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Small Business in Canada - U.S. Manufacturing Productivity and Cost Comparisons

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SMALL BUSINESS
IN CANADA - U.S.
MANUFACTURING PRODUCTIVITY
AND COST COMPARISONS

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ABSTRACT

This paper consists of eight major sections. Section 2 summarizes the rationale for free trade in Canada, with special emphasis on the studies that suggested large gains from freer trade. Section 3 discusses the aggregative evidence from the mid 1970's to date. Section 4 discusses the increased importance of employment in small business in Canada and the United States. Section 5 discusses the differences in productivity and wages between small and large establishments in Canada, and the significantly wider gap between small and large that has emerged in Canada. Section 6 discusses some of the cost comparisons for manufacturing for the two countries, with Section 7 dealing with initial results from a company survey. Section 8 raises some unanswered questions.

1. INTRODUCTION

There are three related concepts that are relevant to the notions of competitiveness, namely, efficiency, economy and effectiveness. Each of these will be defined briefly:

Efficiency is the extent to which high output is achieved from a given combination of inputs, such as labour and capital.

Economy is the degree to which a given product (or group of products) can be produced at low average costs per unit.

Effectiveness is the degree to which the products produced by a country (or company, or industry) correspond to the longer-term shifts in market demand.

This paper will emphasize the first two concepts, by concentrating on comparisons between Canada and the United States for manufacturing. Sections 2 to 5, will emphasize efficiency as measured by productivity. Section 6, will discuss some of the cost comparisons that can be made, including the effects of exchange rate changes. Section 7, will summarize the highlights from a field testing of the questionnaire on some medium sized Ontario establishments.

It is expected that other papers at the conference will discuss whether Canada is focussing on the right products and industries for the new millennium.

2. THE RATIONALE FOR FREE TRADE IN CANADA

Economists in Canada have been researching the potential gains to Canada from freer trade for four decades. That discussion has clarified the various sources of the gains to Canada, and the largest sources of the gains were expected to come from improved efficiency in Canadian plants from longer runs, increased specialization at the plant level and an increase in the two-way flow of manufactured products between Canada and other countries, especially the United States, of course.

Two of the major studies showing large gains in real incomes from free trade are summarized to illustrate the results. Table 1 shows the results for them.

Table 1
Illustrative Estimates of the Costs of Tariffs,
As Percent of Canadian Real GDP

Source of Estimate	Base/Year for Estimate	Percent of GDP
Wonnacott (1975, p. 177)	1974	8.2%
Harris and Cox (1983, p. 114)	1976	8.6%

A summary of the sources of gain in the Wonnacott estimate are shown in Table 2. The major source of the benefit (left side of the table) would come from increased productivity of labour and other factors of production in manufacturing. The benefits would be realized in the form of reductions in relative prices and increases in wages and returns to other factors of production. The estimates are based on a comparable degree of resource utilization before and after free trade. The estimates in Table 2 are based on the year 1974 and a key part of the estimate is based on a closing of the productivity gap in manufacturing between Canada and the United States. This would still leave the key manufacturing plants in Ontario and Quebec slightly below adjacent plants in the U.S. northeast. To allow for possible errors, a range of 7 to 9 percent of GNP is favored in the study (Wonnacott, 1975, p. 178 and surrounding pages).

An alternative approach to estimate the gains from free trade was used by Harris and Cox (1983). They developed and used a computable general equilibrium model (C.G.E. henceforth). This approach developed equations for individual industries within manufacturing for both the demand side and the supply side. They distinguished between industries that could be approximated by a competitive model (where constant returns to scale may be appropriate) and industries where oligopoly and monopolistic competition (with product differentiation) was present. In the latter group of industries, economies of scale were allowed for, and such industries would experience more specialization, more outsourcing of components and more two-way flow of international trade of the intra-industry form. Estimates were developed for 20 industries within manufacturing and 9 in the non-manufacturing group. Such class of models could be adapted to simulate changes in employment and unemployment with free trade in addition to gains in real income. Their estimate of the gains from free trade was 8.6 percent of GDP, very similar to the estimate by Ron Wonnacott for a similar year in the 1970's, as shown in Table 1 above.

Table 2
Estimation of Benefits for Canada of FTA_{US}

Sources of Benefit (real terms)	Per Cent of GNP	How These Benefits Realized (monetary terms)	Per Cent of GNP
(1)		(2)	
A Comparative advantage specialization		I Price reduction	4.0
B Recapture of duty revenue on Canadian exports previously paid to U.S. treasury	2.3	II Increase in equilibrium wage	4.2 (residual estimate)
C Increased productivity of labour and other factors of production in Canada because of economies of scale	5.9	III Increase in equilibrium returns to other factors	
Total benefit, as generated:	8.2	Total benefit, as realized:	8.2
Source: Wonnacott (1975, p. 178)			

There have been a number of other estimates using C.G.E. methods that have given substantially smaller gains from free trade than estimated in the Harris and Cox study noted above. See Brown and Stern (1989) and other studies cited therein, for example. The C.G.E. family of models have the desirable property of a complete general equilibrium model, but are extremely sensitive to the assumptions made by the modeler(s). A key and common assumption in the lower estimate of the gains from freer trade is that there are constant returns to scale and that the input-output coefficients are the same before and after free trade. This assumption simplifies the computations, of course. However, these simplifying assumptions are inconsistent with the evidence on economies of scale in manufacturing for Canada and other countries (Daly 1998). These studies rarely provide any empirical basis for these alternative assumptions.

These gains from freer trade with the U.S. and the related expected narrowing in the productivity gap were expected to provide the basis for increased living standards in Canada. Productivity increases are the primary bases for higher living standards. (In an open economy, changes in international capital flows and changes in the terms of trade can add to, or offset the changes in productivity.)

Increases in productivity levels were also expected to improve Canada's cost position in manufacturing, and permit Canada to participate more fully in world trade in manufactured products, the most rapidly growing part of world trade for almost half a century. (As economic conditions have developed, Canada's cost reductions in U.S. dollars have come primarily from declines in the value of the Canadian dollar. This has amounted to almost 25 percent since 1988, before the reductions under the Canada U.S. FTA began.)

3. CANADIAN EXPERIENCE WITH FREER TRADE SINCE THE 1970's

What does the aggregate evidence on the gains from freer trade show to date for Canada? Canada has been undergoing a series of tariff reductions since 1947. This paper will concentrate on the period since 1977, after a brief comment on the automotive agreement. The tariff reductions that have been implemented and were still having an influence over the last two decades would include:

- § the Kennedy Round (concluded 1967);
- § the Tokyo Round (concluded 1979);
- § the Uruguay Round (concluded April 1994);
- § the Canada - U.S. Free Trade Agreement (implemented January 1, 1989);
- § and the North American Free Trade Agreement (implemented January 1, 1994).

These all involved a phasing in of the tariff reductions, normally spread over ten years. There had been a fairly persistent drop in the ratio of duties to total imports for Canada. However, in the mid 1980's, the rate of price protection for manufactured products was still 6.5 percent (primarily from tariff rates, but some quantitative restrictions also (Department of Finance 1988, pp. 15-20). The period from the mid 1970's to date thus include further important tariff reductions, including most of the CUSFTA reductions (the last remaining reductions were implemented January 1, 1994).

The period of the mid 1970's also covers the two major studies referred to in Table 1 that show large gains from freer trade for Canada.

A further consideration is that the estimates of real output for manufacturing in the U.S. have not yet been revised for the years prior to 1977, so estimates for earlier years are not comparable.

It should be noted that the estimates of real output per hour in the automotive industry had seen the disappearance of the earlier gap in real output per hour worked of more than 30 percent in 1966 below the U.S. to 2 to 4 percent by the late 1970's and 1980's (Fuss and Waverman, 1992, p. 201). On the international trade side, there has been a major increase in the two way flow of trade between Canada and the U.S. in motor vehicles and parts. Plants in Canada produce one (or a few) models and they are then sold in the whole North American market. These results were in line with the predictions of large gains in real output in relation to labour and materials and capital inputs made by the supporters of free trade.

