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THE EFFECT OF TAXATION ON THE FINANCING OF LARGE AND SMALL BUSINESSES IN CANADA

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May 1980

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CHAPTER 1

THE INCOME TAX SYSTEM AND THE FINANCING OF BUSINESS IN CANADA

1.1 Introduction

The purpose of this study is to investigate the impact of the Canadian tax system on the financing of small businesses. Before embarking upon our theoretical and empirical analysis it is pertinent to lay out in careful detail those characteristics of the tax system which are likely to have an impact on the ability of small businesses to finance their operations. The tax system influences the financing of firms primarily through its impact upon the cost of financing various expenditures of a capital nature. The taxes which affect the relative cost of financing small businesses are those which impinge upon capital income - the corporate and the personal income taxes. Property taxes can also be viewed as capital taxes which influence financing costs. However, since they do not treat large and small businesses differentially, we have left them out of consideration.

This chapter begins with a survey of the taxation of capital income in Canada under the corporate and the personal tax systems. This is followed by a discussion of the purposes for which financing is required and the alternate sources of financing to the firm. Finally, an overview is presented of the ways in which the corporate and personal income taxes affect the cost of financing various expenditures using alternative sources of financing.

1.2 The Taxation of Capital Income under the Corporate Income Tax

All corporations carrying on business in Canada are subject to federal corporation income tax as well as provincial corporation income tax in the province in which they reside. In addition, corporations resident in Canada must pay corporate tax on any income earned elsewhere. They do, however, receive a tax credit for corporate taxes paid in other countries. All provinces except Ontario and Quebec currently have tax collection agreements with the federal government whereby the latter collects the taxes for the provinces in exchange for an undertaking by the provinces to use the same tax base.¹ The provinces are then free to vary their own tax rates and institute their own system of tax credits. Since both Ontario and Quebec have corporate tax systems similar to those in the provinces with tax collection agreements, our discussion in this section need not differentiate among jurisdictions.

Corporate taxes are levied at a flat rate on taxable income. In discussing taxable income it is useful to draw a distinction between active business income and non-active business income or investment income. Active business income is that earned as a result of the spending of time, labour and attention by the employees of the firm. Firms are engaged in an active business if a significant part of its profits are gained from such activities. All other income is non-active business income comprised mainly of investment income. As the rules for defining taxable income differs in each case it is worth considering them in turn.

1.2.1 Active Business Income

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The taxable income of corporations engaged in active business is the difference between total revenue and allowable costs over the taxpaying year.² Total revenue includes the value of all sales at the time of the sale regardless of whether or not payment is made at the time of sale. Thus, total revenue is included in the tax base on an accrual basis (rather than a cash or realization

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basis). There will often be a lag between the time of sale and the receipt of payment. This lag gives rise to accounts receivable, one of the types of "assets" that the firm must finance. The implications of taxing revenues on an accrual basis for the financing decision of the firm will be returned to in Appendix 2.

From total revenue the firm is allowed to deduct the costs incurred in the course of earning income over the tax year. These costs are of two main sorts - current and capital costs. As well there are certain special deductions such as depletion allowances for the resource industries. These are discussed in turn.

a. Current Costs

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These include all expenses of a current nature incurred during the tax year such as wages and salaries, fuel, materials, rents, advertising and promotion, insurance, etc. As with total revenues, costs are deductible on an accrual basis at the time at which the expenses are incurred regardless of whether or not payment is made at the same time. Any lag between the undertaking of an expenditure and the payment will give rise to <u>accounts payable</u> (or trades payable). Accounts payable can be thought of as a source of finance to the firm since they are postponements of payment and thus are liabilities.

b. Capital Costs

Capital expenditures are those undertaken to acquire an asset which will be used to produce income over more than one tax year. These include machinery and equipment, non-residential structures, land, resources, inventories and intangible assets such as goodwill and knowledge or information. The tax

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system treats each of these differently but there are basically two sorts of expenses allowed for capital - an interest cost and an expense for the use of the asset (e.g., depreciation). The interest payable on all interest-bearing debt of the firm is deductible from income.³ No deduction is allowed for the imputed cost of non-interest paying sources of finance (e.g., equity). The deductions allowed for the use of the asset varies from asset to asset as follows.

i. Depreciable Assets

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Machinery and equipment and non-residential structures are depreciable assets and are allowed a depreciation expense or capital cost allowance. Each type of depreciable asset is assigned to a class and is written off at the declining balance rate of the class. The declining balance rate is based upon the original cost of the asset, and the rates for each class are meant roughly to accord with the economic life of the asset. It is likely, however, that for many assets the rate of economic depreciation is less than that allowed for tax purposes. For example, machinery and equipment falls in Class 8 and is written off at 20% per year. Statistics Canada lists the average life span of machinery and equipment to be approximately 24 years. This roughly corresponds to an exponential depreciation rate of 8.3%, less than half that allowed for tax purposes.⁴ To ensure that an asset is completely written off, when the asset is scrapped the remaining undepreciated value is written off. Otherwise, under exponential depreciation, it would depreciate indefinitely in smaller and smaller amounts. If a partly depreciated asset is sold for an amount greater than its undepreciated value, there is a recapture of depreciation. The firm adds

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to income the difference between the sale value and the undepreciated value for tax purposes (or subtracts it from taxable income if negative). If it sells for more than its original cost, the firm is subject to a recapture of all depreciation taken as well as to capital gains taxation on one-half the sale value less the original cost. To summarize, for depreciable assets the firm is allowed a write-off for the interest and depreciation costs of holding the asset. However, in neither case is the amount allowed for tax purposes likely to reflect the true costs of using the asset. Only interest arising on debt is deductible rather than full imputed interest. And, tax depreciation rates may not be true rates.

When depreciation allowed for tax purposes is greater than the actual cost of depreciation incurred by the firm, then the firm receives an interest free loan from the government equal to the corporate tax rate times the difference between the amount written off under tax depreciation and that written off normally. These deferred tax liabilities are another source of finance for businesses, and one that varies with the amount of investment of the particular sort undertaken.

The exponential capital cost allowances discussed above are those normally given for depreciable assets. Since 1972, special accelerated depreciation provisions have been in effect for manufacturing and processing firms in Canada. Machinery and equipment used in such activities can be written off over two years using a 50% straight line method. This affords a substantial tax advantage to these firms and increases deferred tax liabilities as a source of finance.

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ii. Land

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Land is a non-depreciable asset so is afforded no capital cost allowance. Only the interest costs incurred in the purchase of the land used for business purposes are deductible (as well as property taxes paid to lower levels of government). On the other hand, if land is not purchased but is rented the rental costs may be written off as current costs. Since the rental payments are also taxable to the owning party at the deductibility of interest for purchasing the asset, no additional taxes are incurred overall as a result of renting rather than owning. Once again, since the full imputed interest costs are not deducted, the firm gets less than the full costs of owning land as a writeoff. Also, any capital gains or losses realized from the sale of land are treated as capital gains for tax purposes and taxed on a nominal basis at half the ordinary tax rate.

