation des intrants au pays est élevé, plus les exportations ont un impact bénéfique sur le pays. En d'autres termes, les exportations concurrentielles internationales qui s'appuient largement sur un processus concurrentiel de transformation des intrants au Canada stimulent davantage la production et l'emploi dans les industries en amont. Le présent document ne prétend pas, toutefois, que les industries à intégration internationale (c.-à-d. celles qui utilisent abondamment les intrants importés pour préserver leur compétitivité mondiale) aient un rôle moindre dans l'établissement d'un secteur d'exportation concurrentiel, ni qu'il faille imposer un contenu canadien à ces industries, ni qu'il y ait absence de gains évidents ou importants au chapitre de l'emploi ou du PIB associés aux exportations des industries à intégration internationale. Limité par la faible envergure de son marché intérieur, le Canada ne peut devenir un concurrent de classe internationale pour tous les intrants et toutes les

gammes de produits. Les intrants importés demeureront essentiels à la survie concurrentielle de plusieurs industries d'exportation.

Cela étant dit, la recherche des "meilleures" industries exportatrices (selon la définition ci-dessus) révèle un grand gagnant par rapport à tous les autres groupes d'industries : le secteur des ressources. Les industries agricoles et les industries de services connexes, les industries minières et les industries du pétrole brut et du gaz naturel -- tous d'importants secteurs d'exportation -- viennent aux premiers rangs. Les seuls points faibles qu'on peut observer dans le secteur des ressources sont que la production de certaines industries sert surtout à approvisionner en intrants intermédiaires d'autres industries d'exportation (c.-à-d. que certains secteurs de ressources n'exportent pas la majorité de leur production), et que certaines industries de ressources ne créent pas autant d'emplois que des industries d'autres secteurs d'exportation.

Outre les industries d'extraction de ressources, les industries manufacturières qui exportent des ressources transformées ressortent aussi du modèle des intrants-extrants comme d'excellentes industries d'exportation. Ensemble, les industries de l'alimentation, du tabac, du bois et du papier représentent près de 17 % des exportations canadiennes, et leur forte utilisation des ressources intérieure entraîne des effets en cascade sur la production, essentiels à l'accroissement des bienfaits économiques des exportations canadiennes.

Au-delà des secteurs de transformation des ressources, les autres industries manufacturières affichent des résultats variables. Globalement, les autres secteurs manufacturières incorporent beaucoup plus d'intrants intermédiaires importés dans leurs produits d'exportation, et se répartissent à peu près également entre les industries qui créent un nombre élevé d'emplois par rapport à la valeur ajoutée canadienne des produits d'exportation et les industries qui créent des emplois relativement bien rémunérés.

Bien que les industries de haute technologie attirent généralement beaucoup d'attention quand vient le temps de formuler les politiques commerciales ou industrielles, elles ne sont pas très différentes des autres industries manufacturières quant à leurs qualités comme industries exportatrices. En fait, les industries de haute technologie semblent être relativement isolées par rapport à l'économie intérieure, puisque leur production est largement exportée et que leurs intrants intermédiaires sont souvent importés. Comme les autres industries manufacturières, les exportateurs de haute technologie se répartissent entre ceux qui offrent des emplois bien rémunérés et ceux qui créent un nombre important d'emplois.

La méthode des intrants-extrants est certes limitée, car elle ne tient pas compte des retombées non quantifiables de la production des secteurs de haute technologie. Un argument répandu est que les industries de haute technologie aident les industries qui les côtoient à devenir plus productives et plus concurrentielles, grâce à des transferts technologiques et à d'autres effets incitatifs. C'est peut-être vrai, et les retombées sont peut-être suffisantes pour justifier des initiatives d'expansion des exportations de haute technologie, mais les résultats de l'étude des intrants-extrants devraient au moins modérer l'enthousiasme manifesté à l'égard de la haute technologie. En termes de gains économiques mesurables pour le pays, par exemple la création d'emplois ou la progression du PIB, les industries de haute technologie ne sont pas un choix évident comme cible des initiatives de soutien aux exportations.

L'analyse des exportations par industrie à l'aide du modèle des intrants-extrants permet de tirer certaines leçons quant à l'approche à adopter pour la conception et la mise en oeuvre de politiques et de programmes visant à améliorer la performance canadienne au chapitre des exportations. Ces leçons sont les suivantes :

- La réalisation d'un excédent commercial perpétuel, l'accroissement de la part canadienne d'un marché étranger particulier et la participation au processus de mondialisation ne sont pas -- et ne devraient pas être -- les objectifs ultimes de la politique commerciale en général et des initiatives d'expansion des exportations en particulier. Fondamentalement, le commerce a pour objet d'accroître le bien-être économique au pays, et son succès se mesure, en fin de compte, en termes de contribution au revenu national. Les programmes commerciaux du MAECI doivent essentiellement viser à ce que le commerce procure des gains à l'économie canadienne.
- Pour mettre au point des initiatives d'expansion des exportations, il faut d'abord analyser notre propre contexte. Les responsables des politiques commerciales doivent avoir une excellente compréhension de la structure des industries canadiennes, afin de pouvoir diriger leurs initiatives de soutien aux exportations et leurs évaluations des marchés étrangers vers les industries dont le commerce est susceptible de procurer le maximum de gains économiques au Canada.
- Les secteurs dont le commerce offre le plus de gains économiques au pays, selon le modèle des intrants-extrants, sont les industries de ressources et les industries de transformation de ressources. Ces industries ne doivent pas être oubliées dans les initiatives gouvernementales de soutien aux exportations. Les industries manufacturières, y compris les industries de haute technologie, doivent être analysées très attentivement à la lumière des objectifs

économiques précis qui sont recherchés, avant d'être recommandées comme cibles d'initiatives particulières d'expansion des exportations.

- La recherche des marchés étrangers offrant le meilleur potentiel de croissance pour les "meilleures" industries exportatrices canadiennes devrait être la dernière étape des initiatives de soutien aux exportations menées par le MAECI. Ce n'est qu'après avoir déterminé les industries canadiennes offrant les meilleures perspectives qu'on devrait entreprendre le repérage de nouveaux marchés pour leurs produits.
- Le modèle des intrants-extrants montre qu'il existe à la fois des industries dont les exportations créent beaucoup d'emplois directs et des industries dont les exportations créent des emplois bien rémunérés. Il n'y a pas beaucoup d'industries qui créent un grand nombre d'emplois bien rémunérés pour la production d'un niveau donné d'exportations. Les responsables des politiques commerciales doivent bien connaître les effets du commerce sur l'emploi. Il est crucial que les initiatives de soutien aux exportations soient compatibles, et entièrement harmonisées, avec les autres politiques économiques du gouvernement, notamment celles ayant trait à l'emploi.

L'exécution du modèle des intrants-extrants à quatre reprises, pour les exportations vers les États-Unis, l'Union européenne, les pays de l'APEC (sauf les États-Unis) et le reste du monde, a permis une analyse précise des exportations canadiennes vers ces régions, par industrie. Aucun marché unique n'est ressorti en tant que destination optimale des exportations. La contribution limitée de l'analyse des intrants-extrants à la sélection des marchés d'exportation met en lumière la nécessité de se fonder sur diverses approches et techniques d'analyse pour la formulation d'un programme gouvernemental global d'expansion des exportations. Le modèle des intrants-extrants n'est qu'un outil d'analyse qui, s'il est utilisé adéquatement, peut aider à mieux comprendre le secteur des exportations et, finalement, à rendre plus efficaces les initiatives gouvernementales de soutien aux exportations.

1. Introduction

From a trade development perspective, two (unranked) priorities are to identify domestic industries that will provide the economic benefits that are normally associated with international trade and to identify particular export markets that will provide, or potentially provide, exporters with opportunities for expansion. This Paper is meant to assist with the first priority and generally to address the second.

Trade policy initiatives, and particularly export initiatives, should seek out industries that are structured in such a way that the maximum domestic gains from international trade accrue with a minimum of cost and effort. The economic gains normally associated with international trade include higher real national income (gross domestic product, or GDP) and improved productivity. Those gains can imply increased employment levels and/or higher returns to the factors of production, including labour. This Paper will explore relationships between the gains from trade and the domestic content (or domestic value-added) of exports across a number of Canadian industries.

It has become a rather widespread response to proclaim that high-tech industries should be the focus of attention whenever policy questions on industrial performance or international trade are brought forth. Presumably, the often unstated thinking is that the "good" jobs are in high-tech, that new and lucrative market opportunities exist for high-tech products, and that the technology spill-overs from high-tech research, development and production will lead to productivity gains and improvements in the international competitiveness of other domestic industries. At first blush, the logic seems hard to counter. Yet, in most public fora there is normally little objective evidence offered in support of high-tech favouritism.¹

¹ That is not to suggest, however, that there is no credible research on the linkages between the gains from trade and the development of domestic high-tech industries. See, for example, L. Tyson, *Who's Bashing Whom? Trade Conflict in High-Technology Industries*, Institute for International Economics, Washington, D.C., 1992, and E.H. Preeg, "Who's Benefiting Whom? A Trade Agenda for High-Technology Industries", in *The Washington Quarterly*, Vol. 16, No. 4, The Center for Strategic and International Studies, Washington, D.C., Autumn 1993, pp. 17-33.

The identification of Canadian industries that can provide and/or reflect the merchandise gains associated with trade -- whether they be high-tech, medium-tech or low-tech industries -- is the crux of this study. It is not, however, a "picking winners" approach to trade policy. Using the Statistics Canada National Input-Output (I-O) model, it is an analysis of the relationships between Canadian industries, their suppliers (both domestic and international) and their interactions in producing exports. The relationships are complex and do not lend themselves to simple comparisons or a simple selection process in terms of the "best" industries to target for export initiatives.

It is important to recognize up front precisely what the input-output analysis of industrial interactions can tell us, and what it cannot, about the Canadian export sector. With regard to industries that export goods and/or are affected by merchandise exports, this Paper will show the extent to which different Canadian industries rely on imported inputs, how export-intensive different industries are, the employment impact of exports by industry, the GDP impact of exports by industry, the average wage of exporting industries and how these relationships can change by exporting to different geographic regions.² The upshot is not quite a ranking of "preferred" industries, but it does provide insight into the different domestic economic impacts that are the results of different industries' exports.

This Paper will point out how Canadian industries measure up to a number of prescribed criteria that will identify which industries' exports have a large and distinctly positive impact on the domestic economy. It will not explain how to favour some industries over others in terms of export initiatives. Instead, it will talk of favouring, focusing on, encouraging or preferring certain industries for export in an abstract sense. The details, such as whether favouring certain industries is feasible, as well as larger questions, such as whether export enhancement programs are in fact an appropriate public policy, are left aside.

Another question unaddressed by the Paper is whether the industries pointed out in the course of the analysis can actually compete internationally. The input-output approach is strictly domestic, and only part of a larger process that should be undertaken before public attention is directed to the promotion of particular domestic industries abroad. In addition to analyzing the structure of domestic industries, it is essential to analyze foreign markets separately to determine their likely receptiveness to Canadian exports.

² The relationships themselves do not really change, but industries change their product mix when exporting to different regions, resulting in an apparent change in some of the relationships.

The remainder of this Paper is organized as follows. Section 2 reviews the importance of trade to the Canadian economy and, by accounting for the import content of exports, calculates a new domestic value-added figure for exports as a share of GDP. In Section 3, some of the shortcomings of available export data are noted. Next, Section 4 provides details on the Statistics Canada National Input-Output model and its application in this Paper. The limitations of the model are clearly stated, as is the model's treatment of exports from service industries. In Section 5, the I-O model output tables that are generated in this Paper are explained and relationships between certain variables are explored intuitively and statistically. Section 6 uses the I-O tables to develop a number of criteria that can assist in identifying particular industries from which the domestic gains from trade are highest. Some of these are service industries that benefit considerably from, and facilitate, merchandise exports. The employment effects of exports are explored in some detail. Since the model was run for a number of different export destinations, Section 7 provides some regional comparisons. Finally, Section 8 lists conclusions and trade policy implications that are drawn from the analysis.

2. The Importance of Trade to the Canadian Economy

Being a small open economy, international trade is often held up as an important contributing factor to Canada's economic well-being. A simple international comparison reveals that merchandise exports are indeed a significant share of our GDP, but not extraordinarily so. Although Canada's merchandise exports are nearly four times higher than the U.S. share relative to GDP, European shares are closer to our own.

Although Table 2.1 is of interest in its comparison of the relative importance of exports in national income, it also raises a number of questions. Since the export share of GDP will be higher for economies that are more internationally integrated, it could inadvertently overstate the importance of trade to those economies in terms of the weight of exports in national income. An example illustrates the point. Consider France and the U.K., each with exports of about one-fifth of GDP. If French industries are quite integrated with those of France's international trading partners, then imported inputs could account for a significant share of some French exports. If, on the other hand, U.K. industries are not internationally integrated, then U.K. exports are likely to contain fewer imported inputs that are domestically transformed and re-exported by U.K. firms. In this case, the 19% of GDP that is accounted for by U.K.

exports would be a more accurate portrayal of the contribution of trade to national income than would be the French figure.³

Table 2.1
G7 Merchandise Exports as a Share of Gross Domestic Product, 1993⁴

Country	Share (%)
Canada	26
Germany	21
United Kingdom	19
France	17
Italy	16 (1992)
Japan	9
United States	7

Given the distortions that can occur in the trade statistics of internationally integrated economies, the question for Canada is how accurate is the 26% figure in demonstrating the importance of trade to the Canadian economy. Some Canadian industries, such as motor vehicles, are very much integrated with U.S. industries. A recent study by the OECD which examined the international sourcing of manufacturing industries in six countries found that Canadian manufacturers rely more on imported inputs than manufacturers in France, Germany, Japan, the U.K. and the U.S..⁵ In addition to motor vehicles, a number of other industries, including petroleum refining,

³ The point can also be made by considering the simple GDP identity $C + I + G + X - M = \text{GDP}$. Imports (M) are consumed (C), invested (I), purchased by government (G) and used in exports (X). The ratio of X/GDP will overstate the share of exports in national income to the extent that the appropriate portion of M has not been subtracted from X, but has been subtracted from GDP.

⁴ Source: IMF, *International Financial Statistics*, Washington, D.C., August 1994, various tables.

⁵ See OECD, *Globalization of Industrial Activities: Background Report*, COM/DSTI/TD(93(109/REV1, Paris, January 1994, pp. 16-7.

textiles, apparel & footwear, computers, aerospace and communication equipment & semiconductors, were found to rely heavily on imported intermediate manufactured inputs in all countries. Without discounting the importance of such industries, which is reflected in their employment and GDP statistics, their export figures tend to hide a sizeable foreign content.

All other things being equal, exports with a large foreign content do not contribute as much to domestic GDP or the employment of domestic resources as exports with less foreign content. While recognizing that, without their foreign content, certain export industries would not be competitive internationally (as the small Canadian economy cannot be a world-class producer of all input components), and there would be a loss of the domestic economic benefits that accompany even those industries that rely heavily on imported inputs, it would be interesting to remove the foreign component to ascertain how much Canadian content is embodied in internationally integrated industries' exports. Only then can it be determined which industries will provide the most employment and GDP gains from trade. Again, other things equal, the higher the degree of input transformation that takes place domestically, the greater the domestic economic impact of exports.

The input-output model does not explicitly provide a Canadian share of the value of exports by industry. It does, however, reveal the import share of commodity inputs in the production of exports, indicating which industries tend to rely more (or less) heavily on imported inputs. The average share of imported commodity inputs in total inputs used in the production of Canadian exports is 27.7%. By industry, the figures range from 5.8% for Tobacco Products Industries to 59.6% for Electrical & Electronic Products Industries.

The model also provides data on imported inputs as a share of gross industry output. In our use of the model, gross industry output is defined as production destined for export plus production destined for other domestic industries (as intermediate inputs) whose output is stimulated by an increase in exports. A specific industry's output is the sum of its inputs, its own value-added (or GDP) and indirect taxes less subsidies. The imported input share of gross industry output for export is 15.4%. If we assume that imported commodities account for the same shares of output destined for export and for intermediate inputs, then 15.4% of exports is imported commodity inputs. If the imported commodity input component of exports

is removed, then instead of 26% of GDP, Canadian merchandise exports represent about 22% of GDP.⁶

3. A Look at the Available Data

As a means of fostering a better understanding of the importance of trade to the Canadian economy, it is necessary to become familiar with the available trade data. Only then can one discover their limitations, and consider alternative methods for examining the role of trade in the economy.

3.1 Customs Versus Balance of Payments

Canadian merchandise trade statistics are reported on a Customs basis and a Balance of Payments (BoP) basis.⁷ Customs based trade statistics are developed from declarations that are filed with Customs when goods are exported from or imported into Canada.

⁶ Another more complex technique yields the same result. The following identity holds in the model:

gross industry output =
total supply of commodities (including imports)
+ direct & indirect effects on GDP
+ indirect taxes less subsidies

Isolating direct output (exports) results in the following:

direct industry output =
commodities used in direct production (including indirect imports)
+ direct effects on GDP
+ indirect taxes less subsidies levied on direct production

The only component of direct output that is isolated in the model is direct effects on GDP. The remainder is shared between commodity inputs and indirect taxes such that each accounts for 66% of their totals (to ensure the identity holds). Imports are then assumed to account for the same share of the supply of input commodities in the production of exports as they do in total production. The result is that imports account for 16.6% of exports, thus reducing exports again to 22% of GDP.

⁷ The following explanation of Canadian international trade statistics is based on explanatory notes contained in Statistics Canada, *Summary of Canadian International Trade*, No. 65-001, Ottawa, February 1994, pp. 55-7.

Imports include all goods that have crossed Canada's territorial boundary and exports include all goods grown, extracted or manufactured in Canada, including goods of foreign origin that have been materially transformed in Canada. Also included in exports are goods of foreign origin that have not been materially transformed (or consumed) in Canada but have been withdrawn from Customs warehouses to be shipped abroad. They are known as re-exports.

