AN EVALUATION OF THE TAX COMPETITIVENESS OF A SMALL MANUFACTURING FIRM IN MANITOBA, SASKATCHEWAN, AND NORTH DAKOTA:

The Representative Firm Approach

by

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I. INTRODUCTION

In recent years, there has been a growing awareness and concern among business and government in Canada about the level of taxation faced by firms and the impact business taxation has on interprovincial and international competitiveness. All levels of governments have come to rely more heavily on taxation as means to finance deficit reduction priorities. At the same time, taxes are becoming increasingly important to business decision-making. Not surprisingly then, in the academic literature, research is moving towards determining and assessing the impact of taxation on the financial decisions of firms.[1]

Although taxation is clearly an important competitive consideration for firms, there are other equally relevant non-taxation factors. The globalization of the world economy has significantly changed the playing field for firms of all sizes. Competition is no longer confined among those firms operating in the same jurisdiction; indigenous firms now have to confront intensified interprovincial and cross-border activity. The reasons for these changes are varied. Differential market costs such as interest rates, labour costs, the exchange rate, capital mobility, and other factors such as sluggish consumer demand have all contributed to the new playing field on which Canadian firms must compete.

These factors have affected small business in Canada especially hard. The majority of firms (over 90 per cent in Canada and the United States) are small businesses native to their respective regions. The Canadian Federation of Independent Business (CFIB) has consistently reported that taxation remains the primary concern among small

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[1] See Robert S. Chirinko, "Business Investment and Tax Policy: A Perspective on Existing Models and Empirical Results", National Tax Journal, June 1986, 39(2), pp. 137-155.

business in Canada.[2] Taxation, costs and other factors, taken together, not only have considerable influence in defining the competitive environment, but also in determining the ability of firms to be competitive.

However, the relative importance of costs and taxation on a firm's competitiveness is difficult to assess due to the many aspects of an individual firm's operations. As a result, views on this subject are conjectural or anecdotal at best. The prevailing view, largely adopted by business and their representative associations through member surveys, is that the Canadian tax system is too burdensome when compared to those of major trade partners. It is argued that the tax burden of Canadian firms is excessive, and that the tax system itself is administratively cumbersome with not enough tax provisions such as income tax credits and deductions to promote investment and disadvantaged sectors of the economy. Some organizations and governments, such as the federal Department of Finance, Canadian Federation of Independent Business and the Conference Board of Canada, have made efforts to examine the relative tax position of Canadian firms.[3] Their analysis, for comparative ease, has examined tax competitiveness across countries and other jurisdictions.

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[2] Canadian Federation of Independent Business, National Business Watch: Results from our Members' Opinion Survey # 26, January to June 1990, Toronto: November 1990.

[3] See Canadian Federation of Independent Business, Taxing Ourselves to Death: The Small Business Tax Burden in Canada, Toronto: November 1990; Canadian Federation of Independent Business, Taxing Ourselves to Death: The Small Business Tax Burden in Manitoba, Toronto: June 1991; Conference Board of Canada, The Competitiveness of Canada's Corporate Tax Structure, by Jacek Warda and Tancredi Zollo, Ottawa: Conference Board of Canada, 1987; Conference Board of Canada, Canada-U.S. Tax Competitiveness in Manufacturing Industries, by Tancredi Zollo, Ottawa: Conference Board of Canada, 1990, summarized in Conference Board of Canada, Canada's International Tax Competitiveness, by Tancredi Zollo, August 1990.

This paper will attempt to provide a quantitative framework for analyzing the inter-jurisdictional tax environment faced by a small firm. Using the representative firm approach, a comparative analysis of three jurisdictions, Manitoba, Saskatchewan, and North Dakota, will be undertaken. Two models for a small firm, called "startup" and "operating", will be developed to facilitate the measurement of and provide a consistent background against which to examine the tax and cost factors considered in this paper. Some simplifying assumptions will be made to permit cross-system comparisons of these factors.

As part of the initial analysis, Manitoba will be established as the "base case" jurisdiction for comparative purposes. Models created are based on general characteristics indigenous to Manitoba. The Manitoba simulation results will then be compared to startup and operating simulations for Saskatchewan and North Dakota.

The second part of the paper will evaluate the effect of taxes on the firm's profitability in the three jurisdictions. Using different assumptions, variants of the startup and operating models will be run for Saskatchewan and North Dakota. The fixed cost simulation, using a partial equilibrium framework, will assume that only tax rates and structures for these jurisdictions are varied. This method will show the extent to which interjurisdictional tax differences affect the operation of a firm upon startup and once established. The variable cost simulation, which is a more general equilibrium approach, assumes that jurisdictional taxes and market costs are varied. This approach will illustrate that tax competition, in itself, is too narrow a focus to determine or properly assess the relative competitiveness of a firm located in the three regions to be studied. It will also

demonstrate the influence and the importance of variable jurisdictional market costs.

By deriving the firm's after-tax income position under the above conditions, conclusions will be drawn about the tax burden faced by the representative firm and the impact it has on its competitive position.

II. TAX COMPETITIVENESS ANALYSIS AND THE REPRESENTATIVE FIRM APPROACH

Several Canadian studies have utilized the representative firm approach for tax competitiveness analysis. This method involves modelling, under specific assumptions, the taxes, costs and revenues for a typical firm in a given industry/sector, then applying the model to different jurisdictions under fixed cost or variable cost conditions. The approaches of the following reports provide useful guidance on how to measure the tax competitiveness and tax liabilities facing firms. They include: the federal Department of Finance's 1978 report The Tax Systems of Canada and the United States: A Study Comparing the Levels of Taxation on Individuals and Businesses in the Two Countries; the Conference Board's 1987 paper, The Competitiveness of Canada's Corporate Tax Structure and the recent updated version entitled Canada-U.S.Tax Competitiveness in Manufacturing Industries; and the Canadian Federation of Independent Business (CFIB) 1991 reports, Taxing Ourselves to Death: The Small Business Tax Burden in Canada and Taxing Ourselves to Death: The Small Business Tax Burden in Manitoba.

The following sections briefly outline each study's general approach. Specific conclusions of these studies will be discussed later in the paper.

II.1 The Department of Finance (Canada) Study

According to the Department of Finance, their 1978 study was the first to examine and quantify systematically the differences in tax systems between Canada and the United States using the representative firm approach.[4] Concerns in the 1970's,

[4] Department of Finance (Canada), The Tax Systems of Canada and United States: A Study Comparing the Levels of Taxation on Individuals and Businesses in the Two Countries, Ottawa: November, 1978, p.1.

similar to those expressed today, focused on the impact of differences in tax rates and structures on capital flows, economic growth, and the ability of Canadian firms to supply international markets.

This study compared the tax positions of firms in the manufacturing and retail trade industries in the two countries. Manufacturing was selected because of its importance to the economy and its sensitivity to tax changes, which were thought to affect their international competitiveness. Retail trade was selected because of its physical and financial distinctiveness from manufacturing. A representative firm was developed for each industry using cost and tax data from Canadian statistics on corporate profits and taxes, business surveys, businesses' financial statements, and corporate tax returns.[5]

For modelling simplicity, several specific assumptions were made. The financial structure of the model firms were assumed to be the average of actual (mature) Canadian firms in both industries. Each firm was assumed to earn a pre-tax profit rate of return and experience asset, liability and real income growth of 5 per cent annually. These assumptions were considered necessary in order to ensure that the model firms had sufficient taxable income to take advantage of available tax incentives and deductions. Smaller firms were assumed to be reduced versions of the average firm having the same financial structure.

A number of simulations of the manufacturing and retail trade models were performed for several tax jurisdictions within the two countries. For large firm simulations, these included Ontario, Alberta, Manitoba, New York, Texas, and Ohio. Small firm

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[5] See Statistics Canada's Corporation Financial Statistics and Corporation Taxation Statistics. Other data sources not identified.

analysis compared Ontario and Ohio. All costs and taxes other than federal and provincial/state corporation income taxes were held fixed due to the computational difficulties in determining these taxes. However, applicable depreciation, and differences in the treatment of inter-corporate dividends, inventories, and investment tax credits were accounted for in the analysis.

The general conclusion of the Finance study was that effective corporation tax rates were lower in Canada than in the United States in 1977. Results indicated that small and large Canadian firms had a tax advantage over their American counterparts, with taxes as a percentage of pre-tax profits being 10 per cent lower for large Canadian firms and 5 to 13 per cent lower for small Canadian firms. Finance concluded that these results were due to Canada's more favourable depreciation, inventory, manufacturing, and small business deduction provisions. In retail trade, Finance found that a Canadian retail firm only had a slight advantage: 1 to 5 per cent lower taxes to pre-tax profit ratio for large firms, and 0.3 to 0.9 per cent for small firms. A small Canadian retail firm had a larger advantage due to the small business deduction in Canada.[6]

II.2 The Conference Board of Canada Studies

II.2.1 1987 Study

At the time of the Conference Board's initial research from 1985 to 1987, the prevailing view among exporters, particularly manufacturers, was that tax incentives available to competing firms in their home countries placed Canadian firms at a significant tax disadvantage. This, in turn, had a pronounced effect on the international

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[6] *Ibid*, pp.48-49.

competitiveness of and international flow of capital in export industries. The Conference Board research sought to evaluate to what extent domestic tax burdens, and especially tax incentives to encourage exports, affected the international competitiveness of manufacturers.

The study compared the domestic tax position of Canadian manufacturers to similar firms operating under tax systems in other countries. The tax regimes of 14 countries and 28 tax jurisdictions were examined for 5 industrial sectors (petrochemical, forest products, steel, machinery, and telecommunications).[7] Sectors were chosen on the basis of competition in foreign markets, volume of exports, and overall contribution to Gross Domestic Product (GDP) in Canada.

The representative firm developed by the Conference Board modeled the after-tax cashflow for a typical Canadian manufacturing plant in the above sectors. A representative product within each sector was also determined based on the size of its exports and degree of value added. The model was constructed using initial investment and annual production and administration costs obtained from several major Canadian manufacturers. Three specific base case financial assumptions were made: the firm is 100 per cent equity financed, has a constant export share to total earnings ratio, and is "associated", which means that the branch plant, as one of several activities of the parent firm, can "flow-through" deductions, credits, and depreciation to be offset by other income sources.

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[7] Countries studied include Canada, United States, Japan, West Germany, United Kingdom, France, Italy, Sweden, Finland, Netherlands, Saudi Arabia, South Korea, Taiwan, and Brazil. Other tax jurisdictions examined included Alberta, British Columbia, Ontario, Quebec, Louisiana, Texas, Oregon, Washington, Ohio, Pennsylvania, California, Massachusetts, Illinois, and North Carolina.

Each tax system was then applied to the models to simulate the effect of each country's tax system. Taxes examined in the model included corporation income and capital taxes, commodity taxes (sales taxes and tariffs on raw materials and intermediate inputs), and jurisdiction-specific taxes. Payroll taxes were excluded from the study even though it was acknowledged that their inclusion could change the results. Other factors considered were the treatment of depreciation, inter-corporation dividends, inventories and the provision of investment tax credits. Other economic parameters and data such as the structure of respective economies, interest rates, and other variables or conditions that might alter effective tax rates were held constant. Variants of the model assumed a stand alone plant and/or mixed debt/equity scenarios.

The Conference Board's overall conclusion, based on comparisons of effective tax rates, was that the tax burdens of Canadian manufacturing firms were lower than those found for most countries and jurisdictions studied. Three countries, Brazil, South Korea, and Taiwan, had more favourable tax regimes than in Canada, resulting in smaller tax burdens for manufacturing firms. Firms in Sweden, Japan, and West Germany had the highest tax burdens due to high corporate income tax rates.[8] Although differences in the tax systems between Canada and the United States were found to be small, the overall tax burden of Canadian firms was less than their counterparts in the United States in all sectors except forest products. However, the Conference Board noted that the relative competitiveness of tax regimes depends on the particular state or province under consideration. Quebec and Alberta, for instance, always ranked as having a more

[8] Summary results for each jurisdiction can be found on pp.4-5 of the report.

advantageous tax regime than the states evaluated.[9] On a sectoral basis, the study found that Canada's tax system produced lower tax burdens for manufacturing firms than the United States in four out of the five manufacturing sectors under the "flow-through" scenario. The Canadian advantage was attributed to more upfront and generous tax incentives including the federal research and development credit, investment tax credit, manufacturing and processing deduction, and depreciation.[10] For stand alone manufacturing plants, the results were less robust, but still placed Canadian firms ahead of counterparts in the United States.

II.2.2 Post-Tax Reform Update

The 1987 Conference Board study precedes federal income tax reform in Canada (1988) and in the United States (1986). The intent of tax reform in both countries was to balance effective tax rates across industries by broadening the corporate income tax base, lowering statutory rates and scaling down investment tax credits and depreciation allowances. The resultant effect was higher effective tax rates for the manufacturing industry in Canada and the United States. In the 1990 update of their 1987 study, the Conference Board concluded that tax reform had diminished the tax advantages Canadian firms had experienced relative to the United States prior to reform. Although higher manufacturing tax liabilities were expected post-reform, the tax burden was found

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[9] The effective tax rates found for the provinces studied ranged from 32 to 55 per cent of pre-tax profit with lower rates usually attributed to Quebec and Alberta and higher rates to Ontario and British Columbia. For the American states analyzed, effective tax rates varied from 33 to 57 per cent of pre-tax profit with lower rates in Texas, Massachusetts, and Oregon, and higher rates in California, Illinois, and North Carolina. At least one Canadian province ranked first or second in each sector.

[10] Tax incentives in other countries vary widely, ranging from investment tax credits, tax holidays, export earnings exemptions, incentive depreciation allowances, and investment reserves.

to be larger for Canadian manufacturers than for similar operations in the United States. Of the four provinces studied, only Quebec had lower corporate taxes, namely in telecommunications and steel, due to its low corporate tax rate and favourable depreciation allowance. Firms in sectors significant to individual provinces such as Alberta's petrochemical and British Columbia's forest products industries were found to have higher tax burdens than their equivalents in the United States. In Ontario, representative firms in all sectors except steel experienced higher relative tax burdens. The reasons for this erosion since 1987 were ascribed to the corporate income tax differential between the two countries (lower in the United States) and higher provincial taxes.

This paper uses the post-reform income tax provisions. The analysis to follow will indirectly evaluate whether reform has placed Canadian small manufacturing firms on a more level playing field.

II.3 The Canadian Federation of Independent Business Studies

In 1991, the Canadian Federation of Independent Business (CFIB) released two reports which examined the tax burdens faced by small businesses in Canada. Since the report pertaining to Manitoba is directly relevant to this paper, its methodology, which parallels the national study, will be summarized. The reports were undertaken in response to a growing despondency and pessimism among their membership, especially small and medium firms, about relative tax burdens, cross-border shopping, and deteriorating international competitiveness.

The CFIB Manitoba study looked at the business tax burden of small and large

firms in 24 sectors and four industries: manufacturing, 11 sectors; wholesale, 5 sectors; retail, 5 sectors; and services, 3 sectors. Sectors were chosen based on their contribution to employment and output, including exports, in Manitoba. The manufacturing industry was over-represented in the study in order to reflect the expected strong impact that their tax burden would have on their domestic and export operations. The tax burden of the retail sector, given the rise in cross-border shopping, was also examined. Three jurisdictions, North Dakota, South Dakota, and Minnesota were selected for comparison because of their proximity, attractiveness to Manitoba businesses, and level of trade with the province.

A representative large, medium and small firm for each sector was defined by asset size utilizing information from Statistics Canada's 1987 Corporation Financial Statistics on financial and operating cost structures.

The small business tax burden was identified to include payroll, corporate income, capital, sales and local taxes.[11] Payroll taxes refer to applicable state/provincial taxes, federal Unemployment Insurance (UI) and Canada Pension Plan (CPP) contributions and their equivalent in the United States. Health care premiums were excluded from the model because it was assumed that these contributions are voluntary, and that most small firms in the United States do not offer health insurance to their employees. Worker compensation premiums were included for Manitoba only because of the different plans available in each state.