iii. Resource Properties

The costs of acquiring resource properties are essentially written off immediately. These include exploration, drilling, and development costs as well as the costs of acquiring property rights (although the cost of acquiring property rights have been depreciated at a rate of 30% since 1979). Since the acquisition of resource properties and their development represents the acquisition of an asset of lasting value their immediate write-off in conjunction with the deductibility in interest payments incurred in financing these affords a substantial tax advantage to investment in the resource industries. From an economic efficiency point of view this can provide an incentive for relative over-investment in these activities. This incentive is compounded by the fact that, despite the fact that all expenses of acquiring resource properties have already been written off, a deduction for the depletion of the resource is allowed. The depletion allowance is 25% of net income from mineral and petroleum production where net income is profits net of the costs of acquisition and exploration and development expenses. There is a limit on the ability to deduct depletion allowance. The depletion deduction is only allowed up to one-third of exploration and development expenses, associated capital expenses, and the purchase of machinery and equipment for processing ore in Canada. For frontier oil exploration the depletion allowance is even more generous. An extra 2/3 of drilling costs in excess of \$5 million on an exploratory well can be deducted.

iv. Inventories

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Firms hold inventories whenever they purchase or produce items before they use them in their production processes or sell them. The general principle in expensing inventories is that they are deductible when used rather than when acquired. The value at which the item is written off is determined using the first-in-first-out accounting (FIFO) method. Thus, each time an item is taken out of inventory it is expensed at the original cost of acquiring the oldest item in the inventory. Since the value of the inventory when it is used may exceed the cost allowed for tax purposes the firm effectively pays a tax on the rise in the value of the inventory over the holding period. The holding of inventories must, of course, be financed and firms are allowed to write-off any interest expenses incurred in financing the inventory. In addition firms are allowed to deduct from taxable income an "inventory allowance" as an indirect way of compensating the firm for the taxation of nominal capital gains in inflationary periods. The write-off is 3% of the value of inventories held at the beginning of the tax year. The implications of this tax treatment of inventories for the financing of businesses will be analyzed in detail in Chapter 3.

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v. Intangible Assets

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One may also view as an asset the acquisition of goodwill and knowledge. Virtually all costs of acquiring goodwill and knowledge are immediately deductible such as research and development, advertising, and marketing expenses. In addition interest costs incurred in financing these expenditures are tax deductible. Thus the firm is given generous tax incentives to undertake these types of capital expenditures. The only exception to the above treatment occurs when goodwill, rights or franchises are acquired by purchase from another firm rather than being accumulated by expenditures. In this case one-half the sale value of the intangibles (or "nothings") is taxed as a capital gain by the selling firm while one half may be written off by the purchasing firm at a 10% declining balance rate.

The above description provides an overview on how income is defined for tax purposes. Once taxable income has been calculated, the appropriate corporate tax rate is applied to determine the taxes payable. The basic corporate tax rate in Canada is 46%. This, however, will vary from province to province according to the legislated provincial rate. As well, there are a number of special cases in which preferential tax rates are given.

a. Small business tax rate

Certain Canadian-controlled private corporations are effectively taxed at a reduced rate of 25% on their active business income by a small business tax credit of 21 percentage points.⁵ This lower tax rate applies to the first \$150,000 of taxable income up to a cumulative total of \$750,000. However, this cumulative total is quite flexible. Firms maintain a cumulative deduction ac-

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count (CDA) which rises as income subject to the lower rate is claimed. However, the CDA is reduced by the amount of dividends paid out of income. Firms can thereby keep their CDA below \$750,000 virtually indefinitely by continually paying dividends out. This stipulation provides a strong incentive for firms to finance by debt or new issues rather than by retained earnings. Some private Canadian corporations have recently been ruled ineligible for the small business tax rate by the federal government. Ineligible corporations are of three main types - certain professionals (doctors, lawyers, dentists, accountants, veterinarians, and chiropractors), personal service corporations deriving more than 2/3 of revenue from one service, and management companies. These non-qualifying corporations receive a tax credit of only $12^{2/3}$ rather than 21 percentage points. The effect of this provision is to remove the incentive for many of these firms to incorporate solely for the purposes of saving taxes.

b. Manufacturing and Processing

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Profits earned in manufacturing and processing activities in Canada are subject to a reduced basic tax rate of 40% (and a small business rate of 20%).

After having calculated taxes payable under the above rates, corporations may deduct several sorts of tax credits the main ones of which are the investment tax credit, the employment tax credit and credit for foreign taxes paid. (We exclude such lesser credits as that for political contributions from consideration here.)

a. Investment tax credit

Firms may deduct from taxes payable a tax credit based upon certain

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investment expenditures. The basic rate is 7% and is applicable to all new investment in production and transport facilities used in Canada. The rate is 10% for areas designated by DREE as slow growth areas and 20% in the Atlantic provinces and the Gaspé region in Quebec. Scientific research and development expenditures (both current and capital) are eligible for a basic 10% tax credit, while those in the Atlantic provinces and Gaspé region obtain 20%. These investment tax credits act as a substantial subsidy to the undertaking of investment expenditures. There is a limit to the credit that may be taken and it is \$15,000 of tax plus one half of taxes payable in excess of \$15,000 per year.

b. Employment Tax Credit

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Until March 31, 1981 firms are eligible for a tax credit on new hirings of full time workers (subject to a declaration that they would not have been hired in the absence of the program). The basic credit is \$1.50 per hour per employee for up to 40 hours per week. In DREE-designated slow growth areas it is \$1.75 per hour while in the Atlantic provinces and Gaspé region it is \$2.00 per hour. The amount of the credit is then treated as taxable income for the recipient firm. Because of this stipulation the employment tax credit is worth more to small firms than to large firms unlike the investment tax credit. For a small firm receiving the maximum credit of \$2.00 per hour for 40 hours, or \$3,120 per year, the net value of the credit is .75 x \$3,120 = \$2,340. For a large corporation it is .54 x \$3,120 = \$1,684.80.

c. Foreign Tax Credit

As mentioned earlier corporations resident in Canada are subject to

taxation on worldwide income. In addition they are allowed in general to deduct from taxes payable those taxes which have been paid to foreign governments at both higher and lower level jurisdictions.

The above discussion all assumes that firms are earning positive taxable income, and are subject to taxes payable large enough to be able to claim all tax credits. In practice, of course, this need not be the case. In some years firms may make small or negative taxable income and the tax system makes an allowance for loss offsets in these cases. Any losses in taxable income may be carried back one year or forward five years and set against income of those years. In addition, all the tax credits discussed above may be carried forward for five years. These liberal loss offset provisions should allow the firm to eventually claim losses against future income gains. If so, the only difference between the carry forward provisions and full loss offsetting is the foregone interest on the offsetting of taxes being postponed to future years.

In addition to corporate income taxes as described above, there are certain provincial capital taxes levied on corporations resident in Ontario, Manitoba and British Columbia. To calculate the tax, provincial tax rates are applied to taxable paid-up capital which includes share capital, reserves, bank loans and long term debt less any deductions made for certain eligible investments. To arrive at provincial taxable capital, taxable capital of the corporation is adjusted for the share of taxable income allocated to permanent establishments in the province. Exemption levels from the tax are provided in Manitoba and British Columbia and tax rates are graduated with the amount of capital in Ontario and British Columbia. Even without graduated tax rates and exemptions, small businesses may be taxed less than large businesses since

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small businesses tend to have much more short term debt compared to large businesses (see Chapter 2).