Customs based trade data are more accurate at measuring imports than they are at measuring exports, since Customs officials typically pay more attention to goods entering the country than to those exiting. Customs based export data can understate and/or incorrectly assign the destination of exports due to lack of proper documentation being filed by exporters, most notably when goods are routed through an intermediate country before continuing on to their final destination. It is thought that this is particularly problematic for Canadian exports to the U.S., an unknown portion of which is destined for third countries.

To derive Balance of Payments data, a number of adjustments are made to aggregated Customs based data so as to conform to National Accounts concepts and definitions. Balance of Payments data are intended to cover all transactions between residents and non-residents which involve merchandise trade. The national accounts recognize merchandise trade to have occurred when ownership of goods changes between residents and non-residents of Canada. This means that adjustments need to be made for timing and valuation, or in instances when there is a change of ownership but no cross-border flow of goods, or when there is a cross-border flow of goods but no change of ownership.

As comparatively good as Canadian trade data are, as they are reported they can not assist in an industrial analysis of the domestic and imported contents of Canadian exports. For that, it is necessary to combine a detailed industry analysis, including an examination of the relationships between industries, both domestic and foreign, with an analysis of their international trading patterns.

4. The Statistics Canada National Input-Output Model

For the purposes of this Paper, the 1990 version (the most recent version available) of the Statistics Canada National Input-Output model was run to capture the inter-industry effects of 1990 Canadian merchandise exports to several geographic regions. The I-O model is a detailed accounting framework of the Canadian production process and the I-O tables are fully integrated in the system of national

accounts.⁸ The input-output approach is the only way to study inter-industry relationships in terms of how industries source their inputs and dispose of their output.

A few basic tables make up the standard I-O framework: gross output of commodities by industry; industry use of commodities and primary inputs such as capital and labour; and consumption and investment of final demand sectors. Several important economic aggregates emerge: the total supply of commodities; the total use of commodities divided between industry (intermediate inputs) and final demand sectors; and an income based estimate of gross domestic product.

For the purposes of this Paper, the supply of inputs in the production process is one of the data series of specific interest. The model is able to separate commodity inputs into those sourced domestically and those imported. In separating the human, material and technological resources used in the production process, inter-industry dependence and international dependence are revealed.

4.1 The Use of the Model

In order to gain a better understanding of the domestic impact of Canadian merchandise exports to specific markets, the I-O model was run five times isolating the following regions:

- the United States;
- the European Union (the EU)⁹;

⁸ For more descriptive explanations of the workings of the I-O model, see E. Poole, *A Guide to Using the Input-Output Model of Statistics Canada*, Statistics Canada Input-Output Division Technical Series No. 58-E, Ottawa, June 1993; P. Mercier, R. Durand and A. Diaz, *Specification of Parameters for the National Input-Output Model*, Statistics Canada Input-Output Division Technical Series No. 18(E), Ottawa, December 1991; and Statistics Canada, *Statistics Canada's Input-Output Model: General Description, Critical Analysis of Partially Closed Version and Alternative Solutions*, Statistics Canada Input-Output Division Technical Series No. 52-E, Ottawa, June 1991.

⁹ EU member countries are Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain and the United Kingdom.

- APEC (minus the U.S.)¹⁰;
- World Total minus the U.S., EU and APEC (known as World Residual); and
- World Total.

For each region, Statistics Canada performed an expenditure shock on the model equivalent to the level of Canadian merchandise exports. This simulated Canadian export activity to the various regions.

Expenditure shocks to the model are composed of direct and indirect effects. In the case of the export shocks, the direct result is the actual level of merchandise exports. The I-O model is set up so that there are no direct imports contained in the original export shock. The indirect results of the increase in exports are other increases in domestic economic activity that support the original export shock. All economic impacts, including employment gains, are thus separated into direct and indirect effects.

4.2 The Limitations of the Model

Neither the model nor this Paper can correct for all of the shortcomings in Canadian export data as outlined in Section 3.1. Exports to the U.S., for example, are still likely to be overstated since the U.S. is used as an intermediate destination for goods going on to third countries.

In general, since the I-O tables are part of the system of national accounts, they are compatible with the Balance of Payments approach to trade. In the I-O framework, exports of both goods and services undergo several adjustments beyond those undertaken in the Balance of Payments. Adjustments account for freight and shipping, certain government transactions and the provision of business and other services. In running the model for this Paper, however, it was not possible for Statistics Canada to fully adjust the regional data. The world total data were fully

¹⁰ APEC currently includes Australia, Brunei, Canada, Chile, China, Hong Kong, Indonesia, Japan, Malaysia, Mexico, New Zealand, Papua New Guinea, Philippines, Singapore, South Korea, Taiwan, Thailand and the United States. Papua New Guinea and Mexico were added at the Ministerial meeting in November 1993, after the I-O was run for this project, and are thus not included. Chile was added in November 1994, and is also not included. The United States is treated as a separate export destination and was dropped from the APEC group.

adjusted, resulting in a gap between the sum of the regional totals and the model's world total.

Further, the world total and regional totals for merchandise exports might not necessarily match those data published elsewhere because exports come from direct output, government sales of goods and services, withdrawals from inventories and other direct leakages. In constructing the tables used in this Paper, direct output from the business sector was the sole source of exports.

4.3 The Treatment of Services

Although the I-O model was shocked only with merchandise exports, it measures the direct and indirect effects on both goods and services industries.¹¹ The direct effects on services industries were included in the world total run of the model, but, for technical reasons concerning data availability, they were not included in the individual regional runs. The services industries that are not included in the regional tables are Finance & Real Estate, Insurance, Educational Services, Health Services and Personal & Household Services. Individually, none of these support industries account for more than 0.7% of the value of total merchandise export to the world.

For the world total, the model is capable of breaking down export commodities normally associated with merchandise exports into a number of services. At its most detailed level, the model provides data on the direct and indirect effects of goods exports on about 30 service commodities. Those effects are assigned to individual service industries, as reported in the derived tables.

There might be some objections to including services in such a way, since the trade data used in the model are normally associated with merchandise trade. However, as noted above, the I-O approach makes a number of adjustments to BoP estimates of exports. One of the results of those adjustments is a decrease the goods portion and an increase the services portion of the total exports of goods and services from the Balance of Payments.

A more fundamental objection to the inclusion of service industries in this project is that the promotion of goods exports and the promotion of services exports

¹¹ As an example of the contribution that both goods and services industries make to an exported commodity, consider a finished manufactured product. Goods industries are involved in its actual manufacture, and service industries provide transportation, computer support, accounting services and others that are an integral part of the production and export processes.

are (or at least should be) quite different activities. In order to sell their services abroad, industries usually need to be physically located in the foreign market. Thus, the rules and regulations surrounding foreign direct investment (such as the right of establishment) are of much more importance to service industries, especially those that do not have the option of maintaining a domestic base from which to export. Since one of the objectives of this project is to stimulate thought on the allocation of official export enhancement resources (as opposed to addressing service type issues such as FDI rules), one might reasonably suggest that it only focus on goods-producing industries.

In any event, the service industries captured in this study are quite small in terms of total exports. By including them, it is discovered (in Section 6) that they are primarily support industries, and that their employment is concentrated in the provision of services for goods-producing industries that export.

5. The Input-Output (I-O) Results

Once the I-O model has been run, Statistics Canada provides the user with a very detailed data set showing the results. Drawing from those tables, a number of other tables have been constructed for inclusion in this Paper. They will be referred to as the derived tables, and are found in Annex 1.

5.1 Evaluations of the Derived Tables

While some of the data in the derived tables need little explanation, there are several columns that should be reviewed more carefully to determine just what information they contain. Then, their relevance to trade policy decisions can be more easily recognized. Each column that is reviewed is done so independently of all others. In other words, for now, the information contained in each column is treated as if it is the entire information set. This avoids qualifying the judgements made about which industries are most appropriate for export initiatives. In the next section, some of the relationships between columns will be identified, and, as might be expected, the decisions on which industries to support become more complex.

Column 1: Exports

Export data are extracted from the model output.¹²

¹² All the model output generated for this Paper is held by the author.

Column 2: Export Share

The export share of a particular industry is calculated by dividing the industry's contribution to merchandise exports by total merchandise exports.

Column 3: Imports

Import data are extracted from the model output. They are imported inputs supplied to industries at all stages of production and are net of duties.

Column 4: Imports/Exports

This column shows industry imported intermediate inputs as a share of an industry's contribution to merchandise exports. By definition, exports in the model contain no direct imports. The figures are not a measure of the import content of exports by industry, since some industry imports are used in the production of intermediate inputs for other domestic industries. It is, therefore, meaningless to subtract imports in column 3 from exports in column 1 to produce an industrial trade balance.

Column 5: Imports/Commodity Inputs

Imports/commodity inputs relates the quantity of industry imports and the total supply of commodities to each industry required to satisfy demand at all stages of production. This includes direct and indirect production, even though we recognize that no direct imports are contained in exports. The result provides a sense of the dependence on imported inputs for a given industry.

This is the first set of data for which we can ask the question, what is preferred from an export point of view -- a higher or lower value? The answer is that industries that import fewer of their inputs are preferred. When an industry that relies heavily on domestic inputs increases its exports, there is a distinct, positive "ripple" effect on the domestic supplier industries. Conversely, when an industry that relies more heavily on imported inputs increases its exports, the effect on the trade balance is mixed and the total GDP impact, including the exporting and supplier industries, is smaller.

Individual industry imports/commodity inputs ratios might be understated since each industry receives inputs from other domestic industries, some of which will contain imports. This column only captures each industry's direct imports. Despite

the possible problems on an individual industry basis, the total industry ratio is reliable.

Column 6: Imports/Gross Industry Output

Imports/gross industry output reveals the imported input content of a particular industry's gross output. Gross output includes exports and all production delivered to the business sector as intermediate inputs. It should be recognized that the total supply of input commodities is only about 55% of the value of gross industry output, so the imported input content is likely going to appear small.

Just as in column 5, individual industry imports/gross industry output ratios might be understated, since each industry receives inputs from other domestic industries, some of which will contain imports. This column only captures each industry's direct imports. Despite the possible problems on an individual industry basis, the total industry ratio is reliable.

Column 7: Exports/Gross Industry Output

Exports as a share of gross industry output show how much of a given industry's gross output is exported and, by extension, how much of its gross output goes to final domestic demand and intermediate inputs for other domestic industries. In a sense, this column reveals whether an industry is an exporter in its own right or whether it is an intermediate supplier to other domestic industries that export.

Export initiatives should focus on industries that export a large portion of their gross output. To the extent that the expansion of export-oriented industries stimulates domestic-based supply industries in a type of chain-reaction, export-oriented industries will have a pronounced positive impact on the economy.

Consider the construction industry. The data clearly indicate that it is not an export industry. Its output is used as inputs in other domestic industries (as well as satisfying final demand). From an export enhancement point of view, it makes little sense to focus on the construction industry. It makes much more sense to encourage exports in the industries that depend on the construction industry for inputs. That way, both the exporting industry and the construction industry increase production, and the total effect on GDP is larger. By targeting the correct industries for export initiatives, trade can cause a feedback effect, stimulating production in several other industries.

Column 8: Direct GDP Effect/Exports

The direct GDP effect as a share of each industry's exports is value-added by that industry as a share of total export value. Included in GDP are wages, salaries and supplementary labour income, net income of unincorporated business, and "other surplus". This is GDP at factor cost. To reach GDP at market prices, one must add commodity and other indirect taxes and import duties, and subtract subsidies.¹³

The direct GDP effect/exports ratio is less than one since the GDP figures are at factor cost while exports are at market prices.¹⁴ In addition, a particular industry's exports might contain value-added from a number of other domestic industries engaged in earlier stages of production. The direct GDP effect/exports ratio only measures the value-added of the last industry in the chain of domestic production.

The direct GDP/export ratio is not a measure of total Canadian content. A ratio of 60% for a particular industry implies that 40% of the value of its exports include the supply of intermediate inputs, both domestic and imported, and indirect taxes less subsidies. Thus, even though the domestic inputs supplied to an industry will nearly always contain some imports, the total Canadian content of a particular industry's exports (i.e., the total Canadian value-added by all Canadian industries involved in the production process) is probably somewhat higher (and, in some industries, considerably higher) than the direct GDP/export ratio indicates.

Direct GDP is used rather than total GDP because direct GDP measures production for export, not for intermediate inputs. A total GDP/export ratio would be misleading since total GDP encompasses all production, including that of intermediate inputs. To associate an industry's indirect GDP with its own exports is incorrect. The construction industry, for example, has a high total GDP but no exports.

In terms of maximizing the positive domestic economic impact of exports, one could argue that export initiatives should be directed exclusively towards industries with a high ratio of direct GDP effect to exports. That way, without knowing whether

¹³ The difference between GDP at factor cost and GDP at market prices is not insignificant. In 1990 (the year for which we ran the model), GDP at factor cost (in millions) was \$592,805, while GDP at market prices was \$669,467. GDP at factor cost was only 88.5% of GDP at market prices. See Statistics Canada, *National Income and Expenditure Accounts*, No. 13-001, First Quarter 1994, Table 1, p.3.

¹⁴ See footnote 6 for details on the relationship between exports and direct GDP effects.

an individual industry's direct GDP/exports ratio is low because it is the final domestic industry in a long production chain or because it relies heavily on imported inputs, we rely on GDP figures to judge the industry's contribution to the economy. The higher GDP is relative to exports, the greater the domestic economic impact. However, it could also be argued that industries with a lower GDP/export ratio should be encouraged to export since they can be the last industries in a domestic chain of production that leads to exports -- encourage them to export and they will stimulate production in all the domestic input industries. For this particular column, it is accepted that both a high and lower ratio may have merit, and a somewhat subjective evaluation of individual industries is required in order to determine which industries' exports contribute most to the domestic economy. In essence, it is necessary to identify the industries whose exported commodities have the highest collective Canadian value-added. Collective value-added is the sum of the Canadian value-added of all industries engaged at all stages of export production.

The direct GDP/exports ratio can be thought of as a multiplier (if it is not expressed in percentage terms), since the denominator is exogenous to the model. It would then represent the dollar amount of direct GDP that would be generated for every dollar of exports. This multiplier differs from the conventional keynesian multiplier in that it does not take into account any induced effects on production, i.e., any GDP effects from an increase in income generated from higher exports.

Column 9: Direct Jobs

Direct jobs is the number of persons employed in the production of exports, and is taken from the model output.

Column 10: Direct Jobs/\$10 million of Industry Exports

This column shows the number of jobs created in a particular industry for every \$10 million worth of the industry's exports.

So far, an industry's "contribution to the economy" has been discussed mainly in the context of its GDP. While that is certainly not incorrect, there is also the employment impact to be considered.

Column 10 provides data on the quantity of jobs each industry creates for a given level (\$10 million) of industry exports. As was the case with column 8, there is a potential ambiguity in the data in this column. If there is a long line of domestic industries involved in the production of a particular export, then each industry in the

production chain will account for a portion of the collective Canadian value-added and employ a portion of the total labour required in the production process. The last industry, which is the export industry of record, might employ relatively few people compared to the value of the export, and thus appear to enjoy extremely high levels of labour productivity.

Although the data in this column are ambiguous in the sense that an individual industry's exports might not correspond very well with its level of direct employment, that ambiguity can lead to certain important discoveries. For example, a large exporting industry's contribution to the domestic economy could easily be overstated if it employs relatively few people per dollar of exports and imports many of its intermediate inputs. Then, the exporting industry is the last in a chain of production, but that chain is mostly outside the domestic economy, and the employment benefits of the export accrue to the foreign industries that provide intermediate inputs.

Column 11: Direct Jobs/\$10 million of Direct GDP Effect

As a means of addressing the potential ambiguities in the direct jobs/\$10 million of industry exports ratio, this column examines direct employment by industry relative to direct industry value-added. By changing the denominator to GDP from exports, there is no longer a concern regarding the export industry being the last in a long line of domestic or foreign input industries. There is no "collective industry effect" of cumulative value-added when we consider only the actual export industry's GDP.

In terms of export initiatives, industries with higher levels of employment are likely to be viewed more favourably. Given the perennial global focus on job creation, and the positive domestic impact that can flow from job creation, a high direct jobs/\$10 million of direct GDP effect ratio can be deemed desirable. Yet, alone, that logic would lead us to encourage exports from relatively labour-intensive industries, and ignore the issue of the quality of jobs. One must be careful to guard against unquestionably preferring an increased employment level without taking job quality into account.

Column 12: Wages, Salaries & Supplementary Labour Income/Direct Jobs

Wages, salaries and supplementary labour income/direct jobs is essentially the average wage of employees engaged in the production of exports for each industry. Labour income earned in the production of intermediate inputs is not included. For the Agricultural and Related Services Industries and Fishing and Trapping Industries, the average wage is considerably lower than that of all other industries. The reason is

that much of the return to labour in agriculture and fishing is counted as net unincorporated business income and "other surplus" in the national accounts (i.e., income is derived but it often is not classified as "wages").

The average wage is one measure of job quality; higher wages imply better quality jobs. The best possible export industry with respect to employment is one that employs a large number of people with a high average wage. To the extent that there is a tradeoff between quality and quantity of jobs, policy makers must consider, if possible, which is more desirable.

Column 13: Total Jobs

Total jobs is the number of persons employed in the production of exports as well as intermediate inputs for other industries. It is taken from model output.

Column 14: Total Jobs/\$10 million of Total Exports

This column shows the number of jobs created in a particular industry for every \$10 million worth of total (i.e., economy-wide) exports. It includes direct jobs created with the industry's share of the \$10 million of exports and indirect jobs created when the industry produces inputs for other industries (both goods and services). The column sums to the total at the bottom. Looked at in another way, the column shows how employment is broken down by industry when total exports increase by \$10 million. Particular industry shares depend on its share of total exports and its labour productivity.