Simulations of the tax system for each jurisdiction were run for each sectorally

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[11]CFIB (June 1991), *op. cit.*, p.5.

representative firm under a fixed cost assumption to capture only differences in tax structures.

The CFIB results emphasized the proportion of the tax burden assigned to the three levels of government (federal, provincial/state, municipal). The Manitoba study concluded that although the tax burden is similar for all sizes of firms in Manitoba, municipal and payroll taxes account for a disproportionately large share of small firms' total tax liability, at 71 per cent compared to larger indigenous firms (42 per cent) and competing small firms in neighbouring states (44 to 51 per cent). Both small and large Manitoba firms had higher overall tax burdens in all sectors analyzed, ranging from 20-35 per cent for small firms, and 10 to 20 per cent for large firms. These outcomes compared less favourably with North and South Dakota than with Minnesota due to lower corporate and local taxes in the Dakotas.

II.4 Other Models

There have been several recent studies in the United States on the location of single establishment or stand alone firms.[12] Most of the models on taxation and industrial location have focused mainly on capital taxation since most states' business tax revenue comes from corporate income and property taxes, both of which are levied partly on capital. The approaches focus, much like the aforementioned Canadian studies, on the impact of tax levels and rates on firms' decision-making. General findings have been that state and local taxes, *ceteris paribus*, only have a slight influence on industry location and states with higher corporate tax rates tend to have less firms establishing in their

[12] See Michael Deich, State Taxes and Manufacturing Plant Location, National Tax Association - Tax Institute of America, 1989 Proceedings of the Eighty-Second Annual Conference, pp.290-299.

regions compared to lower tax jurisdictions. For some manufacturing sectors, no evidence supporting these conclusions could be found. When the influence of state and local taxes on the location of stand alone plants was evaluated, none of the tax variable coefficients were significantly different from zero for any for the industries examined. It was found that branch plants would be less likely to locate in a state as corporate income tax, wages, energy prices, and unionization rates increase.

III. DEFINING A REPRESENTATIVE FIRM

III.1 A Manitoba Firm

This section will define the characteristics of a small manufacturing firm in Manitoba. The startup and operating models to be generated will seek to capture the costs and taxes facing the firm's initial investment and ongoing operations.

The manufacturing industry is expected to contribute 11 per cent to the Manitoba's Gross Domestic Product and employment in 1991.[13] Manufacturing firms represent about 8 per cent of all incorporated firms in Manitoba.[14] Although not the largest contributor to the province's economy, the sector has been chosen based on its sensitivity to intra- and inter-jurisdictional competition.[15] Further, since location costs will be examined, it is assumed that a small manufacturing firm is more mobile with respect to location than, for example, a small retail operation, whose activities would be largely concentrated to serving a particular region.

Although previous studies look at firms of all sizes, the analysis in this paper will be limited to small firms.

The size of the model firm has been determined using several assumptions. Small firms represent over 90 per cent of businesses incorporated in Manitoba.[16] The definition of a small firm, however, is fluid. Different agencies have applied a number of yardstick

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[13] 1991 Manitoba Budget, pp. 8,11.

[14] Statistics Canada, 1987 Corporation Financial Statistics, p.92.

[15] Manufacturing accounts for 55 per cent of Manitoba's exports which are shipped to over 100 countries. Department of Industry, Trade, and Tourism (Manitoba), The Manitoba Advantage, no date, p.1.

[16] Canadian Federation of Independent Business, The Small Business Sector In Manitoba, Toronto: January, 1991, p.1.

measurements. In the Manitoba CFIB study, asset size of under $1 million was used to define a small firm. The CFIB report on the small business sector in Manitoba characterized a small firm as having 50 employees or less.[17] Statistics Canada's Small Business Profiles employed sales of $2 to $10 million as a guideline. This paper will adopt the CFIB parameter of assets under $1 million. Gross sales for the model firm will be set at $3 million, which is frequently used by the Manitoba Department of Industry, Trade and Tourism.

The firm is also assumed to be a stand alone plant with no other operations outside the province. Goods produced are for domestic and international markets. For illustrative purposes, the firm incurs no losses, makes a profit, and has taxable income.

The startup year for the firm is assumed to be 1988. This time period is especially significant for several reasons. As noted previously, 1988 is the first year of federal income tax reform. As part of the federal tax initiatives, the investment tax credit (ITC) was realigned to exclude most regions in Canada. These credits are now offered only to disadvantaged industries, usually in economically depressed areas of the country (the Atlantic provinces and the Gaspé region). The last year a manufacturing firm was eligible to earn the credit was 1988 with carry-forward provisions of 7 to 10 years. To capture the tax effect of this credit, it is included in the model. Results will also be shown with its exclusion. Finally, as of the time of writing, 1988 is the latest year of publicly available corporate financial statistics, which typically have a 2 to 3 year publication lag. Detailed characteristics of the firm, such as the financial and cost structures, have been derived

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[17] *Ibid.*

using the 1987 Corporation Financial Statistics. Where possible, actual market data are used. The analysis will use 1991 tax rates.

The year of operation for the manufacturing firm will be assumed to be the fourth year which coincides with the 1988 to 1991 time period. The lifespan of small businesses tend to be shorter and more volatile than for larger firms, with a greater likelihood of failure or bankruptcy. The fourth year, it is assumed, would reflect some degree of profitability. Many tax credits and incentives available for new startup businesses are typically offered in the first five taxation years. The fourth year will allow the analysis to include these measures.

III.2 The Startup Model

Business decisions with respect to the location of new investments are influenced by start-up costs such as raw materials, land, buildings, taxes and, in the United States especially, by the provision of attractive tax breaks such as those offered by state or county "enterprise zones."[18] Many other qualitative factors, such as the availability of labour, education and unionization of the workforce, also factor into the location decision, but are not dealt with in this paper because of the difficulty in costing these differences and determining their impact on the tax position of a firm.

The assumed basic startup costs are shown below. These variables and the assumptions underlying them are necessary to calculate a firm's ongoing financing and depreciation costs as well as annual property tax liability.

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[18] Enterprise zones are an economic development policy tool adopted by many state and county governments in the United States in the 1980's as a means to stimulate economic growth and efficiency, primarily job creation. Favourable incentives, such as targeted tax abatements, services tailored for specific firms, loan guarantees, direct loans at below market interest rates, tax breaks on capital, and equity participation are promoted to attract investment, expand existing firms, or locate new firms into the zone. Federal and state legislation serve to designate those areas, using specific criteria such as unemployment rates, level of poverty, etcetera.

Net Cost of Investment = Investments Costs + Taxes Payable

where

Investment Costs = Land + Buildings + Machinery & Equipment

and

Taxes Payable = Sales Tax on Building/Construction
+ Sales Tax on Machinery and Equipment
+ Other Applicable Provincial/State Taxes

III.2.1 Investment Costs

Table 1
Startup Model - Manitoba

	($ Thousands)
ASSETS	
Land	91
Building	73
Machinery and Equipment	837
TOTAL FIXED ASSETS	1,000
TAX LIABILITIES	
Sales Tax	
Building	5
Machinery and Equipment	59
Land Transfer Tax	0.3
TOTAL TAX LIABILITY	64
NET COST OF INVESTMENT	1,064
% Taxes	6

Table 1 derives the net cost of investment for the model Manitoba firm at just over $1 million in 1988. Asset values are based on the Winnipeg Real Estate Board's estimate of land (1.25 acres) and space (20,000 square feet) requirements for an average commercial/industrial operation.[19] These specifications are used as parameters for the

[19] Winnipeg Real Estate Board, unpublished data.

small manufacturing firm in the paper. Land and building costs shown reflect 1988 market data for Winnipeg.[20] Machinery and equipment account for the remainder of the $1 million in assets and represents a close approximation of total fixed assets as identified in the 1987 Corporation Financial Statistics for an average manufacturing firm.[21]

III.2.2 Taxes

Table 2
Summary of Applicable Effective Tax Rates - Manitoba
1991 Rates (Per Cent)

	Federal	Provincial	Municipal
General Sales Tax	7	7	_
Payroll Tax	_	2.25	_
Corporate Income Tax			_
Large	38	17	_
Small	12	10	_
Corporate Capital Tax	_	0.3	_
Corporate Income Surtax	3	_	_
Land Transfer Tax	_	1.5	_
Property Tax	_	_	4.42
Business Tax	_	_	10

As Table 2 suggests, Manitoba is one of only three provinces that taxes business inputs such as production machinery, equipment, and buildings but exempts materials used directly in the production of saleable goods.

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[20] Royal LePage, The Royal LePage Market Survey: Canadian Real Estate, 1988, pp.18,32.

[21] This average is representative of all firms in the manufacturing industry. The Corporation Financial Statistics do not breakdown total assets by firm size.

Another tax in Manitoba affecting new investment costs is the Land Transfer Tax (LTT) which a purchaser pays on the fair market value of the property when a transfer of residential and commercial property is registered with the provincial land titles office. The tax has a graduated rate structure. The first $30,000 of property value is exempt; the next $60,000 is taxed at 0.5%; on the next $60,000, a 1 per cent rate is assessed. Property valued above $150,000 is taxed at the general rate of 1.5 per cent.

It is assumed that the model Manitoba firm is operating in Winnipeg. Municipal taxes faced by the firm include local property and business taxes. Property taxes in Winnipeg are assessed on the fair market value of land and attached buildings. The commercial property assessment base is equal to 65.5 per cent of fair market value. Local mill rates, which include municipal, school, and education levies, are then applied to this assessment base. Generally, local levies increase annually as they are a major own-source revenue for the city. Total property taxes payable, after all levies are calculated, is equivalent to an effective tax rate of 4.42 per cent on the fair market value of the property.

The City of Winnipeg also imposes a business (occupancy) tax on commercial firms. This tax is assessed on annual basic occupancy costs, which include electricity, water, heat, air conditioning, and rent/leasehold payments.[22] If the building is owner-occupied as assumed in the model, the municipal assessment board establishes rent based on the rental value of similar space in the area and assesses the business tax accordingly. The business tax rate for manufacturing firms in Winnipeg is 10 per cent and

[22] Water rental was not included in the model due to the inconvertibility of different units of measurement used by each jurisdiction for rental rates.

the rental value for the model firm is $4.25 per square foot per annum. [23]

Taxes, as Table 1 illustrates, account for 6 per cent of the total startup investment.

III.3 The Operating Model

Taxation has a marked effect on the firm's economic behaviour. In reducing the firm's earnings, taxation directly influences savings and investment decisions which, in turn, determines its capacity to expand, undertake new investment, develop product lines, and alter prices.[24] After-tax income, therefore, is an important measure in assessing the firm's competitive position since it affects the firm's ability to compete with imported goods in domestic markets and exported goods in international markets.

Net after-tax income for an operating firm is calculated as:

Total Income - Operating Costs - Indirect Taxes - Direct Taxes

where Total Income - Operating Costs = Net Income
Net Income - Indirect Taxes = Taxable Income
Taxable Income - Direct Taxes = Net After-Tax Income

and Operating Costs = (Wages & Salaries)+(Production Materials)
+(Utility Costs)+(Financing Costs)+(Depreciation/CCA)
+(Other Expenses)

Indirect Taxes = (Federal taxes)+(Provincial/State Taxes)+(Municipal Taxes)

Direct Taxes = (Federal Corporate Income Tax)+
(Provincial/State Corporate Income Tax)

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[23] Winnipeg Real Estate Board, unpublished data.

[24] For a further discussion, see Vijay M. Jog and Jack Mintz, Corporate Tax Reform and Its Economic Impact: An Evaluation of Phase 1 Proposals, in The Economic Impact of Tax Reform by Jack Mintz and John Whalley, Canadian Tax Paper #84, Toronto: Canadian Tax Foundation, 1989. Also, Theodore E. Day, Hans R. Stoll, Robert E. Whaley, Taxes, Financial Theory and Small Business, Toronto: DC Heath & Company, 1985.

III.3.1 Operating Costs

Table 3
Operating Costs - Manitoba

	($ Thousands)
GROSS SALES	3,000
COSTS	
Wages and Salaries	540
Production Materials	1,758
Utility	
Telephone	2
Electricity	16
Financing	114
Depreciation/CCA	80
Other operating costs	30
Total Costs	2,541
% of sales	85
NET INCOME	459
% of sales	15

Table 3 illustrates the various operating costs for the model firm. Gross sales of $3 million is equal to total income. For simplicity, all income is assumed to be active earned income and excludes interest, dividend, royalties, deferred tax payments or other possible passive income. Cost items selected are based on balance sheet detail provided in the 1987 Corporation Financial Statistics. Also, small business sector profiles prepared by Statistics Canada, Small Business and Social Surveys Division, provide similar cost structures specifically for small businesses.[25]

[25] Statistics Canada, Small Business Profiles, Uncatalogued, 1987.

From the Corporation Financial Statistics, it was found that wage and salaries account for about 17 per cent, and production materials for 59.1 per cent of total income. For simplicity, the same salary is assumed to apply to all employees, including office/managerial staff. Using annualized average manufacturing weekly earnings from Statistics Canada's Employment, Earnings and Hours, the number of employees is determined to be 20. The number of employees is an important datum since this figure will be necessary for estimating workers compensation, unemployment insurance, and pension premiums. Material costs have been adjusted in the model to exclude utility costs since market data was available for telephone and electricity charges.

Utility costs were arrived at using information on electricity usage and basic telephone charges.[26] Telephone costs are for basic line rental services only and exclude installation, maintenance, training, toll, and other costs. The monthly electricity load for a small commercial business is estimated by Manitoba Hydro to average approximately 25,000 kilowatt hours.

Several key assumptions were necessary to determine financing costs. From the Corporation Financial Statistics, the asset/liability ratio for the manufacturing sector was determined to be 55:45. Small firms, because of their volatility and greater likelihood of bankruptcy, usually have more difficulty attracting investors and raising external equity than larger firms. Due to this constraint, small firms are compelled to rely more on short-term debt relative to long-term debt. Debt-financing for the model firm is divided between land/buildings and machinery/equipment. Since land and building financing is mortgaged,

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[26] Manitoba Hydro, 1990 Survey of Canadian Electricity Bills; Manitoba Telephone System, unpublished data.

and typically long-term, the 55:45 ratio is applied to these items. Machinery and equipment, which are subject to ongoing replacement and changing technology, is assumed to be fully financed by shorter-term debt. A 20-year amortization period was chosen for land and buildings and 10 years for machinery and equipment.

It should be noted that the debt-equity ratio chosen has a direct influence on the level of after-tax income of the firm but will not alter the comparative results since consistent assumptions are made throughout the analysis. As previously indicated, the 1987 Conference Board study ran their models under two different debt/equity assumptions: 100 per cent for the base case analysis and a mixed, 50:50, debt/equity for the alternative analysis. Under the 50:50 debt-equity option, after-tax cashflow for Canadian firms deteriorated due to higher borrowing costs in Canada. However, total taxes payable were quite similar under both scenarios. Canada's corporate tax rates were largely attributed as the reason for this result.

The interest rate used to calculate financing costs is the average 1988 (the year of acquisition) monthly chartered banks' prime rate on business loans. This rate is 10.83 per cent.[27] Since the costs of acquiring debt are higher for small firms because of the larger risks involved, the interest rate applied to the model firm is 3 percentage points higher (13.83 per cent) than the average rate to reflect these higher borrowing charges.

Depreciation costs for the firm are determined using the federal capital cost allowance (CCA) schedule. CCA rates determine the maximum depreciation which can be claimed; firms in Canada do not have to deduct fully available CCA in a given taxation

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[27] The Bank of Canada, Bank of Canada Review, series B14020, January 1989, p. S75.

year. Buildings are classified as Class 6 assets and are depreciated on a declining balance[28] at a maximum rate of 10 per cent. In 1988, the general classification for machinery and equipment used in a Canadian owned manufacturing firm was changed from Class 29 to Class 39. Under the Class 29 classification, firms were allowed to write off assets over a three-year period, using the straight-line method, at rates of 25, 50, and 25 per cent. The current system depreciates Class 39 assets on a declining balance at a 25 per cent rate. Grandfathered rates have been assigned for the 1988, 1989 and 1990 taxation years at 40, 35, and 30 per cent, respectively. It is assumed that the firm claims full depreciation every year. In the asset acquisition year or the first year of depreciation, a "half-year rule" is applied which restricts depreciation claimed to one-half of the maximum amount that would otherwise be deducted.