Table 3
Comparative Productivity and Real Wage Levels
U.S. and Canada, U.S.=100
Total Economy and Manufacturing
Selected Years, 1977-1996

Year	Real GDP per Employed Person	Real output per Hour Manufacturing	Real Wages per Hour Manufacturing
1977	81.4	90.0	98.2
1985	82.0	84.3	97.7
1988	82.6	76.7	96.3
1996	80.2	73.2	100.0
Sources: Column 1 from B.L.S. (1998), Table 3 based on 1993 Benchmark EKS PPP; Column 2 from Pilat (1996) and B.L.S. (1999); Column 3, price level comparisons from Statistics Canada (1996), p. 87 updated from B.L.S. August 27, 1999			

Table 3 provides some aggregative evidence on productivity and real wage comparisons for Canada and the United States for selected years over the last two decades. The changes over time in real GDP per employed person are relatively small, after a significant narrowing up to about the mid 1970's. Real output per hour in manufacturing shows a widening from a Canadian level about

10 percent below the U.S. in 1977 to more like 38 percent below in 1997. Table 3 allows for the significant upward revision in U.S. manufacturing output released in November 1997. The tariff reductions over that two decade period from the GATT negotiations and the CUSFTA (with implementation starting on January 1, 1989) have not yet had the predicted result of a narrowing in the productivity gap in manufacturing. It continues to be wider in manufacturing than for the economy as a whole in spite of higher capital stocks per employed person in manufacturing in the last comparisons available.¹ A significant degree of foreign ownership persists, with about 40 percent of total shipments being made by plants that were totally foreign controlled (primarily in the U.S.) (CALURA, 1994, pp. 77-84). This foreign ownership has encouraged the relatively easy flow of new technology and managerial and industrial practices into branch plants in Canada.

The failure of the productivity gaps to narrow further in the 1980's and 1990's is partly related to the wider gaps in the unemployment rates and output gaps between Canada and the United States that were present in the later periods. Slack demand is reflected in lower levels of output in relation to capital and labour inputs, as well as higher levels of unemployment. (*Canadian Public Policy*, Supplement, February, 1998). Lee and Tang (1988) estimated that differences in capacity utilization could explain about 10 percent of the productivity gap in manufacturing over the 1989 to 1995 period.

One aspect of industrial structure also contributes to the faster increase in manufacturing productivity in the U.S. than Canada. The electronics industry is relatively much more important in the U.S. than in Canada. From 1977 to 1992 the increase in multifactor productivity in the machinery, electrical and electronic products industries was only 0.74 percent per year in Canada but 2.77 percent in the U.S. (Statistics Canada (1996), p. 109), and this industry group is also relatively more important in the U.S. Since this study was published in 1996, the U.S. has made a major upward revision in their aggregate manufacturing output series, but no later information on the industry composition is available thus far.

This paper has emphasized output per hour, primarily because of the dominance of labour income as a factor in net national income, but also because of its relative availability. Some studies have also allowed for capital input to make a more comprehensive measure of total factor input. Such studies tend to show Canada with relatively more capital per employed person in manufacturing than in the U.S. This has been shown earlier in Walters (1968), Daly (1976), and more recently in Lee and Tang (1998) and Pilat (1996), Tables A8 and A9. The gap in total factor productivity levels are thus slightly wider than for labour productivity alone. (It is not clear that the length of life assumptions in the capital stock estimates are the same in both countries in the more recent studies.)

¹Dorothy Walters (1968). *Canadian Income Levels and Growth: An International Perspective* (Ottawa: Queen's Printer for Economic Council of Canada). For later evidence see Donald J. Daly (1976), *Canada's Comparative Advantage*, pp. 14-17. See also Lee and Tang (1998).

It should be noted that press and television reports over the last decade or more have emphasized plant layoffs and closures, corporate downsizing by major companies (including foreign subsidiaries in Canada), the substitution of capital for labour, increased outsourcing by large companies, and the increased use of automation and computers in business. Similar developments are also taking place in the United States, of course. How can one reconcile the widespread information on these developments in large plant and firms in Canada with the absence of any significant narrowing in the productivity gap in Column 2 in Table 3 above. An interpretation and some evidence on this point will be provided in the next section.

The evidence on real wage levels in the two countries in Column 3 of Table 3 is striking. Real wages in Canadian manufacturing are within four per cent of the U.S. in all the years shown - markedly less than in the productivity comparisons for either manufacturing or the economy as a whole. For both Canada and the United States the increases in real wages in manufacturing have been significantly less than the increase in real output per hour in the same broad industry group over the last two decades. For Canada, the increase from 1977 to 1996 was 7.3 percent compared to 35.9 percent in output per hour. For the U.S. over the same period the increase was only 3 percent in real wages compared to an increase of 60 percent in output per hour (BLS, August 15, 1997). There was thus a slight narrowing in the gap in real wages while there was an important widening in the productivity gap in manufacturing. The levels of real wages in manufacturing reflect a variety of factors outside manufacturing. Capital inflows and the terms of trade can influence real wages in manufacturing. In addition productivity levels in most other industries in Canada are closer to the U.S. than they are for manufacturing. (Lee and Tang, 1998)

Japan has been experiencing a significantly smaller increase in real hourly wages in manufacturing than in real output for many decades. This has continued over the last two decades with an increase in real wages of 50 percent, whole output per hour more than doubled, (BLS August 1997). Japanese manufacturers were passing a major part of the productivity gains in manufacturing along to the buyers of manufactured products within Japan, but also internationally. This had permitted Japanese manufacturers to get an increased share of the rapidly growing market for manufactured products, especially up until 1985. Since then, the appreciation of the Yen relative to many other currencies has drastically slowed the growth in their volume of manufactured exports.

Developments in Canadian trade in manufactured products have been in line, or have even exceeded, the high growth predicted by those supporters of free trade who had predicted large economic gains. The increased specialization at the plant level associated with more outsourcing of small parts and components to smaller organizations domestically would also be reflected in more intra-industry trade. The earlier increase in the two way flow of trade in motor vehicles and parts has broadened to include other manufactured goods. During the 1990's, exports of "other manufactured products" has exceeded that of motor vehicle and parts in 1986 dollars. By the mid-1990's, exports of manufactured products in 1986 dollars had begun to exceed total exports of food, energy materials and other natural resource materials. These changes have been fully analyzed in Schwanen (1997). It should be noted, however, that large increases in imports of manufactured products have also been taking place and Canada continues to have a large net deficit in trade in

manufactured products. For the purposes of this paper the question is how this increase in both manufactured exports and import competition affects the small Canadian-owned establishments in contrast to the large multinationals with one or more large plants.

4. **SMALL BUSINESS - THE MISSING LINK**

Before turning to the evidence on the role of small business in the productivity gap in manufacturing, it may be helpful to highlight the role of large business and the multinationals - what one can appropriately term the Galbraith thesis. In *The New Industrial State (1967)*, J. K. Galbraith put forth the thesis of the dominance of the large corporation. He emphasized its importance in manufacturing, petroleum, banking and finance and the important role of defense industries. He emphasized interlocking directorships in the private sector and the close relationships of business leaders with government in the military - industrial complex. A theme was the dominance of the large corporation in the economy and in public policy. When first written there was still limited international competition from imports on domestic manufacturing.

It is not too strong to say that this has been the dominant paradigm in the economic and business literature over the last three decades. On the Canadian side this has been reflected in the large literature on foreign ownership and the multinationals. Illustrations of such studies are Government of Canada (1972), Rugman (1981), Rugman and McIlveen (1985), Eden (1994) and the many references in each study.

The Porter and Monitor Corporation (1991) deserves special comment. It points out that 64.2 percent of manufacturing shipments in Canada were made by firms with less than 500 employees, while only 17.7 percent of U.S. manufacturing shipments were made by the same size of firms (Porter 1991, p. 293). In spite of the much greater relative importance of small firms in Canada, about 95 percent of the 468 page volume concentrated on large, rather than small firms!

Some initial discussion of the role of small business began in the 1970's. Schumacher (1973) emphasized the social benefits of small business. Litvak (1971) did a study on the role of entrepreneurship in new firms. Peterson (1977) provided a comprehensive discussion of small business in Canada (with some comparisons with the United States), and issues of growth in size and financing. It received widespread distribution, partly through the Canadian Federation of Independent Business.