There is no value attached to an industry having a high or low number in this column. If total exports rise by \$10 million, and each industry contributes to the increase in proportion to its share of current exports, this column shows what happens to industrial employment. It will not follow the pattern of direct employment because it includes jobs created from the production of intermediate inputs.

5.2 Relationships Within the Derived Tables

As mentioned above in the context of the quality versus quantity tradeoff over jobs, there are some intuitive relationships in the derived tables. It is possible -- using basic statistical techniques -- to investigate more rigorously the existence of those relationships. An understanding of some of the relationships, particularly with respect to employment effects, provides an understanding of the industrial structure of

Canadian exports and will assist in the identification of appropriate industries to target for export initiatives.

The strength of the relationships between various columns is tested by calculating a correlation coefficient. Given two sets of data, a correlation coefficient will reveal whether a linear relationship exists between them. Its range of values lies between negative one and positive one. A value of negative one indicates perfect negative correlation, meaning as one set of numbers increases, the other declines. A value of one indicates perfect positive correlation, meaning both sets of numbers advance and decline together. A value of zero indicates no correlation. Values between zero and one, and zero and negative one, indicate the relative strength of positive and negative correlations, respectively.

All correlation coefficients were calculated using data in the World Total derived table, and are assumed to hold for each geographic region.

Since the purpose of this Section is to investigate the existence of intuitive relationships, each test will be introduced by an intuitive question concerning the tables. In brackets are the corresponding columns of the derived tables.

- Intuitive question: Do industries that export more of their output use fewer imported inputs?

Exports/Industry Output and Imports/Commodity Inputs (7 & 5)

It has been suggested that export initiatives should focus on industries that export a relatively large portion of their output, as measured by a high export/industry output ratio. One of the main justifications for preferring such industries is that their exports would stimulate domestic production in other industries that supply intermediate inputs in a type of chain-reaction. In order for that justification to hold, it must first be determined whether those exporting industries tend to rely on imported inputs. If so, the chain-reaction involving domestic suppliers is weakened considerably, as is the positive domestic economic impact of the export.

The correlation coefficient between imports/commodity inputs and exports/industry output is 0.39, indicating a weak, positive relationship. Thus, there is some evidence to indicate that industries that export relatively large shares of their output rely on foreign inputs. As a result, the justification for favouring industries with high exports/industry output ratios has been weakened.

- Intuitive question: Do industries that import larger shares of their commodity inputs employ more productive workers?

Imports/Commodity Inputs and Direct Jobs/\$10 million of Industry Exports (5 & 10)

There is no *a priori* reason to believe that industries that import a relatively large share of their commodity inputs would tend to employ either more people per dollar of exports or fewer people per dollar of exports. In the I-O model, industries use the same capital-labour ratio in the production of exports and intermediate inputs. Inputs come from foreign and domestic sources, and there is no obvious linkage between reliance on imported inputs and employment per dollar of exports.

The correlation coefficient between imports/commodity inputs and direct jobs/\$10 million of GDP is $-.24$, signalling a very weak, but not entirely insignificant, negative correlation. A stronger relationship would imply that industries that rely more on imported inputs tend not to generate as much employment in their production of exports. This can be viewed in a positive or negative light. On the negative side, one can point out that industries that rely more on imported inputs do not generate as much employment in domestic input industries, or in their own industries. On the positive side, industries that rely on imported inputs may appear to be more productive (in terms of labour productivity, not total factor productivity), since they employ fewer people to produce the same dollar value of exports. As was pointed out in Section 5.1, however, there are problems associated with using the direct jobs/industry export ratio to measure an export industry's labour productivity. It is GDP (i.e., value-added) per worker, not exports per worker, that should be used for labour productivity comparisons.

- Intuitive question: Do industries that import larger shares of their commodity inputs employ more productive workers?

Imports/Commodity Inputs and Direct GDP/Direct Jobs (5 & not in tables)

The relationship between imports as a share of commodity inputs and direct jobs per \$10 million of industry exports reveals that industries that tend to import more of their inputs do not generate as much direct employment in the production of exports. The positive spin is that these industries are more "productive". Checking for a statistical relationship between imports as a share of commodity inputs and direct GDP per direct job will test whether the industries are in fact more productive.

The correlation coefficient between imports as a share of commodity inputs and direct GDP per direct job is $-.19$, indicating a very weak negative correlation. Ideally, we would like to find that the industries that import a larger portion of their inputs have higher value-added per employee.¹⁵ Unfortunately, this is not the case. Industries that rely on imported inputs do not generate as much employment in their production of exports, and those that are employed are not necessarily high value-added employees. From an employment perspective, the upshot is that government export initiatives should emphasize industries that do not import relatively large shares of their inputs.

- Intuitive question: Do industries that have a high value-added in their production of exports employ more people?

Direct GDP Effect/Exports and Direct Jobs/\$10 million of Exports (8 & 10)

It has been established that export initiatives could usefully focus on industries that have a high ratio of direct GDP effect to exports. At the same time, there is the question, as outlined above, of whether to favour industries that create more jobs per dollar of exports in order to boost employment, or favour those that create fewer jobs per dollar of exports in order to avoid favouring labour-intensive industries. Investigating the relationship between direct GDP effect/exports data and direct jobs/\$10 million of exports data will reveal (if, in fact, there is any relationship) which jobs approach is implicitly favoured by focusing on industries with a high ratio of direct GDP to exports.

The correlation coefficient between direct GDP effect/exports and direct jobs/\$10 million of exports is $.50$ indicating a moderate positive relationship. Export initiatives directed at industries with high direct GDP effect/export ratios will implicitly favour industries that generate more direct jobs per dollar of exports.

* * * * *

In summary, it seems that the intuitive relationships are generally not as strong when they are tested statistically as they might first appear. The two strongest relationships (even though they are still weak) reveal that industries that import larger

¹⁵ This is based on the previous relationship between imports/commodity inputs and direct jobs/\$10 million of direct exports. The industries that import more inputs create less direct employment. It is hoped that this might be somewhat offset by those industries creating more productive, and presumably higher paying, jobs.

shares of their commodity inputs tend to export most of their output and industries with higher GDP effects relative to exports tend to create more direct jobs.

6. In Which Industries Are the Domestic Gains From Trade Highest?

Clearly, a somewhat more structured evaluation system is required to guide policy makers engaged in export development. Instead of analyzing industries at a general level with only the guidance of intuitive relationships, it is helpful to examine the individual industry profiles that are generated by the I-O model. The profiles will determine which industries have more of the characteristics that reflect high domestic gains from merchandise trade. The desirable characteristics are extracted from the explanation of the derived tables, found in Section 5.1. Five columns are used from the derived world table, and the preferred industries are those with:

- a low import/commodity inputs ratio (column 5);
- a high exports/industry output ratio (column 7);
- either a high direct GDP effect/exports ratio or a lower direct GDP effect/exports ratio if it can be established that the industry tends to rely on domestic intermediate inputs (column 8);
- a high direct jobs/\$10 million of direct GDP effect (column 11); and
- a high wages, salaries & supplementary labour income/direct jobs ratio (column 12).

One way to select industries with the above characteristics is to compare data for each industry with the industry-wide averages that are found at the bottom of each column in the derived world table.¹⁶ If the industry ratio is higher (or lower in the case of the import/commodity inputs ratio) than the average, then that industry is said to possess the desired characteristic.¹⁷

¹⁶ It is recognized that the averages are biased toward the values of the larger exporting industries.

¹⁷ In the case of the direct GDP/export ratio, the industry is said to possess the desired characteristic if its ratio is higher than average, or its ratio is lower than average but the industry also has a lower than average imports/commodity inputs ratio.

6.1 The General Results

The I-O results must be recognized as providing only a snapshot of the industrial structure and inter-industry relationships in the production of exports. There is no means for the model to account for changes in output over time in terms of inter-industry dependencies. As a result, it is not possible to state unequivocally that an increase in a particular industry's exports will cause the same employment, GDP, or import effects as revealed in the model.

At the risk of over-generalizing, the Industry Export Performance Table (available in Annex 2) reveals the following:

- resource industries, transportation and communications services industries and other service industries use relatively less imported inputs in their contribution to exports, as compared to manufacturing industries;
- manufacturing industries and transportation services industries export directly more than half of their output, indicating that they are not supplying their output to other domestic industries as intermediate inputs;
- resource industries are roughly split between exporting most of their output and supplying it to other domestic industries, while almost all service industries ship the largest share of their output to domestic customers;
- the highest concentration of direct jobs per dollar of value-added is in the services industries (although it is recognized that this is due to the denominator, i.e., the service industries export very little directly, and thus have a low value-added in the production of exports), with most manufacturing and only a few resource industries having better than average employment effects;
- with the exception of the agriculture and fishing industries, in which the return to labour is not listed as wages in the national accounts, average wages in the resource industries are by far the highest;
- most of the manufacturing industries' and transportation and communications industries' average wages are relatively high, while other services' wages are by far the lowest.

6.2 Canadian Value-Added

As was pointed out in Section 2, the I-O model does not explicitly provide a Canadian share of the value of exports by industry, but does indicate the import share of commodity inputs in the production of exports (column 5 in the derived world table) and the import share of industry output in the production of exports (column 6 in the derived world table). A unique problem with deriving the Canadian content of exports by accepting the imported commodity input share as a measure of exports' foreign content is that the imports/commodity inputs ratio does not capture the domestic value-added of the exporting industry. This will cause the Canadian content of exports to be underestimated, and the foreign content of exports to be overestimated. A common problem with deriving the Canadian content of exports by using the imports/commodity inputs ratio or the imports/industry output ratio is that intermediate inputs from other domestic industries will almost certainly contain some imports. As a result, there is likely to be an underestimation of the import content, and an overestimation of the Canadian content, of exports by industry.

While fully acknowledging the technical difficulties, it is still of interest to proceed and calculate which groups of industries have a higher Canadian content, or value-added. In order to capture the domestic value-added of the exporting industry, we will use the imports/industry output ratio. Excluding other services, the transportation and communications industries averaged the lowest imports/industry output share, at 4.0%. Primary industries averaged 5.8% and manufacturers averaged 24.7%. In general, the lower the import share of industry output, the higher the Canadian value-added share. This exercise should not be regarded as producing precise measures, but it is indicative of how the industry groups rank in terms of their relative domestic value-added.

6.2.1 Value-Added and the Canada-U.S. Balance

Given the rough estimates of the import values of Canadian exports, one can speculate both quantitatively and qualitatively about a "Canadian value-added balance". Looking at international flows on a value-added basis would reduce exports by the value of their foreign content and reduce imports by the value of their Canadian content. We will approximate the adjustments required to Canadian trade with the U.S. in order to calculate a domestic value-added balance.

On the export side, the I-O reveals, as discussed above, how much imported inputs represent in the value of Canadian exports. By reducing manufacturers' exports by 24.7%, primary sector exports by 5.8% and transportation and

communications industries exports by 4.0%, Canadian merchandise exports to the U.S. fall by approximately 18%, or \$18 billion in terms of the model output for 1990 merchandise exports to the U.S..

The I-O is not able to determine the Canadian content of imports from the U.S.. However, the OECD points out that U.S. sourcing of intermediate inputs in the production of manufactured goods is among the lowest of all OECD countries.¹⁸ The OECD estimates that about 11.5% of intermediate inputs in the U.S. manufacturing sector are imported. With two simplifying assumptions -- that the reliance on imports is similar across all sectors in the U.S. production of exports and that Canadian inputs account for 18% of all imported inputs (the share of Canadian imports in total U.S. imports in 1990) -- Canadian merchandise imports from the U.S. are reduced by 2%, or \$1.9 billion in terms of 1990 merchandise imports.¹⁹

Table 6.1
Canada - U.S. Merchandise Balance, 1993: A Value-Added Approach
 \$ billions

	Balance of Payments Basis	Value-Added Adjustment	Value-Added Basis
Canadian Exports	\$145.4	-\$26.2	\$119.2
Canadian Imports	\$125.7	-\$2.5	\$123.2
Balance	\$19.7		-\$4.0

In 1993, Canada had a merchandise trade surplus of \$19.7 billion with the U.S.. By reducing Canadian exports to the U.S. by 18% to account for their foreign content, and reducing Canadian imports from the U.S. by 2% to account for their Canadian content, the \$19.7 billion trade surplus becomes a \$4 billion value-added

¹⁸ See OECD, *op. cit.*, p. 16.

¹⁹ There is no hidden quantitative analysis behind these two assumptions. Their adoption is entirely based upon qualitative judgements which are open to criticism and refinement. Further research is required for a more accurate assessment, but the result -- of assigning a higher foreign content to Canadian exports to the U.S. than to U.S. exports to Canada -- is considered defensible.

deficit (see Table 6.1). Once again, this exercise should not be regarded as producing a precise measure of the Canadian value-added balance. It is based on simple assumptions and extrapolations, and is meant only as an approximation of the effects of international sourcing on a concept (the value-added balance) that is by no means a widely accepted analytical tool.

6.3 Individual Industry Results

Table 6.2 lists which industries fared the best and worst in the comparison of economic impacts caused by merchandise exports.²⁰ A complete list of how each industry fared is available in the Industry Export Impact Table (Annex 2).

Not every industry listed in Table 6.2 should be regarded as among the most desirable export industries or among the most suitable for the targeting of export initiatives. Problems immediately come to mind with the service industries, which are primarily support industries for goods exporters in the model used in this Paper. Generally, the output of service industries as recorded in this study is not directed abroad, so their inclusion in a list of industries with the best export impacts must be interpreted carefully. The economic benefits associated with services output are stimulated in the first instance by exports from the goods sector. The "five star" and "four star" industries of Table 6.2 are those for which the relative domestic impact of exports is largest, as measured against the criteria listed at the start of Section 6. The inclusion of services implies that the industries that experience the largest positive domestic economic impact from merchandise exports are not necessarily only merchandise exporters themselves. Moreover, a few of the goods industries listed (especially Tobacco Products) are modest exporters whose inclusion is perhaps less justifiable because of low export values. Nonetheless, the inclusion of most of the other higher ranking goods industries found in Table 6.2 is considerably more robust. High export volumes coincide with the positive domestic impact criteria identified above.

Only the Wood Industries and Educational Services Industries recorded better than average gains for each of the five industrial criteria. They use very few imported inputs, export most of their output, have a high value-added share of exports, employ a significant number of people per dollar of value added and pay relatively high

²⁰ In the I-O model, economic activity is attributed to 13 separate industries, 47 separate industries or 209 separate industries, depending on the aggregation level selected by the user. In this Paper, the middle aggregation of 47 industries was used. The relationships between industry aggregations are shown in Annex 4.

average wages. The largest exporter of the Wood Industries is the Sawmills, Planing & Shingle Mills Industry, which exported \$4.8 billion in 1990, mostly to the U.S..

Agriculture & Related Services Industries scored four out of five, missing with their very low average wages. As was mentioned earlier, however, wages appear low in agricultural industries because their incomes are part of unincorporated business income and "other surplus" in the national accounts. While it is beyond the scope of this Paper to adjust agricultural wages to allow for a better comparison with other industries, agriculture should be noted as an excellent exporting industry.

In the resource sector, Mining Industries and Crude Petroleum & Natural Gas Industries also possess four of the five desired characteristics. The only downfall in both industries is the small number of jobs created per dollar of GDP in the production of exports.

Of the twenty-one manufacturing industries listed on the tables, nine scored four out of five. Six out of the nine fell short either in the number of jobs created per dollar of GDP in the production of exports or in the average wage, indicating the tradeoff between job quality and job quantity. There are only five manufacturers that create a relatively high number of jobs and pay relatively high wages.

Table 6.2
Which Industries Post the Greatest Domestic Gains From Trade?

Five Star Industries	Wood
	Educational Services *
Four Star Industries	Agriculture & Related Services
	Mining
	Crude Petroleum & Natural Gas
	Services Related to Mineral Extract. *
	Food
	Beverage
	Tobacco Products
	Rubber Products
	Furniture & Fixtures
	Paper & Allied Products
	Printing, Publishing & Allied Products
	Primary Metal
	Machinery
	Transportation Services *
	Pipeline Transport *
Storage & Warehousing *	
Wholesale Trade *	
Insurance *	
One Star Industries	Refined Petroleum & Coal Products

* Note that these service industries provide value-added support to other industries engaged in the production of merchandise exports. The services are not exported directly and service industries do not export merchandise.

The least desirable manufacturing exporters include Plastic Products Industries, Leather & Allied Products Industries, Primary Textile & Textile Products Industries, Transportation Equipment Industries (including the automotive sector!) and Refined Petroleum & Coal Products Industries, although there are a few qualifications. Plastic Products Industries were just below average in two characteristics and Leather & Allied Products Industries fell just short on one. Refined Petroleum & Coal Products Industries were the only industries to have only one of the desirable export characteristics.

In general, the service industries perform well except that nearly all are support industries for other exporters, as is evidenced by the low exports/industry output ratios, and average wages are the lowest of all industries. One stand-out, as noted above, is the Educational Services Industries, which exceeds each of the five industry criteria. The Wholesale Trade Industries and the Insurance Industries are close to matching educational services. Only their exports/industry output ratios are lower than average, as is typical of service industries.²¹

Transportation Industries, Pipeline Transport Industries and Storage & Warehousing Industries come very close to scoring five out of five. Transportation Industries, the largest exporters of the group, export less than an average share of their output.

6.4 High-Tech Industries

In the derived tables, it is not possible to isolate high-tech industries since they are contained within too broadly defined industry categories. To identify and analyze high-tech industries, it is necessary to return to the I-O model output and extract the data for particular industries from tables containing the most narrowly defined industry grouping. Using an OECD classification system for high-tech industries, the Canadian high-tech export sector is said to contain the following industries: Aircraft & Aircraft Parts Industry; Telecommunication Industry; Electronic Parts & Components Industry; Electronic Computers & Peripherals Industry; Miscellaneous Office & Business Machines Industry; Pharmaceutical & Medicine Industry; Indicating & Recording

²¹ However, it should be recalled that what our use of the I-O model reflects in this regard is not an analysis of all exports generated by these services, or those listed in the next paragraph, but rather the impact of merchandise exports or export-related activity on these industries. That is, what is captured reflects activity in the goods sector in the first instance.