Other expenses are assumed to represent 1 per cent of gross sales and include minor costs such as repairs, maintenance, professional and management fees.

After all costs are considered, the firm makes a pre-tax profit of 15 per cent of gross sales.

III.3.2 Indirect Taxes

Indirect taxes consist of a compilation of federal, provincial (state) and municipal (local) taxes and premiums. These are identified for Manitoba in Table 4.

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[28] The declining balance method provides that depreciation claimed in one taxation year reduces the asset value base, known as the undepreciated capital cost, which can be depreciated at the statutory rate in the subsequent taxation year.

Table 4
Indirect Taxes - Manitoba

	($ Thousands)
Federal	
CPP Premiums	12
UI Premiums	19
Provincial	
Sales Tax	3
Payroll Tax	-
Corporate Capital Tax	3
WCB premiums	13
Municipal	
Property Tax	7
Business Tax	10
Total Indirect Taxes	68
TAXABLE INCOME	391
% of sales	13

The Goods and Services Tax is not included in the analysis because it is viewed as a flow-through with a 100 per cent rebate provided to registered businesses. Federal Canada Pension Plan (CPP) and Unemployment Insurance (UI) premiums are calculated using 1991 rates. The employee's portion of UI premiums is 2.25 per cent for the first half of 1991 and 2.8 per cent for the last half of 1991, on wages up to a maximum of $35,360.[29] The employer's share is equal to 1.4 times the employee's contribution. For CPP, the employer rate is 2.3 per cent of wages up to $27,500, or $632.50, whichever is less.[30]

[29] Revenue Canada Taxation, 1991-1992 Employers' Guide to Payroll Deductions, p.5.

[30] Revenue Canada Taxation, Manitoba Source Deductions Table, January 1991, p.4-8.

The provincial sales tax in Manitoba applies to electricity and telephones charges. "Other" operating expenses are also sales taxable. Manitoba is one of four provinces with an employer payroll tax and the province's rate ranks second highest in Canada after Quebec. This payroll tax is similar in purpose to health care premiums and is known as the Health and Post-Secondary Education Levy in Manitoba. Annual payrolls under $600,000 qualify for full exemption from the tax. Annual payrolls between $600,000 and $1.2 million are taxed at a rate of 4.5 per cent on the excess of payroll above $600,000, which is equivalent to an effective rate of 2.25 per cent if the full $1.2 million were taxed. Annual payrolls in excess of $1.2 million are fully taxable. The model firm has a total annual payroll $540,197 and thus qualifies for full exemption.

The Corporate Capital Tax (CCT) is a wealth tax applied to paid-up capital exceeding $1 million. The 1991 rate of 0.03 per cent is calculated on the net cost of investment identified in the startup model since all costs, including taxes associated with the investment, are capitalized.

Workers' compensation premiums vary according to occupation and are generally categorized using Employment and Immigration Canada's Standard Industrial Code (SIC) classification system. The 1986 Canada Census data were used to allocate manufacturing employees among the various manufacturing SIC occupation codes. These codes were then matched to the corresponding premium rate. Taking a weighted average of these rates arrives at an average manufacturing premium of $2.38 per $100 of payroll in Manitoba.[31]

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[31] See Appendix C, p.79 and Appendix E for calculations. Worker compensation rates for Manitoba were obtained from the Workers Compensation Board of Manitoba, 1991 Classification of Industries and Provisional Assessment Rates, January 1, 1991.

As acknowledged in the Conference Board's report, local taxation can have a significant effect on the competitiveness of the corporate tax system. Municipal levies are less interdependent with taxes imposed by other governments and, unlike corporate income taxes, are not linked to profitability. Although local tax rates may be lower than federal/provincial/state tax rates, they vary significantly among jurisdictions. Property or realty tax regimes, as the Saskatchewan and North Dakota comparisons will illustrate, are an important element to comparative tax analysis.

The municipal level of taxation, as shown in Table 4, represents 25 per cent of indirect taxes paid by the firm. Payroll taxes (unemployment insurance, Canada pension, and workers compensation premiums), at 64.7 per cent, account for the largest portion of indirect taxation.

III.3.3 Direct Taxes

The goal of the firm is to reduce ultimately the amount of income on which corporation income taxes will be assessed. Allowances for income reductions are inherently embodied as incentives in the tax system.

All indirect taxes listed above are deductible against taxable income. Interest expenses and depreciation, which are also deductible, were shown in Table 3 under operating costs. Although there might be an incentive for firms to change their debt/equity ratio as corporate tax rates rise to increase the deductibility of interest expenses, it is assumed that there are no changes to the capital structure of the firm as corporate income tax rates vary.

The final stage in building the operating model is to determine the amount of

corporate income tax payable. The corporate tax system attempts to distinguish between active business and passive investment income, and treats them differently for tax purposes. Corporate income taxes have traditionally been emphasized when the tax burden of firms are analyzed, since this form of taxation is generally viewed as having the largest influence on investment. However, as the discussion of municipal taxes indicated, this tax measure is no longer the only consideration. Governments, nevertheless, continue to provide tax credits directly or other tax-related concessions to encourage investment in particular industries or regions experiencing slow economic growth. Not surprisingly then, one aspect of the structure of the tax system for small business is the eligibility for the low rate and in the case of manufacturing, typically some other type of tax breaks.

In Canada, most provinces adhere to the Federal-Provincial Tax Collection Agreement, which prescribes federal collection and administration of both federal and provincial corporate and personal income taxes.[32] Taxable income in Table 4, for example, is equivalent to the federal and Manitoba Government definition for calculating corporate income tax (CIT), which is based on a percentage of taxable income. Both governments have reduced corporate rates for small businesses and the requirements to qualify as a small firm follow the federal guidelines.

The model Manitoba firm is eligible for the federal Small Business Deduction (SBD),[33] which is equivalent to 16 per cent of the first $200,000 of taxable (earned

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[32] Quebec is a non-signing province which administers both its own corporate and personal income taxes; Alberta and Ontario manage their own corporation income taxes.

[33] The Small Business Deduction was introduced in 1972 and is a credit applied against basic federal corporation income tax on active business income. It was developed to assist in the financing of smaller Canadian businesses through retained earnings.

business) income and is applied against basic federal corporate income tax payable. Firms which pay provincial taxes receive a federal tax abatement equal to 10 per cent of taxable income. The combined SBD and tax abatement credits reduce the basic federal corporation tax rate from 38 to 12 per cent. In addition, all firms are subject to a 3 per cent federal corporate income surtax. As a Canadian manufacturer, the model firm is eligible for a federal manufacturing and processing profits deduction[34] and also qualifies for the investment tax credit on its startup capital investments, which is assumed to be completely carried forward from 1988 to the fourth operating year (1991).[35]

In Manitoba, there are two corporate income tax rates: a general small business rate of 10 per cent on the first $200,000 of taxable income on firms qualifying for the SBD and a 17 per cent rate for large corporations. Businesses incorporated after August 1988 qualify for the Manitoba New Small Business Tax Reduction.[36] This program provides a five-year tax holiday whereby small businesses pay tax at a reduced rate starting at 0 per cent in year 1, and increasing to the full 10 per cent small business rate in year 6. The model firm in year 4 is taxed at 6 per cent.

Table 5 shows the after-tax cashflow for the model firm, which represents 10 per

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[34] The Manufacturing and Processing Profits Deduction (MPPD) is a 5 percentage point rebate from basic federal corporate income tax. Only Canadian Controlled Private Corporations involved in manufacturing and processing in Canada qualify.

[35] The Investment Tax Credit, a federal tax incentive to promote business investment, is calculated as a percentage of expenditures on new capital assets such as buildings, machinery, equipment, implements in several industries. In 1986, most qualifying expenditures were announced for phase-out by 1989. The last taxation year for earning the credit on most new investments in Canada was 1988, except for the Atlantic provinces and the Gaspé region.

It should also be noted that prior to 1988, investment tax credits reduced the amount of undepreciated capital costs (UCC) in the year a claim is made. Now, the credits claimed in one taxation year reduces the UCC depreciated in the subsequent taxation year.

[36] See 1988 Manitoba Budget, pp.C3-4.

cent of sales. Federal income taxes payable, before the investment credit, are the largest portion of the direct tax burden at 61.7 per cent compared to 38.3 per cent for provincial taxes. Once the investment tax credit is subtracted from federal taxes, the total direct tax burden falls significantly from $115,590 to $86,400 with federal taxes representing less than half (or 49 per cent) of this total.

Table 5
Direct Taxes - Manitoba

	($ Thousands)
Corporate Income Tax	
Federal	71
Investment Tax Credit	(29)
Provincial	44
Total	86
% of sales	3
NET AFTER-TAX INCOME	304
% of sales	10

III.3.4 Limitations of the Analysis

The preceding outline of the model Manitoba firm attempts to capture the key aspects and assumptions necessary to compare this firm with a similar firm operating in Saskatchewan and North Dakota. However, several other factors, which could be relevant under a different set of assumptions and therefore produce a different set of results, are worth noting.

The tax system itself, particularly movements in visible tax rates, can influence the decision-making behaviour of firms. Two obvious instances are reflected in a firm's choice

of debt to equity ratio and employment decisions. As noted previously, it could be in a firm's interest to hold more debt for interest deduction purposes when corporate tax rates rise in order to reduce the taxable income (and resulting tax liability) on which these higher rates are applied. Similarly, a firm could change its hiring decisions based on increases or decreases in the level of payroll taxes per employee that are employer paid. The forthcoming comparison of the model Manitoba firm with other jurisdictions will examine payroll taxes and their relative importance to a firm's overall tax burden. However, variants of the model to illustrate the possible impact of the tax system on the decision-making behaviour of firms such as those referred to above were not considered in the analysis that follows.

The startup and operating model of the Manitoba firm describes several market costs facing the model firm. This listing, however, does not attempt to encompass all costs a firm assesses in making its location decision. Nonetheless, it is worth mentioning two additional costs which could have an impact on a firm's location decision. These include differences in the relative prices of inputs and transportation costs among various jurisdictions. Firms would likely be influenced, depending on the size of operation, by the cost of building construction materials and/or goods used in the production process since these items usually represent a large portion of a firm's startup and operating costs. Lower costs, therefore, could produce substantial savings. For simplicity, and due to the difficulty in obtaining reliable statistics on these variables, this paper assumes that machinery and equipment costs and ongoing production material costs are the same in each jurisdiction.

In determining where to locate, a firm would likely evaluate the access to markets for its goods and associated transportation costs. High transportation costs not only add to a firm's operating costs but also affect the firm's price competitiveness. This paper assumes that the firm serves the same market, regardless of location. As a result, transportation costs are not included as a cost factor in the analysis.

As the following section will make clear, this paper focuses primarily on the taxation of firms by the various levels of government. The provision of numerous public services (i.e. road maintenance, education of workforce) to these same firms by tax-levying governments is not considered in this paper. It is worth noting that in Canada, earmarking of tax revenues for specific services is rare, thus making it difficult to establish a "tax-price" for a given tax.

To explore the factors mentioned above requires extensive sensitivity analysis. Since this paper has adopted specific and pre-determined parameters, where available, for the model firm, no sensitivity analysis was performed. However, it is recognized that added robustness to the paper's results could be obtained by varying these qualitative factors.

IV. IS THE MANITOBA FIRM OVERTAXED?

IV.1 A Comparison with Saskatchewan

Saskatchewan, of similar size, population, and near proximity to Manitoba, is considered a key competitor for the province in attracting new business and investment. Table 6 shows that, as we might expect, the provincial tax regime in Saskatchewan closely parallels the Manitoba tax system.

Table 6
Summary of Applicable Effective Tax Rates - Saskatchewan
1991 Rates (Per Cent)

	Federal	Provincial	Municipal
General Sales Tax	7	7	–
Payroll Tax	–	–	–
Corporate Income Tax			
Large	38	15	–
Small	12	10	–
Corporate Capital Tax	–	0.5	–
Corporate Income Surtax	3	–	–
Land Transfer Tax	–	–	–
Property Tax	–	–	2.25
Business Tax	–	–	7.2

Several differences in the two tax systems should be noted. In February 1991, Saskatchewan announced its intention to harmonize its sales tax fully with the federal Goods and Services Tax by January 1, 1992 with partial integration to commence April

1, 1991. Given that the harmonization plan has since been rebuked, the analysis will proceed under a non-harmonized scenario. Tax rates shown represent current, not announced rates. Without harmonization, Saskatchewan's sales tax base is narrower than Manitoba's.

The general large corporation income tax rate is 2 percentage points lower than Manitoba's rate, which ranks amongst the highest in Canada alongside Newfoundland and New Brunswick. The small business rate, at 10 per cent, is the same as that in Manitoba and five other provinces. Saskatchewan also has a small business tax reduction initiative with an identical application and rate structure to the Manitoba program. The corporation capital tax is an additional 0.2 per cent higher than Manitoba's rate. Saskatchewan has no payroll or land transfer tax. Workers' Compensation premiums, determined in the same manner as for Manitoba, are 28¢ higher at $2.66 per $100 of payroll.

Municipal taxes are similarly composed of property and business taxes. However, the rates and structures of these measures in Saskatchewan are not the same as Manitoba. For the property tax, local mill levies are assessed on 7.5 per cent of the current fair market value for buildings and 25 per cent for land. Total levies payable is equivalent to an estimated 2.25 per cent of current fair market value of these assets.[37] The business tax applies to various industrial and commercial zones in Regina and is structured similarly to the property tax. Local mill levies, however, are based on a different taxable assessment value. The taxable portion is a statutory rate schedule set according

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[37] City of Regina, Assessment and Taxation Department. 1986 Regina Business Assessment Schedule.

to the type of business. The rate is $4.15 per square foot for manufacturers.[38] Accordingly, the effective business tax rate for Regina is 7.2 per cent of current fair market value.

IV.2 The Fixed Cost Operating Simulation - Saskatchewan

Under this model, all market costs without tax implications, salary and wages, materials costs, utility, and other costs and are held constant. This method highlights the impact of tax differences on the firm's after-tax income. Financing costs are subject to change because their calculation is based on the capitalized value of an asset, which includes purchase price and applicable sales tax.[39] Similarly, sales tax paid on fixed assets under the startup model will differ according to the tax treatment of individual assets (land, building, machinery and equipment) in each jurisdiction. Depreciation, a federal tax provision, will also vary between Canada and the United States.

In this case, financing and depreciation costs are the same for the model Manitoba and Saskatchewan firm since both provinces have the same sales tax rate and follow the federal depreciation schedule. Saskatchewan's tax rates are applied using the same costs as shown in Tables 1 and 3.

Table 7 shows that there is little or no change in most federal, provincial, and municipal tax liabilities between the two provinces. Indirect taxes, at 45.7 per cent of total taxes paid, are slightly higher than in Manitoba (44.1 per cent) due to workers' compensation premiums and corporate capital tax rates differences. Direct taxes, on the

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[38] The Saskatchewan Gazette, The Urban Municipality Act (No.1) Amendment Regulations, 1986, Regina: Government of Saskatchewan, p.83.

[39] Sales tax in this instance is "capitalized" rather than deducted as a business expense.

other hand, are $4,000 more for the Manitoba firm because of the higher large corporate income tax rate in that province. Together, these tax differences appear to have an

Table 7
Fixed Cost Operating Model
Under Saskatchewan Tax Regime

	($ Thousands)	
GROSS SALES	3,000	
OPERATING COSTS	2,541	
NET INCOME	459	
% of sales	15	
	Manitoba	Saskatchewan
INDIRECT TAXES/LEVIES		
Federal		
CPP Premiums	12	12
UI Premiums	19	19
Provincial/State		
Sales Tax	3	2
Payroll Tax	-	n/a
Corporate Capital Tax	3	5
WCB premiums	13	14
Municipal/Local		
Property Tax	7	4
Business Tax	10	12
Total Indirect	68	69
TAXABLE INCOME	391	390
% sales	13.0	13.0
DIRECT TAXES		
Corporate Income Tax		
Federal	71	71
Investment Tax Credit	(29)	(29)
Provincial/State	44	41
Total Direct	86	82
NET AFTER-TAX INCOME	304	308
Manitoba=100		101

almost negligible impact on the firm's after-tax income. These results suggest that a small manufacturing firm, *ceteris paribus*, would find an equally attractive operating environment in either jurisdiction.