1.2.2 Investment Income

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In addition to producing income from real assets firms may also hold assets which provide purely investment income, especially financial assets but also real assets for rental. This type of income is called non-active business income and is treated differently under the corporate tax system. A main consideration determining the tax treatment of investment income is the fact that the corporation holding the income-earning asset is acting more or less like an intermediary between its own capital owners (shareholders or debt issuers) and the institution issuing the asset. Many of the provisions of the tax system exist solely to prevent the double taxation of the income originally generated which passes through two or more corporations before it ultimately reaches the household. The provisions, however, differ according to whether the investment income is held by a public corporation or a private corporation. These are considered in turn.

a. Public Corporations

Investment income earned by a corporation may come in several forms including dividends and capital gains on shares held, interest on debt and rental on real assets. Dividends received by public corporations from taxable Canadian corporations are exempt from taxation on the principle that to tax them would be to impose a corporate tax twice. At the same time, one half of capital gains are taxed.⁶ There is therefore an element of double taxation which will

later be discussed more fully. Interest income is fully taxed when received by public corporations as is rental income from real assets and dividends from foreign corporations. Of course, interest payments are also fully tax deductible so to the extent that debt holdings of the firm are financed by debt issue, no net tax is incurred on interest. If the debt holdings are financed by equity the costs of financing are not deductible and the interest does not flow through tax free. This source of taxation will be returned to again later when analyzing the impact of the tax system in financing decisions of firms.

There are a number of special provisions in regard to the taxation of financial institutions that are important in relation to the financing of business. First, financial corporations such as banks, trust and loan corporations and credit unions are permitted to deduct from taxable income a reserve for doubtful debts. Debts are the aggregate of outstanding principal and unpaid interest of loans and mortgages excluding those mortgages issued under the National Housing Act. Financial institutions may compute a reserve equal to 11,2% of the first \$2 billion of total amounts of qualifying securities and 1% of any excess. The total deduction allowed is limited to the previous years deduction plus 1/3 of the maximum amount of debts owing. As the deduction for doubtful debts is not related to the actual riskiness of a loan, loans to small businesses may be penalized if they are riskier than those made to large corporations.

Second, the tax law recognizes certain special cases for tax treatment: a) Pension corporations are tax exempt. When payments are made to owners, the income is taxed as would employment earnings. There is, however, a gain to the holders of pensions in being able to write-off contributions to plans and delaying the payment of taxes on interest accruing over time. b) Credit unions are con-

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sidered to be private corporations for the purposes of claiming the small business tax credit which is calculated on a somewhat different basis than that allowed for non-financial corporations.⁷ c) Dividends paid by mutual funds to its shareholders are treated as capital gains income. We shall discuss in Chapter 3 how the relative differences in the taxation of certain financial institutions can affect the cost of capital of and the flow of funds to small and large businesses.

b. Private Corporations

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Unlike with public corporations, the investment income of private corporations is supposed to be fully integrated with that of their owners so as to ensure a completely tax-free flow of investment income through the corporation to the shareholder. Since small businesses fall into the category of private corporations, this ensures that the investment income of small corporations is tax free. The integration of the investment income of private corporations is accomplished by a combination of refundable taxes and tax credits. Dividends received by private corporations from taxable Canadian corporations are required to pay a 25% refundable tax. When the dividends are paid out a tax credit of \$1 for every \$4 of dividends paid is claimed by the firm. Thus the credit exactly compensates for the refundable tax originally paid so the dividends flow through the firm untaxed. The refundable tax on dividends received serves the purpose of removing an incentive for shareholders to accumulate dividend income in a private corporation in order to postpone the payment of tax.

The other sources of investment income (interest, rent, dividends from non-Canadian sources, and one-half of capital gains) are fully taxed when received by the corporation (at the rate of 46% since the small business rate only applies to active business income). Full integration of interest income is

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roughly achieved by the tax credit of \$1 for every \$4 of dividends paid out along with the dividend tax credit of 50% discussed later under the personal income tax.⁸ The tax credit on dividends received by the firm is limited by the amount of tax that has been paid by the firm on its investment income and not yet credited. This is called the "refundable dividend tax on hand". The firm obtains a tax credit on dividends paid out only to this extent to prevent the tax credit from applying to active business income earned or to the one-half of capital gains that has gone untaxed. In this way the investment income is all eventually integrated with the personal tax structure.

To summarize this section, the corporate tax system seems to afford favourable treatment to both the active business income and the investment income of small corporations. As far as active business income is concerned, small corporations eligible for the small business deduction obtain the benefit of a lower flat rate of tax and this in turn implies a larger subsidy under the employment tax credit scheme. For investment income, investment income is fully integrated to ensure a tax-free flow through private corporations. For public corporations only dividends flow through tax-free in addition to interest income on bonds which are financed out of debt.

1.3 The Taxation of Capital Income under the Personal Income Tax

Capital income is taxed again when received by households as personal income. The personal and corporate income taxes both fall under the same Act and similar rules apply. Residents in Canada are taxed on their worldwide income but receive tax credit for income taxes paid to foreign governments. It is again useful to distinguish between the tax treatment of business income

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under the personal tax and the treatment of investment income. Once again, most provinces have tax collection agreements with the federal government (all except Quebec) and our discussion will be limited to the common case.

1.3.1 Business Income

Income earned by individuals through unincorporated businesses is subject to personal income taxation. The general principles for calculating taxable income by subtracting allowable costs from total revenue are identical to those for corporations so there is no need to repeat them here. Taxable income so calculated is then taxed according to the personal income tax rate structure rather than the flat corporate tax rate.

One interesting feature of the tax system is that there could be a tax advantage to incorporating a business rather than earning active business income as an unincorporated individual. Under the latter the business income is taxed at progressive personal rates. Under the former, the business income is first subject to the corporate income tax and then again subject to the personal income tax when paid out as dividends. However, some relief for the double taxation of business income under incorporation is afforded by the 50% dividend tax credit discussed in the following section. This dividend tax credit system is designed to give the shareholder credit for one-half the corporate taxes paid when the corporate tax rate is 50%. However, for a firm subject to the small business rate of 25%, the dividend tax credit overcompensates the shareholder for corporate taxes paid.⁹ There is thus a tax advantage from taking business income through the small corporation. It was for this reason that certain small businesses were ruled ineligible for the full small business deduction. The incentive was thereby removed for incorporating solely for tax purposes.

Another possible advantage to incorporating is to accumulate funds in the private corporation so as to postpone payment of personal taxation and yield the owner an interest-free loan on the tax ultimately owing. The extent to which this may be done is somewhat limited by the Cumulative Deduction Account mechanism. The CDA provides an incentive to pay out dividends once a fairly generous upper limit is approached.

1.3.2 Investment Income

Individuals receive investment income in the form of dividends, interest, rent, and capital gains. Interest, rent, and dividends from non-Canadian corporations are all fully included as taxable income (subject to the deduction discussed below). One-half of capital gains are taxed while dividends from Canadian corporations are also taxed but subject to a dividend tax credit. The dividend tax credit is meant to be applied at a rate of 50% with grossed-up dividends being added to taxable income. However, owing to the fact that the credit must be divided between federal and provincial governments its calculation is not so straightforward and its amount is only approximately 50%. The calculation is done as follows. Dividends are grossed-up by 50% and added to taxable income. A federal tax credit of 25% of the grossedup dividend is then applied. Since provincial taxes are calculated as a percentage of federal taxes the credit is compounded by the provincial rate applicable. In Ontario, for example, the rate is 44% of the federal tax so that the total dividend tax credit is $.25 \pm .44(.25) \pm .37$ of grossed-up dividends. Since the gross-up of dividends is 50% then the total credit given against tax-

1.4 The Financing of Businesses

Firms require funds to finance lags that occur between the outlay of cash for expenditures and the receipt of payments for goods and services. That is, they need financing to cover negative cash flows. It is useful at this point to set out explicitly the sorts of expenditures which typically require financing and the types of financing available. Actual financing of firms will be discussed in more detail in Chapter 2.