Instruments Industry; and Other Scientific & Professional Equipment Industry.²² The results for high-tech industries in terms of the desired export characteristics listed at the start of Section 6 are found in Annex 3, in the High-Technology Industries Table.

As a group, high-tech industries tend to export most of their output and they pay higher than average wages. High-tech exporters create only an average number of direct jobs per dollar of GDP in the production of exports and they import substantially more input commodities than the average exporting firm. As with other manufacturing industries, there is a clear trade-off between job quality and job quantity in the high-tech industries. Of the eight industries considered, five paid higher than average wages and the other three created more than the average number of jobs per dollar of GDP.

The high export/industry output ratios for high-tech industries imply that they are not supply industries producing intermediate inputs for other exporters. High-tech industries are exporters in their own right, but they rely very heavily on imported inputs. One of the justifications for encouraging the exports of industries with high export/industry output ratios is that they should stimulate a chain reaction of domestic input production. Unfortunately, in the high-tech sector, the input industries that benefit from higher exports are often located abroad.

6.5 Employment Considerations

Since two of the economic gains that trade is meant to bestow are increased national income and either increased employment or increased productivity (with both leading to higher total returns to labour), it is necessary to analyze more closely the employment effects of different industries' exports.

An earlier study by M. Martin of the Department of Foreign Affairs and International Trade used the 1987 version of the I-O model to determine that total employment in the export sector and supporting industries in 1991 amounted to 1,649,395 jobs.²³ Using the 1990 version of the model, this Paper finds that in 1990, 1,708,580 Canadian workers were engaged either directly or indirectly in the production of merchandise exports. The difference of 59,185 jobs can be explained

²² The OECD classification system and a similar U.S. Department of Commerce system are found in L. Tyson, *op. cit.*, p. 20.

²³ M. Martin, *Exports and Job Creation*, Policy Planning Staff Paper 93/06, Department of Foreign Affairs and International Trade Canada, Ottawa, June 1993, p.13.

by different export levels and commodity mixes between 1990 and 1991, and changes in the structural relationships between Canadian industries in the 1987 and 1990 versions of the I-O model.

Another macroeconomic employment statistic that the model provides is the number of jobs per billion dollars of Canadian exports. Since the model splits shocks into their direct and indirect effects, it can determine the direct and indirect employment effects of exports by industry. Once again, the direct effect in our running of the model is actual exports; the indirect effect is the domestic production of intermediate inputs that is stimulated in support of the original export production. In 1990, \$1 billion worth of Canadian exports resulted in 6,161 direct jobs and 5,497 indirect jobs, for a total of 11,658 jobs.²⁴ This compares to the 12,016 jobs total computed in the Martin study.

6.5.1 Employment by Industry

The top five industries in terms of direct jobs created in the production of exports are listed in Table 6.3. The Transportation Equipment Industries group is the leader by far, accounting for nearly 15% of all direct export jobs. Interestingly, Transportation Equipment Industries account for about 25% of exports, implying (at first glance) that their workers are more productive than those in the average export industry. However, that is not necessarily the case. For a measure of labour productivity, one must consult column 11 of the derived tables. It indicates that Transportation Industries do employ fewer workers per dollar of GDP in the production of exports, and are thus more productive than the average export industry, but not by much. Beyond the slight productivity advantage that Transportation Industries have, they employ less labour than their share of total exports might imply because of the high import content of their exports. Imported inputs represent nearly 40% of the value of gross industry output. With such a low domestic value-added in the production of exports, it is not surprising that Transportation Equipment Industries employ a small labour force relative to the value of their exports.

²⁴ Equivalently, one could say that \$85,780 of Canadian exports supported one Canadian job.

Table 6.3
Direct Jobs in Total World Merchandise Exports

Industry	Direct Jobs
Transportation Equipment	130,958
Agriculture & Related Services	96,333
Wholesale Trade	72,025
Transportation	68,591
Business Services	56,019

Table 6.4 presents the top five industries in terms of total jobs created in the production of exports. These are jobs created in the direct production of exports as well as in the production of intermediate inputs used by other domestic industries. Business Services Industries moved up to number 3 from its number 5 ranking in Table 6.3, indicating that a significant number of indirect jobs are created in business services with increased exports in other industries. This is what we expect in the service sector and is consistent with findings in Section 6.3.

In addition to the numbers of direct and indirect jobs per industry, it would be useful to trace the direct and indirect employment effects of individual industry exports. In other words, we would like to know what happens to employment across all industries if, for example, exports of the transportation industries increase. This would provide a sense of how important the exports of one industry are in creating jobs across a number of other industries. The practical problem with such an approach is that the model would need to be run once for each industry's exports that we wished to isolate. Instead, the derived tables present data on the direct employment effect of each industry's exports (column 9) and the indirect employment effect (for each industry) of all other industries' exports (column 13 minus column 9).

Table 6.4
Total Jobs in Total World Merchandise Exports

Industry	Total Jobs
Transportation Equipment	165,555
Wholesale Trade	150,428
Business Services	148,789
Agriculture & Related Services	141,395
Transportation	130,980

6.5.2 Job Quality Versus Job Quantity

The tradeoff between the quantity and quality of jobs is nowhere more evident than in an industry-by-industry comparison of columns 11 and 12 -- the number of direct jobs created per \$10 million of industry GDP in the production of exports and the average wage.

Even excluding Agriculture & Related Service Industries and Fishing & Trapping Industries, which have unique data problems, the industries with the highest direct jobs/\$10 million of industry GDP ratios have among the lowest wages, salaries and supplementary labour income/direct jobs ratios, and industries with the highest wages, salaries and supplementary labour income ratios tend to have low direct jobs/\$10 million of industry GDP ratios, although there are some exceptions. In general, export industries that pay well tend to use fewer workers per dollar of value-added in the production of exports, and industries that use a large number of workers per dollar of value-added in the production of exports tend not to pay as well.

There are ten industries -- Services Related to Mineral Extraction, Rubber Products Industries, Wood Industries, Printing, Publishing & Allied Industries, Machinery Industries, Electrical & Electronic Products Industries, Transportation Services Industries, Wholesale Trade Industries, Insurance Industries and Educational Service Industries -- that have a higher than average direct jobs/\$10 million of GDP ratio and a higher than average wages, salaries & supplementary labour income/direct jobs ratio.

The lowest ranking industries, with lower than average wage and job creation per dollar of value added numbers, are Quarry & Sand Pit Industries. The majority of industries -- 34 out of 45 -- fall somewhere between the employment extremes, with either above average wages and below average job creation, or vice-versa.

7. Regional Comparisons

7.1 Export Destinations

Three-quarters of total Canadian exports are destined for the United States. As was mentioned in Section 3, exports to the U.S. are probably overstated since some Canadian exports to the U.S. are actually destined for third countries. Table 7.1 reveals that the U.S. is by far the largest market for manufactured exports, but resource industry exports are more widely spread. High-tech exports are largely destined for the U.S., with the EU being another significant market.

Table 7.1
Export Shares by Region

Export Destination	Total	Resource	Manufacturing	High-Tech
U.S.	74.1	54.7	79.4	75.0
APEC (less U.S.)	11.2	22.7	7.7	6.4
EU	8.3	9.6	8.2	12.3
Residual	6.4	13.0	4.7	6.3

7.2 The I-O Model and Regional Comparisons

Much of the government export development effort goes towards identifying the "best" export markets. The best markets are the ones in which the greatest potential for increased exports exists, and there is a match between market opportunities and the ability or expertise of domestic industries. Alone, the input-output analysis can not suggest where new export opportunities might exist or

whether domestic industries have the relative international expertise. Since the I-O is restricted to providing information on the structure of, and relationships between, domestic industries, it does not allow the user to analyze international markets.

Given the limitations of the I-O in the selection of "winning" regions, it might seem that the model has little to offer on a regional basis. That is not entirely the case. The same criteria that were laid out in Section 6 to compare industries (In Which Industries Are Domestic Gains From Trade Highest?) can also be used to compare export regions.

The basic input-output relationships that exist between industries do not change with changing export markets. This means that Agriculture & Related Services industries, for example, use the same inputs, and purchase them from the same industries, in the production of their exports to the U.S. as they do in their production of exports to EU countries. The differences that can be noted in the different regional derived tables between Agriculture & Related Services Industries are a reflection of different export commodity mixes to different export regions.

Even if inter-industry relationships are identical across export markets (i.e., industries export the same commodities to each region), the regional averages in the derived tables can differ based on different industry export shares. The column totals in the derived tables are weighted averages of industry data; if the weights change with industries' shares of total regional exports, the regional totals change.

Although exports are region-specific in the model, imports are not. The imports that a particular industry requires in the production of exports to the U.S., for example, are not exclusively from the U.S.; they can come from all over the world. Thus, a trade deficit with one region or country might be partially the result of a trade surplus with another. Therefore, the model produces no meaningful regional trade balances.²⁵

As an aside, the problem with the model's trade balances can be extended to regional trade balances in general. Canada might have a trade surplus with one country and a trade deficit with another, but the trade deficit could be at least partially the result of importing intermediate inputs for the production of exports destined for the country with which we have the trade surplus. If Canada really wanted to

²⁵ The trade balances the model provides do not correspond to balances available in published trade statistics, since the imports in the model are only those that are used in the direct and/or indirect production of exports.

"correct" its trade deficit, the export product mix destined for the country with which we have the surplus would need to change. The input-output model serves to highlight the integration of an economy with all its trading partners, and to discount a regional approach to trade balances.

7.3 Regional Trade Up Close

As is evidenced by column 4 of the derived tables (Table 7.2 below), for every dollar of exports to different geographic regions, there are different import impacts. The tendency is likely to look more favourably upon regions which show less import impact, since in those regions Canadian exports are not "offset" by imports, and the net positive effect on the trade balance will be larger.

Table 7.2
Import/Export Ratio (column 4)

Export Destination	Imports/Exports (%)
APEC (less U.S.)	15.6
Residual	17.9
EU	18.5
U.S.	29.2

Column 5 of the derived tables (Table 7.3 below) contains imports as a share of commodity inputs. It is clear from Tables 7.2 and 7.3 that total exports to APEC countries (less the U.S.) result in fewer imports, and, by extension, require fewer imported inputs in their production. Exports to the U.S. result in significantly more imports and embody more imported inputs.

Table 7.3
Imports/Commodity Inputs Ratio (column 5)

Export Destination	Imports/Commodity Inputs (%)
APEC (less U.S.)	17.5
EU	20.0
Residual	20.4
U.S.	31.0

Industries that rely more on imported inputs must, by definition, rely less on domestic inputs. For a given increase in total exports, we expect activity in domestic input supply industries to be stimulated more with exports to APEC countries than with exports to the U.S.. Thus, for a given increase in exports, we expect a greater total impact on domestic GDP if the export markets are APEC countries.

Table 7.4
Total GDP Effect/Total Exports Ratio (table 3.8, model output)

Export Destination	Total GDP Effect/Total Exports
APEC (less U.S.)	0.79
Residual	0.77
EU	0.76
U.S.	0.65

The calculations contained in Table 7.4 confirm the expected, although the GDP effect is not much different between APEC, the residual countries and the EU. The U.S. figure is the outlier, with a smaller impact on domestic GDP than any other export destination considered. The upshot is that current exports to APEC countries

(less the U.S.) result in a larger positive impact on domestic GDP (for a given level of exports) than do exports to any other region, due primarily to the exporting industries' increased reliance on domestic inputs.

7.4 Regional Employment Comparisons

It comes as no surprise that more jobs are created by exports to the U.S. than exports to any other region. Table 7.5 shows that 68.7% of all export jobs are related to exports to the U.S..

The U.S. is also the export destination for which the fewest number of direct jobs are created relative to total jobs (49.3%). The implication is that, per dollar of exports, exports to the U.S. result in a relatively larger number of indirect jobs when compared to other export destinations. The positive economic chain-reaction of exporting -- at least as far as employment is concerned -- is largest for exports to the U.S..

Table 7.5
Export Jobs by Export Destination²⁶

Export Destination	Direct Jobs	Indirect Jobs	Total Jobs	Share of Total Jobs (%)	Direct/ Total Jobs (%)
U.S.	524,514	538,677	1,063,191	68.7	49.3
APEC (less U.S.)	116,220	96,173	212,393	13.7	54.7
EU	69,379	70,562	139,941	9.0	49.6
Residual	79,995	52,151	132,146	8.6	60.5

²⁶ The sum of total jobs in this table does not match the world total from the world derived table because of the reasons given in Section 4.2 "Limitations of the Model".

7.4.1 Job Quality Versus Job Quantity Revisited

Comparing columns 11 and 12 from the derived tables (Tables 7.6 and 7.7 below) reveals a nearly complete reversal between the rankings of regions in terms of direct jobs per \$10 million of GDP in the production of exports and wages, salaries and supplementary labour income per direct job. There is a clear tradeoff between regions where exports result in increases in employment and regions where exports create high paying jobs.

Table 7.6
Direct Jobs/\$10 million of Direct GDP Ratio (column 11)

Export Destination	Direct Jobs/\$10 million of Direct GDP
Residual	207.4
APEC (less U.S.)	176.3
U.S.	152.8
EU	152.0

Table 7.7
Wages, Salaries & Supplementary Labour Income/Direct Jobs Ratio (column 12)

Export Destination	Wages, Salaries & SLI/ Direct Jobs
U.S.	\$38,956
EU	\$38,678
APEC (less U.S.)	\$30,153
Residual	\$25,408

For an industrial comparison and analysis, it is appropriate to limit considerations of the employment effect of exports to direct jobs. For a regional analysis, the total employment effect is more appropriate. If government resources are used to encourage exports to a specific region, the total employment effect is one measure as to whether those resources are appropriately applied. Tables 7.6 and 7.7 are reproduced using total employment data in Tables 7.8 and 7.9.

Table 7.8
Total Jobs/\$10 million of Total GDP Ratio (not in derived tables)

Export Destination	Total Jobs/\$10 million of Total GDP
Residual	195.7
APEC (less U.S.)	179.5
EU	162.9
U.S.	162.0

Table 7.9
Wages, Salaries and Supplementary Labour Income/Total Jobs Ratio (table 3.8, model output)

Export Destination	Wages, Salaries & SLI/Total Jobs
U.S.	\$35,788
EU	\$35,374
APEC (less U.S.)	\$30,208
Residual	\$27,486

Just as was the case with direct jobs, there exists an inverse relationship between the rankings of wages, salaries and supplementary labour income/total jobs and total jobs/\$10 million of total GDP.

Again, as was the case with industrial comparisons, policy makers engaged in trade development must be aware of the relationship between the quality and quantity of jobs. One way to address the tradeoff between the number of jobs created and average salaries is to multiply the total jobs/\$10 million of total GDP ratio by the wages, salaries and supplementary labour income/total jobs ratio. The result will be wages, salaries and supplementary labour income/\$10 million of total GDP, a measure of the total return to labour, which is presented in Table 7.10.

Table 7.10
Wages, Salaries & Supplementary Labour Income/\$10 million of Total GDP Ratio

Export Destination	Wages, Salaries & SLI/\$10 million of Total GDP
U.S.	\$5,804,814
EU	\$5,762,425
APEC (less U.S.)	\$5,422,336
Residual	\$5,379,010

The greatest return to labour from an export generated increase in GDP of \$10 million -- assuming the increase is met by all industries according to their present export shares -- come from exporting to the U.S., followed closely by the EU. It is acknowledged that such a simple approach to account for the tradeoff between quality and quantity of jobs does not settle policy in any absolute, definitive way. There is still no easy answer. If it is accepted that the number of jobs created is more important than the average wage, or vice-versa, the industries which provide those jobs should be targeted for export initiatives, regardless of their export markets.

8. Conclusions and Trade Policy Implications

8.1 The Relevance of the I-O Approach

Throughout the Paper, a number of qualifications have been identified with respect to interpreting the I-O results. Those qualifications accentuate the inadequacies of the model and, by extension, its results. However, any analytical tool will have its limitations. To retain the strengths of a particular analytical approach, its limitations need to be fully recognized, and one must refrain from ascribing too much to its results. Versatility is traded for a more focused accuracy.

The I-O approach is acknowledged as only one way to analyze the role of exports in an economy. Its contribution to complex questions surrounding the importance of exports and the preference of some exports over others is part of a larger (probably multidisciplinary) approach. What the I-O can contribute is a discernment of the relationships between domestic industries and of certain non-dynamic domestic effects of exports. It is from this perspective that conclusions are drawn.

8.2 On Guard Against Mercantilism

Given the focus of the Department of Foreign Affairs and International Trade - as well as this Paper -- on export development (i.e., negotiated market access, export promotion, and defence of rules-based access), it is all too easy to adopt unwittingly a mercantilist view of international trade. Mercantilists believed uncategorically that exports were good and imports were bad, and that the economic benefits of international trade were the accumulated assets that resulted from running a trade surplus.

The input-output approach to export analysis highlights the international dependencies of Canadian export industries. It simultaneously discounts the notion that exports are inherently good for the economy and the notion that imports are inherently bad. On the export side, the I-O reveals how different industries' exports result in different domestic economic impacts. Some industries' exports, for example, create a far greater number of jobs than do the exports of other industries. According to the model, exports are good for the economy, but some are better than others.

As for imports, the I-O illustrates the dependence on imported inputs in the production of exports. Without imported inputs, the production of some exports would not be possible, and the economic gains associated with those exports would

be lost. This Paper recommends favouring export industries that rely less on imported inputs in order to stimulate domestic intermediate input industries. While recognizing the importance of imports, from an export enhancement perspective, it makes sense to focus somewhat more on industries that rely on domestically produced inputs to the degree that this approach supports internationally competitive production.