IV.3 The Startup Simulation - Saskatchewan

Under the variable cost option, local market costs are allowed to vary to reflect differences in indigenous market conditions and their impact on taxes and after-tax income.

Table 8
Startup Simulation - Saskatchewan

	($ Thousands)
ASSETS	
Land	84
Building	80
Machinery and Equipment	837
TOTAL FIXED ASSETS	1,001
TAX LIABILITIES	
Sales Tax	
Building	6
Machinery and Equipment	59
Land Transfer Tax	–
TOTAL TAX LIABILITY	64
NET COST OF INVESTMENT	1,065
% Taxes	6

For a startup Saskatchewan manufacturing firm, the net cost of investment is almost identical to the Manitoba firm, due to only slight differences in market costs. Average industrial land prices for 1.25 acres of land were about $6,460 less in Regina than Winnipeg in 1988. Average building prices, on the other hand, at $4 per square foot

in Regina were $7,500 higher than Winnipeg.[40] Machinery and equipment is the only variable that is not altered due to the statistical difficulties of determining and costing individual machinery and equipment expenditures for each jurisdiction.

IV.4 The Variable Cost Operating Simulation - Saskatchewan

Both jurisdictions appear to be relatively competitive at the startup phase; noticeable differences are found when Saskatchewan costs, along with tax rates, are applied to the operating model.

IV.4.1 Operating Costs

Table 9
Operating Costs - Saskatchewan

	($ Thousands)
GROSS SALES	3,000
COSTS	
Wages and Salaries	617
Production Materials	1,758
Utility	
Telephone	2
Electricity	23
Financing	114
Depreciation/CCA	81
Other operating costs	30
Total Costs	2,625
% of sales	88
NET INCOME	375
% of sales	12

[40] Royal LePage, The Royal LePage Market Survey: Canadian Real Estate, 1988, p.32.

Using the model firm's cost components, net income is calculated for the Saskatchewan firm. Market cost differences are significant in two areas: wages and salaries, and electricity charges. Saskatchewan's average weekly manufacturing earnings are almost $74 more per worker than the comparable Manitoba wage.[41] Electricity in Manitoba is also less expensive with average monthly charges $580 less than in Saskatchewan.[42]

The cost variances, by creating a 18.3 per cent wedge between net income earned in Manitoba and Saskatchewan, clearly illustrate that locality has a marked impact on the competitiveness of firms. Local costs, by seriously impeding the Saskatchewan firm's pre-tax income position, places the Manitoba firm in a more favourable operating climate even after taxes are considered, as the following sections confirm.

IV.4.2 Indirect Taxes

The wage and electricity cost differences have a direct influence on the amount of indirect taxes paid by the Saskatchewan firm. Payroll taxes, including Canada pension plan, unemployment insurance, and workers' compensation premiums, are more in Saskatchewan, 68.9 per cent of the indirect tax burden compared to 64.7 per cent for Manitoba, due to the higher weekly wage. Municipal taxes, which were singled out by the CFIB as a major tax burden for firms, account for 25 per cent of the indirect tax burden for the model firm in Winnipeg and slightly less for the firm in Regina. Combined, payroll and municipal taxes, total about 90 per cent of indirect taxes paid by both firms. Other

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[41] Statistics Canada, Employment, Earnings and Hours, Cat. No. 72-002, June 1991, pp. 68,70.

[42] Manitoba Hydro, 1990 Survey of Canadian Electricity Bills.

taxes, such as the higher corporate capital tax also add to the Saskatchewan firm's total tax liability. Sales tax paid, however, is less than in Manitoba, due to the electricity charge exemption. The indirect tax differentials, totalling approximately $5,700, result in a 8 per cent higher indirect tax burden for the Saskatchewan firm which translates into lower taxable income and, hence, lower corporate income taxes.

Table 10
Indirect Taxes - Saskatchewan

	($ Thousands)
Federal	
CPP Premiums	13
UI Premiums	22
Provincial	
Sales Tax	2
Payroll Tax	n/a
Corporate Capital Tax	5
WCB premiums	16
Municipal	
Property Tax	4
Business Tax	12
Total Indirect Taxes	74
TAXABLE INCOME	301
% of sales	10

IV.4.3 Direct Taxes

As Table 11 shows, when direct taxes are applied to the firm's taxable income, earnings drop from $300,824 to $252,120 which is 18.1 per cent less than the after-tax income of the Manitoba firm (see Table 4). Both firms take advantage of the small business tax provisions for income under $200,000 and the full amount of the federal

investment tax credit. However, these incentives are not enough to offset the competitive disadvantage resulting from higher costs and indirect taxes.[43]

Table 11
Direct Taxes - Saskatchewan

	($ Thousands)
Corporate Income Tax	
Federal	49
Investment Tax Credit	(29)
Provincial	29
Total	48
% of sales	1.6
NET AFTER-TAX INCOME	252
% of sales	8

Tables 12 and 13 summarize the major tax, cost, and income differences for the Saskatchewan firm. Under the fixed cost scenario, the similar tax rates and structures of both jurisdictions are fully reflected in the corresponding distributions of the tax burden. The distribution of taxes between indirect and direct taxes under the variable cost model show the major differences between Saskatchewan and Manitoba. Indirect taxes represent the majority of business taxes paid for the Saskatchewan firm (60 per cent) and direct taxes, the largest portion for the Manitoba firm (56 per cent), with or without the investment tax credit. By examining the relative tax burdens according to the three levels of government, it can be seen that the provincial and federal tax share are equal for both

[43] The firm is allowed to claim that portion of the investment tax credit up to federal corporate tax payable. If the value of the credit exceeds tax payable in one taxation year, it may be carried forward to be applied toward federal corporate tax payable in the following 7 to 10 years.

firms with the inclusion of the investment tax credit. The federal share would comprise the largest portion of the tax burden for both firms (55 to 57 per cent) if the credit was excluded. Municipal taxes are the smallest contributor to the overall tax burden, which suggests that these taxes are not as burdensome for profitable firms as corporate income or payroll taxes.

Table 12
Summary of Tax Differences - Manitoba and Saskatchewan
(Per Cent)

	MANITOBA		SASKATCHEWAN			
			Variable Cost Model		Fixed Cost Model	
	Including Credits	Excluding Credits	Including Credits	Excluding Credits	Including Credits	Excluding Credits
TOTAL TAXES						
% Indirect	44	37	60	49	46	38
% Direct	56	63	40	51	54	62
TOTAL TAXES						
% federal	48	56	44	55	48	57
% provincial	41	35	43	35	41	35
% municipal	11	9	13	10	10	9

The small tax differences noted in the fixed cost simulation and significant cost differences in the variable cost run imply that the competitive advantage for Manitoba lies more with lower locational costs than with its tax climate. Table 13 reveals that after-tax income is 17 per cent higher for the Manitoba firm than for the Saskatchewan firm under the variable cost model, and 1 per cent lower under the fixed cost variant.

Table 13
Summary of Cost Differences - Saskatchewan Relative to Manitoba

Manitoba=100	Fixed Cost Model	Variable Cost Model
Wages	–	114
Electricity	–	143
Net Income	100	82
Taxable Income	100	77
After-Tax Income	101	83

IV.5 A Comparison with North Dakota

North Dakota, one of two states bordering Manitoba, has been actively seeking new businesses in the past year, with particular emphasis on attracting Canadian firms. The state is especially interested in small manufacturing and, in 1990, ranked first among 21 low-intensity manufacturing states for most favourable investment climate.[44]

There are several key differences between North Dakota and Manitoba. The most notable distinctions are fiscal effort and capacity at the federal and provincial/state levels of government. In Canada, governments have considerable responsibility for raising own-source revenues in addition to relying on transfers from higher levels of government. Provincial governments have constitutional restrictions on their taxing powers and, consequently, most tax policy requires a high degree of federal-provincial cooperation and coordination. Under the terms of the Federal-Provincial Tax Collection Agreements in

[44] North Dakota Economic Development Commission, Doing Business in North Dakota, Bismarck, N.D.: North Dakota Economic Development Commission, 1991, p.4.

Canada, for example, Manitoba and Saskatchewan can only make basic income tax rate changes without federal concurrence. In the United States, federal levels of taxation are higher than at the state or local level since a larger portion of public services are provided through direct federal transfers. For the 1991/1992 fiscal year, per capita provincial (state) government expenditures equal approximately $4,800 in Manitoba, $4,835 in Saskatchewan, and $2,500[45] in North Dakota.[46] North Dakota is also constitutionally required to have a balanced budget. A direct consequence of these institutional arrangements in the United States is that the share of federal government tax revenues would be expected to be higher than in Canada.

Table 14
Summary Of Applicable Effective Tax Rates - North Dakota
1991 Rates (Per Cent)

	Federal	State	Municipal
General Sales Tax	–	5	–
Payroll Tax/UI Tax	6	5.4	–
Corporate Income Tax	15-34	3.0-10.5	
Corporate Capital Tax	–	–	–
Corporate Income Surtax	5	–	–
Land Transfer Tax	–	–	–
Property Tax	–	–	2.075
Business Tax	–	–	–

[45] All dollar values referring to North Dakota, and any other data respecting the United States, have been converted to Canadian currency. The exchange rate used is the Bank of Canada average noon rate from January to September 1991. Bank of Canada, Bank of Canada Review, series b3400, September 1991, p. s114. This exchange rate is $1.1494 Cdn.

[46] 1991 Manitoba Budget, p.B13; 1991 Saskatchewan Budget, p.14 ; and Office of Budget and Management (North Dakota), Legislative Appropriations for the 1991-93 Biennium, pp. A-1 to A-4.

Comparing American and Canadian federal, state and provincial business taxes is difficult due to statistical, conceptual, technical, and legislative differences. These limitations are especially evident when examining corporation income taxes. However, for purposes of this analysis, assumptions have been made in the fixed and variable cost model simulations in order to minimize these distinctions. The United States definition of taxable income, for example, diverges from the Canadian definition only in areas not included in this paper, such as the treatment of dividend income. Taxable income, in other words, as it is derived in the Manitoba model, applies in both the Canadian and United States context. North Dakota, which has the authority to derive independently its own system of deductions, adjusts state taxable income by the full amount of federal income taxes payable.

In the United States, health care premiums are generally privately funded, partly by the employer. The provision of this benefit is only mandatory in a few states and many small businesses do not offer employer-sponsored health care plans. This variable is accounted for in the analysis by including federal hospital insurance premiums, which are optional for firms depending on the existence of and their membership in separate health care plans.[47] These premiums are calculated as part of the federal social security levy. The regulated federal hospital insurance rate is 1.45 per cent of each employee's salary, up to a maximum annual salary level of $143,675.[48] The United States' equivalent of the

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[47] Eli. J. Warach, ed., 1991 Federal Tax Handbook, Englewood Cliffs, N.J.: Maxwell Macmillan, 1990, pp. 6-7, 859.

[48] Employer coverage of employee health care costs varies considerably among firms in the United States. The federal hospital insurance rate identified above represents the minimum employer coverage mandated by law. Private health care plans have much higher premiums.

Canada Pension Plan is the Old Age, Survivor and Disability Insurance (OASD). The employer contribution for this insurance is 6.2 per cent of individual salaries up to $61,378. An additional $36.66 monthly supplementary medical insurance premium is also included for the North Dakota firm. This ensures the broadest coverage comparable to Manitoba and Saskatchewan's health care services.

Workers' compensation costs in North Dakota are the second lowest among all states.[49] The state's average cost for workers' compensation was found to be only one-fifth of the national average in 1990.[50] Premiums are assessed on the first $4,138 of salary per employee. Rates range from a low of $0.77 for clerical staff to a maximum $96 for bridge construction workers per $115 of salary.[51] For simplicity, a weighted average premium, calculated in the same manner as in Manitoba and Saskatchewan, was determined. This premium is $13.40.

Unemployment insurance (UI) is a form of payroll tax imposed by both the federal and state governments in the United States. In North Dakota, UI tax revenues are allocated to a trust fund from which benefits are paid out. Unlike Canada, UI benefits are not supplemented with funds from government general revenues. The rate established for various job classifications in each industrial sector changes each year according to the financial position of the trust fund, that is, surplus ("positive-balance" industries) or deficit

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[49] North Dakota Economic Development Commission, *op. cit.*, p.5.

[50] *Ibid.*

[51] North Dakota Workers Compensation Bureau, Rates and Classifications, July 1, 1991.

("negative-balance" industries). A positive balance means that savings are passed along to employees and employers in the form of lower premiums. The manufacturing industry in North Dakota is currently a "positive-balance" industry. The 1991 minimum state rate, which presently applies to manufacturing, is 2.8 per cent on taxable wages over $13,563 up to a maximum of 5.4 per cent for negative-balance industries. New firms are eligible for a reduced rate of 3.25 per cent. Federally, the rate is 6 per cent above taxable wages of $8,046 and is reduced by an offsetting credit for state UI taxes, which reduces the effective federal rate to 0.6 per cent.[52]

Preferential tax treatment to specific or targeted industries and firms is also prevalent in other measures, such as direct tax incentives. The extensive use of these inducements in North Dakota, as will be illustrated, has a direct impact on the firm's tax position vis-à-vis the Manitoba firm.

The general sales tax rate in North Dakota is 5 per cent and, unlike Manitoba, exempts electricity and machinery and equipment used in manufacturing. The sales tax base in Manitoba and North Dakota exempts most services, basic groceries, and prescription drugs. North Dakota is ranked in the lowest third of 48 states in terms of total state and local sales tax burden.[53] Eleven cities in North Dakota impose a local sales tax of up to 1 per cent; Fargo does not impose any additional local sales taxes.

Local taxes are based on those levied in Fargo, which is the largest city in North Dakota and accounts for 12 per cent (75,000) of the state's population. The effective

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[52] Warach, *op. cit.*, p. 859; Fidel C. Mendoza, et al., eds., 1991 All States Tax Handbook, Englewood, N.J.: Maxwell Macmillan 1991, pp. 267-70.

[53] North Dakota Economic Development Commission, *op. cit.*, p. 7.

property tax rate in Fargo is equivalent to 2.075 per cent of the current fair market value of real property and, as in Canada, consists of civic, school, hospital, library and other levies. This rate is less than that assessed in Winnipeg (4.42 per cent) and Regina (2.25 per cent). Furthermore, Fargo provides a commercial and industrial property tax exemption to new firms equal to 100 percent of their tax liability in the first two tax years, 75 per cent in year three, 50 per cent in year four and 25 per cent in year five. A full exemption is awarded to firms in years 3 to 5 if a plant shows a minimum 10 per cent annual job creation rate.

In the United States, there is no distinction between small and large corporations for corporate income tax purposes. Instead, a graduated rate structure moves small firms into lower tax brackets. North Dakota has six income tiers and is ranked in the middle of the 45 states which impose a state corporate income tax.[54]

Table 15
North Dakota Corporate Income Tax Rates

Taxable Income (US$)	Rate
Up to $3 million	3
$3 to $8 million	4.5
$8 to $20 million	6
$20 to $30 million	7.5
$30 to $50 million	9
Over $50 million	10.5

State income tax rates are applied against taxable income. In many states, a deduction exists to reduce the amount of income subject to tax. This deduction is equal

[54] North Dakota Economic Development Commission, *op. cit.*, p.6.

to a percentage of federal income tax payable. North Dakota is one of only six states that allows a deduction representing 100 per cent of federal corporate income taxes.[55] The calculation of state income taxes on this adjusted taxable income reduces the effective state corporate tax rates in North Dakota from 6.93 to 2.5 per cent.