Firms need financing for the following main categories of expenditures real capital, inventories, accounts receivable, cash, and financial assets. In the purchase of real capital we include depreciable capital such as machinery and equipment and plant, non-depreciable capital (land), and depletable resources. We could also include the acquisition of intangible assets since the principles involved are the same. Inventories may include materials and intermediate goods purchased for use in production processes at a later date, work in progress, and final goods to be sold at a later date. All holdings of stocks of inventories require the outlay of funds for financing as well as any holding costs that may be incurred. Accounts receivable arise out of lags between the sale of products and the receipt of payment. Finally, firms may purchase financial assets such as debt or shares which will yield a return in the future.

In each of the above cases, some financing will be required and the amount of the expenditures actually undertaken will generally depend upon the cost at which the financing can be attained. The firm will have several sources of finance potentially available to it. We shall classify these sources into five types. The first is debt issue which generally includes all forms of interest-bearing securities of both a long and short-term nature. The next two categories comprise the equity finance of the firm-retained earnings and new

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issues. Retained earnings are profits otherwise available for dividend pay out which are retained for investment in the firm. New issues are sales of shares in the market. Next, accounts payable represents trade credit obtained from other firms on the purchase of inputs. Finally, deferred taxes may be viewed as a form of financing in the sense that it is a postponement of tax payments.

In discussing the cost of financing firms most of our attention will be devoted to the interaction between the tax system and the first three categories of finance encompassing debt and equity. The latter category of financing, deferred taxes, is associated directly with particular uses of the funds, specifically, certain categories of real capital expenditures. This source of financing will be incorporated into the costs associated with that particular type of investment. Accounts payable will only be dealt with briefly.

It should be stressed at the outset that it is not our intention to analyze the determinants of the financial structure of the firm. Such a study would take us much too far afield. Rather, we shall take the financial structure of various sorts of firms as given and analyze the impact of the tax structure on the cost of financing the firm, given the observed financial structure. It is undoubtedly the case that the tax system itself influences the debtequity structure of the firm by, for example, favouring debt to equity financing or retained earnings to new share issue. Our analysis will, however, be limited to investigating the impact effect of taxes on firms' financing costs for given debt-equity ratios and will not incorporate induced effects on the cost of financing via changes in the debt-equity ratio. The following section will summarize the sorts of influences the tax system has on the cost of financing various sorts of investments by various types and sizes of firms.

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1.5 The Effect of Taxes on the Costs of Financing Investments by Canadian Firms

The subsequent chapters of this report undertake to analyze theoretically and empirically the impact of the Canadian tax system on the financing of small businesses relative to larger ones. As a prelude to that more detailed analysis it is worth summarizing here in a rather more cursory manner the main ways in which taxes impinge upon the financing and investment decisions of firms. The corporate and personal income taxes affect both the relative costs of using funds for various types of investments and also the relative costs of financing by sources of funds. In this concluding section we shall review the impact of the tax regulations on the uses and on the sources of financing respectively.

1.5.1 The Uses of Financing

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The main uses of financing are for the purchase of capital, inventories, accounts receivable, and financial assets. Each of these are subject to special tax regulations which have an influence on their relative costs.

a. Capital

The user cost of capital in the absence of taxes includes depreciation and interest charges less capital gains. The corporate tax system attempts to give write-offs for some of these but does so only imperfectly. If it did so perfectly the tax would be neutral at the margin.¹⁰ The capital cost allowance is intended to account for depreciation. On the one hand, as was suggested above, the rate at which CCA is offered is likely to exceed the economic rate of depreciation on capital. On the other hand, since CCA is based upon historic cost, the write-off allowed in periods of inflation is less than the replacement cost and this may entail some taxation of nominal capital gains. Overall, it is not clear whether the CCA provisions increase or decrease the user cost of capital in the presence of taxation.

Interest deductibility is allowed but only for interest actually paid. Some of the interest costs associated with holding capital are imputed, viz., those associated with the equity financing of capital. Since only interest paid on debt is deductible, the user cost of capital is likely to be higher on this account in the presence of corporate taxation. In the presence of inflation, nominal interest rates may be written off which presumably incorporate some element of the inflation in them. This is beneficial to the firm and partly compensates for the fact that only historic cost depreciation is allowed.¹¹ In fact, the granting of write-off of nominal interest rates is equivalent to a partial write-off of the real principal of a security (as long as the principal is not indexed). This is simply the other side of the well-known phenomenon that if inflation is incorporated in securities via an increase in the interest rate rather than an indexing of the principal, the debtor is in fact being required to pay off part of the real principal through interest rate payments.

Overall, in periods of inflation it is not clear how much, if at all, the user cost of capital is increased. We can only be certain that the lower the debt-equity ratio, the higher will be the increase in the cost of capital. By the same token, the higher the tax rate, the greater will be the increase in the cost of capital. The relative impact of inflation in small businesses will depend upon the magnitude of these two statistics relative to large firms.

In addition to the ordinary write-offs for depreciation and interest, there are a number of special concessions in the tax system which serve to reduce the cost of capital. The first is the investment tax credit which subsidizes the purchase of real capital by all firms at the same rate. Next, the accelerated two-year write-off for manufacturing and processing machinery and equipment provides a substantial reduction to the user cost of capital for that use of funds.

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Finally, there are the immediate write-off provisions for the acquisition of intangible capital (goodwill and knowledge) and resource properties as well as the depletion allowances on the latter which reduce the user cost associated with capital tied up in those uses. The various incentives listed here apply to all firms, small and large alike and it is not clear that one size is favoured over the other.

b. Inventories

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Inventories obtain two sorts of write-offs as well - an interest writeoff on debt used to finance them and a write-off when used based on the FIFO accounting principle. On the one hand, the interest write-off only partially covers the full imputed interest costs of holding inventories since no writeoff is allowed against equity financing. Once again firms with low debt-equity ratios will be discriminated against. Also, the FIFO accounting method, like historic cost depreciation, requires that the firm pays a corporate tax on all capital gains whether real and nominal. In periods of inflation this can increase the cost of holding inventories significantly. That increase could be expected to be greater the higher is the tax rate of the firm. The effect of taxation also depends on the holding period as will be discussed in Chapter 3. It will be a matter of empirical fact to establish whether small firms are discriminated against on this account.

c. Account Receivable

Under the tax system firms (excluding agricultural) must include sales as taxable income when they are billed not when payment is made. Firms, in turn, must finance the value of such sales until payment is received. Firms are then allowed to deduct from taxable income their borrowing costs but not the opportunity cost of equity financing. Moreover, the return on accounts

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receivables, which may be higher prices on goods sold or credit charges, is included in taxable income. Accounts receivable are thus treated for tax purposes as any financial asset held by a firm. The difference in the tax treatment of small and large firms in terms of the costs of holding accounts receivable depends on the corporate tax rate applied to taxable income and the extent to which firms are equity financed.

d. Financial Assets

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The treatment of financial assets including cash and the income theron under the tax system differs for private and public corporations. For private corporations, investment income is fully integrated with the personal tax of the ultimate shareholder so that it flows through untaxed at the corporate level. On the other hand, certain types of investment income of public corporations are subject to corporate taxation and this imposes some tax burden on these corporations vis-à-vis others. In addition, it implies that the cost of capital for firms partly owned by public corporations can be somewhat higher.