John Birch stimulated interest in the role of small business in providing new jobs (Birch 1987 which expanded an earlier 1979 report for M. I. T.). Case (1992) provides a useful review of the debate that John Birch's initial study created and also has some interesting case studies of the role of small firms in the high technology field, emphasizing the flexibility and fast response that can be achieved in small entrepreneurial companies.

There have also been a number of studies of small business in Canada by government, trade associations and research groups, including Amboise (1991), Ministry of Industry, Trade and Technology (1991), Industry, Science and Technology (1992), Canadian Chamber of Commerce (1992), Gray (1994), MacIntosh (1994), Sharwood Report (1994), Canadian Department of Industry (1994) and Industry Canada (1995). Studies of small business is almost becoming a growth industry. The big growth in small business studies came after the earlier work on free trade and was not really related to Canada's performance in manufacturing over the last two decades of reduced tariffs.

For our purposes, there are two initial questions, namely:

- what has happened to employment in the different size groups in Canadian manufacturing? and
- how do these developments in Canada compare with the U.S.?

Table 4
Number of Employees by Size Group,
Manufacturing in Canada,
Percent Change, 1972 to 1993

Size Group	Percent Change
0-4	+22.8
5-9	+12.9
10-19	+38.8
20-49	+31.2
50-99	+18.6
100-199	+5.8
200-499	-15.0
500-999	-22.4
1,000+	-27.5
Head Offices, etc.	+5.0
Total	-1.7
Sources: Statistics Canada, <i>Manufacturing Industries of Canada: Type of Organization and Size of Establishment</i> (Ottawa: No. 1975) p.19 and Statistics Canada, <i>Manufacturing Industries of Canada: National and Provincial Areas, 1993</i> (Ottawa: Dec. 1995), p.201.	

It is clear that there has been a remarkable shift in the size distribution of employment, with a significant net reduction in employment in large establishments (over 200 employees), and a significant net expansion in employment in the smaller sized establishments. This, of course, reflects a very dynamic process of births and deaths and shifts in the size categories of continuing plants.

This shift in employment towards smaller establishments has been well documented in additional detail by John Baldwin and associates in Statistics Canada. They have been able to follow changes for individual plants over time from their micro longitudinal panel data sets, which provide a perspective on dynamic changes not possible from published data. Baldwin and Picot (1994) found that net job creation for smaller establishments in Canadian manufacturing was greater than in large establishments from 1970 to 1990. Baldwin (1996) showed that the small plants in manufacturing experienced an increased share of employment from 1973 to 1992 in all five industry sectors (resource based, labour intensive, scale related, product differentiated, and science based).

A recent study on entrepreneurship (Peterson 1999) also shows the increased importance of employment in smaller establishments in Canada.

For the purposes of this paper, it is also significant that the growth in employment in smaller establishments was more rapid in Canada than the United States (Baldwin-Picot, 1994, esp. Figures 1 to 6 and related discussion). It is also important that the small plants were becoming increasingly important during the 1980's.

It might be noted that the data on employment by company size shows a similar pattern, with a decline in the median size of company from 1978 to 1988 for manufacturing, and almost all the individual industries within manufacturing (Wannell, 1991, esp. Charts 13 to 16 and related discussion).

In light of the evidence on the increased importance of small establishments and small companies in Canada, it seems desirable to speculate on some of the reasons for this growth.

One consideration is the improvement in communication and transportation. Fax's, E-mail, lower rates for long-distance telephone calls make it faster and cheaper to communicate orders and information. Truck transportation provides more flexibility and faster door to door delivery than freight trains. Serviced land costs can be lower a short distance away from major metropolitan areas, one storey buildings can be cheaper than the older higher rise factories of earlier decades.

The lower costs of computers and flexible software packages for accounting, payrolls and personnel records permit small establishments and firms to stay close to the leading edge of new technology - both in the plant and the office. Small business can be more flexible in creating and adopting new technology (Audretsch 1996).

Newspapers and company reports indicate an increased amount of outsourcing by large

companies and plants. Parts and components that were previously made internally might now be subcontracted out - a shift from hierarchy to markets. This can be partly due to the flexibility of smaller establishments or lower wages in small plants (see the next section).

The net reduction in employment in large plants was not limited to blue collar workers, but there were frequent examples of early retirements and layoffs in middle management as well in the sluggish growth since mid 1975. Some of those laid off have set up their own small companies and plants. They may be willing to make smaller earnings but get the satisfaction of running their own business. The lack of employment alternatives in large plants and firms may encourage the growth of smaller organizations.

Most of these developments have been taking place in the United States also and have been discussed there. Since the changes in Canada have been even more marked in magnitude, it is desirable to consider whether there are some factors in the Canadian environment that can help explain the more rapid growth in employment in small and medium enterprises in Canada.

Tax considerations can also be a contributing factor to the magnitude of the growth in small manufacturing businesses. The federal corporate income tax rate on the first \$200,000 of active business income is significantly less than for annual profits above that level. This tax rate is also less than the marginal tax rate under the personal income tax. Individual shareholders receiving dividends from Canadian corporations are also entitled to a 25 per cent dividend tax credit. This effectively reduces the tax rate payable by individuals on Canadian dividend income (Brown et al 1998). Thus there can be tax advantages in incorporating, rather than operating as an unincorporated business and receiving income in the form of dividends. However, the current limit acts as an incentive to keep taxable income below \$200,000 per year. These and other provisions in Canada's tax treatment of small business results in the treatment being among the most generous in the world (Mintz, 1997, pp. 5.6 and 5.7). These tax incentives were designed to encourage smaller businesses and they may have contributed to the faster growth in employment in small business in Canada than the U.S.

The financing of small business has been an area of discussion and sometimes concern. Borrowing costs are relatively higher for small firms to access the capital market, reflecting to some degree the greater risks, and also some economies of scale on large compared to small issues. Historically, the chartered banks lent to small business, but often relied on physical assets and inventories as a basis of lending. Their lending limits at the branch level were often low. The increased importance of human capital, new technology and new computer applications have become more important in the knowledge intensive industries of the present and future, and Canadian branch managers may not have the skills and authorization to lend to such new enterprises. Banks in the U.S. (operating on a local basis) provide more loans to small business than in Canada. In addition, corporate profit levels in Canadian manufacturing have been lower than in the U.S., especially for smaller firms (Wilson 1995). This makes it difficult for small firms to finance growth internally, especially for rapidly growing ones. Venture capital sources of funds are much fewer in Canada than the U.S. (after allowing for the one-tenth difference in size). The small firm with potential for rapid

growth may be more constrained by the Canadian financial market than the lifestyle small organizations on the one hand, or the large firm with close connections and representation on the boards of directors of Canada's chartered banks, on the other.

Another important factor in the Canadian macro environment is the decline in the value of the Canadian dollar. The average noon rate for the Canadian dollar was \$1.23 in 1988 (the last full year before the implementation of CUSFTA). By early 1999 it was as low as \$1.52, a further decline approaching 25 per cent. This would significantly increase the prices of U.S. imports in Canadian dollars and have far more impact on reducing competitive pressure on Canadian plants than the elimination of the remaining tariff barriers. The exchange rate change would also increase the costs of imported materials and components and put pressure on profit margins of firms selling in the domestic market, but also dependent on imported materials.

However, the exchange rate changes would have impacts on both costs and alternative import competition for both large and small establishments. I am not aware of any studies that have examined any differential impact that the exchange rate depreciation would have on small, compared to large establishments. This is an important issue that needs further study.

All of these considerations thus far can apply to the United States, as well as Canada.

A new consideration for Canada is the improved access to the U.S. market made possible by the elimination of the last tariffs in the U.S. (We are aware of the continued risks to exports from contingency protection in the U.S.) There were about twenty U.S. states within 400 miles of the manufacturing belt between Windsor and Cornwall and those states had levels of population and income five or six times all of Canada. Quebec is not quite as well situated by U.S. states within 400 miles, but the population and income in those adjacent states was two or three times the Canadian totals. This much larger market can permit a small plant to be highly specialized and sell in a market substantially greater than anything available historically. There are, however, greater risks in a highly competitive market, whose profitability can be quickly changed by exchange rate changes. There is also the increased scope for import competition (as can be seen in import statistics for manufactured products). This enlarged market from free trade can be a factor in the faster growth in small plants in Canada than in the U.S., and the acceleration in the growth of small plants in the 1980's.