One of the factors in the question of whether imported inputs contribute to or detract from the domestic economy is whether there exist any competitive domestic industries producing the imports in question. If so, imports can displace domestic input production and reduce the positive domestic economic impact of export expansion.²⁷ If there are no import competing industries, then imported inputs can only add to domestic economic well being by providing otherwise unavailable intermediate inputs of the required cost and quality and allowing for the production of certain exports. This Paper makes no assumptions about the existence or competitiveness of Canadian import competing industries, and recognizes that further research in this area would be useful.

8.3 The Globalization Process

Some of the judgements in this Paper (for example, export industries that rely relatively less on imported inputs provide a more positive domestic economic impact) are made with the qualification "holding everything else constant". Of course, in the real world where business and policy decision are made, nothing is constant. Business is becoming more internationally integrated in an ongoing process that has come to be known as globalization. Competitive businesses have new approaches to research and development, production, marketing and input sourcing, among other things.

The analysis conducted in this Paper -- especially that which looks at the relationships between imported inputs and exports -- should not be interpreted as being ignorant of, or a backlash against, the globalization process. Despite the internationalization of business, economic policy decisions, including those concerning trade policy, are still centred on improving domestic economic conditions. There is

²⁷ Theory suggests that imports displace domestic producers that are not able to compete internationally and thus free up resources to be reallocated to more efficient uses. Those efficiency gains can then lead to increased economic growth. As a result, the original negative domestic impact, i.e., the reduction in output of the inefficient import competing industries, can be fully offset by the eventual efficiency gains from resource reallocation. Even when imported inputs appear at first to detract from the economy, it can be argued that over time they will contribute to economic growth.

no inconsistency between recognizing the globalization process and focusing trade policy in general, and export initiatives in particular, on internationally active industries that contribute the most to the domestic economy.

8.4 I-O Lessons for the Organization of Canadian Export Initiatives

In analyzing the industry-by-industry effects of increased exports at the level of detail allowed by the I-O framework, it is inevitable for one to return to the most fundamental questions of why nations trade. In short, nations trade in order to increase their economic well-being. The underlying reason for increasing the level of exports, as revealed by the I-O, is to seek out domestic gains from trade, including increased GDP, increased employment and/or higher average wages.

In order to maximize the positive domestic economic impact per dollar of export promotion expenditure, DFAIT export initiatives must be based primarily on achieving the aforementioned gains from trade.²⁸ Trade should not be about capturing foreign market share, waving the Canadian flag abroad, attempting to duplicate certain practices of other successful trading nations, or creating a more internationalized domestic business sector. How many domestic firms actually export -- or even the level of exports to particular markets -- should not gauge the success of government export programs. The trade activities of DFAIT need only be judged by their domestic economic impact as measured by the delivered gains from trade.

To that end, DFAIT trade personnel should be well versed in the basic economic justifications for trade and the quantifiable gains from trade. It is not enough to grapple with uncertain notions concerning international competitiveness, the globalization process or the desirability of trying to ensure a perpetual trade surplus. It is equally undesirable to assign personnel to export initiatives without first indicating to them what the desired results are. Since the gains from trade are not uniform across industries or export destinations, the government's current economic priorities (increased job creation, for example) must be enveloped in the trade policy development process and ultimately in export initiatives.

An integral part of developing a better understanding of the gains from trade, as well as the government's economic agenda and the role that trade can play in it,

²⁸ Although delivering the gains from trade should be the primary goal of export initiatives, there are other economic benefits such as the transfer of technology and positive externalities associated with trade that should also be considered. Covering all the possible gains from trade is beyond the scope of this Paper.

is a working knowledge of the structure of Canadian industries. With such an understanding, trade officials can properly direct export resources so as to assist those industries that will most readily contribute to trade policy, and wider government economic policy, goals.

Of course, any discussion of the function of trade officials would be incomplete without referring to their role in gathering intelligence and disseminating assessments of foreign market conditions. The I-O approach suggests that the identification of foreign markets in which exports might increase is the final step in export promotion. Once the association has been made between the gains from trade and the industries that can provide them, then it is time to discover foreign outlets for their production. If the order of business in developing export initiatives is first to seek out export markets that are dynamic and growing, and then encourage domestic industries *en masse* to sell into those markets, then the domestic economic gains from trade are not necessarily going to be as high as they could be if a better understanding of domestic industries resulted in a more focused exercise.

8.4.1 Lessons From the Value-Added Balance

The exercise undertaken in Section 6.2.1 which transformed Canada's 1993 merchandise trade surplus with the U.S. into a value-added deficit serves to illustrate the importance of acquiring a deeper understanding of the Canadian industrial structure, the degree to which Canadian industries are internationally integrated, and the effect that both can have on Canadian trade. Without attaching too much importance to the actual numbers (since a different set of assumptions would lead to a different result, including the possibility of a continued surplus), the value-added deficit emphasizes that trade officials need to look beyond the available trade statistics.

In and of itself, a trade surplus with a particular country or region does not necessarily imply that the domestic economy is benefitting to the degree possible through trade. A trade deficit can be equally misleading. While it is not recommended that trade officials attempt to calculate value-added balances, it is suggested that they familiarize themselves with the export industries that contribute the most to the domestic economy in terms of direct and indirect employment and value-added. Maximizing the domestic economic gains from trade could require more effort even in those markets where Canada already appears to enjoy a trade surplus.

8.5 I-O Lessons for the Industrial Targeting of Canadian Export Initiatives

Canada's resource industries account for about 15% of exports and, as a group, score the highest using the criteria set out in the I-O framework to select the ideal export industries. The drawbacks concerning resource industries are that some are clearly producers of intermediate inputs for other domestic export industries and some do not generate as much employment as the average export industry. Although the promotion of resource industry exports needs to be conducted in a different manner than the promotion of manufacturing industries, which can take advantage of trade fairs to display their products to selected foreign buyers, the domestic economic benefits of resource industry exports implies that they should not be ignored.

In addition to the industries that export resources, the industries that export processed resources are also identified by the I-O as excellent export industries. Together, the food, tobacco, wood and paper industries account for nearly 17% of Canada's exports. Due to their heavy reliance on domestic resource inputs, their reliance on imported inputs is well below average for export industries. This type of chain reaction effect on domestic production is one of the keys to maximizing the positive domestic economic impact of exports.

For all the attention that high-tech industries attract, they do not perform much better than manufacturing industries in general with respect to their desirable export characteristics. They appear to operate in relative isolation from other domestic industries since their output is largely exported and their intermediate inputs are often imported. In a small, open economy such as Canada, the quantifiable spill-overs of high-tech export production may thus be smaller than the business economics literature might otherwise suggest.

As a result, in order to justify focusing on high-tech exports, the nonquantifiable spill-overs of their production must be quite large. High-tech exports must transfer technology and know-how to other domestic industries and there must be a distinct positive dynamic economic effect associated with their production.

Findings on the relative attractiveness of resource industry exports, and the relative unattractiveness of high-tech exports, are not unique to this Paper. In a study of Canada's international competitiveness, A. Rugman and J D'Cruz state:

... Industrial policy should not focus on a relatively uncompetitive and small sector of Canada's industrial base. Instead, it should build upon the existing current success of Canada's resource industries. This is not to say that high-

growth industries should be ignored in industrial policy but that their promotion should be more proportionate to the contribution those industries make to Canada's industrial mix.²⁹

The Rugman and D'Cruz paper goes on to claim that there are two considerations to keep in mind when assessing the appropriateness of a government-led high-tech strategy.³⁰ First, high-tech export sectors develop following the establishment of domestic high-tech markets. Canada is simply too small to cultivate and support many of its own high-tech industries. Second, the international competitiveness of high-tech industries is often based on the government subsidies they receive. Canada cannot win a subsidization competition. Our pockets simply are not deep enough.

The results for other manufacturing industries in the I-O analysis are mixed. On the positive side, they tend not to be producers of intermediate inputs and they tend to employ labour at higher than average wages. However, as a group, manufacturing industries employ fewer workers per dollar of exports than average and they rely more heavily on imported inputs. In terms of their suitability for export initiatives, manufacturing industries must be carefully scrutinized in the context of very specific economic goals.

The I-O approach confirms that service industries are structured in a different way than resource and manufacturing industries and require a different approach with respect to encouraging their international expansion. The I-O illustrates that service industries are largely support industries, providing intermediate inputs to other domestic exporting industries. In order to provide those intermediate inputs to foreign firms, service industries need to be located in foreign markets. Traditional government programs for promoting exports are not particularly well suited for service industries, which require assistance with issues such as interpreting foreign regulations on establishing local business enterprises.

8.6 I-O Lessons for Employment

Without providing any sense of the appropriate response, the I-O exemplifies the difficult real world dilemma that policy makers are confronted with in the tradeoff

²⁹ See A.M. Rugman and J. D'Cruz, *Canadian Strategies for International Competitiveness*, in *Business in the Contemporary World*, Vol. 3, No. 1, Bentley College, MA., Autumn 1990, p.94.

³⁰ See A.M. Rugman and J. D'Cruz, *op. cit.*, p. 99.

between job quality and job quantity. The model is not able to make any employment related recommendations without guidance on the fundamental question of whether the priority of trade policy is the number of jobs created in the export sector or the average wage of those new jobs. Once the employment goals of trade policy are agreed upon, the I-O can assist in selecting industries to target for export initiatives.

Since employment effects are only one consideration in the formulation of trade policy and in export promotion initiatives, they can be analyzed in conjunction with other considerations. For example, the I-O reveals that if high-tech industries are the focus of certain export initiatives, the employment effect will be the creation of a relatively small number of high paying jobs. Thus, the I-O provides the employment context (both direct and indirect jobs created as well as average wage rates) of trade initiative decisions that are based on other criteria.

8.7 I-O Lessons for Targeting Specific Export Markets

In one respect, the I-O analysis is least useful in assisting with the selection of new and/or expanding export markets. Yet, through its unique approach to analyzing exports, the I-O provides a valuable -- if obvious -- lesson: the domestic economic impact of exports is the same regardless of export markets. The I-O approach suggests first finding industries that deliver the desired domestic economic impact, and then seeking out foreign markets for them.

In terms of ranking present export destinations, the I-O provides very mixed results. Exports to APEC countries other than the U.S. have the largest GDP effect/total exports ratio; exports to the Residual countries create the most jobs per dollar of GDP generated in the production of exports; and exports to the U.S. result in jobs with the highest average wage and total return to labour. Even with the intent of increasing exports according to their provision of the domestic gains from trade, there is no simple solution in selecting export destinations. Once again, it is up to policy makers to provide some guidance on the underlying economic goals toward which the export sector is meant to contribute.

The limited contribution of I-O analysis in the selection of export markets emphasizes the fact that there are a number of approaches and analytical techniques that are required in the formulation of a comprehensive and consistent export development program. The I-O analysis is a small part of what should be a much larger process. All factors, including political and economic motivations which can change over time, must be weighed and offset against each other in setting the optimal trade policy agenda.

Annex 1: Derived Tables from the Input-Output Model

World Total	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Industry (M aggregation)	Exports (\$ 000s)	Export Share (%)	Imports (\$ 000s)	Imports/ Exports (%)	Imports/ Commodity Inputs (%)	Imports/ Industry Output (%)	Exports/ Industry Output (%)	Direct GDP Effect/ Exports (%)	Direct Jobs	Direct Jobs/ \$10 million of Industry Exports	Direct Jobs/ \$10 million of Direct GDP	Wages, Sal. & SLI/ Direct Jobs (\$)	Total Jobs	Total Jobs/ \$10 million of Total Exports
1 Agricultural & Related Services Ind	4,837,019	3.3	454,826	9.4	11.0	6.2	66.0	51.2	96,333	199.2	389.1	5,211	141,395	9.6
2 Fishing & Trapping Industries	398,311	0.3	86,694	21.8	17.5	6.9	31.5	59.3	9,552	239.8	404.3	7,852	30,293	2.1
3 Logging & Forestry Industries	191,579	0.1	241,605	126.1	7.7	4.3	3.4	40.8	1,222	63.8	156.3	44,179	35,486	2.4
4 Mining Industries	7,582,048	5.2	807,203	10.6	18.4	7.1	66.5	56.9	33,745	44.5	78.3	53,400	47,947	3.3
5 Crude Petroleum & Natural Gas	9,131,325	6.2	567,241	6.2	9.8	4.5	72.4	49.6	15,347	16.8	33.9	65,548	21,199	1.4
6 Quarry & Sand Pit Industries	51,067	0.0	11,587	22.7	16.6	6.9	30.5	55.0	340	66.6	121.1	35,297	1,114	0.1
7 Service Related To Mineral Extract.	26,620	0.0	109,644	411.9	21.2	10.1	2.5	49.4	235	88.1	178.5	42,631	9,556	0.7
8 Food Industries	5,219,377	3.6	539,511	10.3	10.9	7.8	75.5	29.2	32,897	63.0	215.8	27,753	39,989	2.7
9 Beverage Industries	674,164	0.5	52,167	7.7	13.9	7.0	90.7	46.7	2,923	41.9	89.7	51,002	3,100	0.2
10 Tobacco Products Industries	112,888	0.1	4,057	3.6	5.8	3.0	84.1	46.9	294	26.1	55.6	57,750	350	0.0
11 Rubber Products Industries	1,173,502	0.8	337,801	28.8	34.6	19.6	68.2	41.5	9,975	85.0	204.8	42,805	14,631	1.0
12 Plastic Products Industries	1,124,927	0.8	326,312	29.0	28.4	16.9	58.4	39.4	9,757	86.7	220.2	29,620	16,410	1.1
13 Leather & Allied Products Ind.	148,839	0.1	50,172	33.7	37.9	23.9	70.9	35.9	1,806	121.3	337.8	22,704	2,532	0.2
14 Primary Textile & Textile Prod. Ind	929,945	0.6	337,153	36.3	33.3	19.7	54.4	39.4	7,634	82.1	208.5	31,177	14,805	1.0
15 Clothing Industries	378,226	0.3	82,416	21.8	29.1	16.4	75.4	43.2	5,693	150.5	348.7	21,079	7,539	0.5
16 Wood Industries	5,925,697	4.0	448,854	7.6	8.0	5.6	74.1	28.8	39,870	67.3	233.9	38,576	54,052	3.7
17 Furniture & Fixture Industries	720,247	0.5	106,416	14.8	25.1	13.8	93.2	44.1	8,924	123.9	281.0	26,558	9,590	0.7
18 Paper & Allied Products Industries	13,048,094	8.9	1,185,398	9.1	12.8	7.7	85.2	38.3	54,039	41.4	108.2	52,555	65,140	4.4
19 Printing, Publishing & Allied Ind.	626,983	0.4	130,794	20.9	14.3	6.3	30.3	54.1	6,466	103.1	190.5	36,189	21,009	1.4
20 Primary Metal Industries	10,319,179	7.0	2,738,633	26.5	23.7	17.1	64.4	24.1	34,892	33.8	140.4	55,056	62,069	4.2
21 Fabricated Metal Product Industries	3,184,644	2.2	796,883	25.0	24.3	13.6	54.4	43.7	31,045	97.5	223.0	34,145	56,066	3.8
22 Machinery Industries	3,857,792	2.6	977,242	25.3	37.2	20.8	82.2	42.8	30,553	79.2	184.8	37,214	37,195	2.5
23 Transportation Equipment Industries	36,266,469	24.7	16,500,959	45.5	53.8	39.6	86.9	23.8	130,958	36.1	151.4	44,930	165,555	11.3
24 Electrical & Electronic Products	8,919,310	6.1	4,122,401	46.2	59.6	38.7	83.7	33.7	52,172	58.5	173.7	37,626	63,394	4.3
25 Non-metallic Mineral Products Ind.	894,168	0.6	181,392	20.3	23.1	11.8	58.3	47.1	6,510	72.8	154.6	38,556	11,443	0.8
26 Refined Petroleum & Coal Products	2,809,935	1.9	1,730,702	61.6	33.4	30.7	49.9	6.9	1,984	7.1	101.6	63,012	3,977	0.3
27 Chemical & Chemical Products Ind.	5,171,923	3.5	1,401,488	27.1	21.8	13.8	50.8	33.9	15,210	29.4	86.8	48,916	31,524	2.2
28 Other Manufacturing Industries	1,633,739	1.1	449,964	27.5	38.5	21.3	77.2	42.4	17,359	106.3	250.5	29,956	22,789	1.6
29 Construction Industries	880	0.0	134,758	15,311.8	14.1	6.0	0.0	59.6	2	28.3	47.4	0	23,679	1.6
30 Transportation Industries	7,502,864	5.1	616,270	8.2	9.1	4.4	53.6	48.0	68,591	91.4	190.5	37,031	130,980	8.9
31 Pipeline Transport Industries	991,585	0.7	36,283	3.7	7.9	2.3	62.0	65.9	1,824	18.4	27.9	57,565	2,943	0.2
32 Storage & Warehousing Industries	425,267	0.3	22,337	5.3	8.9	3.5	66.9	53.4	6,110	143.7	269.0	25,860	9,134	0.6
33 Communication Industries	770,903	0.5	77,258	10.0	10.3	2.7	26.6	74.5	7,506	97.4	130.7	41,966	26,877	1.8
34 Other Utility Industries	613,395	0.4	213,665	34.8	19.0	4.5	12.8	74.1	2,560	41.7	56.3	47,267	20,254	1.4
35 Wholesale Trade Industries	5,195,699	3.5	304,600	5.9	9.4	2.8	47.9	67.0	72,025	138.6	206.9	36,099	150,428	10.3
36 Retail Trade Industries	207,034	0.1	53,923	26.0	7.1	2.2	8.6	64.6	5,572	269.1	416.5	18,306	64,587	4.4
37 Finance & Real Estate Industries	1,021,367	0.7	173,706	17.0	7.8	2.6	15.1	56.1	6,870	67.3	119.9	43,085	50,425	3.4
38 Insurance Industries	799,289	0.5	92,543	11.6	9.8	5.6	48.3	29.3	5,553	69.5	237.1	60,149	11,498	0.8
39 Govt. Royalties On Nat. Resources	0	0.0	0	N/A	N/A	0.0	0.0	N/A	0	N/A	N/A	N/A	0	0.0
41 Business Service Industries	2,933,121	2.0	219,022	7.5	9.9	2.7	36.2	72.6	56,019	191.0	263.2	27,955	148,789	10.2
42 Educational Service Industries	153,530	0.1	5,945	3.9	10.7	3.9	99.9	60.9	2,137	139.2	228.5	37,444	2,138	0.1
43 Health Services Industry	6,778	0.0	824	12.2	14.5	3.7	30.6	61.0	91	134.0	219.8	33,029	252	0.0
44 Accommodation & Food Service Ind.	35,219	0.0	27,823	79.0	9.2	3.7	4.7	55.4	984	279.4	504.4	14,228	20,398	1.4
45 Amusement & Recreational Services	325,578	0.2	66,663	20.5	18.3	10.7	52.2	41.7	3,626	111.4	266.8	20,410	6,166	0.4
46 Personal & Household Service Ind.	3,312	0.0	2,010	60.7	11.3	3.7	6.2	70.1	78	235.4	335.6	12,830	1,203	0.1
47 Other Service Industries	217,723	0.1	55,445	25.5	11.7	3.1	12.1	68.4	5,742	263.7	385.3	13,932	48,679	3.3
Total	146,561,562	100.0	36,882,589	25.2	27.7	15.4	61.1	37.6	902,923	61.6	163.7	35,986	1,708,580	116.6

Sources: Exports and Gross Industry Output, table 3.4; Imports and Supply of Commodity Inputs, table 3.5; Jobs, table 3.10; Direct GDP and Wages, Salaries and SLI, table 3.6.