There are two potential sources of additional corporate taxation on investment income flowing through public corporations. The first is that associated with the return to equity held by these corporations. Only the dividends from Canadian corporations are tax free when received by a public corporation. Capital gains are taxable as are dividends received by non-Canadian corporations. This imposes a double source of corporate taxation on the ultimate shareholder since the original income yielding the dividends and capital gains was already taxed at the corporate rate. Receiving the income through a public corporate intermediary implies an additional layer of corporate taxation as opposed to receiving the equity income directly. This increases the cost of financing firms via equity issued to public corporations rather than to individuals. Whether or not small firms are more susceptible to this increased cost of financing de-

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pends upon whether or not they rely more on institutional versus individual financing.

The other source of discriminatory treatment is interest income which is fully taxed when received by the corporation. If the debt is itself financed by debt issued by the public corporation the interest written off on account of the latter will offset the interest paid on debt held and tax-free flow through will occur. On the other hand, if the public corporation uses equity financing it obtains no write-off and the corporate tax on the interest received represents an added layer of corporate tax which the shareholders would not have borne if they had held the debt themselves. This distortion and the previous one on capital gains and non-Canadian dividends is avoided in private corporations by the tax credit to the firm on the payment of dividends.

1.5.2 The Sources of Financing

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The main sources of financing for the firm are debt, retained earnings, and new issues. The interaction of the corporate and personal tax systems influences the relative costs of financing by these three sources. The most important tax consideration here is the interest deductibility of debt at the corporate level. Since the costs of equity finance are not deductible, the relative cost of debt to equity finance is reduced. Firms which have higher debt-to-equity ratios will face relatively lower costs of finance.

Personal tax treatment of the various sources of capital income will also influence the relative costs of debt to equity finance. Interest payments are subject to full personal taxation after the initial \$1,000 deduction. On the other hand dividend and capital gains income is taxed preferentially. Dividends from Canadian corporations enjoy the benefit of the 50% dividend tax credit while only one-half of capital gains are taxed. This preferential treatment of equity income in the hands of shareholders partly offsets the preferential treatment given to debt finance at the corporate level, as mentioned earlier.

The dividend tax credit was designed to make the effective tax rate on dividends roughly equivalent to that in capital gains. While this has the intended effect of reducing the incentive for individuals to take equity income in the form of capital gains rather than dividends, it also removes the tax advantage to firms from financing by retained earnings rather than new issues. This will be elaborated further in Chapter 3.

Finally, as discussed above, firms obtaining equity finance from public corporations may face a higher cost of capital due to the double taxation of capital gains.

The subsequent chapters are devoted to a more detailed analysis of the impact of the tax system on the financing of small relative to large businesses. From our discussion in this chapter it is apparent that the tax system will have a differential impact on small businesses to the extent that their debt-equity ratios differ, the holding period of their inventories differ, and their capital structure. The next chapter will be devoted to presenting the empirical facts relevant to these issues.

FOOTNOTES

- For a full description of federal-provincial tax collection agreements see Robin W. Boadway (1980).
- Corporations are free to define their own taxpaying year in any way they wish so as to accord with their own accounting procedures.
- 3. Interest deductibility on foreign debt is limited by the so-called "thin capitalization" provisions. According to these, a portion of the interest on outstanding debt to specified non-residents (generally foreign shareholders) is not tax deductible if the debt outstanding is three times the book value of equity. The portion is calculated as debt owing to specified non-residents less three times the book value of equity divided by outstanding debt owing to specified non-residents.
- 4. For the service lives of various types of capital see Statistics Canada, *Fixed Capital Stocks and Flows*. This document calculates capital stocks in Canada using straight line depreciation and a given service life. The exponential depreciation rate corresponding roughly to a straight line rate for an asset of service life T is calculated as follows.

Consider the following diagram which depicts the capital remaining at various times t as a result of \$1 of capital being depreciated under straight line and exponential depreciation.



The two schemes of depreciation will be approximately the same when the areas beneath the two curves are the same; that is, after integration, when $T/2 = 1/\alpha$ where α is the exponential rate of depreciation. Thus when T = 24 years, $\alpha = .083$.

- 5. Also all provinces excluding Quebec, Prince Edward Island and Nova Scotia have a lower corporate tax rate on small business compared to other businesses. Provincial corporate tax rates may be found in the annual publication *The National Finances* (Canadian Tax Foundation: Toronto).
- Capital losses may be offset against capital gains within the same firm in the current year or indefinitely into the future. Also mutual funds

when paying out the capital gain to shareholders receive a refund of capital gain taxes paid.

7. An additional tax credit of 25% is allowed on taxable income over the amount allowed for the small business income deduction. The amount of income allowed for this additional tax credit is limited by the increase in a year of the cumulative reserve. The reserve is equal to 5% of the total of debts owing to members and of shares held by members.

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- 8. The correspondence is only rough for two reasons. First, the tax credit provisions on dividend payments are designed to offset one half the corporate tax paid under a corporate tax rate of 50%. Since the corporate tax rate is only 46%, more than one half is offset by the credit. The other half is supposed to be offset by the personal dividend tax credit of 50%. Owing to the complicated way in which the dividend tax credit is shared by the provincial and federal governments, the correspondence is only rough here as well. The exact mechanism for computing the dividend tax credit is discussed in Section 1.3 below.
- 9. Suppose \$1,000 of taxable income is earned by a small corporation. Corporate taxes of \$250 are paid and, say, the remaining \$750 is paid out as dividends. With a 50% dividend tax credit, \$750 is grossed-up to \$1,125, is added to taxable income, and a tax credit of \$375 is given. This credit exceeds the \$250 originally paid in corporate taxes.
- 10. See R.W. Boadway and N. Bruce (1979) and R.W. Boadway and N. Bruce (1980), for a discussion of the circumstances in which the corporate tax is neutral.

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11. In fact, with full debt financing and a true depreciation rate for tax purposes, the compensation would be exact and the tax would be neutral. See Boadway and Bruce (1979).

CHAPTER 2

FINANCIAL CHARACTERISTICS OF FIRMS BY ASSET SIZE

2.1 Introduction

In the previous chapter we found that the taxation of business income differs for śmall and large firms. First, corporate income tax rates are lower for small businesses. Second, various deductions and credits allowed in calculating the tax (i.e.: capital consumption allowances, interest deductions, tax credits, inventory allowances, etc.) would have a differential impact on the costs incurred by small versus large businesses owing to the different capital and financial structures of firms. In this chapter, we shall document how various characteristics differ across firms by asset size, these characteristics being important in assessing the impact of corporate and personal taxes on the cost of capital of firms.

- Much of the differential impact of taxation on small versus large businesses depends not only on tax rates but also on the mix of real capital and the combination of liabilities used to finance capital formation. For instance, if a small business generally holds more inventories in relation to total assets compared to a large business and if the tax on inventories is relatively greater than on other forms of capital then the tax system may create a greater tax burden for a small business compared to a large business. Similarly, the cost to a firm in financing its investment is influenced by corporate and personal tax rates and by the method used to finance investment. If, for example, the gross of tax return paid to holders of debt is lower than that paid to equity owners due to taxes, then businesses with higher debtequity ratios will experience a lower cost of capital in financing investment plans and will thus be favoured by the tax system.