However, it is still puzzling that Canada now has relatively more small plants than the U.S., where they have grown up with easy access to a larger national market.

5. PRODUCTIVITY AND WAGES IN SMALL BUSINESS

How has this increased role for small business in Canada affected the productivity gap in manufacturing?

Figure 1 shows an important contrast between small and large plants. In 1973, large plants

had levels of productivity about 15 percent above the national total, but two decades later it was about 40 percent above. On the other hand, small plants had levels about 15 percent below the national average, and this had widened to about 30 percent about two decades later. The gap between large and small had widened from about 30 points in 1973 to about 70 points in 1992 and the widening in the gap accelerated during the 1980's. In other words, there has been a widening gap in productivity between small and large plants since the early 1970s.

Table 5 shows the relative productivity of large and small plants compared to the U.S. average shown in Column 2 of Table 3. Large plants in Canada have had slightly larger productivity gains than U.S. manufacturing in total. This is in line with the studies showing larger gains from freer trade.

On the other hand, smaller establishments had levels of productivity about 70 per cent of the U.S. in 1977, but this has fallen below 60 per cent of the U.S. by the early 1990s. It is these smaller plants that have had the big increases in employment (as shown in Table 4), but these smaller plants are falling further behind the U.S. national averages. This development had not been anticipated by either the supporters or the critics of free trade.

Figure 1
Relative Productivity for
Small and Large Plants, Canada, 1973-1992

Source: Baldwin (1998), p.362

Table 5
Relative Productivity of Large and Small Plants
Canada as Percent of U.S. Average

Size of Plant	1977	1987	1992
Canada 500+	108	105	114
Canada 1-100	69	58	57
Canada All	90.0	79.6	82.4
Sources: Table 3 and Figure 1 (visual)			

There is also some evidence that the lower levels of productivity are heavily concentrated in the Canadian-owned sector of manufacturing. This can be seen in Table 6 for the 1970's. Large Canadian-owned plants (more than 400 employees) were roughly comparable to foreign-owned larger plants, but smaller Canadian-owned plants were only half or two-thirds as productive as small foreign-owned plants (based on the same size and industry cells that contained both forms of ownership).

Table 6
**Selected Comparisons Between Sectors of Control
 Canadian Manufacturing Sector**

Plant Size Measured in Employees	Value Added/Production Worker (Ratio Cdn. To Fgn.)	Percentage of Sales	
		Cdn.	Fgn.
Fewer than 50	.50	19%	5%
50 to 200	.67		
200-400	.75		
Greater than 400	1.00	23%	53%

Source: D. J. Daly and D. C. MacCharles, *Canadian Manufactured Exports: Constraints and Opportunities*, (Montreal: IRPP, 1986), p.20.

**Figure 2
 Relative Productivity by Size Class and Control**

Source: Baldwin (199?)

Figure 2 shows the relative productivity by size class and ownership. The larger plant sizes have undergone increases in relative productivity levels in the later period, while smaller domestic plants (under 100 employees) have declined in relative levels. There is only a small difference in relative productivity levels of large and small foreign establishments, but small domestic establishments had productivity levels only half the foreign establishments with under 100 employees in the 1985-90 period. It is clearly the small domestically-owned plants where the relative productivity levels have experienced the greatest relative declines.

Similar contrasts between large foreign-controlled establishments and small domestically controlled establishments emerged in an econometric study, using time series data from 1973 to 1993 for three size groups and four broad industry groups in manufacturing. Both marginal and average labour productivities were estimated. Average labour productivity was measured by total shipments divided by total employment, with shipments measured in real terms by the output price index at the corresponding 4-digit industry level. (Baldwin and Dhaliwal 1998). The study found stronger productivity growth in larger than smaller plants and the largest gains occurred in large foreign-controlled plants. Similar results were obtained when net output rather than gross shipments were used in the measurements of outputs.

There are some differences between small and large establishments in value added per employee in the United States, but the differences are not quite as great as those shown in Tables 5 and 6 for Canada. However, an even more important factor is that the smaller establishments are relatively more important in Canada than in the United States. Establishments with fewer than 500 employees contributed about 64 percent of shipments, compared to only 55 percent in the U.S., as shown in Table 7. (Similar data for the 1980s were shown in a figure in Porter (1991), p.293, but the estimate of 17.7 in the U.S. for plants under 500 employees must be in error).

Table 7
Relative Shares of Shipments
by Establishment Size
U.S. (1992) and Canada (1993)

Establishment Size	Percent of Shipments	
	U.S.	Canada
1-49	12.32	13.65
50-99	9.19	11.17
100-499	33.81	38.94
500-999	14.66	12.83
1,000 and more	30.24	23.41
Sources: U.S. Department of Commerce, 1992 <i>Census of Manufactures, General Summary</i> , p. 1-178 and Statistics Canada, <i>Manufacturing Industries of Canada: national and provincial areas</i> , 1993, p. 200.		

Clearly the increased importance of employment in small business has been associated with a slippage in productivity levels of small Canadian-controlled establishments relative to the national totals. It is these developments that have prevented the productivity levels in Canadian manufacturing from closing the gap with the U.S. as expected.

It is also clear that small firms in manufacturing pay less than larger firms (Morrisette 1993). From 1972 to 1991 there was also a tendency for large plants to experience increases in relative wages, and small plants to undergo relative declines (based on 7 classes of plant size). By 1991 the relative wages of the smallest to the largest class size were wider by 1991 than it had been in 1973 in all five broad industry groups within manufacturing. These tendencies were more apparent in the 1980's than in the 1970's. (Baldwin 1996).

The increased relative importance of small plants (and firms) had thus contributed to a smaller increase in real wages for total manufacturing as well as slowing the increase in productivity for total manufacturing in Canada.

It should be noted that labour costs relative to capital costs are lower for small firms than large ones. The smallest firms (under \$ 5 million in revenue) have higher costs of funds and higher rates of return on equity than the largest firms (over \$ 100 million in revenue). (Caldwell et. al. 1995). On the other hand, hourly earnings and wages are lower in small plants and firms, and the differences have widened in recent decades. It is reasonable to expect that smaller firms and plants would be relatively more labour-intensive and use relatively less capital per worker. Under these conditions, differences in output in relation to total factor input would be less than in relation to labour input alone in comparisons between small and large organizations. This area has not been explored here but the company questionnaire asks for information on this point.

A number of studies have looked at productivity differences between Canada and the U.S. within manufacturing. Someshwar and Lemprière (1992), for example examined 18 component industries for selected years from 1961 to 1990. The variation around the mean was about 20 per cent smaller in 1990 than in 1961. The more extreme differences in productivity by industry had diminished significantly over three decades.

Wolff (1999) also found a reduction in the degree of differentiation in industry productivity for Canadian manufacturing from 1970 to 1993. Furthermore, considerable convergence in relative labour productivity also took place between 1963 and 1970, and 1993 for 29 manufacturing industries for 14 OECD countries

This strengthens the view that the large variations in inter-country comparisons of labour productivity within manufacturing industries have been reduced over the last three decades, not just for Canada, but for a majority of the OECD countries.

On the other hand, the differences between small and large organizations within Canada have become significantly wider, with a wider gap between smaller Canadian-owned establishments and

larger establishments. The differences in productivity within foreign-owned plants between small and large organizations is much less, as illustrated in Figure 2.

When the increases in employment are occurring in lower wage establishments, there is an understandable reluctance for workers laid off in high wage establishments to accept employment in the low wage establishments. When this shift appears to be more apparent for Canada than the United States, this could be important in the persistence of a higher unemployment rate in Canada. This possibility does not seem to have been considered in the studies published in the recent special issue of *Canadian Public Policy* on the Canada - U.S. unemployment gap.

6. CANADA – U.S. COST AND REAL WAGE COMPARISONS

Earlier sections have emphasized labour productivity as a simple and more readily available measure of efficiency. (It is recognized that total factor input including capital, is a preferable measure, but inter-country comparisons of capital input by broad industry are not currently available. Earlier studies, now some decades old, showed more capital per employee in Canada than the U.S., both for manufacturing and in total. The gaps in total factor input per employee would thus be even larger than shown in Table 3, Column 2). This section will extend the discussion to look at a few cost comparisons, emphasizing comparisons at a point in time and limited to Canada – U.S. comparisons. The discussion will be limited to total manufacturing, as no information by plant size is available.