United States		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Industry (M aggregation)	Exports (\$ 000s)	Export Share (%)	Imports (\$ 000s)	Imports/ Exports (%)	Imports/ Commodity Inputs (%)	Imports/ Industry Output (%)	Exports/ Industry Output (%)	Direct GDP Effect/ Exports (%)	Direct Jobs	Direct Jobs/ \$10 million of Industry Exports	Direct Jobs/ \$10 million of Direct GDP	Wages, Sal. & SLI/ Direct Jobs (\$)	Total Jobs	Total Jobs/ \$10 million of Total Exports	
1	Agricultural & Related Services Ind	1,457,438	1.5	140,558	9.6	8.3	4.9	50.5	44.5	25,667	176.1	395.5	5,182	51,780	0.5
2	Fishing & Trapping Industries	20,771	0.0	39,035	187.9	17.5	6.9	3.7	59.3	498	239.8	404.3	8,031	13,640	1.4
3	Logging & Forestry Industries	57,380	0.1	155,471	271.0	7.7	4.3	1.6	40.8	366	63.8	156.3	43,706	22,835	2.3
4	Mining Industries	1,549,537	1.5	239,373	15.4	18.1	7.1	45.7	54.0	7,627	49.2	91.1	47,728	14,628	1.5
5	Crude Petroleum & Natural Gas	8,184,618	8.2	476,668	5.8	9.8	4.5	77.2	49.6	13,756	16.8	33.9	65,570	17,814	1.8
6	Quarry & Sand Pit Industries	33,164	0.0	7,354	22.2	16.6	6.9	31.2	55.0	221	66.6	121.1	36,234	707	0.1
7	Service Related To Mineral Extract.	15,048	0.0	70,874	471.0	21.2	10.1	2.1	49.4	133	88.1	178.4	37,710	6,177	0.6
8	Food Industries	3,115,351	3.1	337,467	10.8	11.3	8.0	74.2	29.6	20,810	68.8	225.7	27,486	25,348	2.5
9	Beverage Industries	614,909	0.6	46,316	7.5	13.9	7.0	92.8	46.9	2,579	41.9	89.3	51,185	2,771	0.3
10	Tobacco Products Industries	56,691	0.1	2,059	3.6	5.8	3.0	83.2	46.9	148	26.1	55.6	54,116	178	0.0
11	Rubber Products Industries	1,032,024	1.0	291,548	28.3	34.6	19.6	69.5	41.5	8,773	85.0	204.8	42,860	12,628	1.3
12	Plastic Products Industries	991,539	1.0	269,072	27.1	28.5	17.0	62.6	39.4	8,598	86.7	220.3	29,547	13,517	1.3
13	Leather & Allied Products Ind.	125,065	0.1	41,662	33.3	37.9	23.8	71.4	36.6	1,558	124.6	340.6	23,105	2,140	0.2
14	Primary Textile & Textile Prod. Ind	574,675	0.6	231,350	40.3	33.1	19.7	48.9	38.6	4,723	82.2	212.7	30,702	10,247	1.0
15	Clothing Industries	288,162	0.3	61,878	21.5	29.1	16.4	76.5	43.2	4,342	150.7	348.8	20,960	5,667	0.6
16	Wood Industries	3,933,246	3.9	324,492	8.2	8.7	6.0	72.6	30.0	27,659	70.3	234.5	37,492	37,855	3.8
17	Furniture & Fixture Industries	905,067	0.9	129,048	14.3	24.7	13.5	95.0	44.1	11,271	124.5	282.5	26,794	11,886	1.2
18	Paper & Allied Products Industries	9,577,279	9.5	892,691	9.3	13.0	7.9	84.9	37.5	41,794	43.6	116.5	52,041	50,004	5.0
19	Printing, Publishing & Allied Ind.	513,463	0.5	91,877	17.9	14.5	6.4	35.6	54.1	5,351	104.2	192.7	36,069	14,714	1.5
20	Primary Metal Industries	6,370,742	6.3	1,960,835	30.8	25.1	17.6	57.3	27.2	26,047	40.9	150.6	49,717	48,477	4.8
21	Fabricated Metal Product Industries	2,588,951	2.6	611,288	23.6	23.7	13.1	55.5	45.2	28,426	102.1	225.6	34,095	45,935	4.6
22	Machinery Industries	2,775,661	2.8	694,305	25.0	37.1	20.7	82.8	42.9	21,952	79.1	184.5	36,989	26,532	2.6
23	Transportation Equipment Industries	32,528,896	32.4	15,070,586	46.3	54.3	40.5	87.4	22.8	111,773	34.4	150.5	45,064	141,506	14.1
24	Electrical & Electronic Products	7,018,715	7.0	3,419,187	48.7	61.4	41.3	84.7	31.2	39,494	56.3	180.3	36,639	47,518	4.7
25	Non-metallic Mineral Products Ind.	775,904	0.8	148,097	19.1	23.2	11.8	61.9	47.2	5,604	72.2	152.9	38,545	9,340	0.9
26	Refined Petroleum & Coal Products	2,323,832	2.3	1,212,105	52.2	33.4	30.7	58.9	6.9	1,641	7.1	101.6	62,783	2,785	0.3
27	Chemical & Chemical Products Ind.	3,615,328	3.6	958,701	26.5	22.0	13.9	52.3	34.1	11,197	31.0	90.8	48,140	21,865	2.2
28	Other Manufacturing Industries	1,023,542	1.0	271,942	26.6	36.4	19.9	74.8	42.9	10,647	104.0	242.3	30,524	14,486	1.4
29	Construction Industries	0	0.0	80,466	N/A	14.1	6.0	0.0	N/A	0	N/A	N/A	N/A	14,145	1.4
30	Transportation Industries	3,443,046	3.4	330,676	9.6	9.1	4.4	45.7	48.1	31,708	92.1	191.6	36,269	71,082	7.1
31	Pipeline Transport Industries	920,051	0.9	30,661	3.3	7.9	2.3	68.1	65.9	1,692	18.4	27.9	57,905	2,487	0.2
32	Storage & Warehousing Industries	37,716	0.0	5,469	14.5	8.9	3.5	24.2	53.4	542	143.7	269.0	25,836	2,236	0.2
33	Communication Industries	76,296	0.1	40,063	52.5	10.9	2.9	5.6	72.6	508	66.5	91.6	45,302	12,307	1.2
34	Other Utility Industries	592,669	0.6	151,616	25.6	19.1	4.5	17.4	74.0	2,468	41.6	56.3	47,407	14,358	1.4
35	Wholesale Trade Industries	3,003,154	3.0	193,474	6.4	9.4	2.8	43.6	67.0	41,631	138.6	206.9	36,103	95,548	9.5
36	Retail Trade Industries	159,712	0.2	36,817	23.1	7.1	2.2	9.7	64.6	4,298	269.1	416.5	18,379	44,098	4.4
37	Finance & Real Estate Industries	0	0.0	87,101	N/A	7.8	2.5	0.0	N/A	0	N/A	N/A	N/A	26,327	2.6
38	Insurance Industries	0	0.0	21,302	N/A	9.8	5.8	0.0	N/A	0	N/A	N/A	N/A	2,647	0.3
39	Govt. Royalties On Nat. Resources	0	0.0	0	N/A	N/A	0.0	0.0	N/A	0	N/A	N/A	N/A	0	0.0
41	Business Service Industries	9,678	0.0	97,365	1,006.0	10.2	2.8	0.3	60.0	114	117.9	196.5	35,051	62,785	6.3
43	Health Services Industry	0	0.0	144	N/A	14.6	3.0	0.0	N/A	0	N/A	N/A	N/A	51	0.0
44	Accommodation & Food Service Ind.	61	0.0	16,377	27,028.8	9.2	3.7	0.0	57.0	0	0.0	0.0	N/A	12,005	1.2
45	Amusement & Recreational Services	27,340	0.0	20,669	75.6	19.2	11.8	15.7	33.6	174	63.6	189.0	23,011	1,445	0.1
46	Personal & Household Service Ind.	0	0.0	1,160	N/A	11.3	3.8	0.0	N/A	0	N/A	N/A	N/A	683	0.1
47	Other Service Industries	24,940	0.0	32,817	131.6	12.4	3.2	2.4	75.3	727	291.4	386.8	17,889	28,009	2.8
	Total	100,361,660	100.0	29,342,017	29.2	31.0	18.0	61.4	34.2	524,514	52.3	152.8	38,956	1,063,191	105.9

Sources: Exports and Gross Industry Output, table 3.4; Imports and Supply of Commodity Inputs, table 3.5; Jobs, table 3.10; Direct GDP and Wages, Salaries & SLI, table 3.6.

APEC (Minus the United States)		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Industry (M aggregation)	Exports (\$ 000s)	Export Share (%)	Imports (\$ 000s)	Imports/ Exports (%)	Imports/ Commodity Inputs (%)	Imports/ Industry Output (%)	Exports/ Industry Output (%)	Direct GDP Effect/ Exports (%)	Direct Jobs	Direct Jobs/ \$10 million of Industry Exports	Direct Jobs/ \$10 million of Direct GDP	Wages, Sal. & SLI/ Direct Jobs (\$)	Total Jobs	Total Jobs/ \$10 million of Total Exports	
1	Agricultural & Related Services Ind	1,629,648	10.9	152,155	9.3	13.0	7.1	75.7	54.2	34,141	209.5	386.8	5,234	43,379	29.0
2	Fishing & Trapping Industries	11,778	0.1	16,572	140.7	17.5	6.9	4.9	59.3	282	239.8	404.3	7,807	5,791	3.9
3	Logging & Forestry Industries	101,534	0.7	42,708	42.1	7.7	4.3	10.3	40.8	648	63.8	156.3	44,701	6,273	4.2
4	Mining Industries	2,819,942	18.8	213,438	7.6	18.0	6.8	89.6	58.9	12,162	43.1	73.2	55,131	13,400	8.9
5	Crude Petroleum & Natural Gas	114,321	0.8	22,556	19.7	9.8	4.5	22.8	49.6	192	16.8	33.9	65,591	843	0.6
6	Quarry & Sand Pit Industries	6,816	0.0	1,406	20.6	16.6	6.9	33.6	55.0	45	66.6	121.1	36,099	135	0.1
7	Service Related To Mineral Extract.	2,316	0.0	11,574	499.8	21.2	10.1	2.0	49.4	20	88.1	178.5	40,822	1,009	0.7
8	Food Industries	1,168,477	7.8	102,334	8.8	9.6	7.0	79.8	27.5	7,606	65.1	237.0	26,623	8,873	5.9
9	Beverage Industries	15,811	0.1	1,683	10.6	13.3	7.2	67.4	44.1	65	41.3	93.8	49,716	95	0.1
10	Tobacco Products Industries	14,815	0.1	536	3.6	5.8	3.0	83.6	46.9	39	26.1	55.6	55,808	46	0.0
11	Rubber Products Industries	31,420	0.2	12,272	39.1	34.6	19.6	50.2	41.5	267	85.0	204.8	42,866	532	0.4
12	Plastic Products Industries	41,892	0.3	20,184	48.2	28.1	16.8	34.8	40.4	383	91.3	228.2	28,855	1,031	0.7
13	Leather & Allied Products Ind.	11,271	0.1	3,678	32.6	37.3	24.5	75.0	31.4	113	100.4	319.6	23,619	163	0.1
14	Primary Textile & Textile Prod. Ind	174,050	1.2	47,236	27.1	34.3	19.8	72.8	41.3	1,208	69.4	168.1	35,118	1,810	1.2
15	Clothing Industries	16,973	0.1	4,886	28.8	29.4	16.6	57.6	43.3	255	150.1	346.3	21,211	442	0.3
16	Wood Industries	1,068,663	7.1	66,170	6.2	7.1	5.0	80.7	27.5	6,813	63.7	231.9	40,004	8,533	5.7
17	Furniture & Fixture Industries	13,137	0.1	2,273	17.3	25.0	13.9	80.1	43.5	168	128.2	295.0	26,072	210	0.1
18	Paper & Allied Products Industries	1,415,899	9.5	117,957	8.3	12.3	7.3	87.1	39.9	5,217	36.8	92.4	54,084	6,270	4.2
19	Printing, Publishing & Allied Ind.	15,776	0.1	9,730	61.7	14.0	6.2	10.1	51.7	160	101.3	196.0	35,598	1,571	1.0
20	Primary Metal Industries	1,187,860	7.9	292,898	24.7	25.6	18.1	73.5	27.7	5,067	42.7	154.3	48,136	6,910	4.6
21	Fabricated Metal Product Industries	254,046	1.7	65,523	25.8	25.4	14.5	56.1	41.8	2,192	86.3	206.6	35,885	4,051	2.7
22	Machinery Industries	262,077	1.7	74,191	28.3	37.5	21.0	74.2	42.8	2,085	79.5	185.9	37,568	2,799	1.9
23	Transportation Equipment Industries	511,440	3.4	163,800	32.0	40.6	23.7	74.1	42.0	3,443	67.3	160.3	44,624	4,567	3.0
24	Electrical & Electronic Products	437,537	2.9	175,353	40.1	52.3	31.0	77.2	39.9	2,741	62.6	157.2	39,511	3,619	2.4
25	Non-metallic Mineral Products Ind.	25,435	0.2	9,075	35.7	22.2	11.7	32.7	46.0	182	71.7	156.1	38,267	561	0.4
26	Refined Petroleum & Coal Products	34,589	0.2	168,642	487.6	33.4	30.7	6.3	6.9	24	7.1	101.6	62,944	387	0.3
27	Chemical & Chemical Products Ind.	941,768	6.3	234,030	24.9	21.5	13.9	55.8	31.9	2,341	24.9	77.9	51,948	4,706	3.1
28	Other Manufacturing Industries	181,257	1.2	53,116	29.3	42.4	23.8	81.1	41.7	2,031	112.1	268.6	28,866	2,520	1.7
29	Construction Industries	0	0.0	18,871	N/A	14.1	6.0	0.0	N/A	0	N/A	N/A	N/A	3,318	2.2
30	Transportation Industries	1,762,640	11.8	111,942	6.4	8.8	4.2	65.9	48.1	16,220	92.0	191.5	36,273	24,877	16.6
31	Pipeline Transport Industries	2,769	0.0	1,656	59.8	7.9	2.3	3.8	65.9	5	18.4	27.9	57,730	134	0.1
32	Storage & Warehousing Industries	174,702	1.2	7,528	4.3	8.9	3.5	81.5	53.4	2,510	143.7	269.0	25,868	3,078	2.1
33	Communication Industries	18,578	0.1	6,583	35.4	10.4	2.6	7.5	72.6	124	66.5	91.6	45,807	2,173	1.5
34	Other Utility Industries	194	0.0	22,056	11,349.8	18.9	4.4	0.0	82.5	1	47.9	58.1	44,003	2,098	1.4
35	Wholesale Trade Industries	466,882	3.1	34,367	7.4	9.4	2.8	38.1	67.0	6,472	138.6	206.9	36,096	16,972	11.3
36	Retail Trade Industries	30,527	0.2	6,841	22.4	7.1	2.2	10.0	64.6	822	269.1	416.5	18,367	8,194	5.5
37	Finance & Real Estate Industries	0	0.0	16,956	N/A	7.8	2.5	0.0	N/A	0	N/A	N/A	N/A	5,008	3.3
38	Insurance Industries	0	0.0	5,890	N/A	9.8	5.6	0.0	N/A	0	N/A	N/A	N/A	732	0.5
39	Govt. Royalties On Nat. Resources	0	0.0	0	N/A	N/A	0.0	0.0	N/A	0	N/A	N/A	N/A	0	0.0
41	Business Service Industries	1,487	0.0	11,770	791.5	10.1	2.8	0.4	60.0	18	117.9	196.5	39,291	7,304	4.9
43	Health Services Industry	0	0.0	37	N/A	14.6	3.0	0.0	N/A	0	N/A	N/A	N/A	13	0.0
44	Accommodation & Food Service Ind.	9	0.0	2,835	32,164.8	9.2	3.7	0.0	57.0	0	246.0	431.6	13,838	2,078	1.4
45	Amusement & Recreational Services	4,374	0.0	3,426	78.3	19.2	11.8	15.0	33.9	29	65.2	192.3	26,010	243	0.2
46	Personal & Household Service Ind.	0	0.0	231	N/A	11.3	3.8	0.0	N/A	0	N/A	N/A	N/A	137	0.1
47	Other Service Industries	4,524	0.0	8,302	139.3	11.9	3.1	2.2	73.8	129	285.4	386.5	17,464	5,508	3.7
	Total	14,977,236	100.0	2,343,266	15.6	17.5	9.1	58.2	44.0	116,220	77.6	176.3	30,153	212,393	141.8

Sources: Exports and Gross Industry Output, table 3.4; Imports and Supply of Commodity Inputs, table 3.5; Jobs, table 3.10; Direct GDP and Wages, Salaries & SLI, table 3.6.