As a prelude to a detailed consideration of the effects of the tax structure on small business we shall investigate how certain financial and real capital characteristics vary across firms. More specifically, some of the characteristics to be examined in detail will be:

- 1. The allocation of physical capital among inventories, land, plant and equipment and buildings. As tax depreciation rates and tax credits are more liberal for some forms of capital, firms with favourably taxed forms of capital will be treated more advantageously than others.
- 2. The time that inventories, accounts receivable and accounts payable are held. If firms do not deduct from taxable income the true costs of holding inventories, accounts receivable as assets and accounts payable as liabilities, then the holding periods for these assets and liabilities are relevant for assessing the impact of taxes on costs.
- 3. Debt-Equity Ratios: Firms with higher debt-equity ratios may experience a higher or lower cost of capital depending on the relative impact of personal and corporate taxes on the gross return paid to owners of debt and equity capital.
- 4. Retained Earnings to Shareholders' Equity Ratio: As to be shown in Chapter 3, differences in the taxation of dividends and capital gains earned by shareholders can influence the cost of capital depending on the extent to which investment is financed by retentions rather than by new equity issues.

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5. Financial Ratios as Related to Bankruptcy (Leverage, "Current" and "Quick" Ratios): If the government taxes the return to risk taking received by equity holders certain financial ratios measure the riskness of firms with respect to the possibility of bankruptcy.

The central purpose of this chapter is to describe the differences among firms by size with respect to the above and other related characteristics. In Section I we describe the data used for this study and present a financial balance sheet for firms of various asset sizes. In Section II, we present and discuss in detail various financial statistics as mentioned above that will be used in the analysis of later chapters.

2.2 A Balance Sheet Description of Firms by Asset Size

In this section we describe the data used to compare the financial characteristics of firms and then present the financial balance sheets of firms of different asset size.

2.2.1 The Data

Data made available to us from Statistics Canada and the Economic Council of Canada classify corporate firms according to six asset sizes and eighteen industry groups.¹ Two years were considered: 1976 and 1977. As there are few differences in our final results in the choice of years we use 1977 as the year for analyzing the financial statements of firms by asset size. For the first three asset sizes (firms less than \$5 million in asset size) only a sample of firms are included while the universe of firms is used for the other asset catories. There was considerable change in the number of

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firms in each asset size class when comparing 1976 and 1977 data. In general, the number of firms decreased for the first three asset size groups and increased for the last three asset size groups when comparing the two years of data.

The data provide detailed end of year accounting statements on revenues, expenses, assets (such as land, plant and equipment, buildings, inventories, accounts receivable, financial and other assets) and total liabilities (loans, bonds, accounts payable and shareholders' equity). These financial statements are based on historical accounting practices (book data) where assets and total liabilities fail to properly reflect market values. As our analysis to be presented in Chapter 4 requires market value not book data, it would be appropriate to specify the nature of the differences between the use of book and market value data.

There are two important differences between data based on historical accounting and those based on market values. First, measuring inventories and fixed assets based on the accumulation of past expenditures as under historical accounting understates the market value of assets because prices of capital goods rise with inflation and unanticipated technological and demand changes may increase the profitability of firms. Second, the interest paid on debt includes a payment to the debtholder for (i) postponing his consumption to the future and (ii) compensation for the loss arising from inflation in the purchasing power of the principal of the loan. If debtholders underanticipate future inflationary rates, then the interest paid on debt becomes inadequate compensation and the market value of the debt falls (as there is a transfer of wealth from bondholders to the owners of the firm). Thus historical accounting measures of debt may overstate the market value of debt when inflation is unanticipated.

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As many long term liabilities were issued in the 1960's and early 1970's (especially corporate bonds) and debtholders did not anticipate the inflation rates that have been experienced since 1974, it would be expected that the book values of debt would be more than the market value of debt. This implies that shareholders' equity based on historical accounting understates the market value of equity. As shareholders' equity is simply the difference between assets and debt, then the market value of shareholders' equity is understated by book value since the value of assets are understated and the value of debt is overstated for the reasons outlined above.

In our description of firms by asset size, we will be measuring debt-equity ratios, and perhaps other financial variables, based on book value data. It will be incumbant upon us to make clear the importance of any bias that may arise from the use of book rather than market value data in our later analysis. Fortunately, as we shall discuss later in Chapter 4, the use of book for market value data will tend to strengthen many of our final conclusions.

The data to be presented provides an end-of-year distribution of assets, liabilities and shareholders' equity (i.e.: "stock" variables). For the purpose of examining the effect of taxation on current year decisions, we would also be interested in computing "flow" variables such as the proportion of newly acquired assets financed by increases in debt and equity during the year. These calculations are impossible to do without data on (i) the acquisition of assets and total liabilities during a year (working capital statement) or (ii) beginning of the year assets and total liabilities for the same sample of firms. We did attempt to calculate changes in various components of assets and total liabilities of the average firm in each asset size cate-

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ciently negative to dominate the whole of both asset size groups. By excluding this sector, we tend to reduce debt-equity ratios for small asset size firms but leave unaffected most other measures not requiring the use of equity. As will be seen later, the inclusion of the mining and mined product sector will tend to strengthen our conclusions.

As can be gleaned from Table 1, there are a number of major differences in the financial characteristics of firms of various asset sizes. Considering the proportion of total assets accounted for by various assets and total liabilities, we can note some of the following differences among such firms (less than \$5 million in total assets), medium size firms (\$5-\$25 million assets) and firms with more than \$25 million dollars in asset size: 1. Small and medium size firms have fewer fixed assets and investment in affiliates as a proportion of total assets compared to large firms.

- Small and medium size firms have more cash and deposits, inventories, accounts receivable and other assets (which include tangibles and deferred charges) as a proportion of total assets than large firms.
- 3. Small and medium size tend to finance more of their assets with current liabilities (especially accounts payable and bank loans) and due to affiliate noncurrent liabilities.
- 4. Large firms tend to finance assets through the use of corporate bonds (funded debt) and equity (especially new issues³) compared to small and medium sized firms.
- Deferred tax liabilities as a proportion of total assets is greater for large compared to small and medium size businesses.

The financial statements of small, medium and large businesses as highlighted above in Table 1 will be the basis for analyzing the financial

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characteristics of firms as presented in the next section. Before we present these financial characteristics, it would be helpful for later discussion if we know which of the above asset size groups claim the small business tax credit (which was 21% in 1977).

It would not be expected, even in the smallest asset size group, that all firms would claim the small business tax credit. First, only Canadian controlled privately-held companies are eligible to claim the credit, and only an active business income. Publicly-traded and foreign firms in the sample would pay corporate taxes at the full rate of tax. Second, some companies, small in asset size, could earn taxable income greater than \$150,000 which would be an upper limit on the amount of the small business tax credit claimed. We are interested, in knowing what tax rate influences the marginal decisions of firms. Such information is not available to us. However, we do have the total amount of corporate taxes paid and the amount of the small business tax credit claimed. Let p_s denote the proportion of the sample's income claiming the small business tax credit. If we assume that the firms that claim the small business tax credit have income below \$150,000 such that they receive the tax credit on the last dollar of income earned then the following relationship would hold:

Total Amount of Small Business Tax Credit Claimed Corporate Taxes Paid Plus Small Business Tax Credit Claimed

= p_s Small Business Tax Credit Rate Corporate Tax Rate Without a Tax Credit

By rearranging the above expression one can estimate p_s from the above. Note that by making the assumption that all firms earn less than \$150,000, we likely

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gories using end of year 1976 and 1977 data. Although there was considerable change in the number of firms in each category from one year to the next, it was assumed that those firms entering and leaving the asset size class would not affect the sample mean. However, this assumption did not bear out in the data as there were decreases in some components of average firm assets and liabilities when comparing 1976 and 1977 figures (the only exception was for the largest asset size group of over \$25 million).² It was thus apparent that the sheer growth of firms through the acquisition of new assets meant that firms leaving an asset size class in 1976 were larger and perhaps maturer than those entering the asset size class. Changes from 1976 to 1977 in the averages calculated for various components of assets and total liabilities would not be appropriate to use except for perhaps the largest asset size group (of which the sample did not change too much between the two years). However, the "flow" variables that we have calculated are somewhat useful in pointing out the bias inherent in using the end-of-year distribution of assets and total liabilities rather than a distribution of changes of assets and liabilities during the year as an indicator of marginal financing decisions. For the largest sized firms, it seems that there was greater reliance (in 1977) on new equity issues and less debt as methods of finance when comparing "flow" and "stock" data. For other asset size groups, the differences in the use of "flow" and "stock" data are less apparent.