How do aggregate unit labour costs for manufacturing compare in the 1990's? These can be approximated by comparing compensation per hour with real output per hour for manufacturing in the two countries. For 1996, hourly compensation costs for production workers in Canadian manufacturing were 94 per cent of the U.S. (B. LS 1999). However, output per hour was 73.2 per cent of the U.S. for the same year (1996), which implies a level of unit labour costs about 28 per cent higher than the U.S. This would appear to be a serious cost disadvantage in a free trade environment. It is possible, of course, that the high cost sectors could be in products and industries that are not traded internationally to a significant degree.

However, if Canadian manufacturers tend to be high cost producers, one would expect it to be reflected in lower corporate profits. This is what appears in a special Statistics Canada comparison (Wilson et. al. 1995).

Canadian manufacturers have been doing very well in exports to the United States during the 1990's, which is hard to explain with the evidence on high costs. They would have achieved even larger increases if their costs had been closer to U.S. levels, of course. It should also be noted that dramatic increases in imports of manufactured products have also been taking place. Such changes are bound to reflect on increase in intra-industry trade, and an increased specialization at the plant level on both sides of the border. When trade between affiliated foreign-controlled firms is so large, the decisions on plant specialization are important. (Cameron 1998 for facts on the 1990 to 1994 period).

When smaller Canadian-owned plants are falling farther behind the larger plants in Canada, in value added per employee, it would be helpful to know how they are faring in relation to the marked increases in both exports and imports of manufactured products. The last such comparison ended in 1979.

Evidence that Canada has been a high cost, low productivity producer of manufactured products has been available for more than three decades, based on a survey of company costs (by cost components) that asked for prices in the two countries. For example, for 31 identical product matches, the unweighted mean was about 25 per cent higher in Canada than the U.S. and about 60 per cent of the items were 20 per cent or more higher in Canada. (Daly, Keys and Spence, 1968, pp 96-97). This was at a time when compensation per hour in manufacturing was about twenty per cent less in Canada. This implied a significantly lower level of output per hour in manufacturing in Canada.

This study and the related research on productivity, tariffs, scale economies and pricing, led to a number of recommendations relating both to public policy and corporate strategy.

A key recommendation for public policy was free trade, to permit increased real incomes and living standards through higher productivity. The policy implications were discussed in a series of studies and conferences by the Economic Council of Canada, the Ontario Economic Council and the Macdonald Royal Commission. The Canada – U.S. Free Trade Agreement was eventually approved after a general election in which free trade was a major issue.

An important recommendation for corporate strategy was to improve productivity. The company survey had indicated that many Canadian plants produced a wider range of products than a plant of the same size in the same industry in the United States. Increased specialization in Canadian plants was important to get costs down to the U.S. level with free trade. This has clearly happened in the automotive sector (facilitated by a small number of multinationals), but medium-sized Canadian-owned plants have been less successful, as discussed in Section 5, above.

An increase in productivity on a continuing basis was necessary, as U.S. manufacturing has also continued to increase productivity on a longer-term basis. Such steps were necessary, but not sufficient. Manufacturing costs in Canada in the 1960's were well above the U.S. If increases in productivity were matched by comparable increases in compensation per hour and other non-labour costs, Canada would persist in the same high cost situation with free trade as was present in the 1960's and earlier. It was important that an important part of the productivity gains be passed along to the buyers of manufactured products, both within Canada and internationally. This was the strategy that manufacturing companies in Japan had followed during the 1960's and 1970's when they had been increasing their share of the world market for manufactured products.

Canadian manufacturers have apparently been following such strategies. Between 1977 and 1997, real output per hour increased 45 per cent in Canada, while real wages increased only 9 per

cent. (These changes in real wages reflect not only what is happening in manufacturing, but also changes in relative prices in the non-manufacturing areas. Prices of service in the consumer price index have gone up more rapidly than goods prices during the 1980's and 1990's in Canada). This development outside the manufacturing sector has restrained the real wage increases received in manufacturing.

However, U.S. manufacturers have been even more successful in this area. Output per hour has gone up 80 per cent from 1977 to 1997 (more than in Canada), while real wages has increased only 6 per cent over the same period – and less than in Canada. These changes underlay the level comparisons in Table 3, where Canada's real wages per hour were roughly the same as the U.S. in the late 1990's, while the productivity gap in manufacturing has widened.

Canada's competitive position in manufacturing is affected not only by productivity levels and changes, but also what happens to compensation per hour and exchange rates. In the last quarter century, hourly compensation costs were consistently closer to the U.S. than the levels of output per hour. In 1975, compensation costs were 6 per cent below the U.S., but slightly faster inflation and exchange rate changes brought them 10 per cent above the U.S. in 1991. Since then, declines in the value of the Canadian dollar have brought compensation per hour down to 9 per cent below the U.S. in 1997 and a further widening is to be expected in 1998 and 1999, when they become available. Between 1991 and 1998, the value of the Canadian dollar dropped about 23 per cent, and from 1974, the drop was 34 per cent. These exchange rate changes have been so large that they have more than offset the widening productivity gap of recent decades. The money cost position was less above the U.S. at the close of the century than it had been in 1991. Exchange rate changes had eased the competitive pressures on domestic manufacturers to a significant degree. However, many manufacturing companies could be very vulnerable to international competition if the Canadian dollar was to recover from its historic lows in 1998 and 1999.

Exchange rate changes of this magnitude have an important impact on the structure of relative prices and profitability within Canada. Companies active in export markets set prices to match U.S. prices. An exchange rate depreciation increases their returns on Canadian dollars. When many costs are increased domestically in Canadian dollars, corporate profits increased for such companies. On the other hand, companies who purchase raw materials and components abroad (increasingly in the U.S. market), would find their costs going up and they could find their profit margins squeezed. An exchange rate change can thus have a divergent impact on profits in the export sector from those purchasing goods and services abroad. (It is recognized that other countries have seen even larger changes in their exchange rates than the Canada—U.S. Rate, such as the Japanese yen in relation to the U.S. dollar. However, these other countries may have lower ratios of trade to GDP, or a more diversified country composition of exports, so bilateral exchange rate changes need not have as large an impact as in Canada).

We do not have any information on how the changes in money costs discussed in this section affect the small and medium sized establishments discussed in other parts of this paper.

**An Examination of the Small Firm
Productivity Gap in Manufacturing
between Canada and the United
States:**

**Summary of Preliminary Interviews –
Greater Toronto Area**

Dr. Donald J. Daly

**Michael Helfinger
Gordon Sharwood (Sharwood & Company)**

January 21, 2000

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Introduction and Methodology

This report summarizes the findings of seven in-depth interviews with CEOs and senior executives of small and medium-sized (50 to 500 employees) manufacturing firms in the Greater Toronto Area. Four interviews were carried out on-site, and three were transmitted and received back by fax.

The questionnaire was designed to probe the full range of hypotheses advanced by economists and policy analysts explaining the disparity between the productivity levels of Canadian and U.S. manufacturers. Questions fell under the specific headings of:

- Productivity Track Record (assessment of firm and industry performance)
- Entry, Exit and Growth of firms
- Capital (access, and state of plant and equipment)
- Technology (product, process, and information)
- Scale Economies
- Labor Quality
- Entrepreneurship
- Government Policy

The questionnaire comprised a total of 41 questions (some in several parts). This summary includes tabulations of a number of selected questions relating to certain “hot button” issues commonly raised in connection to manufacturing productivity in Canada. Examples are: economies of scale, modernity of plant and equipment, unionization, and the dependence on a low-valued Canadian dollar.

It was also intended to gather suggestions for programs at all levels of government that could improve the productivity performance of Canadian small and medium-sized manufacturers.

A draft is included as an Appendix to the Proposal to Canadian Community Investment Plans or CCIPs submitted along with the July 30 Progress Report.