At the local level, the city of Fargo provides new corporations with a full exemption from state income tax in the first five taxation years. As with the property tax exemption referred to earlier, new firms are eligible for the income tax exemption if they are newly established firms. Qualifying firms must clearly demonstrate new capital investment and must not be restructured existing enterprises. For firms not meeting the property or income tax exemption requirements, there is a wage and salary income credit of 0.5 to 1 per cent of payroll for larger, new, out-of-state, or expanded established firms. This credit is equal to 1 per cent of payroll for the first three years and 0.5 per cent for the remaining two years. Restructured or newly purchased existing businesses are not granted any exemptions.

Federal corporate income tax rates are shown in Table 16. The highest marginal rate is 34 per cent for income over $114,940. An additional 5 per cent surtax is applied on taxable income between $114,940 to $385,050, which raises the effective rate for this income tier to 39 per cent.

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[55] Illinois Tax Foundation, Illinois Tax Climate, 14th ed., Chicago: Illinois Tax Foundation 1989, p. 14.

Table 16
United States Corporate Income Tax Rates

Taxable Income (US$)	Rate
Up to $50,000	15
$50,000 to $75,000	25
$75,000 to $100,000	34
$100,000 to $335,000	*39
Over $335,000	34

* Includes surtax of 5 per cent.

At the federal level in the United States, state and local taxes are fully deductible to reduce taxable income. In Canada, indirect taxes are similarly fully deducted. However, firms which are liable for provincial corporate income tax receive a flat 10 per cent abatement on federal corporate tax rates, regardless of the amount of provincial income taxes paid. Firms in the United States, on the other hand, can reduce their federal corporate income tax liability by deducting the full amount of state income taxes from taxable income.

Since federal corporate income taxes reduce state taxable income and state income taxes reduce federal taxable income, firms have the option of estimating state tax payable in the current tax year or using actual taxes paid in the previous year for the federal computation. State income taxes cannot be deducted from taxable income if exemption or rebate provisions, such as those offered in North Dakota, exist.

IV.6 The Fixed Cost Operating Simulation - North Dakota

When North Dakota taxes are applied to the fixed cost model firm, the results show the main differences between the two jurisdictions. Two cost components with tax consequences, financing costs and depreciation, are adjusted under this model for North

Dakota. The model firm's financing costs are reduced by $7,000 since no sales tax is applied in North Dakota to the assets, buildings, machinery and equipment, which are financed by debt in the model.

The determination of depreciation varies between the United States and Canada because of different rates and computation techniques. The depreciation schedules in the United States match the writeoff period of an asset with its projected economic lifespan. The 1986 Tax Reform Act changed depreciation allowances by assigning longer recovery periods to some assets.[56] All assets are now categorized under the revised Asset Depreciation Range System: 3-year, 5-year, 7-year, 10-year and 15-year classes. Most production machinery and equipment, which previously was considered a 3-year or 5-year asset, falls within the 5-year and 7-year classifications. Claims are determined on a double declining balance basis with a transition to straight-line to maximize deductions. Depreciation rates are prescribed by legislation and claims vary depending on the date the asset is brought into service, the nature of the asset and its intended use, and other considerations. For the North Dakota firm, it is assumed that the machinery and equipment are brought into use in January 1988 and depreciated over a 7-year recovery period. Buildings, previously assigned a 19-year recovery period, are classified under a 31 1/2 year recovery period and are depreciated on a straight-line basis.

Allowable depreciation for the firm under the fixed cost model is $26,000 higher than the maximum amount claimable by its Manitoba counterpart. This implies that the North Dakota firm is able to writeoff depreciable assets at a faster rate than the federal

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[56] Joseph R. Oliver, Preparing the 1120 Return, 1991 Edition, Englewood Cliffs, N.J.: Maxwell Macmillan 1991, pp. 440-52; Warach, *op. cit.*, pp. 338-401.

schedule permits in Canada. However, it should be cautioned that there is no time limit for depreciating assets in Canada, whereas in the United States firms must claim full depreciation each year and within specific recovery periods. Beyond the prescribed lifespan, no additional depreciation is available. These changes to depreciation and financing costs increase net operating costs by $19,000.

Indirect taxes are marginally higher (6.9 per cent) for the firm in North Dakota due to increased federal UI and social security premiums. These higher payroll taxes, which account for 95.9 per cent of the indirect taxes for the firm (including exemptions) compared to 64.7 per cent for the Manitoba firm. The higher payroll taxes more than offset the higher property taxes in Winnipeg. The CFIB Manitoba study concluded that local and payroll levies are the primary source of higher tax burdens for Winnipeg firms compared to the three states examined. In Table 17, which includes social and health premiums not considered in by the CFIB, municipal and payroll taxes comprise the largest share of indirect taxes for both firms and 39.6 per cent of total taxes paid for the Manitoba firm compared to 36.2 per cent for the North Dakota firm. The distribution of the direct tax burden imposed by the federal and provincial/state governments is noticeably different for each jurisdiction. The firm in North Dakota pays 43.2 per cent more federal corporate income tax than under Canada's tax system even though its taxable income is $24,000 less. The federal tax liability of the Manitoba firm is further improved with the use of the investment tax credit; federal corporate income tax payable drops from $71,160 to $41,969. The higher federal income taxes for the North Dakota firm are greatly offset by the low corporate income tax rate and exemption at the state level. Nonetheless,

Table 17
Fixed Cost Operating Model
Under North Dakota Tax Regime

	($ Thousands)	
	Manitoba	North Dakota
GROSS SALES	3,000	
OPERATING COSTS	2,541	2,560
NET INCOME	459	440
% of sales	15	15
INDIRECT TAXES/LEVIES		
Federal		
CPP Premiums/Soc.Sec.Levy	12	50
UI Premiums/tax	19	2
Provincial/State		
Sales Tax	3	2
Payroll Tax	-	n/a
Corporate Capital Tax	3	n/a
WCB premiums	13	10
UI premiums/tax	n/a	8
Municipal/Local		
Property Tax	7	3
Exemption	n/a	(1.7)
Business Tax	10	n/a
Total	68	73
TAXABLE INCOME	391	367
% sales	13.0	12.2
DIRECT TAXES		
Corporate Income Tax		
Federal	71	125
Investment Tax Credit	(29)	-
Provincial/State	44	7
Exemption	n/a	(7)
Total	86	125
NET AFTER-TAX INCOME	304	242
Manitoba=100		80

the overall direct tax burden is 31.1 per cent higher in North Dakota than in Manitoba.

High federal payroll and corporate income taxes place the North Dakota firm at a competitive disadvantage under the fixed cost model. After-tax income for the firm is $62,000 less than that for the Manitoba firm.

IV.7 The Startup Simulation - North Dakota

There are major cost differences between the two jurisdictions, and they have a marked effect on the income position of the firms under the variable cost model. Table 18 illustrates the net cost of investment for the firm in North Dakota. Startup costs are

Table 18
Startup Simulation - North Dakota

	($ Thousands)
ASSETS	
Land	17
Building	121
Machinery and Equipment	837
TOTAL FIXED ASSETS	975
TAX LIABILITIES	
Sales Tax	
Building	–
Machinery and Equipment	–
Land Transfer Tax	–
TOTAL TAX LIABILITY	0
NET COST OF INVESTMENT	975
% Taxes	0

$63,962 less for the firm than if it had invested in Manitoba. Industrial land costs in Fargo, at $13,800 per acre, are much lower than in Winnipeg.[57] Building costs, on the

[57] North Dakota State Department of Assessment, unpublished data.

other hand, are $43,112 more in North Dakota. The price of industrial space is almost double at $6.03 per square foot compared to $3.63 per square foot in Winnipeg. Expenditures on machinery and equipment, once again, are assumed to be the same, regardless of firm location.

The net savings in North Dakota are given more prominence when taxes are considered. The state sales tax exempts buildings and new machinery and equipment. There is also no land transfer tax. As a result, the model North Dakota firm has no taxes associated with its startup investment. In contrast, the model Manitoba firm pays $64,000 in sales and land transfer taxes.

IV.8 The Variable Cost Operating Simulation - North Dakota

Additional cost savings to the North Dakota firm are evident when the ongoing variable costs of the firm are added to the analysis.

IV.8.1 Operating Costs

Table 19 illustrates the operating costs of the model North Dakota firm. Average weekly earnings for the manufacturing sector are lower in the United States than in Canada. The average North Dakota wage, at $395.25, is significantly ($124.17) less than the Manitoba average of $519.42.[58] This difference alone translates into an annual $129,000 advantage for the model North Dakota firm.

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[58] United States Department of Labour, Bureau of Labour Statistics, Employment and Earnings, August 1991, 38(8).

Table 19
Operating Costs - North Dakota

	($ Thousands)
GROSS SALES	3,000
COSTS	
Wages and Salaries	411
Production Materials	1,758
Utility	
Telephone	3
Electricity	20
Financing	93
Depreciation	108
Other operating costs	30
Total Costs	2,423
% of sales	81
NET INCOME	577
% of sales	19

In Manitoba, monthly electricity charges for a small business load of 25,000kwh are $290 less than the cost for a similar operation in Fargo. This difference provides the model Manitoba firm with a $3,475 annual cost advantage over the model North Dakota firm. Since three utility companies serve the Fargo district, electricity costs here are assumed to represent a composite of the average rates among these firms.[59]

Financing costs in North Dakota are 18 per cent lower than in Manitoba primarily due to lower startup costs and a lower interest rate. The United States prime interest rate averaged 9.39 per cent in 1988, the startup year of the firm. The prime rate charged by chartered banks in Canada on business loans for the same period averaged 10.83 per

[59] North Dakota Economic Development Commission, *op. cit.*, p.12; and Northern States Power Company, NSP North Dakota Electric Rates: Commercial and Industrial Services, April 1, 1989.

cent. The rate applied to the North Dakota firm is 3 percentage points above the United States prime at 12.39 per cent to reflect higher financing costs for small firms. The rate differential between the Canadian and American interest rates is 1.44 per cent, which translates into an annual $12,000 cost saving to the North Dakota firm.[60]

Depreciation costs, as exemplified under the fixed cost variant, are, once again, noticeably higher at $108,357 compared to $80,381 for the Manitoba firm. This cost variable is cited in the studies discussed earlier as an equally important measure, in addition to obvious tax rates and structures, in assessing a jurisdiction's competitiveness. The results of the variable and fixed cost simulations suggest that although recent tax reform in both countries has made depreciation less attractive, firms in the United States now have a more favourable depreciation system than Canada. These findings differ from the result obtained by the Conference Board's study of manufacturing for the 1985 to 1987 tax years.

The cost differentials discussed above clearly favour the North Dakota firm. After all variables are included, net income is 20.6 per cent higher and as a per cent of sales (gross income), is 19 per cent compared to 15 per cent for the Manitoba firm.

IV.8.2 Indirect Taxes

The pattern of indirect taxation found under the fixed cost model is duplicated when market costs vary. However, lower wage costs, which reduce the firm's payments for federal and state payroll taxes and premiums, produce a sizeable $10,000 difference in indirect taxes paid by the North Dakota firm under the fixed and variable cost scenarios.

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[60] If the Canadian interest rate were applied to the North Dakota firm, its financing costs would be only 8 per cent lower.

Table 20
Indirect Taxes - North Dakota

	($ Thousands)
Federal	
Unemployment Insurance Tax	2
Social Security Levy	40
State	
Sales Tax	2
Corporate Capital Tax	n/a
Unemployment Insurance Tax	8
Workers' Compensation Tax	10
Municipal/Local	
Property Tax	3
Exemption	(1.4)
Total Indirect Taxes	63
TAXABLE INCOME	515
% of sales	17

Payroll taxes still represent the largest indirect tax burden for the North Dakota firm and are 26.7 per cent more than the payroll tax liability of the Manitoba firm. Property taxes, on the other hand, are almost negligible in Fargo. The property tax exemption reduces tax payable from $2,860 to $1,430. The Winnipeg local tax burden is still significantly higher. The North Dakota firm, with almost no other indirect tax liabilities than payroll taxes, still has a lower overall indirect tax burden than the Manitoba firm. The wage and municipal tax differentials give the variable cost North Dakota firm a $148,000 pre-tax (direct) income advantage compared to the fixed cost model.

IV.8.3 Direct Taxes

The tax and cost savings discussed above increase the taxable income of the firm, resulting in $48,410 more in federal corporate income taxes than under the fixed cost

model and about $102,020 more than the Manitoba firm (before the ITC credit). The state income tax exemption has little effect on the overall tax liability, which implies that the value of tax incentives is less for firms with lower taxable income and corporate income tax rates than firms facing higher rates and tax liabilities.

Table 21
Direct Taxes - North Dakota

	($ Thousands)
Corporate Income Tax	
Federal	173
State	10
Exemption	(10)
Total	173
% of sales	6
NET AFTER-TAX INCOME	341
% of sales	11

The distribution of taxes is also notable. Table 22 clearly demonstrates the different taxation practices, authority, and reliance of the federal, provincial/state, and municipal governments. For both firms, direct taxation is the largest portion of the tax burden, however, its distribution between governments in each jurisdiction varies widely.

The majority of the North Dakota firm's direct taxation is at the federal level; the Manitoba firm, on the other hand, faces substantial federal and provincial direct tax liabilities.

The indirect and direct taxation measures of the federal government in the United States are significant, with federal corporation income and payroll taxes accounting for 91 per cent of the North Dakota firm's tax burden with the variable cost simulation. This compares to about 48 per cent for the firm in Manitoba, including the investment tax credit.

Table 22
Summary of Tax Differences - Manitoba and North Dakota
(Per Cent)

	MANITOBA		NORTH DAKOTA			
			Fixed Cost Model		Variable Cost Model	
	Including Credits	Excluding Credits	Including Exemptions	Excluding Exemptions	Including Exemptions	Excluding Exemptions
TOTAL TAXES						
% Indirect	44	37	37	36	27	26
% Direct	56	63	63	64	73	74
TOTAL TAXES						
% federal	48	56	90	86	91	87
% provincial	41	35	10	13	8	12
% municipal	11	9	0.9	2	0.6	1

Table 23 summarizes the impact of the tax measures on after-tax income. Net after-tax income, under this fixed cost option, is one-fifth less than that for the Manitoba firm. However, the Manitoba income gain deteriorates when variable costs place the North Dakota firm in a more favourable after-tax position with after-tax income 12.5 per cent higher than for the Manitoba firm and 41.3 per cent higher than under the fixed cost model.

Table 23
Summary of Cost Differences - North Dakota Relative to Manitoba

Manitoba=100	Fixed Cost Model	Variable Cost Model
Wages	–	76
Electricity	–	121
Financing Costs	–	82
Depreciation	–	135
Net Income	100	126
Taxable Income	94	132
After-Tax Income	80	112

V. CONCLUSION

The results of the preceding analysis reinforce the importance of assumptions to comparative tax analysis. The basic tax differences between Manitoba and the two other jurisdictions are captured under the fixed cost and variable cost models. However, the magnitude of these differences vary with the assumptions made about the model firm. As the analysis has shown, the fixed and variable cost variants produce two different sets of final results.

Payroll taxes, as we have seen, are a significant portion of the tax burden facing the firm in all three jurisdictions, especially in North Dakota. Federal payroll taxes in the United States are 35 per cent higher than those in Canada and state payroll taxes, 27.2 and 11.2 per cent higher than provincial taxes in Manitoba and Saskatchewan. These variations reflect different fiscal responsibilities among the different levels of governments in the United States and Canada.

Although payroll taxes are a larger portion of the North Dakota firm's overall tax burden than for the Canadian firms, it is worthwhile mentioning that of all taxes applicable to manufacturers in Canada, the payroll tax is the most disliked by these firms. Similarly, in the United States, where the social security levy has doubled over the past decade, many businesses have called for a reduction in the rate.[61] In Canada, the Canadian Manufacturers' Association has reported that payroll taxes in Canada are growing at twice the rate in the United States.[62]

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[61] For a growing number of American individuals and businesses, social security premiums exceed federal income tax payable. See Dan Goodgame,"A Time For Leadership," Time, December 9, 1991, p.44.

[62] Canadian Manufacturer's Association, The Canadian Competitiveness Index, September 1991, p.5.