2.2.2 Financial Statements of Firms By Asset Size Group

In Table 1, we present the end of year distribution of assets and total liabilities of firms by asset size. Throughout our calculations, we omit the mining and mine products sector which had negative profits and retained earnings reserves for the first and second asset size groups, suffi-

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Table 1: FINANCIAL STATEMENT COMPARISON OF FIRMS BY ASSET SIZE FOR THE YEAR 1977 (Mining Excluded)

	FIRMS	BY ASS	ET SIZE	CATEGO	RY - \$M	<u>il</u> .
	0-14	1/4-1	1-5	<u>5-10</u>	10-25	25+
No. of Firms	5550	3384	3088	1688	1039	707
ASSETS		As a Pi	roporti	on of T	otal Ass	sets
Cash and Deposits Accounts Receivable Inventories Other Current Assets	.10 .18 .22 .09	.06 .21 .25 .09	.03 .22 .28 .10	.02 .20 .27 .11	.02 .20 .27 .11	.01 .12 .20 .10
Sub Total: Current Assets	. 59	.61	.63	.62	.60	.43
Fixed Assets Less Accumulated Depreciation Financial Assets Investment in Affiliates Other Assets	.30 .03 .01 .07	.29 .02 .01 .07	.28 .02 .02 .05	.26 .03 .04 .05	.28 .02 .05 .05	.42 .02 .09 .04
Total Assets	1.00	1.00	1.00	1.00	1.00	1.00
TOTAL LIABILITIES						
Bank Loans Short-term Loans Accounts Payable Long Term Debt Due Due to Affiliates Other Current Liabilities	.14 .02 .19 .02 .06 .07	.13 .02 .19 .02 .05 .05	.13 .03 .17 .02 .06 .05	.12 .02 .16 .01 .08 .05	.10 .01 .15 .01 .09 .05	.05 .01 .11 .01 .06 .04
Sub Total: Current Liabilities	.50	.46	.46	.44	.41	.28
Long Term Bank Loans Due to Affiliates Mortgage Debt Funded Debt	.02 .18 .05 .01	.02 .08 .05 .01	.02 .07 .05 .02	.03 .08 .04 .02	.03 .08 .02 .02	.02 .05 .01 .13
Long Term Debt (Net of Debt Due)	.13	.11	.12	.11	.11	.17
Deferred Tax Other Noncurrent Liabilities	-	.01	.01 .01	.03 .02	.03 .02	.06 .01
Sub Total: Noncurrent Liabilities	.31	.21	.22	.23	.23	.29

Table 1 (Cont'd)

	0-1-4	1/4-1	1-5	5-10	10-25	25+
No. of Firms	5550	3384	3088	1688	1039	707
SHAREHOLDERS' EQUITY		As a Pr	roportio	on of To	otal Ass	ets
Paid-in Capital Contributed Surplus Reserves	.06 .01 .11	.06 .01 .26	.06 .01 .25	.07 .01 .25	.09 .01 .26	.14 .03 .26
Sub Total: Equity	.18	.33	.32	.33	.36	.43
Total Liabilities	1.00	1.00	1.00	1.00	1.00	1.00

Source: Statistics Canada

overestimate the proportion of income paying a lower corporate tax on the last dollar of taxable income earned.⁴ As we see below, this may be especially rela-

In 1977 the small business tax credit rate was 21%. Firms, if not qualifying for the business tax credit, would pay a corporate tax rate in 1977 based on an average of manufacturing and nonmanufacturing combined federal and provincial corporate tax rates (the weighting depends on the portion of corporate taxes in each asset size category paid by the manufacturing sector). In Appendix 3, we estimate the federal and provincial corporate tax rate for manufacturing firms to be 42% and for nonmanufacturing firms 48% in 1977. Using this information, we present the portion of income in each asset size class claiming the business tax credit in Table 2.

As can be seen from Table 2, a large portion of the income of firms of less than \$1 million in asset size (the first two categories) seem to claim the small business tax credit. This portion will be used to calculate the corporate tax rate influencing the marginal investment and financing decisions of firms. We caution, nonetheless, the estimated portion of firms claiming the small business tax credit on the last dollar of taxable income earned may be higher particularly for the second asset size category of firms. The data to be presented in later tables show little difference in many of the characteristics among the second, third and fourth asset size categories. If the corporate tax rate is the only relevant parameter in affecting these firm's decisions then it seems that we have overestimated the proportion of the income claiming the small business tax credit on the last dollar of taxable income earned especially for the second asset size category. However, the overestimate of p_s will not affect our later conclusions in any appreciable way.

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2.3 Characteristics of Firms of Different Size

This section examines in detail the differences in characteristics of firms by asset size. The characteristics that are of interest to this study are the following: (i) the structure of capital held by firms (ii) the holding periods for inventories, accounts receivable and accounts payable, (iii) the method of finance and (iv) other pertinent financial variables related to the impact of taxation on firms.

2.3.1 The Structure of Capital

As suggested in Chapter 1, some types of assets, especially depreciable assets, may receive more favourable treatment under tax law compared to other types of assets. To the degree that small businesses as compared large businesses hold assets which are more favourably treated under tax law. then the impact of taxation would be less for small businesses (the converse would also be true).

In Table 3, we present the distribution of capital net of accumulated depreciation (inventories, land, buildings, plant and equipment and other depreciable assets) by asset size category. In our calculation of total net fixed assets we have excluded net depletable assets that are primarily held by the mining and mine products sector. Net depletable assets as a proportion of total net fixed assets held by firms other than those in the mining sector is negligible for the first five asset size groups and less than 5% for the largest asset size group. As we do not concern ourselves in later chapters with detailing the impact of taxation on the holding of depletable assets, this omission of net depletable assets will not affect our conclusions in any appreciable way.

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	Table 2: ESTIN TAX C	AATED PORTION OF THE CREDIT FOR EACH ASSE	SAMPLE CLAIMING T SIZE CATEGORY -	THE SMALL BUSINESS 1977 (Mining Exclud	ed)
(1)	(2)	(3)	(4)	(5)	(9)
Asset Size	Portion of Corporate Taxes Paid By Manu- facturing Firms	Average Corporate Tax Rate	Small Business Tax Credit Rate Divided by (3)	Claimed Tax Credit ÷ Total of Tax Credit Claimed and Corporate Tax Paid	Portion of Sample Claiming Tax Credit (5) ÷ (4)
(S mil.)		(22)			(%)
- 1 2 2 2 2	.28	46.3	.454	.423	93.2
-%4 I	.22	46.7	.450	.351	78.0
1 - 5 -	. 20	46.8	.449	.117	26.1
5 - 10	.14	47.2	.445	.012	2.7
10 - 25	.19	46.9	.448		- 1
25 and over	.10	47.4	.443		3 -

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As can be seen in Table 3, firms of less than \$1 million in asset size hold more land relative to larger firms. Larger firms hold relatively more buildings compared to small businesses. Small firms hold more plant and equipment compared to large firms except for the very largest asset size group. As for inventories, small firms hold relatively more inventories as a share of net fixed assets compared to the very largest firms but hold fewer inventories in relation to medium sized businesses.⁵

The differential impact of taxation on the holding of fixed assets depends not only on the extent to which differently-treated assets for tax purposes are held in relation to total net fixed assets, but also on the depreciation rates used for physical capital and the holding period for inventories. From data published by Statistics Canada (Fixed Capital Flows and Stocks (13-523)) we computed depreciation rates for buildings, and plant and equipment averaged separately for manufacturing and nonmanufacturing industries (Appendix B). It can be assumed that these depreciation rates for physical capital by industry do not vary for firms across asset size. As for inventories it would be expected that the holding period for inventories can vary across asset size. In the following section, we present holding periods for inventories as well as for other assets or liabilities forwhich holding periods are important determinants of the cost of financing.