This initial batch of interviews was intended as a “trial run” for future surveys targeting specific communities in Southern Ontario. We are currently exploring sources of funding for these surveys, possibly through the Canadian Community Investment Plan (CCIP) of Human Resources Development Canada. Our experience and feedback gathered were to be used to refine the questionnaire and the process of identifying target firms in the future phases of the study. **We expect to complete the broader study incorporating this larger sample (25 to 40, including those already completed) of firms during the fall of 1999. The report will contain a full set of tabulations and will be shared with Industry Canada.**

At first, the target list focused on the Town of Oakville, and included manufacturers listed in *Scott's*

Directory falling within the predetermined size range in terms of number of employees. It was later decided to add to the list with Greater Toronto Area companies suggested by the Alliance of Manufacturers and Exporters of Canada, with a representative of the Alliance acting as an intermediary. This greatly enhanced our success rate in completing interviews.

The Alliance, together with local CCIP directors, will continue to act as an intermediary in future rounds of interviews. The initial round just completed enabled us to progress along a “learning curve” and we expect the future interviews to proceed with much greater efficiency.

Assessment of Productivity Performance

A majority of respondents felt that the productivity performance of their firms and was competitive with similarly-sized American players, though a couple admitted that their productivity fell short of that of U.S. peers. In terms of the assessing the productivity of their Canadian peers against like American firms, a similar pattern held. A number of respondents were not able to assess the competitiveness of small versus large Canadian players, those who were rated it either “about the same” or worse.

Outsourced work was taken on by a majority of respondents. Most of these said that the work outsourced by other firms accounted for between 10% and 25% of their total volume. Generally, no significant difference was reported in productivity gains in outsourced work taken on and their regular production activities. Only two respondents reported outsourcing work themselves. In one case, the outsourced work was of a type requested by a customer that was not compatible with the company’s core activity. In another case, outsourcing was driven by a desire to circumvent restrictive work rules demanded by the union, which were seen as rendering in-house production uncompetitive from a cost standpoint.

Entry, Exit and Growth of Firms

The sample was divided between firms reporting incremental change or infrequent restructurings, and those reporting frequent major changes (more than five or two to five significant restructuring events in the past 15 years). These major changes could include: change in ownership, change in product line and/or markets served, significant plant expansion or reconstruction.

Companies that reported frequent major changes all report that the restructuring events accelerated productivity, though this group was split between those seeing a gradual, long-term impact and those experiencing significant immediate growth.

In categorizing principal competitors, most respondents identified foreign companies, both

established players and new entrants. The competitive benchmarks identified for productivity growth varied. A couple of respondents mentioned foreign competitors, two others mentioned “existing players exhibiting rapid growth.”

Automation/Plant & Equipment; Access to Capital

The sample was split between respondents who felt that “our workers have all the equipment they can use effectively” and those who admitted that their progress in automation lagged behind larger Canadian players and/or American competitors. Most respondents, however, described their plant and equipment as “a combination of old and new incorporating average practice technology.” Only one respondent described his plant’s machinery as “state-of-the art incorporating best practice technology.” Competitors were also generally described as “average” in plant and equipment technology, though one respondent characterized U.S. players and Canadian subsidiaries of multinationals as “state of the art.” Another maintained that his facility led U.S. competitors, whose technology was mostly older.

Those who felt that they were automated to the maximum extent feasible maintained that the only constraints they faced in purchasing new equipment was the need to show satisfactory return on investment. Firms that admitted to lagging competitors pointed to high Canadian corporate taxes as an obstacle to greater investment in automation. A couple mentioned the low value of the Canadian dollar driving up the price of imported machinery. Other mentions of measures that could promote automation included targeted tax incentives or grants/subsidies/low interest loans.

Respondents varied in identifying the key challenge they faced in financing expansion and modernization. A couple could not identify any significant challenges. The cost of financing was the most frequently cited constraint. Other mentions included the timeliness of the financing administration and approval process and the forms of financing available. The most frequently mentioned remedy to the challenges and constraints faced was greater understanding by financial institutions of small and medium-sized manufacturers and of the dynamics of particular industries.

Technology and Innovation

Respondents were asked about the most important source of ideas for commercially viable product and process technologies. A majority of interviewees mentioned multiple sources. One checked all the boxes (suppliers, customers, competitors, in-house R&D, employee suggestions, alliances with other firms). In-house R&D, customers, competitors, equipment suppliers and alliances with other firms were the most frequent mentions. Most believed that their competitors went through a similar

process, though one respondent pointed out that his larger international competitors undertake more ongoing, systematic R&D and competitor intelligence.

Questions 13a and 13b:

Sources of new ideas on commercially viable process and product innovations (total mentions)

	<u>Process</u>	<u>Product</u>
Equipment suppliers	5	2
Customers	4	4
Competitors	2	2
Shop floor employees' suggestions (quality circles)	2	1
In-house, applied R&D	4	5
Licenses		1
Alliances with other firms	4	3

The owner/CEO/COO was cited most frequently as the principal driver of innovation within the organization, followed by the management team. One respondent identified all levels of the organization, including shop floor workers, as well as suppliers.

In assessing American competitors' access to technology, the sample was split between respondents who believed U.S. firms did not have easier or superior access, and those who cited better-developed linkages between the private sector, government and educational institutions in the United States.

Trade shows and conferences were the most frequently mentioned sources of information about emerging technologies with commercial potential. Other mentions were legal competitor intelligence and networking.

When asked to identify the most important factor in applying technology to enhance productivity, interviewees' most frequent responses were increased internal R&D and increased investment in state-of-the-art machinery and equipment.

A majority of respondents felt that computers had improved the productivity of their companies "significantly;" a couple maintained that it had done so "very significantly." Most respondents listed a number of ways in which information technology has boosted productivity. "Speeding up changes in products and processes" and "satisfying the requirements of customers" were the most frequent mention. "Enhancing information flows and coordination within the firm" was also cited several times. A majority of respondents stressed the importance of continuous learning among all employees for the benefits of IT to be fully realized.

Economies of Scale/Exports

A majority of respondents agreed or strongly agreed that production runs in their firms were shorter than in comparable U.S. firms. In one case, this was explained by the bulky, low value-added nature of the items produced (meaning high transportation costs) and the manufacturers' distance from the core North American market for the product. This effectively restricted the company to the more fragmented Canadian market, with some exports to the northeastern U.S. The company in question thus effectively operated under "branch plant" rather than "free trade" dynamics. The argument was advanced that the type of rationalization that took place in Canadian automotive manufacturing after the Auto Pact was not feasible in all sectors.

These firms, however, were all seeking to rationalize production; i.e. turn out larger volumes of a narrower range of products. Since the signing of the Free Trade Agreement, **almost all the companies in the sample have increased exports to the United States as a percentage of total volume**, and a couple reported increasing the overseas share of sales.

The relationship of exchange rates and monetary policy to export opportunities is discussed below under Public Policy Environment/Macroeconomic Issues.

Labor Issues/Management Recruitment

The sample was split between respondents who felt that recruiting workers with the necessary skills, training and education had become somewhat or significantly more difficult over the past decade, and those who believed that it is about equally difficult today.

Most firms in the sample promote managers from within. In a couple of cases, senior managers are primarily family members. Almost all senior executives were university graduates, with business administration and/or accounting backgrounds predominating. **Only two individuals held engineering degrees.** The one non-university graduate was a CEO who was a skilled tradesman.

Academic Backgrounds of Senior Executives

Engineering degree (with or without P.Eng designation)	2
Business Administration (BComm, BBA, MBA)	3
Accounting designation (CA, CGA, CMA,	4

CPA – with or without business degree)	
Liberal arts degree	3
Skilled trades	1
Total reporting	12

Companies in the sample reported employing an average of four professional engineers on staff. One firm outsourced its engineering work.

Some firms carried out on-site research and development but none had dedicated R&D departments or full-time research scientists on staff.

In general, respondents did not believe that high Canadian unemployment levels relative to the United States, or an influx of unskilled workers (through immigration or internal migration within Canada) had a significant impact, either through discouraging automation or making recruitment easier. The greatest difficulty in recruiting, however, was identified as existing at the managerial/professional and skilled trades levels.

Identified attractions of the firm to qualified job applicants varied. The most frequent mentions related to flexibility (likely compared to larger firms): attractive career path with upward mobility and a lack of bureaucracy and red tape/freedom to be creative. In terms of most important qualifications, “the right attitudes and values” was the most frequently mentioned, followed by “previous experience and on-the-job training.” A couple of respondents mentioned the quality of primary and secondary education (basic literacy and quantitative skills).