Recent federal rate increases seem to give some credence to this view. Federal payroll taxes in Canada support key social programs such as unemployment insurance and the Canada Pension Plan. The likelihood of these premiums being reduced or abolished appears small. To fund increasing social program costs, unemployment insurance premium rates were increased in mid-1991 from 2.25 per cent to 2.8 per cent of taxable wages and to 3 per cent in 1992. These increases raised the maximum annual premium from $795.60 in early 1991 to $892.84 as of July 1, 1991, and to $1107.60 as of January 1, 1992. Canada Pension Plan contribution rates rose by 0.1 per cent at the beginning of 1992, increasing annual premiums from $632.50 to $696 per employee.

At the provincial level, a tax on employer payrolls was introduced in the 1980's by four provinces as revenue-raising measures. Due to intense lobbying by many industries, most provinces established exemption levels which have been increased in recent years. The Manitoba firm in the paper benefits from this measure. Some provinces, such as Manitoba, have publicly expressed their intention to abolish the provincial payroll tax altogether. Further, the 1991 federal budget announced restrictions to the deductibility of provincial corporate capital and payroll taxes from taxable income for federal income tax purposes.

Workers' compensation premiums are also another area of concern for Canadian businesses.[63] As with CPP and UI premiums, businesses are disturbed by higher costs resulting from regulated rate increases associated with these premiums. Workers' compensation premiums for North Dakota are over $9 per $100 of payroll more than for

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[63] See Sonita Horvitch, "Workers' Compensation a Headache," Financial Post (Daily), July 19, 1991.

Manitoba and Saskatchewan, but the taxable wage base is much lower which suggests that this premium is based on less extensive coverage than in the two provinces. Many states have much higher premiums.

The growing presence and use of payroll taxes by federal, and more recently in Canada by provincial governments, ultimately impact on labour costs since these taxes are directly tied to the number of employees and their respective salaries.

Corporate income taxes were also significant for each jurisdiction and accounted for the largest share of total taxes. As noted in the comparison with North Dakota, federal corporate income taxes far outweigh state income taxes. In the two provinces examined, federal and provincial taxes are more evenly distributed between both levels of government. The most notable difference was the existence of small tax provisions in Canada. Under the fixed cost model, these deductions and incentives reduced the Manitoba firm's income tax burden to 31.2 per cent less than the North Dakota firm's even though the Manitoba firm had higher taxable income.

Local taxes were found to represent only a fraction of the overall tax burden in the three regions, ranging from 9 to 13 per cent for the provinces under the variant models, and 1 to 2 per cent for North Dakota before the property tax credit. In dollar terms, municipal taxes were about the same in Winnipeg and Regina, and much lower in Fargo.

Depreciation allowances, generous in both countries prior to tax reform, appear to be still more favourable in the United States than in Canada due to modified depreciation schedules. However, higher depreciation rates and faster writeoff periods are not necessarily beneficial for all firms. Some firms, for example, may hold assets for a longer

duration than the prescribed writeoff period. Further, for small firms, depreciation is more likely to comprise a larger fraction of pre-tax cashflow, and consequently, these firms may gain less from faster depreciation provisions. For the variable cost North Dakota firm, depreciation costs are the third highest cost after wages and salaries and production materials. In Manitoba and Saskatchewan, it is the fourth highest expenditure, with financing costs third.

The overall effect of tax differences, including exemptions, deductions, and credits, is shown in Graph 1. The total tax burden is defined, using a simple measurement, as the ratio of taxes paid to pre-tax cashflow (net income). This ratio is analogous to the overall effective tax rate for each jurisdiction.[64]

Under the fixed cost model, the Manitoba firm has a 5 per cent lower effective total tax rate than Saskatchewan, and 11 per cent less than North Dakota. From a tax perspective, Manitoba appears to provide a more favourable tax system. These findings parallel the conclusion of the Finance and 1987 Conference Board studies which, in a pre-reform tax environment, found Canadian manufacturing firms at a competitive advantage over their counterparts in the United States. However, the results are in marked contrast to the post-reform CFIB Manitoba and Conference Board studies, which concluded that a similar Canadian manufacturing firm was now at a competitive disadvantage.

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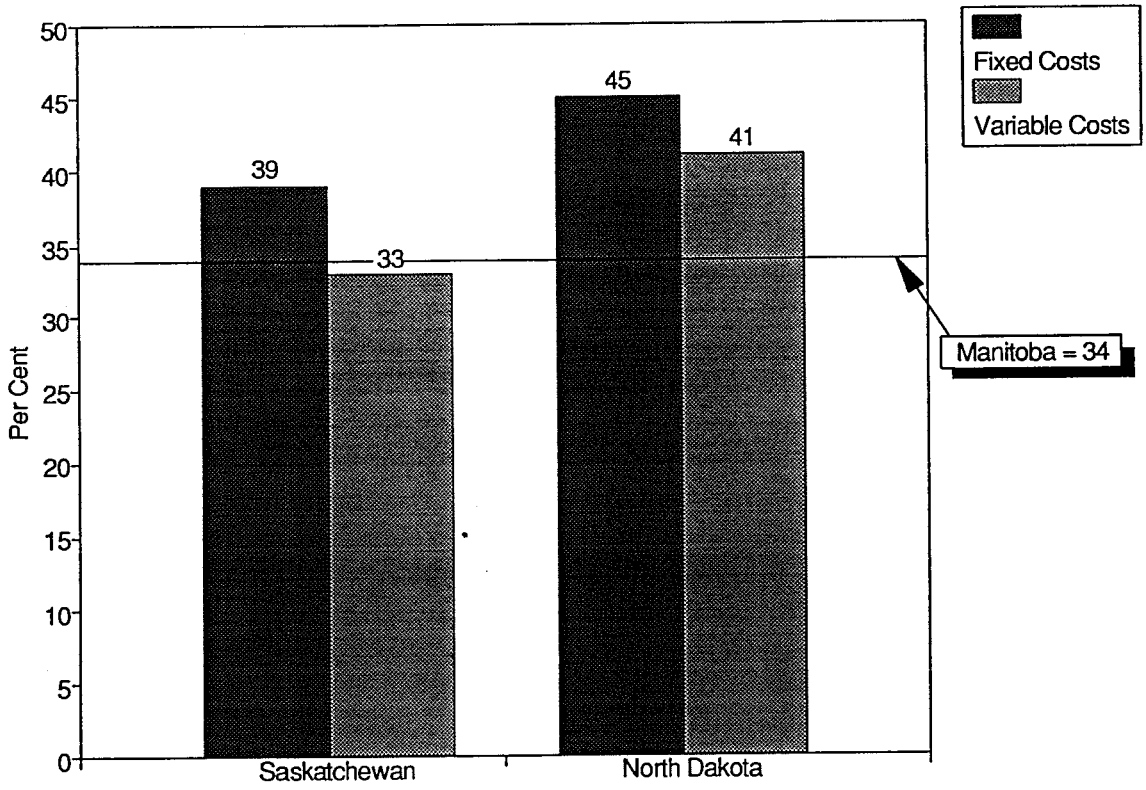
[64] Used in Finance and Conference Board Study. Also see Don Fullerton, Which Effective Tax Rate?, Woodrow Wilson School, Princeton University. Princeton, N.J.: Princeton University, 1983 for a complete discussion on the use of effective tax rates in taxation studies.

Graph 1
Comparison of Total Tax Burdens



Differences in study results reflect different model assumptions. Two assumptions in particular can significantly alter the outcomes under the fixed cost model: the profitablilty of the firm and the inclusion (or exclusion) of various tax measures in each study. If the firm has little or no taxable income, then direct taxes have a negligible impact on the firm and indirect taxes, especially payroll taxes, take on considerable importance. The CFIB Manitoba study concluded that payroll and local taxes were the largest portion of the tax burden for Manitoba manufacturing firms. The conclusion drawn in this paper contrasts these findings. The analysis in section IV assumed that the firm earns a profit; the distribution of taxes paid for the Manitoba firm are almost evenly split between indirect

and direct taxation. This paper, unlike previous studies, includes social premiums for all three jurisdictions, without exception. These indirect taxes, as the discussion of payroll taxes suggested, have a significant impact on the distribution of taxes and overall tax burden of the firm.

Fixed costs studies, in looking at tax changes only, are limited in analytical scope. Graph 1 proves to be misleading under the variable cost scenario because although the total tax burden is the lowest for Manitoba, its after-tax income is less compared to North Dakota which has a 6 per cent higher tax burden when costs vary.

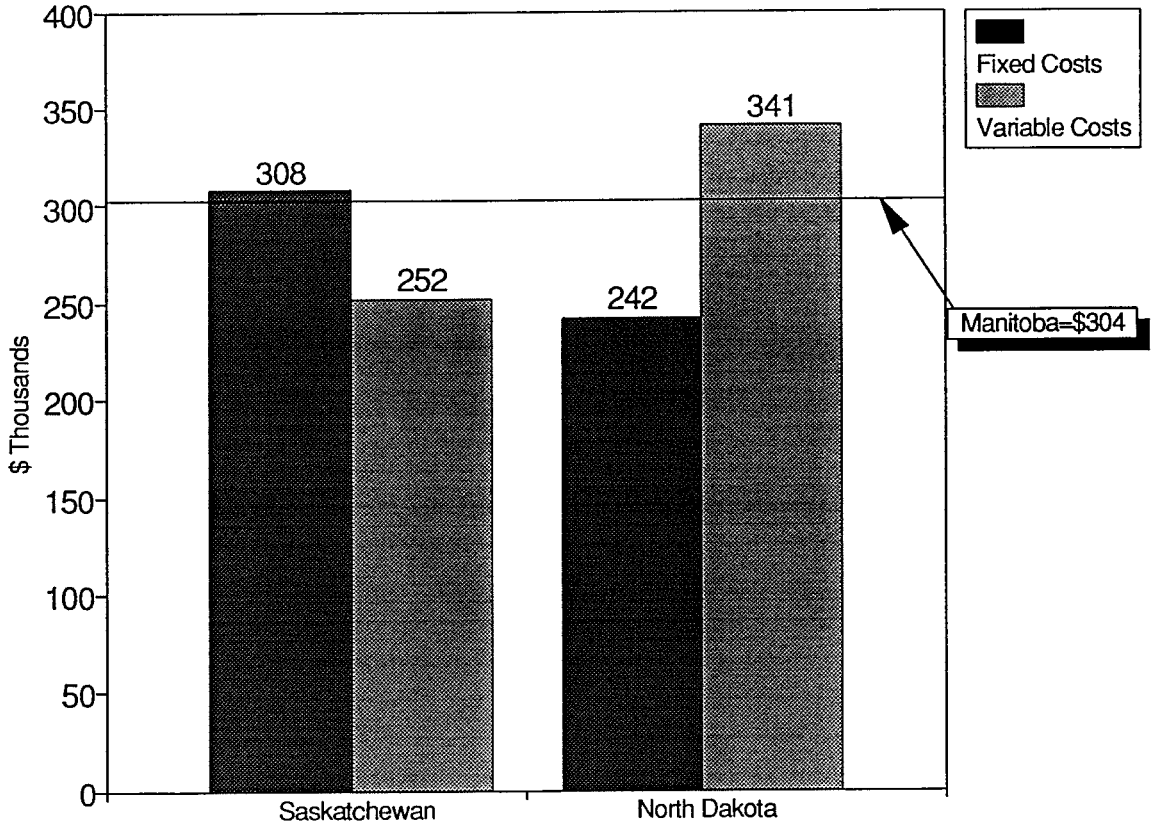
Market costs not only intensify the tax differences noted above, but offset the tax advantage previously enjoyed by the Manitoba firm relative to North Dakota.

Since a lower effective tax rate does not necessarily imply higher after-tax income, this income measurement itself, as Graph 2 suggests, appears to be a more accurate indicator of the impact of taxation on a firm's competitiveness.

The higher Canadian wage is, in turn, the most significant cost factor that differentiates a firm's operating disadvantage in Manitoba versus North Dakota. The North Dakota firm's high after-tax income, as illustrated in Graph 2, is attributed to lower labour costs and their influence on tax calculations. More competitive wages and salaries would likely improve a Canadian manufacturing firm's competitiveness. The Canadian Manufacturer's Association (CMA) has identified labour costs as one of three determinants of competitive advantage for manufacturing firms. The selling price of manufactured goods traded domestically and internationally, and the international balance of payments are the two other considerations. According to the CMA, unit labour costs

grew more rapidly in Canada than in the other G-7 countries from 1980-90. Inflation during this period was also higher in Canada than the average of the other six countries. These factors, in turn, contributed to a deterioration in Canada's pricing performance and an increase in the trade deficit in manufactured goods.[65]

Graph 2
Comparison of After-Tax Income



The variable cost model, as a more comprehensive tax competitiveness analysis approach, is better able to reflect these movements in addition to exploring strengths and weaknesses of a jurisdiction's tax system. The tax burden facing a manufacturing firm is

[65] *Ibid*, pp. 1,3,6.

undoubtedly important; however, labour, overhead costs and service input costs also have a direct impact on competitive advantage. Changes in the firm's competitiveness, in terms of losses or gains in pricing leverage, can therefore be attributed, to some degree, to higher operating costs as well as taxation. The interaction and examination of both factors, as this study concludes, is necessary to arrive at an assessment of a firm's competitive position.

APPENDIX A

DESCRIPTION OF COMPUTER APPLICATION

All tables were generated using Quattro Pro (version 3.0), a software spreadsheet package. Quattro Pro functions and macros were then utilized to build formulas to calculate simultaneously the variables for each model simulation and jurisdiction. Quattro Pro offers the benefits of advanced accounting applications required to produce amortization and depreciation schedules and other complex calculations that were necessary to replicate actual financial, tax, and other cost structures.

APPENDIX B

DESCRIPTION OF MODEL SIMULATIONS AND VARIABLES
STARTUP MODEL SIMULATION
(Tables 1,8,18)

Exchange Rate

All variables in Appendix B and C are expressed in Canadian dollars, unless otherwise indicated. Data for North Dakota was converted to Canadian funds using the Bank of Canada average monthly rate from January to September 1991. The Canada/United States exchange rate (*EXCHRTE*) for as of the end of September 1991.

EXCHRTE = 1.1494

Investment costs

The startup investment includes three assets: land, building, and machinery and equipment.

Land Costs (LC)

LC = *ACRC* x *ACR*

The average 1988 price of industrial land in Winnipeg, Regina, and Fargo is:

MACRC = 72,500 *SACRC* = 67,333 *NDACRC* = 13,792

A commercial/ warehouse building of 20,000 square feet requires about 1 1/4 acres of land.

ACR = 1.25

MLC = 90,625 *SLC* = 84,167 *NDLC* = 17,241

Building Costs (BC)

BC = *AVSQFTC* x *SQFT*

Plant space is assumed to be 20,000 square feet.

SQFT = 20,000

MAVSQFTC = 3.625 *SAVSQFTC* = 4.00 *NDAVSQFTC* = 6.03
MBC = 72,500 *SBC* = 80,000 *NDBC* = 120,687

Machinery and Equipment Costs (MEC)

The cost of the startup asset size of the Manitoba firm is assumed to total $1 million. The remainder of the initial investment, after land and building costs are calculated, is applied towards machinery and equipment. This amount, $836,875 in Winnipeg, is then used as a constant for the Saskatchewan and North Dakota firm.

MEC = STAS - (LC + BC)

Taxes

Sales Tax (SALTX)

STSALTX = (BC + MEC) x SALTXRT

MSALTXRT = 7% *MSTSALTX* = 63,656
SSALTXRT = 7% *SSTSALTX* = 64,181
NDSALTXRT = 5% *NDSTSALTX* = 0

North Dakota does not tax buildings and exempts initial purchases of machinery and equipment by new firms.

Land Transfer Tax (LTT)

Manitoba is the only jurisdiction to assess a land transfer tax.