European Union	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Industry (M aggregation)	Exports (\$ 000s)	Export Share (%)	Imports (\$ 000s)	Imports/ Exports (%)	Imports/ Commodity Inputs (%)	Imports/ Industry Output (%)	Exports/ Industry Output (%)	Direct GDP Effect/ Exports (%)	Direct Jobs	Direct Jobs/ \$10 million of Industry Exports	Direct Jobs/ \$10 million of Direct GDP	Wages, Sal. & SLI/ Direct Jobs (\$)	Total Jobs	Total Jobs/ \$10 million of Total Exports
1 Agricultural & Related Services ind	292,917	2.6	30,688	10.5	10.9	6.2	58.8	52.2	5,936	202.7	388.3	5,216	9,585	8.5
2 Fishing & Trapping Industries	16,937	0.1	13,272	78.4	17.5	6.9	8.8	59.3	406	239.8	404.3	7,807	4,637	4.1
3 Logging & Forestry Industries	14,531	0.1	36,273	249.6	7.7	4.3	1.7	40.8	93	63.8	158.3	44,697	5,328	4.7
4 Mining Industries	1,627,731	14.4	161,337	9.9	18.9	7.6	76.9	56.0	6,874	42.2	75.4	55,407	8,668	7.7
5 Crude Petroleum & Natural Gas	21,504	0.2	12,152	56.5	9.8	4.5	8.0	49.6	36	16.8	33.9	65,600	454	0.4
6 Quarry & Sand Pit Industries	6,076	0.1	1,293	21.3	16.6	6.9	32.5	55.0	40	66.6	121.1	36,094	124	0.1
7 Service Related To Mineral Extract.	2,703	0.0	8,825	326.5	21.2	10.1	3.1	49.4	24	88.1	178.5	40,803	769	0.7
8 Food Industries	715,685	6.3	61,478	8.6	10.0	7.0	81.8	30.3	5,286	73.9	243.6	25,544	6,033	5.3
9 Beverage Industries	24,315	0.2	2,252	9.3	14.2	7.5	80.7	44.2	101	41.7	94.3	51,939	124	0.1
10 Tobacco Products Industries	32,640	0.3	1,153	3.5	5.8	3.0	85.6	46.9	85	26.1	55.6	55,796	99	0.1
11 Rubber Products Industries	33,281	0.3	10,912	32.8	34.6	19.6	59.9	41.5	283	85.0	204.8	42,868	473	0.4
12 Plastic Products Industries	39,975	0.4	17,383	43.5	28.2	16.8	38.7	40.0	356	89.1	222.6	29,204	880	0.8
13 Leather & Allied Products Ind.	11,229	0.1	3,506	31.2	37.5	24.4	78.2	32.7	119	106.2	324.4	23,075	159	0.1
14 Primary Textile & Textile Prod. Ind	111,740	1.0	33,889	30.3	34.2	19.9	65.7	39.6	858	76.8	193.8	32,614	1,402	1.2
15 Clothing Industries	22,382	0.2	5,445	24.3	29.7	16.6	68.4	43.6	337	150.4	344.7	21,308	491	0.4
16 Wood Industries	834,886	7.4	60,484	7.2	7.4	5.2	71.9	28.3	5,479	65.6	231.7	39,462	7,643	6.8
17 Furniture & Fixture Industries	20,887	0.2	3,264	15.6	24.9	13.7	87.4	44.0	261	124.8	283.7	26,606	299	0.3
18 Paper & Allied Products Industries	2,088,952	18.5	160,205	7.7	12.0	7.0	91.3	40.1	7,616	36.5	90.9	54,397	8,579	7.6
19 Printing, Publishing & Allied ind.	40,304	0.4	9,465	23.5	14.4	6.4	27.2	53.2	412	102.3	192.4	35,436	1,499	1.3
20 Primary Metal Industries	1,510,867	13.4	331,234	21.9	24.0	17.5	79.6	25.0	5,513	36.5	145.8	52,953	7,214	6.4
21 Fabricated Metal Product Industries	186,886	1.7	50,482	27.0	24.8	13.8	51.1	44.4	1,803	96.5	217.2	34,249	3,494	3.1
22 Machinery Industries	295,095	2.6	75,871	25.7	37.4	20.9	81.3	42.8	2,351	79.7	186.1	37,896	2,883	2.6
23 Transportation Equipment Industries	661,881	5.9	176,006	26.6	39.3	21.4	80.4	46.1	4,862	73.5	159.4	45,641	5,940	5.3
24 Electrical & Electronic Products	831,617	7.4	358,345	43.1	58.6	36.8	85.4	36.0	4,857	58.4	162.4	39,088	5,796	5.1
25 Non-metallic Mineral Products Ind.	64,776	0.6	13,746	21.2	23.5	12.1	57.2	46.8	525	81.0	173.0	37,574	882	0.8
26 Refined Petroleum & Coal Products	78,465	0.7	107,872	137.5	33.4	30.7	22.3	6.9	55	7.1	101.6	62,949	248	0.2
27 Chemical & Chemical Products Ind.	489,369	4.3	126,197	25.8	21.5	13.3	51.7	35.0	1,457	29.8	85.1	48,669	2,989	2.6
28 Other Manufacturing Industries	225,749	2.0	55,516	24.6	38.0	21.0	85.4	42.7	2,441	108.1	253.3	29,576	2,885	2.6
29 Construction Industries	0	0.0	11,939	N/A	14.1	6.0	0.0	N/A	0	N/A	N/A	N/A	2,100	1.9
30 Transportation Industries	641,395	5.7	56,320	8.8	9.1	4.4	49.7	48.1	5,905	92.1	191.5	36,272	12,037	10.7
31 Pipeline Transport Industries	213	0.0	1,057	497.1	7.9	2.3	0.5	65.9	0	18.4	27.9	58,804	86	0.1
32 Storage & Warehousing Industries	25,445	0.2	1,531	6.0	8.9	3.5	58.4	53.4	366	143.7	269.0	25,867	626	0.6
33 Communication Industries	13,742	0.1	4,823	35.1	10.7	2.8	7.9	72.6	91	66.5	91.6	45,799	1,537	1.4
34 Other Utility Industries	52	0.0	19,183	36,708.6	19.2	4.5	0.0	75.7	0	42.9	56.7	44,619	1,796	1.6
35 Wholesale Trade Industries	282,248	2.5	22,943	8.1	9.4	2.8	34.5	67.0	3,913	138.6	208.9	38,096	11,331	10.0
36 Retail Trade Industries	19,152	0.2	4,745	24.8	7.1	2.2	9.1	64.6	515	269.1	416.5	18,367	5,683	5.0
37 Finance & Real Estate Industries	0	0.0	10,958	N/A	7.8	2.5	0.0	N/A	0	N/A	N/A	N/A	3,283	2.9
38 Insurance Industries	0	0.0	3,361	N/A	9.8	5.6	0.0	N/A	0	N/A	N/A	N/A	418	0.4
39 Govt. Royalties On Nat. Resources	0	0.0	0	N/A	N/A	0.0	0.0	N/A	0	N/A	N/A	N/A	0	0.0
41 Business Service Industries	1,020	0.0	9,013	883.9	10.1	2.9	0.3	60.0	12	117.9	196.5	39,340	5,559	4.9
43 Health Services Industry	0	0.0	20	N/A	14.6	3.0	0.0	N/A	0	N/A	N/A	N/A	7	0.0
44 Accommodation & Food Service Ind.	8	0.0	2,106	26,625.0	9.2	3.7	0.0	57.0	0	245.9	431.6	15,420	1,544	1.4
45 Amusement & Recreational Services	2,517	0.0	2,395	95.2	19.2	11.8	12.4	33.8	16	64.3	190.6	26,179	171	0.2
46 Personal & Household Service Ind.	0	0.0	163	N/A	11.3	3.8	0.0	N/A	0	N/A	N/A	N/A	96	0.1
47 Other Service Industries	3,218	0.0	4,716	146.5	12.1	3.1	2.1	74.7	93	288.7	386.7	17,952	4,091	3.6
Total	11,292,390	100.0	2,083,819	18.5	20.0	10.7	58.1	40.4	69,379	61.4	152.0	36,678	139,941	123.9

Sources: Exports and Gross Industry Output, table 3.4; Imports and Supply of Commodity Inputs, table 3.5, Jobs, table 3.10; Direct GDP and Wages, Salaries & SLI, table 3.6.

World Residual	1	2	3	4	5	6	7	8	9	10	11	11	12	13
Industry (M aggregation)	Exports (\$ 000s)	Export Share (%)	Imports (\$ 000s)	Imports/ Exports (%)	Imports/ Commodity Inputs (%)	Imports/ Industry Output (%)	Exports/ Industry Output (%)	Direct GDP Effect/ Exports (%)	Direct Jobs	Direct Jobs/ \$10 million of Industry Exports	Direct Jobs/ \$10 million of Direct GDP	Wages, Sal. & SLI/ Direct Jobs (\$)	Total Jobs	Total Jobs/ \$10 million of Total Exports
1 Agricultural & Related Services Ind	1,561,691	18.0	138,216	8.9	13.4	7.3	82.0	54.0	32,636	209.0	386.9	5,233	38,759	44.6
2 Fishing & Trapping Industries	12,956	0.1	4,654	35.9	17.5	6.9	19.1	59.3	311	239.8	404.3	7,808	1,626	1.9
3 Logging & Forestry Industries	6,972	0.1	8,641	123.9	7.7	4.3	3.5	40.8	44	63.8	156.3	44,691	1,269	1.5
4 Mining Industries	943,318	10.8	87,048	9.2	18.0	6.9	74.9	58.6	4,618	49.0	83.5	52,157	5,788	6.7
5 Crude Petroleum & Natural Gas	150,120	1.7	16,295	10.9	9.8	4.5	41.4	49.6	252	16.8	33.9	65,593	609	0.7
6 Quarry & Sand Pit Industries	3,605	0.0	772	21.4	16.6	6.9	32.3	55.0	24	66.6	121.1	36,081	74	0.1
7 Service Related To Mineral Extract.	6,523	0.1	7,333	112.4	21.2	10.1	9.0	49.4	57	88.1	178.5	40,815	639	0.7
8 Food Industries	519,947	6.0	46,943	9.0	9.8	7.1	78.4	28.8	2,744	52.8	183.1	29,966	3,325	3.8
9 Beverage Industries	10,802	0.1	1,090	10.1	13.8	7.4	73.4	43.4	45	41.4	95.4	51,219	60	0.1
10 Tobacco Products Industries	6,692	0.1	242	3.6	5.8	3.0	83.5	46.9	17	26.1	55.6	55,814	21	0.0
11 Rubber Products Industries	26,717	0.3	9,039	33.8	34.6	19.6	58.0	41.5	227	85.0	204.8	42,869	392	0.5
12 Plastic Products Industries	40,652	0.5	15,502	38.1	28.2	16.8	44.1	39.3	354	87.0	221.5	29,488	782	0.9
13 Leather & Allied Products Ind.	4,613	0.1	1,649	35.8	39.3	23.6	66.0	39.3	62	135.0	343.1	22,967	93	0.1
14 Primary Textile & Textile Prod. Ind	87,669	1.0	26,057	29.7	33.5	19.5	65.6	40.6	807	92.1	226.9	30,098	1,229	1.4
15 Clothing Industries	19,269	0.2	4,474	23.2	29.3	16.5	71.2	43.0	287	149.2	346.5	21,169	404	0.5
16 Wood Industries	146,876	1.7	13,117	8.9	7.8	5.4	60.6	29.1	998	67.9	233.8	38,573	1,666	1.9
17 Furniture & Fixture Industries	16,620	0.2	2,505	15.1	24.6	13.5	89.7	43.8	210	126.5	288.9	26,584	235	0.3
18 Paper & Allied Products Industries	627,104	7.2	61,874	9.9	13.2	8.0	81.5	38.1	2,614	41.7	109.5	51,983	3,329	3.8
19 Printing, Publishing & Allied Ind.	22,893	0.3	7,176	31.3	14.7	6.5	20.8	52.2	247	107.8	206.5	35,250	1,123	1.3
20 Primary Metal Industries	972,808	11.2	226,874	23.3	24.0	17.4	74.4	25.3	3,606	37.1	146.7	53,234	5,097	5.9
21 Fabricated Metal Product Industries	242,129	2.8	56,776	23.4	25.4	14.5	61.8	41.8	2,153	88.9	212.5	35,047	3,547	4.1
22 Machinery Industries	404,089	4.6	100,063	24.8	38.2	21.4	86.5	42.7	3,177	78.6	184.1	37,665	3,673	4.2
23 Transportation Equipment Industries	570,399	6.6	173,097	30.3	42.1	25.1	82.7	39.8	3,720	65.2	163.7	43,233	4,481	5.2
24 Electrical & Electronic Products	522,127	6.0	167,290	32.0	48.1	26.6	83.0	44.4	3,490	66.8	150.4	40,828	4,220	4.9
25 Non-metallic Mineral Products Ind.	25,566	0.3	7,188	28.1	22.6	11.9	42.3	45.6	183	71.6	157.1	38,061	437	0.5
26 Refined Petroleum & Coal Products	78,001	0.9	103,854	133.1	33.4	30.7	23.1	6.9	55	7.1	101.6	62,942	239	0.3
27 Chemical & Chemical Products Ind.	256,356	2.9	90,128	35.2	22.4	13.8	39.4	37.5	852	33.2	88.8	46,286	2,177	2.5
28 Other Manufacturing Industries	159,123	1.8	45,801	28.8	43.1	24.2	84.2	41.7	1,755	110.3	264.7	29,025	2,098	2.4
29 Construction Industries	0	0.0	10,095	N/A	14.1	6.0	0.0	N/A	0	N/A	N/A	N/A	1,773	2.0
30 Transportation Industries	685,263	7.9	47,940	7.0	8.9	4.3	61.3	48.0	6,289	91.8	191.3	36,312	10,425	12.0
31 Pipeline Transport Industries	424	0.0	803	189.3	7.9	2.3	1.2	65.9	1	18.4	27.9	56,386	65	0.1
32 Storage & Warehousing Industries	197,314	2.3	7,766	3.9	8.9	3.5	89.3	53.4	2,835	143.7	269.0	25,868	3,176	3.7
33 Communication Industries	27,394	0.3	4,324	15.8	10.5	2.7	16.8	72.6	182	66.5	91.6	45,807	1,399	1.6
34 Other Utility Industries	141	0.0	12,159	8,608.8	18.9	4.5	0.1	75.0	1	42.4	56.5	46,802	1,150	1.3
35 Wholesale Trade Industries	303,029	3.5	20,442	6.7	9.4	2.8	41.6	67.0	4,201	138.6	206.9	36,096	10,096	11.6
36 Retail Trade Industries	27,965	0.3	3,791	13.6	7.1	2.2	16.6	64.6	753	269.1	416.5	18,368	4,540	5.2
37 Finance & Real Estate Industries	0	0.0	10,505	N/A	7.7	2.5	0.0	N/A	0	N/A	N/A	N/A	3,088	3.6
38 Insurance Industries	0	0.0	3,303	N/A	9.8	5.6	0.0	N/A	0	N/A	N/A	N/A	410	0.5
39 Govt. Royalties On Nat. Resources	0	0.0	0.00	N/A	N/A	0.0	0.0	N/A	0	N/A	N/A	N/A	0	0.0
41 Business Service Industries	1,427	0.0	6,895	483.3	10.1	2.9	0.6	60.0	17	117.9	196.5	39,349	4,267	4.9
43 Health Services Industry	0	0.0	23	N/A	14.6	3.0	0.0	N/A	0	N/A	N/A	N/A	8	0.0
44 Accommodation & Food Service Ind.	14	0.0	1,645	11,719.6	9.2	3.7	0.0	57.0	0	246.0	431.6	14,484	1,206	1.4
45 Amusement & Recreational Services	2,784	0.0	2,091	75.1	19.2	11.8	15.7	33.8	18	64.3	190.4	26,164	148	0.2
46 Personal & Household Service Ind.	0	0.0	129	N/A	11.3	3.8	0.0	N/A	0	N/A	N/A	N/A	77	0.1
47 Other Service Industries	5,355	0.1	3,393	63.4	12.2	3.2	5.0	74.5	154	287.9	386.6	17,832	2,927	3.4
Total	8,696,748	100.0	1,559,003	17.9	20.4	10.7	59.7	44.4	79,995	92.0	207.4	25,408	132,146	151.9

Sources: Exports and Gross industry Output, table 3.4; Imports and Supply of Commodity Inputs, table 3.5; Jobs, table 3.10; Direct GDP and Wages, Salaries & SLI, table 3.6.