Comparing the quality of their workforces against international competitors, most respondents rated them “about the same” or “somewhat better.” Only one executive rated his workforce “somewhat worse.”

A majority of respondents either reported that unions were not a factor in their industry or that union issues should be able to be handled by skilled management. A couple mentioned that a relatively greater union presence in their industry compared to the U.S. exerted upward pressure on wages, and/or that the union in their shop (the Canadian Auto Workers, in both cases) opposed automation, flexible work rules, profit sharing and worker participation in decision-making.

**Question 29:
Unionization and Competitiveness**

<u>Statement</u>	<u>Number of Mentions</u>
Unionization drives up wage rates in our industry relative to the United States	2
The union in our shop opposes automation, flexible work rules, and worker participation in decision-making	2
Strikes or threats of strikes have cause us to lose export customers and postpone expansion plans	1
The shop is unionized but labor-management relations are cooperative	0
Skilled management should be able to handle the union issue	1
Unions are not a factor in our industry/town/region	3

Entrepreneurship

Firms in the sample reported average annual growth rates in sales of 5% to 15% per annum, and most target growth of more than 10% annually over the next five years.

Innovation in products, processes, organizational structure and organization of production was most frequently cited as an important factor behind the success of the firm. Quality of workforce, quality of management, and relationship to suppliers and customers also received multiple mentions.

A majority of interviewees identified “dealing with intensified competition” as the most important challenge faced by owners and management in recent years. A couple of firms mentioned recruiting high-quality managers and engineers, while one mentioned exchange rate fluctuations.

Several respondents were unable to comment on the comparative climates for entrepreneurship in Canada and the United States. Those who responded were split on whether Canada and the U.S. offered a superior climate.

“Maximizing the profitability of the firm” was mentioned most frequently as the principal objective of both the respondents’ companies and domestic and foreign competitors. Other mentions included ensuring the survival of the firm, safeguarding the jobs of the employees and expanding and growing the firm.

Public Policy Environment/Macroeconomic Issues

Issues under this general heading include: exchange rates/monetary union, taxation, and the overall public policy market.

Exchange Rates

Most respondents maintained that elimination of exchange rate risk (through fixed exchange rate or adoption of the U.S. dollar as Canada's currency) and/or elimination of border measures and the threat of the U.S. invoking trade remedy legislation would promote exports. However, exchange rate risk was generally not identified as a critical factor. Only one respondent stated that the prices of their products were "very sensitive" to the price of imported inputs. Most believed that the current low value of the Canadian dollar was promoting their export business.

As noted above, however, a couple of respondents cited the low C\$ as a barrier to purchasing state-of-the-art machinery. For some types of machinery, competition from low-cost, soft-currency Asian countries was reported as holding prices down, but certain types of specialized machinery produced in the United States and Western Europe have risen significantly in price over the past two years.

When presented with a hypothetical situation where the value of the Canadian dollar rose to 90 cents in U.S. funds, a majority of respondents felt their companies could absorb the impact by reducing costs and improving productivity. Only one maintained that such a development would drive his firm out of business. Another envisioned a contraction in sales, but continued survival for the company.

Question 24:

If the Canadian dollar rose to 90 cents in U.S. funds, your firm would:

Reduce costs and increase productivity to stay in business	5
Change product lines and/or industry and markets served	0
Move some or all of operations to the United States	0
Continue operating with reduced output	1
Go out of business	1

Taxation

As mentioned above, corporate and payroll tax rates in Canada were mentioned by a couple of respondents as an impediment to automation and modernization. The loss of management and professional talent to the United States due to the more steeply progressive Canadian personal income tax structure did not emerge as a major concern within this group of companies. Only one respondent checked the box behind the statement “Many qualified managers and candidates leave for the United States because of higher after-tax incomes.”

General Policy Environment

The overall public policy climate in Canada is generally seen as more favorable to the firms’ activities during the 1990s than in previous decades. Specific favorable initiatives mentioned include balancing the federal budget, provincial tax reductions, the FTA and NAFTA, and reduction of red tape and paperwork. Respondents were split between whether the federal or provincial government has been more generally beneficial. One respondent maintained that, overall, “government is still the problem,” and industry and trade associations and education and training institutions were more likely to be seen as contributing positively to the success of the firm.

Conclusion

In many respects, the CEOs and senior executives in this sample of small and medium-sized Canadian manufacturers generally displayed positive attitudes and proactive approaches to technological change and the evolving international business environment. For example:

- Most have become significantly more export-oriented over the past decade.
- Most look at U.S. and/or overseas competitors as benchmarks in their productivity performance.
- As a group, they express high awareness of the role of technological innovation and information technology in competitiveness and success, and maintain a flexible and open approach to gathering ideas for innovation.
- Most respondents do not profess to be heavily dependent on a low-valued Canadian dollar for their survival, and appear to be prepared to absorb the impact of a stronger C\$ through productivity improvements. None of the interviewees sees inexpensive unskilled labor (due to immigration and continued high unemployment rates relative to the United States) as a substitute for automation, modernization and innovation.

On the other hand, a number of patterns in the responses to the questionnaire are consistent with popular explanations of the productivity lag between Canadian and U.S. manufacturing sectors:

- Most respondents admit that their companies' plant and equipment is on a whole less modern and sophisticated than that of similar-size competitors in the United States.
- Most report producing shorter runs of a greater variety of products than similar-size competitors in the United States.
- There was a general absence of individuals with engineering or science backgrounds in senior management positions.
- From an organizational standpoint, research and development appeared to be treated as an incidental rather than a core activity.

It should be cautioned that this sample was skewed somewhat in favor of firms active in the Alliance of Canadian Manufacturers and Exporters. Companies active in trade associations could be reasonably assumed to, as a whole, be governed by more progressive management cultures than their peers.. One of the CCIP directors contacted regarding the future phases of the study has promised to lead the consulting team to companies whose management cultures may be described as more insular and change-resistant. Firms fitting this description are generally highly resistant to participation in surveys, but including a few such companies in the sample will be valuable to identifying and understanding the drivers of productivity and Canada's performance relative to international competitors.

Comments on Questionnaire/Next Steps

The most significant feedback relating to the questionnaire was in the form of several suggestions that the field of education and training be more directly and extensively addressed. The effectiveness of the public education system in developing basic literacy and quantitative skills, and the availability of skills training, were mentioned as key concerns. It was also suggested that the question about the number of research scientists employed be replaced with a more general question on whether research and development is conducted on the premises. These suggestions will be incorporated into the questionnaire for future phases of the study.

In future interviews, we will seek to enlist local Canadian Community Investment Plan directors, as well as the Alliance of Manufacturers and Exporters as intermediaries in securing cooperation among small and medium-sized manufacturers. Our experience with the preliminary interviews suggests that the involvement of an intermediary or center of influence is extremely helpful to the efficient execution of the interview process. This is because small manufacturers are inherently resistant to participation in surveys, due to lean staffs and a lack of familiarity among some owners/CEOs with consulting and public policy research. Also, we have found that the format of the questionnaire does not lend itself well to telephone interviews, and we expect future surveys to encompass a mix of on-site interviews and faxed questionnaires.

A remaining issue is whether the research team will focus on companies identified as laggards, through anecdotal or other evidence, or leaders in growth, technology, quality and management culture. The former would give a clear picture of the roots of Canada's small/medium manufacturer productivity lag, but would not identify solutions. The "success stories" would be easier to survey, because these companies tend to be active in community groups and industry associations. They would point the way toward management solutions and remedial programs, but the issue of causes would be less well addressed. Most likely, we will ask the intermediaries to identify a survey sample comprising a mix of companies.