LTT = (FMV1 x LTTRT1) + (FMV2 x LTTRT2) + (FMV3 x LTTRT3) + (FMV4 x LTTRT4)

FMV1 = less than 30,000 *LTTRT1* = 0
FMV2 = 30,000-90,000 *LTTRT2* = 0.5
FMV3 = 90-150,000 *LTTRT3* = 1.0
FMV4 = over 150,000 *LTTRT4* = 1.5

LTT = 306.25

APPENDIX C

DESCRIPTION OF MODEL SIMULATIONS AND VARIABLES
OPERATING MODEL: FIXED AND VARIABLE COST SIMULATIONS

Operating Costs (Tables 3,9,19)

Salaries and Wages (SW)

Manufacturing salaries and wages represent 17 per cent of total income and when applied to gross sales of $3 million total $511,000. The number of employees was then determined using Manitoba average weekly earnings (*AWE*) in the manufacturing sector.

Employees = *SWC*/(*MAWE* x 52 weeks)= 18.9

MAWE = 519.42

For simplicity, the number of employees was rounded to 20.

TOTSW = *AWE* x 52 weeks x 20 employees

MTOTSW = 540,197 *STOTSW* = 617,032 *NDTOTSW* = 411,066

Production Materials

According to the 1987 Corporation Financial Statistics, production materials represent 59.2 per cent of total income or $1.776 million. Utility costs are included in Statistics Canada's definition of materials, but are identified separately in the operating model. Material costs are reduced by the amount of utility costs for the Manitoba firm. Revised material costs total $1.758 million or 58.6 per cent of sales and this percentage is applied across all jurisdictions.

Utility Costs (UTC)

Utility costs include telephone and electricity costs.

Telephone costs (TELC)

Telephone costs are based on average basic monthly rent for a multiline (4 trunk) business service.

TELC = *TELMTHC* x 12 months

MTELMTHC = 184.20 *SMTELMTHC* = 156.80 *NDTELMTHC* = 217.47

Electricity Costs (ELEC)

Electricity costs are calculated using monthly charges applicable to a 25,000 kilowatt hour load.

ELEC = *ELEMTHC* x 12 months

MELEMTHC = 1363.40 *SELEMTHC* = 1943.90

There are three utility companies which serve Fargo. An average monthly charge is determined using the following monthly rates.

	Base rate (*BASRT*)	Per Kilowatt Hour Rate (*KWRT*)
Montana-Dakota Power (*MDP*)	$13.792	6.101¢
Otter Tail Power (*OTP*)	$8.764	7.911¢
Northern States Power(*NSP*)	$8.045	5.701¢

AVBASRT = (*MDPBASRT* + *OTPBASRT* + *NSPBASRT*)/3
AVKWRT = (*MDPKWRT* + *OTPKWRT* + *NSPKWRT*)/3

NDELEMTHC = *AVBASRT* + (25,000 x *AVKWRT*)

AVBASRT = 10.201 *AVKWRT* = 6.574
NDMTHC = 1652.98

Financing Costs (FINC)

Land and building are financed through shareholdings (45 per cent) and a mortgage (55 per cent) over a 20-year amortization period. Machinery and equipment is assumed to be fully debt-financed over a 10-year amortization period.

The interest rate used is three points above the prime rate: 13.83 per cent in Canada (as charged by chartered banks on business loans) and 12.39 per cent in the United States.

Using Quattro Pro financial functions, fourth year interest payments are derived for the firms.

	Amount	Annual Amortized Payment
Manitoba Firm		
Land & Building	168,506	
Debt (55%)	92,678	12,324
Machinery and Equipment	895,456	101,666
Saskatchewan Firm		
Fixed Cost Model	Same as Manitoba firm.	
Variable Cost Model		
Land & Building	169,767	
Debt (55%)	93,372	12,416
Machinery and Equipment	895,456	101,666
North Dakota Firm		
Fixed Cost Model		
Land & Building	163,125	
Debt (55%)	89,719	11,931
Machinery and Equipment	836,875	95,015
Variable Cost Model		
Land & Building	137,928	
Debt (55%)	75,860	8,977
Machinery and Equipment	836,875	84,050

Depreciation (DEPR)

Items eligible for depreciation are building and machinery and equipment costs.

Canada

It is assumed that full depreciation is claimed each year. The three-year depreciation formula is expressed as

$$MAXDEPRY1 = [0.5BCDRT \times ((BC \times SALTX) + BC)] + [0.5MEDRT1 \times ((MEC \times SALTX) + MEC)]$$
$$UBCY1 = BC - DEPRY1$$
$$UMECY1 = MEC - DEPRY1$$

$$MAXDEPRY2 = (BCDRT \times UBCY1) + (MEDRT2 \times UMECY1)$$
$$UBCY2 = UBCY1 - DEPRY2$$
$$UMECY2 = UMECY1 - DEPRY2$$

MAXDEPRY3 = (*BCDRT* x *UBCY2*) + (*MEDRT3* x *UMECY2*)
UBCY3 = *UBCY2* - *DEPRY3*
UMECY3 = *UMECY2* - *DEPRY3*

MAXDEPRY4 = (*BCDRT* x *UBCY3*) + (*MEDRT4* x *UMECY3*)

BCDRT = 10% *MEDRT1* = 40%
MEDRT2 = 35% *MEDRT3* = 30%
MEDRT4 = 25%

The calculations for Manitoba and Saskatchewan are

MMAXDEPRY4 = 80,381 *SMAXDEPRY4* = 80,956

United States

Depreciation rates are prescribed for each year over the lifetime of the asset and are applied to the purchase price of the asset.

MAXDEPRY4 = (*BCDRTY4* x *BC*) + (*MEDRTY4* x *MEC*)

BCDRTY4 = 3.175% *MEDRTY4* = 12.49%

NDFMAXDEPRY4 = 106,828 *NDMAXDEPRY4* = 108,357

Other Operating Costs (OTHC)

This variable represents a composite of minor operating costs (management fees, charitable donations, advertising, office supplies) not specified individually in the model. The percentage of other operating costs to gross sales is based on the 1987 Corporation Financial Statistics data which, after excluding bad debt provisions, asset writedowns, and employee benefits, is reduced from 10 per cent of gross sales to an estimated 1 per cent. Bad debt provisions and asset writedowns are assumed to be zero and employee benefits (*UIC*, *CPP*) are shown separately.

Indirect Taxes (Tables 4,7,10,17,20)

Federal Taxes

Federal indirect taxes include employer contributions for the Canada Pension Plan (*CPP*) and unemployment insurance (*UIC*) premiums in Canada, and the unemployment insurance tax (*UIT*) and social security levy (*SSL*) in the United States.

Canada

Canada Pension Plan Premiums (CPPP)

If *ECPPP* < 632.50, then *ECPPP* = 2.3% x *TXW* <= $27,500

TOTCPPP = *ECPPP* x # employees

In the model, *TXW* = *AWE* x # weeks.

Manitoba

MECPPP = 621.23
MTOTCPPP = 12,424

Saskatchewan

Fixed Cost Model - same as Manitoba.

Variable Cost Model

SECPPP = 709.57 > 632.50
STOTCPPP = 12,650

Unemployment Insurance Premiums (UIC)

The *UIC* rate increased from 2.25 per cent from January 1 to June 30, 1991 to 2.8 per cent of income from July 1 to December 31, 1991. The employer's share of contributions remain at 140 per cent of each employee's share. The maximum insurable earnings per employee also remain fixed, at $35,360 per annum.

Since *TOTSW*/20 < 35,360, then

EMUIC < 892.84, then *EMUIC* = (2.25% x *TXW*/2) + (2.8% x *TXW*/2)
EMPUIC = (1.4 x *EMUIC*)
TOTEMPUIC = *EMPUIC* x # employees

Manitoba

MEMUIC = 682.00
MEMPUIC = 954.80
TOTEMPUIC = 19,096

Saskatchewan

Fixed Cost Model - same as Manitoba.

Variable Cost Model

SEMUIC = 779.00
SEMPUIC = 1090.60
TOTEMPUIC = 21,812

United States

Unemployment Insurance Tax (UIT)

In the United States, an unemployment insurance tax is applied at the federal and state level.

Federal

FMAXTXW = TXW <= 8046
EFUIT = FUITRT x *FMAXTXW*

A federal *UIT* credit is given for state unemployment insurance taxes (*STUIT*) paid by firms. The amount of state unemployment insurance tax payable eligible for credit is equivalent to federal unemployment insurance tax payable at a 5.4% *FUIT* rate or actual *STUIT* payable, whichever is less.

ECFUIT= CRFUITRT x FMAXTXW

State

STMAXTXW = TXW <= 13,563
ESTUIT = STRT x *STMAXTXW* *TOTSTUIT = ESTUIT x # employees*

If *ESTUIT* < *ECFUIT*, then
TOTFUIT = (*EFUIT* - *ESTUIT*) x # employees, else
TOTFUIT = (*EFUIT* - *ECFUIT*) x # employees

FUITRT = 6% *STRT* = 2.8%

North Dakota

Fixed Cost Model

Same as variable cost model because federal and state UI calculations do not capture wage differences.

Variable Cost Model

EFUIT = 482.75
ECFUIT = 434.47
ESTUIT = 379.76 *TOTSTUIT* = 7,595
TOTFUIT = (482.75 - 379.76) x 20 = 2,060

Social Security Levy (SSL)

The social security levy is a composite variable including Old Age, Survivors, and Disability Insurance (*OASD*), Hospital Insurance (*HI*), and a fixed monthly supplementary medical insurance (*SMI*). Employers and employees contribute the same amount for *OASD* and *HI*.

SSLMAXTXW = TXW <= 61,378
EOASDP = OASDRT x *SSLMAXTXW*
EHIP = HIRT x *SSLMAXTXW*
EOAHIP = (*EOASDP* + *EHIP*) <= $4695
ESMI = SMIPREM x 12 months
TOTSSL = (*EOASDP* + *EHIP* + *ESMI*) x # employees

OASDRT = 6.2% *HIRT* = 1.45%
SMIPREM = 36.66

North Dakota

Fixed Cost Model

Manitoba manufacturing wages are applied to the calculations above.

NDFEOASP = 1674.61
NDFEHIP = 391.64
NDFEOAHIP = 2066.25
NDFESMI = 439.99
NDFTOTSSL = 50,125

Variable Cost Model

NDEOASP = 1245.14
NDEHIP = 291.20
NDEOAHIP = 1536.34
NDESMI = 439.99
NDTOTSSL = 39,527

Provincial/State Taxes

Taxes calculated include sales tax, provincial payroll and corporation capital taxes, state unemployment insurance tax, and workers compensation premiums.

Sales Tax (SALTX)

OPSALTX = (*TELC* + *ELEC* + *OTHC*) x *SALTXRT*

Manitoba

MSALTX = 3,385

Saskatchewan

Fixed Cost Model	*SFSALTX* = 2,240
Variable Cost Model	*SSALTX* = 2,232

North Dakota

Fixed Cost Model	*NDFSALTX* = 1,600
Variable Cost Model	*NDSALTX* = 1,630

Payroll Tax (PAYT)

Manitoba is the only jurisdiction that imposes a payroll tax.

Rate Schedule

$ payroll	%
Under 600,000	0.0
600,000-1,200,000	4.5
over 1,200,000	2.25

In the operating model, the Manitoba firm falls within the exemption level and pays no payroll tax.

Corporation Capital Tax (CCT)

The corporation capital tax exists in Manitoba and Saskatchewan.

If *CPTL* > $1 million, then

CCT = *TOTCPTL* x *CCTRT*

MCCTRT = 0.3% *SCCTRT* = 0.5%

Manitoba

MCCT = 3,192

Saskatchewan

Fixed Cost Model *SFCCT* = 5,320
Variable Cost Model *SCCT* = 5,326

Workers' Compensation Premiums (WCP) (see Appendix E)

Each jurisdiction requires employers to pay workers' compensation premiums. Premium rates are classified by type of worker and are expressed as $ per $100 payroll. Several classifications apply to the manufacturing industry. An average the manufacturing classification rates was taken to arrive at a weighted mean premium for the manufacturing industry.

$$WWCPRT = \frac{(NEOCC1 \times WCPOCC1) + (NEOCC2 \times WCPOCC2) + \ldots + (NEOCCn \times WCPOCCn)}{WCP0CC1 + \ldots + WCPOCCn}$$

MWWCPRT = 2.38 *SWWCPRT* = 2.66 *NDWWCPRT* = 13.56

TOTWCP = *WWCPRT* x *WCTXW* x # of employees

MWCTXW = *MTXW* <= 38,000
SWCTXW = *STWX* <= 39,000
NDWCTXW = *NDTXW* <= 4,138

MTOTWCP = 12,857 *SFTOTWCP* = 14,369 *NDFTOTWCP* = 9,616
STOTWCP = 16,413 *NDTOTWCP* = 9,616

Municipal Taxes

Property and business taxes are assessed at the local level.

Property Taxes (PROPTX)

- Property taxes are levied in each jurisdiction.

Manitoba

Winnipeg property taxes were applied to the Manitoba firm.

TXFMV = *FMVRT* x *FMV*

MUNLEV = *TXFMV* x *MUNRT* *SCHLEV* = *TXFMV* x *SCHRT*
EDUCLEV = *TXFMV* x *EDUCRT*

TOTPROPTX = *MUNLEV* + *EDUCLEV* + *SCHLEV*

MFMVRT = 65.5% *MMUNRT* = 3.2919%
MSCHRT = 1.4115% *MEDUCRT* = 2.045%

MFMV = 163,125 *MTXFMV* = 106,847
MMUNLEV = 3,517 *MSCHLEV* = 2,185
MEDUCLEV = 1,508 *MTOTPROPTX* = 7,210

Saskatchewan

Regina property taxes were computed for the fixed and variable cost model.

STXFMV = (*SBCFMVRT* x *SBC*) + (*SLCFMVRT* x *SLC*)
SMUNLEV = *STXFMV* x *SMUNRT* *SEDUCLEV* = *STXFMV* x *SEDUCRT*
HOSPLEV = *STXFMV* x *HOSPRT* *LIBLEV* = *STXFMV* x *LIBRT*

TOTPROPTX = *SMUNLEV* + *SEDUCLEV* + *HOSPLEV* + *LIBLEV*

SBCFMVRT = 7.5% *SLCFMVRT* = 25%
SMUNRT = 6.37% *HOSPRT* = 0.182%
SEDUCRT = 6.938% *LIBRT* = 0.691%

Fixed Cost Model

Manitoba land and building costs were used to determine property taxes under the fixed cost model.

MBC = 72,500 *MLC* = 90,625
SFTXFMV = 28,094 *SFMUNLEV* = 1,789
SFHOSPLEV = 51 *SFEDUCLEV* =1,949
SFLIBLEV = 194 *SFTOTPROPTX* = 3,983

Variable Cost Model

SBC = 80,000
STXFMV = 27,042
SHOSPLEV = 49
SLIBLEV = 187

SLC = 84,167
SMUNLEV = 1,722
SEDUCLEV =1,876
STOTPROPTX = 3,834

North Dakota

ASVAL = (*LC* + *BC*) x *ASRT*
NDTXFMV = *ASVAL* x *NDFMVRT*

NDMUNLEV = *NDTXFMV* x *NDMUNRT*
NDEDUCLEV = *TXFMV* x *NDEDUCRT*
OTHLEV = *TXFMV* x *OTHRT*

STCTYLEV = *TXFMV* x *STCTYRT*
PARLEV = *TXFMV* x *PARRT*

NDTOTPROPTX = *NDMUNLEV* + *STCTYLEV* + *NDEDUCLEV* + *PARLEV* + *OTHLEV*

TXEXEMP = *NDTOTPROPTX* x *EXEMRT*

ASRT = 50%
EDUCRT = 23.42%
STCTYRT = 7.345%

NDFMVRT = 10%
PARRT = 3.247%
EXEMRT = 50%, year 4

NDMUNRT = 7.207%
OTHRT = 0.4563%

Fixed Cost Model

North Dakota property taxes were applied to the Manitoba firm.