Annex 2: Industry Export Impact

Industry Export Impact		1	2	5	7	8	11	12	
Industry (M aggregation)	Score out of 5	Exports (\$ 000s)	Export Share (%)	Imports/Commodity Inputs (%)	Exports/Industry Output (%)	Direct GDP Effect/Exports (%)	Direct Jobs/\$10 million of Direct GDP	Wages, Sal. & SLI/ Direct Jobs (\$)	
1	Agricultural & Related Services Ind	4	4,837,019	3.3	11.0 *	66.0 *	51.2 *	389.1 *	5,211
2	Fishing & Trapping Industries	3	398,311	0.3	17.5 *	31.5	59.3 *	404.3 *	7,852
3	Logging & Forestry Industries	3	191,579	0.1	7.7 *	3.4	40.8 *	156.3	44,179 *
4	Mining Industries	4	7,582,048	5.2	18.4 *	66.5 *	56.9 *	78.3	53,400 *
5	Crude Petroleum & Natural Gas	4	9,131,325	6.2	9.8 *	72.4 *	49.6 *	33.9	65,548 *
6	Quarry & Sand Pit Industries	2	51,067	0.0	16.6 *	30.5	55.0 *	121.1	35,297
7	Service Related To Mineral Extract.	4	26,620	0.0	21.2 *	2.5	49.4 *	178.5 *	42,631 *
8	Food Industries	4	5,219,377	3.6	10.9 *	75.5 *	29.2 **	215.8 *	27,753
9	Beverage Industries	4	674,164	0.5	13.9 *	90.7 *	46.7 *	89.7	51,002 *
10	Tobacco Products Industries	4	112,888	0.1	5.8 *	84.1 *	46.9 *	55.6	57,750 *
11	Rubber Products Industries	4	1,173,502	0.8	34.6	68.2 *	41.5 *	204.8 *	42,805 *
12	Plastic Products Industries	2	1,124,927	0.8	28.4	58.4	39.4 *	220.2 *	29,620
13	Leather & Allied Products Ind.	2	148,839	0.1	37.9	70.9 *	35.9	337.8 *	22,704
14	Primary Textile & Textile Prod. Ind	2	929,945	0.6	33.3	54.4	39.4 *	208.5 *	31,177
15	Clothing Industries	3	378,226	0.3	29.1	75.4 *	43.2 *	348.7 *	21,079
16	Wood Industries	5	5,925,697	4.0	8.0 *	74.1 *	28.8 **	233.9 *	38,576 *
17	Furniture & Fixture Industries	4	720,247	0.5	25.1 *	93.2 *	44.1 *	281.0 *	26,558
18	Paper & Allied Products Industries	4	13,048,094	8.9	12.8 *	85.2 *	38.3 *	108.2	52,555 *
19	Printing, Publishing & Allied Ind.	4	626,983	0.4	14.3 *	30.3	54.1 *	190.5 *	36,189 *
20	Primary Metal Industries	4	10,319,179	7.0	23.7 *	64.4 *	24.1 **	140.4	55,056 *
21	Fabricated Metal Product Industries	3	3,184,644	2.2	24.3 *	54.4	43.7 *	223.0 *	34,145
22	Machinery Industries	4	3,857,792	2.6	37.2	82.2 *	42.8 *	184.8 *	37,214 *
23	Transportation Equipment Industries	2	36,266,469	24.7	53.8	86.9 *	23.8	151.4	44,930 *
24	Electrical & Electronic Products	3	8,919,310	6.1	59.6	83.7 *	33.7	173.7 *	37,626 *
25	Non-metallic Mineral Products Ind.	3	894,168	0.6	23.1 *	58.3	47.1 *	154.6	38,556 *
26	Refined Petroleum & Coal Products	1	2,809,935	1.9	33.4	49.9	6.9	101.6	63,012 *
27	Chemical & Chemical Products Ind.	3	5,171,923	3.5	21.8 *	50.8	33.9 **	86.8	48,916 *
28	Other Manufacturing Industries	3	1,633,739	1.1	38.5	77.2 *	42.4 *	250.5 *	29,956
29	Construction Industries	2	880	0.0	14.1 *	0.0	59.6 *	47.4	0
30	Transportation Industries	4	7,502,864	5.1	9.1 *	53.6	48.0 *	190.5 *	37,031 *
31	Pipeline Transport Industries	4	991,585	0.7	7.9 *	62.0 *	65.9 *	27.9	57,565 *
32	Storage & Warehousing Industries	4	425,267	0.3	8.9 *	66.9 *	53.4 *	269.0 *	25,860
33	Communication Industries	3	770,903	0.5	10.3 *	26.6	74.5 *	130.7	41,966 *
34	Other Utility Industries	3	613,395	0.4	19.0 *	12.8	74.1 *	56.3	47,267 *
35	Wholesale Trade Industries	4	5,195,699	3.5	9.4 *	47.9	67.0 *	206.9 *	36,099 *
36	Retail Trade Industries	3	207,034	0.1	7.1 *	8.6	64.6 *	416.5 *	18,306
37	Finance & Real Estate Industries	3	1,021,367	0.7	7.8 *	15.1	56.1 *	119.9	43,085 *
38	Insurance Industries	4	799,289	0.5	9.8 *	48.3	29.3 **	237.1 *	60,149 *
39	Govt. Royalties On Nat. Resources		0	0.0	N/A	0.0	N/A	N/A	N/A
41	Business Service Industries	3	2,933,121	2.0	9.9 *	36.2	72.6 *	263.2 *	27,955
42	Educational Service Industries	5	153,530	0.1	10.7 *	99.9 *	60.9 *	228.5 *	37,444 *
43	Health Services Industry	3	6,778	0.0	14.5 *	30.6	61.0 *	219.8 *	33,029
44	Accommodation & Food Service Ind.	3	35,219	0.0	9.2 *	4.7	55.4 *	504.4 *	14,228
45	Amusement & Recreational Services	3	325,578	0.2	18.3 *	52.2	41.7 *	266.8 *	20,410
46	Personal & Household Service Ind.	3	3,312	0.0	11.3 *	6.2	70.1 *	335.6 *	12,830
47	Other Service Industries	3	217,723	0.1	11.7 *	12.1	68.4 *	385.3 *	13,932
	Total		146,561,562	100.0	27.7	61.1	37.6	163.7	35,986

A star indicates better than average performance. The score out of 5 indicates the number of stars.

** In column 8 indicates the industry was below average but granted a star based on its performance in column 5.

Annex 3: High-Technology Industries

High Technology Industries

Industry (W aggregation)	Score out of 5	1 Exports (\$ 000s)	2 Export Share (%)	5 Imports/ Commodity Inputs (%)	7 Exports/ Industry Output (%)	8 Direct GDP Effect/ Exports (%)	11 Direct Jobs/ \$10 million of Direct GDP	12 Wages, Sal. & 'SLI/ Direct Jobs (\$)
99 Aircraft & aircraft parts industry	3	3,554,880	2.4	37.7	85.2 *	48.9 *	157.6	46,723 *
117 Telecommunication equipment ind.	3	978,353	0.7	48.3	90.2 *	53.7 *	112.8	46,365 *
118 Electronic parts & components ind.	2	2,483,412	1.7	76.0	86.0 *	18.4	243.1 *	30,789
120 Electronic computers & peripherals	2	2,247,448	1.5	71.9	95.0 *	26.3	162.6	38,111 *
121 Misc. office, business machines	3	275,136	0.2	57.6	84.3 *	43.7 *	152.7	40,976 *
139 Pharmaceutical & medicine industry	3	268,948	0.2	20.8	69.9 *	55.3 *	90.1	42,186 *
144 Indicating & recording instruments	2	385,550	0.3	38.7	66.9 *	47.2 *	205.2 *	35,889
145 Other scientific & prof. equipment	3	390,269	0.3	38.0	86.5 *	42.9 *	209.6 *	35,057
Total		10,583,995	7.2	58.2	86.4	37.1	164.0	41,146
Average (all industries)				27.7	61.1	37.6	163.7	35,986



Annex 4:
Industry Aggregations in the Statistics Canada National Input-Output Model

13 Industries

1. Agricultural &
Related Services
Industries

2. Fishing & Trapping
Industries

3. Logging & Forestry
Industries

4. Mining, Quarrying
& Oil Well Industries

5. Manufacturing
Industries

47 Industries

1. Agricultural &
Related Services
Industries

2. Fishing & Trapping
Industries

3. Logging & Forestry
Industries

4. Mining Industries

5. Crude Petroleum
& Natural Gas

6. Quarry &
Sand Pit Industries

7. Service Related To
Mineral Extract.

8. Food Industries

209 Industries

1. Agriculture, Livestock
2. Agriculture, Fieldcrop

3. Fishing & Trapping
Industries

4. Logging & Forestry
Industries

5. Gold Mines
6. Other Metal Mines
7. Iron Mines
8. Asbestos Mines
9. Potash Mines
10. Salt Mines
11. Misc. Non-Metal Mines Exc. Coal
12. Coal Mines

13. Crude Petroleum
& Natural Gas

14. Quarry &
Sand Pit Industries

15. Service Related To
Mineral Extract.

16. Meat & Meat Products (Exc.
Poultry)
17. Poultry Products Industry
18. Fish Products Industry

5. Manufacturing Industries
(continued)

8. Food Industries
(continued)

19. Fruit and Vegetable Industries
20. Dairy Products Industries
21. Flour & Cereal Food Industries
22. Feed Industry
23. Vegetable Oil Mills (Exc. Corn Oil)
24. Biscuit Industry
25. Bread & Other Bakery Products Industry
26. Cane & Beet Sugar Industry
27. Sugar Confectionery Industries
28. Tea and Coffee Industry
29. Misc. Food Products Industries
n.e.c.

9. Beverage Industries

30. Soft Drink Industry
31. Distillery Products Industry
32. Brewery products Industry
33. Wine Industry

10. Tobacco Products Industries

34. Tobacco Products Industries

11. Rubber Products Industries

35. Rubber Products Industries

12. Plastic Products Industries

36. Foamed & Expanded Plastic Products
37. Plastic Pipe & Pipe Fittings Industry
38. Plastic Film & Sheeting Industry
39. Plastic Bag Industry
40. Other Plastic Products Industries
n.e.c.

13. Leather & Allied Products Industries

41. Leather Tanneries
42. Footwear Industry
43. Misc. Leather & Allied Prod. Industries

14. Primary Textile & Textile Products

44. Man-Made Fibre & Filament Yarn Industry

The Impact of Exports

5. Manufacturing
Industries
(continued)

14 Primary Textile & Textile
Products
(continued)

45. Other Spun Yarn & Woven Cloth
Industries

46. Wool Yarn & Woven Cloth
Industry

47. Broad Knitted Fabric Industry

48. Misc. Textile Products Industries

49. Contract Textile Dyeing &
Finishing

50. Carpet, Mat & Rug Industry

15. Clothing Industries

51. Men's and Boy's Clothing
Industries

52. Women's Clothing Industries

53. Children's Clothing Industry

54. Misc. Clothing & Apparel
Industries

55. Hosiery Industry

16. Wood Industries

56. Sawmills, Planing & Shingle Mills

57. Veneer and Plywood Industries

58. Pre-fab. Wooden Bldg. & Cabinet

59. Door, Window & Other Millwork
Industries

60. Wooden Box & Coffin Industries

61. Particle & Water Board Industries

62. Misc. Wood Industries

17. Furniture & Fixture
Industries

63. Household Furniture Industries

64. Office Furniture Industries

65. Other Furniture & Fixture
Industries

18. Paper & Allied
Products Industries

66. Pulp Industry

67. Newsprint Industry

68. Paperboard, Bldg Board & Oth.
Paper

69. Asphalt Roofing Industry

70. Paper Box & Bag Industries

71. Other Converted Paper Products
Industries

5. Manufacturing Industries (continued)

19. Printing, Publishing & Allied Industries

- 72. Commercial Printing Industries
- 73. Publishing Industries
- 74. Combined Publishing & Printing Industry
- 75. Platemaking, Typesetting & Bindery

20. Primary Metal Industries

- 76. Ferro-alloy & Steel Foundries
- 77. Other Primary Steel Industries
- 78. Steel Pipe & Tube Industry
- 79. Iron Foundries
- 80. Non-ferrous Smelting & Refining Industry
- 81. Aluminum Rolling Casting, Extruding
- 82. Copper Rolling, Casting & Extruding
- 83. Other Metal Rolling, Casting Etc.

21. Fabricated Metal Product Industries

- 84. Power Boiler & Heat Exchanger Industry
- 85. Pre-eng. Metal Bldg (Exc. Portable)
- 86. Fabricated Structural Metal Ind n.e.c
- 87. Ornamental & Arch. Metal Prod. Industry
- 88. Stamped, Pressed & Coated Metals
- 89. Wire and Wire Products Industries
- 90. Hardware, Tool & Cutlery Industries
- 91. Heating Equipment Industry
- 92. Machine Shops Industry
- 93. Other Metal Fabricating Industries

22. Machinery Industries

- 94. Agriculture Implement Industry
- 95. Commercial Refrigeration Equipment
- 96. Compressor & Turbine Industries
- 97. Construction & Mining Machinery
- 98. Sawmill & Other Machinery Industries n.e.c.

5. Manufacturing
Industries
(continued)

23. Transportation
Equipment Industries

- 99. Aircraft & Aircraft Parts Industry
- 100. Motor Vehicle Industry
- 101. Truck, Bus Body & Trailer Industry
- 102. Motor Vehicle Engine & Parts Industry
- 103. Motor Vehicle Wiring Assemblies
- 104. Motor Vehicle Stampings Industry
- 105. Motor Vehicle Steering & Suspension
- 106. Motor Vehicle Wheel & Brake Industry
- 107. Motor Vehicle Plastic Parts Industry
- 108. Motor Vehicle Fabric Accessories
- 109. Other Motor Vehicle Access. & Parts
- 110. Railroad Rolling Stock Industry
- 111. Shipbuilding and Repair Industry
- 112. Misc. Transportation Equipment Industries

24. Electrical & Electronic
Products

- 113. Small Electrical Appliance Industry
- 114. Major Appliances (Elec & Non-elec.)
- 115. Electric Lighting Industries
- 116. Record Players, Radio & TV Receiver
- 117. Telecommunication Equipment Industry
- 118. Electronic Parts & Components Industry
- 119. Other Electronic Equipment Industries
- 120. Electronic Computers & Peripherals
- 121. Misc. Office, Business Machines
- 122. Electrical Transformer Industry
- 123. Misc. Electrical Industrial Equip.
- 124. Communications, Energy Wire & Cable
- 125. Battery Industry

The Impact of Exports

5. Manufacturing Industries
(continued)

24. Electrical & Electronic Products
(continued)

126. Misc. Electrical Product Industries

25. Non-metallic Mineral Products Industries

127. Clay Products Industries
128. Cement Industry
129. Concrete Products Industries
130. Ready-mix Concrete Industry
131. Glass & Glass Products Industries
132. Non-metal Mineral Insulation Industry
133. Misc. Non-metallic Mineral Products

26. Refined Petroleum & Coal Products

134. Refined Petroleum & Coal Coal Products

27. Chemical & Chemical Products Industries

135. Industrial Inorganic Chemicals n.e.c.
136. Industrial Organic Chemicals n.e.c.
137. Agricultural Chemical Industries
138. Plastic & Synthetic Resin Industry
139. Pharmaceutical & Medicine Industry
140. Paint and Varnish Industry
141. Soap & Cleaning Compounds Industry
142. Toilet Preparations Industry
143. Other Chemical Products Industries

28. Other Manufacturing Industries

144. Indicating & Recording Instruments
145. Other Scientific & Prof. Equipment
146. Jewellery & Precious Metal Industry
147. Sporting Goods Industry
148. Toys and Games Industry
149. Sign and Display Industry

The Impact of Exports

5. Manufacturing
Industries
(continued)

28. Other Manufacturing
Industries
(continued)

150. Floor Tile, Linoleum, Coated
Fabric
151. Musical Instrument Sound
Recording
152. Misc. Manufactured Products
n.e.c.

6. Construction
Industries

29. Construction
Industries

153. Repair Construction
161. Construction, Other Activities

7. Transportation &
Storage
Industries

30. Transportation
Industries

162. Air Transport & Services
Incidental
163. Railway Transport & Rel.
Services
164. Water Transport & Rel. Services
165. Truck Transport Industries
166. Urban Transit System Industry
167. Interurban & Rural Transit
Systems
168. Taxicab Industry
169. Misc. Transportation Industries
170. Other Services Incid. to
Transport
171. Highway & Bridge Maintenance
Industry

31. Pipeline Transport
Industries

172. Natural Gas Pipeline Transport
Industry
173. Crude Oil & Other Pipeline
Transp.

32. Storage & Warehousing
Industries

174. Storage and Warehousing
Industries

8. Communication
Industries

33. Communication
Industries

175. Radio & Television Broadcasting
Industry
176. Cable Television Industry
177. Telecommunication Carriers &
Other
178. Postal Service Industry

The Impact of Exports

9. Other Utility Industries	34. Other Utility Industries	179. Electric Power Systems Industry 180. Gas Distribution Systems Industry 181. Other Utility Industries n.e.c.
10. Wholesale Trade Industries	35. Wholesale Trade Industries	182. Wholesale Trade Industries
11. Retail Trade Industries	36. Retail Trade Industries	183. Retail Trade Industries
12. Finance Insurance & Real Estate Industries	37. Finance & Real Estate Industries	184. Banks & Oth. Deposit Accepting Inst. 185. Trust/Deposit Accepting Mortgage Co. 187. Other Finance & Real Estate Industries
	38. Insurance Industries	188. Insurance Industries
	39. Govt. Royalties On Nat. Resources	189. Govt. Royalties On Nat. Resources
13. Community, Business, Personal Serv.	41. Business Service Industries	191. Computer & Related Services 192. Professional Business Services 193. Advertising Services 194. Misc. Business Services
	42. Educational Service Industries	195. Educational Service Industries
	43. Health Services Industry	196. Hospitals 198. Other Health and Social Services

The Impact of Exports

13. Community, Business
Personal Serv.
(continued)

44. Accommodation &
Food Services Ind

199. Accommodation Service
Industries
200. Food & Beverage Service
Industries

45. Amusement &
Recreational
Services

201. Motion Picture & Video Prod.
Dist.
202. Motion Picture Exhibition
203. Theatre, Sports & Rec. Services
204. Race Tracks and Gambling
Operations

46. Personal & Household
Services Industries

205. Laundries & Cleaners
206. Other Personal Services

47. Other Service Industries

207. Photographers
208. Bus Ass./Mach. Car
Leasing/Other Serv
209. Other Repair & Maintenance
Services

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