Appendix: List of CEOs/Executives Interviewed

Craig Beggs
VP Finance
IDMD Manufacturing
45 Progress Avenue
Scarborough, ON
(416) 299-4865
Product line: Point of purchase equipment

Sheldon Caplan
Vice President and Corporate Counsel
VitaFoam Products Canada Ltd.
150 Toro Road
Downsview, ON M3J 2A9
(416) 630-6633
Product Line: Foam products

Alex Gray
President
Gray Tools
299 Orenda Road
Brampton, ON L6T 1E8
(905) 457-3014
Product line: Industrial safety products and hand tools

George Holbeche
President
Caloritech
2767 Brighton Road
Oakville, ON L6H 6J4
(905) 829-4422
Product line: Industrial heaters

Jeff Pritchard
President
Vac Aero International Inc.
1371 Speers Road
Oakville, ON L6L 2X5
(905) 827-4171
Product line: Heat treating, heat treating equipment

Werner Scheliga
Chairman/CEO
Unique Mould Makers Limited
1830 Ellesmere Road
Scarborough, ON M1H 2V5
(416) 289-6653
Product line: Plastic molds for packaged goods industry

Tim Walter
Executive Vice President
E.F. Walter Limited
51 Wingold Avenue
Toronto, ON M6B 1P8
(416) 762-4492
Product line: Felt products

8. QUESTIONS FOR FUTURE RESEARCH

The increased relative importance of small plants and firms in Canadian manufacturing has clearly been a key factor in the growth of employment and the slower increase in productivity and money and real wages.

The evidence in Section 5 suggests a growing gap in relative productivity of small domestically-owned establishments in Canada compared with establishments in the United States. By 1992 Canadian establishments with less than 100 employees were only about 55 per cent of the U.S. average, a wider gap than in the 1970s. What are the main factors contributing to any differences in cost and productivity performance for smaller establishments in Canada compared to adjacent U.S. competitors? A survey of smaller establishments in selected urban areas in Ontario is now in its early stages, being implemented by Michael Helfinger with myself as consultant. Start-up funding has been provided by Industry Canada. This approach at the micro level is in line with the emphasis of new growth theory being recommended by such scholars as Richard Lipsey, Paul Romer and Peter Howitt.

However, it is not clear how the dramatic increase in the two way flow of trade in manufactured products between Canada and the United States has affected the small and large establishments and the Canadian and foreign-controlled establishments. Has the increase in exports for large foreign-owned establishments been above average? On the other hand, have the smaller Canadian-owned establishments been particularly hard hit by competition from the large economy to the south? (Daly 1990).

It should be noted that a previous study had shown faster increases in exports of small Canadian-owned establishments than in foreign subsidiaries. This special tabulation covered the years 1970 to 1979 (Baldwin and Gorecki 1983). This project required a matching of establishment data from the census of manufacturing with the commodity data from international trade statistics. Changes in exchange rates (both up and then down for the Canadian dollar), the implementation of free trade, the increased relative importance of employment in smaller Canadian-owned establishments and the depressions and slower growth in Canada in the 1980's and 1990's make an update of that material essential.

Another area is the desirability of re-examining the evidence on economies of scale. There has clearly been a decline in the average size of plants and the average size of firms in manufacturing over the last two decades. Possible factors contributing to this change were mentioned earlier, but the relative importance of the factors has not been studied to our knowledge. It may not be an easy project to do, of course.

Another area is the topic of small business financing. Costs are relatively higher for small firms to access the capital market. Historically, the chartered banks lent to small business, but often relied on physical assets and inventories as a basis of lending. The increased importance of human capital, new technology and computer applications have become more important in the knowledge

intensive industries of the present and future. It is much more difficult to assess credit risks in these new and smaller plants and companies. There is considerable variability between one small plant and another, with much higher rates of both exit and entry among small establishments. Corporate profit levels have been lower in Canadian manufacturing than in the U.S., especially for smaller firms (Wilson 1995) There is also very little correlation between the growth in employment in one period (1983-86) and the next period (1986-90) (Picot and Dupuy 1996). This makes the whole topic of financing of small business a very difficult one.

Small business has been an important source of employment growth in Canadian manufacturing, but the contribution of small plants to real and money wage income, to profits and to productivity per employee has been to pull down the national totals.

Small plants have clearly been a factor in checking the narrowing in the productivity gap between Canadian and U.S. manufacturing that has been taking place in the larger plants, especially the foreign-owned.

A special thanks to John Baldwin for making available the numerous studies done by he and his colleagues and advice and encouragement on this project. Helpful comments on an earlier draft have been received from Richard Harris, Robert McGuchin, Sunder Magun, Tom Rymes, Andrew Sharpe and Gordon Sharwood.

Appendix

Labour Productivity Levels in Manufacturing Canada –U.S. Comparisons

Dirk Pilat has provided a comprehensive study for the O.E.C.D. on inter-country productivity levels for manufacturing and selected service sectors. The study draws on the work that has been underway at the Groningen Growth and Development Centre for many years. This note comments on the results for manufacturing for Canada and the United States. I plan to use these results in some current ongoing work, as it uses more recent base than was previously available, and also covers other major industrialized countries using comparable methods.

This note highlights some of the results and compares them with previous Canada – U.S. comparisons.

Level and Dispersion

The study uses a mixture of “industry-of-origin” approach (which is the theoretically correct approach) to sectoral productivity comparisons and also uses “expenditure PPPs.” The latter starts off with the more readily available data on prices for comparable products at the final purchase level and then works back to allow for differences in taxes and distribution margins to the industry level. This approach needs prices at the industry level for purchased materials (as does the “industry-of-origin approach).”

For 1985, the study shows Canadian manufacturing at 84.3 per cent of the U.S., a narrower gap than in any previous study. (Earlier studies can be carried forward to 1985 using BLS data for manufacturing). Rao and Lampière (1992) show 81.0 for the same year, while an updating to 1985 from Frank (1977) gives 70.6, a gap almost twice as wide as in the O.E.C.D. study. The O.E.C.D. study shows a larger gap for individual years in the 1980s and 1990s than in 1973, a result consistent with all the other studies on the manufacturing productivity gap between Canada and the United States (using both studies based on level comparisons and changes over time).

The latest study also shows much less dispersion around the mean than in the previous studies for Canada (by West and Frank), and in 15 previous studies for manufacturing for other countries. The coefficient of variation is about 35 per cent less than in the previous studies shown in Table 1, even though the study by Pilat is based on more industry components than in the previous studies (more variability is normally present with more industry disaggregation than with fewer industry groups).

A related study by de Jong (1966) compares the relative price level for manufacturing at 100.5 per cent of the U.S. in 1987, with little variation around the average (de Jong, 1996, Tables 3 and B. 6). These price differences are substantially less than earlier Canadian studies such as Daly, Keys and Spence (1968) which were based on actual price comparisons supplied by companies in Canada.

Table 1
Productivity Differences within Manufacturing
Summary of Industry Numbers and Coefficients of Variation
(Fifteen price and quantity comparisons)

	Number of Industries	Coefficient of Variation
Median (15 studies)	26	0.318
Mean (15 studies)	27	0.348
Canada – West (1963)	29	0.382
Canada – Frank (1974)	33	0.324
Canada – Pilat (1987) Table A7	35	0.227
Source: Irving B. Kravis, "A Survey of International Comparisons of Productivity," <i>Economic Journal</i> , March 1976, Table 6, p. 34. Studies based on exchange rates have been excluded. Means, medians and standard deviation have been prepared for the present study.		

Two points should be made about the results in the manufacturing productivity comparisons by Pilat and de Jong. For one thing, the coverage ratio for total manufacturing in 1988 is only 27.75 (de Jong, Table 2). This is substantially less than West (1971, p. 66), which had a coverage of 77.9 per cent for outputs and 59.9 per cent for inputs. Furthermore, the coverages in 1988 appear to be higher for industries with standardized products that are easy to measure and compare (such as beverages, tobacco, wood products, paper products and non-metallic mineral products) and lower in such differentiated products as rubber and plastics, fabricated metal products, machinery and equipment and electrical machinery and equipment. Earlier studies by West and Frank found productivity levels comparable or higher in the former standardized products, but substantially lower in the latter product groups with greater product diversity. It is possible that these differences in coverage could lead to an understatement of the productivity differences in Canada and the United States in the base years of the 1980s.

A further point is that a projection backward to 1977 from the Pilot benchmark for 1985 shows a smaller gap for manufacturing than is shown in Table 3 for GDP per employed person in 1977. Such a result is inconsistent with comparison based on censuses of manufacturing and price comparisons of the two countries, and also company interviews at the time.

I plan to use the results from Pilat, but there is a risk that the gaps could be greater than shown.

A planned survey of manufacturing plants in Ontario will obtain comparative prices in Canada and the U.S. for 1999, together with company views on the comparative production practices in the two countries.

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