NDFASVAL = 81,562
NDFMUNLEV = 573
NDFEDUCLEV = 1,910
NDFOTHLEV = 37

NDFTXFMV = 8,156
NDFSTCTYLEV = 599
NDFPARRT = 265

NDFTOTPROPTX = 3,385

NDFTXEXEMP = 1,692

Variable Cost Model

NDASVAL = 68,964
NDMUNLEV = 485
NDEDUCLEV = 1,615
NDOTHLEV = 31

NDTXFMV = 6,896
NDSTCTYLEV = 506
NDPARRT = 224

NDTOTPROPTX = 2,862

NDTXEXEMP = 1,431

Business Taxes (BUSTX)

Business taxes are applicable in Manitoba and Saskatchewan.

Manitoba

MBUSTX = (*RNT* + *MELEC*) x *MBUSTXRT*

Electricity costs include heat, water, lighting, air conditioning.

MBUSTXRT = 10% *RNT* = 85,000 MELEC = 16,361
MBUSTX = 10,136

Saskatchewan

SBUSASMT = (*SQFT* x *BUSASMTRT*)

SBMUNLEV = *SBUSASMT* x *SMUNRT* *SBEDUCLEV* = *SBUSASMT* x *SEDUCRT*
BHOSPLEV = *SBUSASMT* x *SHOSPRT* *BLIBLEV* = *SBUSASMT* x *LIBRT*

SBUSTX = *SMUNLEV* + *SEDUCLEV* + *HOSPLEV* + *LIBLEV*

Fixed Cost Model

Same as variable cost model.

Variable Cost Model

BUSASMTRT = 4.15 per square foot
SBUSASMT = 83,000
SMUNRT = 6.37% *HOSPRT* = 0.182%
SEDUCRT = 6.938% *LIBRT* = 0.691%

SBMUNLEV = 5,287 *SBEDUCLEV* = 5,758
BHOSPLEV = 151 *BLIBLEV* = 573

SBUSTX = 11,770

Direct Taxes (Tables 5,7,11,17,21)

Federal

Canada

Federal Corporation Income Tax (CFCIT)

CFCIT = *TXY* x *CFCITRT*
SBD = *SBDLMT* x *SBDRT* or *TXY* x *SBDRT*, whichever is less
MPPD = (*TXY* - *SBDLMT*) x *MPPDRT*
TXABAT = *TXY* x *TXABATRT*
CFCITS = (*CFCIT* - .10*TXY*) x *CFCITSRT*
CFCITPAY = *CFCIT* - (*SBD* + *MPPD* + *TXABAT*) + *CFCITS*
ITC = (*BC* + *MEC* + *SALTX*(*BC* + *MEC*)) x *ITCRT*

CFCITRT = 38% *TXABAT* = 10% *ITCRT* = 3%
SBD = 16% *MPPD* = 5% *CFCITSRT* = 3%
SBDLMT = 200,000

Manitoba

MTXY = 390,770 *MFCIT* = 148,493 *MSBD* = 32,000 *MMPPD* = 9,538
MTXABAT = 39,077 *MCFCITS* = 3,282 *MITC* = 29,191 *MCFCITPAY* = 71,160

Saskatchewan

Fixed Cost Model

SFTXY = 390,181 *SFCFCIT* = 148,269 *SFSBD* = 32,000
SFMPPD = 9,509 *SFTXABAT* = 39,018
SFITC = 29,191 *SFCFCITS* = 3,277
SFCFCITPAY = 71,019

Variable Cost Model

STXY = 300,824 *SCFCIT* = 114,313 *SBD* = 32,000 *STXABAT* = 30,082
SCFCITS = 1,567 *SITC* = 29,191 *SCFCITPAY* = 48,756
SMPPD = 5,041

United States

Federal Corporation Income Tax (UFCIT)

UFCITPAY = (*UFCITRT1* x *TXY1*) + (*UFCITRT2* x *TXY2*) +
(*UFCITR3* x *TXY3*) + *UFCITS*

UFCITS = *TXY4* x *UFCITSRT*

UFCITRT1 = 15% *TXY1* = first 57,470
UFCITR2 = 25% *TXY2* = next 28,735
UFCITR3 = 34% *TXY3* = over 86,205
UFCITSRT = 5% *TXY4* = over 114,940 up to 13,505

North Dakota

Fixed Cost Model

NDFTXY = 366,980 *NDFUFCITS* = 12,602 *NDFUFCITPAY* = 124,773

Variable Cost Model

NDTXY = 514,525 *NDUFCITS* = 13,505 *NDUFCITPAY* = 173,183

Provincial/State

Provinical Corporation Income Tax (PCIT)

PCIT in Manitoba and Saskactchewan are calculated in the same manner.

PCITPAY = (*SMTXY* x *SMCORPRT*) + (*LGTXY* - *SBDLMT*) x *LGCORPRT*

Manitoba

MSMCORPRT = 6% in year 4 *MLGCORPRT* = 17%
MTXY = 390,770 *MPCITPAY* = 44,431

Saskatchewan

SMCORPRT = 6% in year 4 *SLGCORPRT* = 15%

Fixed Cost Model

SFTXY = 390,181 *SFPCITPAY* = 40,527

Variable Cost Model

STXY = 300,824 *SPCITPAY* = 29,140

State Corporation Income Tax (STCIT)

State corporation income tax was determined for North Dakota.

STCITPAY = (*TXY* - *UFCITPAY*) x *STCITRT*
STEXEM = *STEXEMRT* x *STCIT*

North Dakota

STCITRT = 3% *STEXEMRT* = 100%

Fixed Cost Model

NDFTXY = 366,980 *NDFUFCITPAY* = 124,773
NDFSTCITPAY = 7,266

Variable Cost Model

NDTXY = 514,525 *NDUFCITPAY* = 173,183
NDSTCITPAY = 10,240

APPENDIX D

LIST OF VARIABLE CODES

The prefixes (M)anitoba, (S)askatchewan and (N)orth (D)akota are assigned to variables where required. SF and NDF prefixes identify Saskatchewan and North Dakota, respectively, under the fixed cost model simulations. All variables are expressed in Canadian dollars or percentages as appropriate.

ACR	number of acres
ACRC	land cost per acre
ASRT	asset value assessment rate
ASVAL	asset value for determining Fargo property taxes
AVBASRT	average monthly composite basic rate, electricity charge (ND)
AVKWRT	average monthly composite electricity charge, per kilowatt hour rate (ND)
AVSQFTC	building cost per square foot
AWE	average weekly earnings in the manufacturing sector
BASRT	base rate, monthly electricity charge
BC	total building cost
BCDRT	depreciation rate, building costs
BCDRTY4	year 4 building depreciation rate (ND)
BCFMVRT	fair market value assessment rate on building costs
BEDUCLEV	education levy, business taxes
BHOSPLEV	hospital levy, business taxes
BMUNLEV	municipal levy, business taxes
BUSASMT	assessment base, business taxes
BUSASMTRT	business tax assessment rate (manufacturing)
BUSTX	business taxes
BUSTXRT	business tax rate
CCT	corporation capital tax
CCTRT	corporation capital tax rate
CFCIT	Canadian federal corporation income tax
CFCITPAY	Canadian federal corporate income tax payable
CFCITRT	Canadian federal corporation income tax rate
CFCITS	Canadian federal corporation income surtax
CFCITSRT	Canadian federal corporation income surtax rate
CPP	Canada Pension Plan
CPPP	Canada Pension Plan Premiums
CPTL	paid-up capital
CRFUITRT	federal unemployment insurance tax rate for credit (US)
DEPR	depreciation
DEPRY#	depreciation claimed, (# = 1,2,3)
ECFUIT	maximum FUIT per employee eligible for credit
ECPPP	CPPP per employee
EDUCLEV	education levy, property taxes
EDUCRT	education levy rate applied to taxable portion of FMV, property taxes
EFUIT	maximum FUIT per employee

EHIP	HI premium per employee
ELEC	total electricity costs
ELEMTHC	monthly electricity charge
EMPUIC	UIC premium per employee, employer's share
EMUIC	UIC premium per employee
EOAHIP	OASD and HI premium per employee
EOASDP	OASD premium per employee
ESMI	annual SMI per employee
ESTUIT	STUIT per employee
EXCHRTE	Canada - United States exchange rate = 1.1494
EXEMRT	property tax exemption rate
FINC	financing costs
FMAXTXW	maximum taxable wages (FUIT)
FMVRT	taxable portion of fair market value
FMV	fair market value of real property and/or capital assets
FMV#	taxable portion of property value (# = 1,2,3,4)
FUIT	federal unemployment insurance tax (US)
FUITRT	federal unemployment insurance tax rate (US)
HI	hospital insurance (US)
HIRT	hospital insurance (employer) contribution rate (US)
HOSPLEV	hospital levy, property taxes
HOSPRT	hospital levy rate, property taxes
ITC	investment tax credit
ITCRT	investment tax credit rate
KWRT	electricity charge, per kilowatt hour rate
LC	total land costs
LCFMVRT	fair market value assessment rate, land cost
LGECORPRT	large corporation income tax rate
LGTXY	taxable income eligible for large corporation income tax rate
LIBLEV	library levy, property taxes
LIBRT	library levy rate, property taxes
LTT	land transfer tax
LTTRT#	applicable land transfer tax rate (# = 1,2,3,4)
MAXDEPRY#	maximum depreciation (# = 1,2,3,4)
MDP	Montana-Dakota Power Company
MEC	machinery and equipment costs
MEDRT	depreciation rate, machinery and equipment
MEDRTY3	year 3 machinery and equipment depreciation rate
MPPD	manufacturing & processing profit deduction
MPPRDRT	manufacturing & processing profit deduction rate
MUNLEV	municipal levy, property taxes
MUNRT	municipal levy rate applied to taxable portion of FMV, property taxes
NEOCC#	number of employees in manufacturing occupation (# = # of classifications)
NSP	Northern States Power Company

OASD	old age, survivors, and disability Insurance (US)
OASDRT	OASD contribution rate
OPSALTX	sales tax payable, operating model
OTHC	other operating costs
OTHLEV	other levy (ND)
OTHRT	other levy rate (ND)
OTP	Otter Tail Power Company
PARLEV	park district levy
PARRT	park district levy rate
PAYT	payroll tax
PCIT	provincial corporation income tax
PCITPAY	provincial corporation income tax payable
PROPTX	property taxes
RNT	rent/leaseholds, or their equivalent
SALTX	sales tax
SALTXRT	general sales tax rate
SBD	small business deduction
SBDLMT	small business deduction limit ($200,000)
SBDRT	small business deduction rate
SCHLEV	special school levy
SCHRT	special school levy rate applied to taxable portion of FMV
SMCORPRT	small corporation income tax rate
SMI	fixed monthly supplementary medical insurance (US)
SMIPREM	SMI monthly rate
SMTXY	taxable income eligible for small corporation income tax rate
SQFT	square footage
SSL	social security levy (United States)
SSLMAXTXW	maximum taxable wages for SSL
STAS	total fixed assets, startup model
STCIT	state corporation income tax
STCITPAY	state corporation income tax payable
STCITRT	state corporation income tax rate
STCTYLEV	state/county levy (ND)
STCTYLEV	state/county levy rate (ND)
STEXEM	state corporation income tax exemption
STEXEMRT	state corporation income tax exemption rate
STMAXTXW	maximum taxable wages (STUIT)
STRT	ND unemployment insurance tax rate
STSALTX	total sales tax payable under startup model
STUIT	state unemployment insurance taxes
SW	salaries and wages
SWC	salaries and wages costs as 17% of gross sales
TELC	total telephone costs
TELMTHC	monthly telephone charge
TOTCPPP	total CPPP
TOTCPTL	total capital ("net cost of investment")
TOTEMPUIC	total UIC premiums, employer's share

TOTFUIT	total federal unemployment insurance tax payable after credit
TOTPROPTX	total municipal property taxes
TOTSSL	total employer social security contribution
TOTSTUIT	total amount of STUIT
TOTSW	total salary and wage costs
TOTWCP	total WCP premiums
TXABAT	federal tax abatement for Canadian companies paying provincial taxes
TXABATRT	TXABAT rate
TXEXEMP	property tax exemption
TXFMV	taxable portion of fair market value of land and building
TXW	taxable portion of wages
TXY#	taxable income (# = 1,2,3,4)
UBCY#	undepreciated building cost (# = year 1,2,3)
UMECY#	undepreciated machinery and equipment cost (# = year 1,2,3)
UFCIT	federal corporation income tax (US)
UFCITPAY	federal corporation income tax payable (US)
UFCITRT#	first federal corporation income tax rate (US) (# = 1,2,3)
UFCITS	United States federal corporation income tax surtax
UFCITSRT	United States corporation income tax surtax rate
UIC	unemployment insurance (Canada)
UIT	unemployment insurance tax (US)
UTC	total utility (telephone and electricity) costs
WCP	workers compensation premiums
WCPOCC#	WCP rate applicable to associated manufacturing occupation (# = # of classifications)
WCTXW	WCP taxable portion of wages and salaries
WWCPRT	weighted WCP rate

APPENDIX E

AVERAGE WEIGHTED WORKERS' COMPENSATION PREMIUMS

Manufacturing Occupations	Number of Employees	WCB Rate
	North	Dakota
DURABLE GOODS		
Lumber & Wood Products	202	11.16
Furniture & Fixtures	140	18.92
Stone, Clay & Glass Products	151	22.52
Primary Metal Industries	209	30.34
Basic Steel Products	75	18.92
Fabricated Metal Products	394	9.82
Machinery & Equipment	578	22.29
Electronic & Electrical Equipment	462	22.29
Transportation Equipment	537	11.72
Instruments & Related Products	281	2.21
Miscellaneous Manufacturing	105	1.60
NONDURABLE GOODS		
Food & Kindred Products	487	16.16
Textile Mill Products	193	8.09
Apparel & Other Textile Products	295	8.09
Paper & Allied Products	200	3.34
Printing & Publishing	445	3.34
Chemicals & Allied Products	316	11.39
Petroleum & Coal Products	46	11.18
Rubber & Plastic Products	249	14.31
Leather & Leather Products	35	8.12
Average Manufacturing WCB Premium (weighted mean)		13.36
Average Manufacturing WCB Premium (unweighted mean)		12.79

Sources: North Dakota Workers Compensation Bureau, Rates and Classifications, July 1, 1991; Saskatchewan Workers' Compensation Board, 1991 Rate Classification of Industries, January 1, 1991; Statistics Canada, 1986 Canada Census: Population and Dwelling Characteristics: Occupation, March 1989, Cat. No. 93-112; United States Department of Labor, Bureau of Labor Statistics, Employment and Earnings, August 1991, 38(8); Workers Compensation Board of Manitoba, 1991 Classification of Industries and Provisional Assessment Rates, January 1, 1991.

Manufacturing Occupations	SIC Codes	Number of Employees	WCB Rate	Number of Employees	WCB Rate
		Saskatchewan		Manitoba	
PROCESSING OCCUPATIONS	81/82				
Metal Processing	813/814	690	2.50	1,525	4.60
Clay, Glass & Stone Processing & Forming	815	575	4.00	470	1.90
Chemicals, Petroleum, Rubber & Plastic Processing	816/817	610	1.90	660	1.68
Food & Beverage Processing	821/822	4,530	2.10	7,485	3.44
Wood Processing	823	700	4.50	355	2.35
Pulp & Paper Making	825	175	1.75	620	2.76
Textile Processing	826/827	55	0.85	300	1.31
MACHINING & RELATED OCCUPATIONS	83				
Metal Machining	831	915	3.00	2,955	4.60
Metal Shaping & Forming	833	3,855	3.00	5,560	4.60
Wood Machining	835	105	4.50	350	2.76
Clay, Glass, Stone & Related Machining	837	230	4.00	320	1.78
PRODUCT FABRICATING, ASSEMBLING & REPAIRING OCCUPATIONS	85				
Other Metal Products	851/852	720	5.75	2,495	
Electrical, Electronic & Related Equipment	853	2,575	0.60	4,520	1.59
Wood Products	854	880	4.50	1,865	2.01
Textile, Fur & Leather Products	855/856	1,775	0.70	7,075	1.55
Rubber, Plastic & Related Products	857	375	0.90	860	2.08
Mechanics & Repairers	858	13,910	3.00	15,075	1.51
Average Manufacturing WCB Premium (weighted)		2.66		2.38	
Average Manufacturing WCB Premium (unweighted)		2.80		2.53	

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