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2.3.2 Holding Periods for Inventories, Accounts Receivable and Accounts Payable

It will be made obvious in Chapter 3 that the impact of taxation on the marginal benefits and costs of holding inventories and accounts receivable as assets and accounts payable as a liability can depend on the period for which

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Table 3: ESTIMATED STRUCTURE OF CAPITAL OF FIRMS BY ASSET SIZE FOR THE YEAR 1977 (Mining Excluded)

Asset Size	Inventories	Land	Buildings ²	Plant and Equipment ² and Other Depreciable Assets
(\$ mil.)	(%)	(%)	(%)	(%)
$0 - \frac{1}{4}$	42.3	6.0	12.5	39.2
14 -]	46.3	8.0	13.5	32.2
1 - 5	50.0	5.9	13.9	30.2
5 - 10	50.9	4.5	14.5	30.1
10 - 25	49.1	4.9	13.8	32.2
25 and over	33.3	3.8	16.8	46.1

As a Percentage of Total Inventories and Fixed Assets Net of Accumulated Depreciation

1. Excludes Depletable Assets.

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2. To arrive at buildings, plant and equipment and other depreciable assets net of depreciation, it was assumed that total accumulated depreciation was distributed in the same manner as the assets gross of accumulated depreciation. For firms that did not report the distribution of fixed assets, it was assumed that land, and depreciable assets were distributed in the same way as for firms that did report the distribution of fixed assets.

Source: Statistics Canada

such items are held. If taxation reduces the benefits and/or increases the costs of holding inventories, accounts receivable and accounts payable, we shall show in Chapter 3 that the adverse impact of taxation depends on the holding period.

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To compute the average period for which inventories are held as an asset before being sold, one simply calculates the ratio of inventories (averaged for beginning and end of year) to sales.⁶ This ratio would provide the portion of a year that an inventory is held (the inverse, sales to inventories, would be the inventory turnover ratio). Similarly, the average period of credit given on sales of goods and services can be computed as the ratio of accountsreceivable (averaged for beginning and end of year) to sales. For the period in which payments are delayed for materials used in production by the firm, the ratio of accounts payable(averaged for beginning and end of year) to the cost of material may be computed as well.

One difficulty encountered with the data is that the beginning-ofyear accounting figures for inventories, accounts receivable and accounts payable were unavailable. Rather than using data based on averages of beginning and end-of-year values, we took the end of year figures only. Hence, the length of period calculated for the holding period of inventories, accounts receivable and accounts payable is overstated. There is no reason to believe, however, that any particular bias is introduced in comparing firms of different size. If the building up of inventories stocks, accounts receivable and accounts payable is based on approximately the same growth rate for firms of all sizes then the holding periods that have been calculated would not be biased upwards for any particular asset size category.

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Table 4 presents the holding periods for inventories, accounts receivable and accounts payable. As can be seen, small firms (less than \$1 million in asset size) tend to hold both inventories and account receivable for a shorter period of time compared to large and medium-sized firms. As for accounts payable, the differences in the period of credit for firms by asset size is less apparent. For the very smallest asset size category, firms hold for a shorter time accounts payable liabilities compared to other categories.⁷

The data in Tables 1 and 4 show that small and medium sized firms hold more inventories, accounts receivable and accounts payable as a proportion of total assets but for a shorter period of time compared to the largest businesses (over \$25 million dollars in asset size). However, the holding periods are all relatively short and are not of sufficient magnitude. Hence the differential impact of taxation on small and large businesses will depend more on the structure of capital rather than holding periods for inventories, accounts receivable and accounts payable.

2.3.3 Method of Finance

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The impact of taxation on businesses depends not only upon the structure of their assets but also on the method of finance used by small and large businesses to acquire capital. As interest payable to debt holders is deductible from corporate taxable income and there is differential treatment on the personal tax side for various sources of income (dividends, capital gains and interest), the financial cost incurred by businesses in acquiring new capital varies according to the method of finance. In Chapter 3 we will develop how personal and corporate income taxes affect the cost of capital of

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Table 4:	HOLDING PERIODS FOR INVENTORIES, ACCOUNTS RECEIVABLE,	,
	AND ACCOUNTS PAYABLE FOR FIRMS BY ASSET SIZE FOR THE	
	YEAR 1977 (Mining Excluded)	

Holding	Periods	as a	Proportion	of a Year

Asset Size (\$ mil.)	Inventories	Account Receivables	Account Payables
$0 - \frac{1}{4}$.07	.06	.10
1 ₄ -]	.12	.11	.16
1 - 5	.14	.11	.14
5 - 10	.16	.13	.15
10 - 25	.17	.13	.16
25 and over	.16	.17	.13

Source: Statistics Canada.

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firms. Suffice it is to say at this point that the impact of taxes differs for debt,⁸ new equity and retained earnings as sources of finance for firms.

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There are two financial ratios to be measured that will be of interest in later chapters. The first is the debt-equity ratio which commonly is used as a measure of leverage and indication of the possibility of bankruptcy. For our purposes, the debt-equity ratio is important in another regard. As only interest paid on borrowed funds is deductible from corporate taxable income, debt is differently treated than equity from a tax point of view. Thus in our definition of debt we wish to include all those liabilities that enable the firm to deduct interest payments from taxable income. These liabilities include all interest bearing long and short term loans, bonds, mortgages, accounts payable and liabilities due to affiliates and shareholders.⁹

It should be noted that in the above definition of debt we have excluded deferred tax liabilities and other current and noncurrent liabilities. Deferred tax liabilities arise from timing differences between the finm's book and government tax depreciation streams. When the tax depreciation rate is greater than the book depreciation rate, as it is currently, businesses will write off a greater amount of depreciation for tax purposes from taxable income compared to depreciation written off from book profits in the early years of a depreciable asset's life and the converse for later years. To cover future tax liabilities arising in later years, firms transfer current tax savings into a deferred tax liability account. Given that depreciation rates used for book accounting are less than that used for tax purposes, the deferred tax liability accounts can continue to grow so long as the firm continues to grow by acquiring new capital. There are no interest charges asso-

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ciated with deferred tax liabilities. It is thus inappropriate to include deferred tax and liabilities as a part of interest deductible debt. Moreover, firms cannot adjust deferred tax liabilities as other forms of debt. Given the book and tax depreciation rates, deferred tax liabilities are determined solely by the firm's investment decisions.

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It can also be argued that some other current and noncurrent liabilities, which include items such as current taxes payable, deferred charges, dividends payable, deferred interest payments and provision for minority shareholders' interest, are not part of the interest-bearing debt. Indeed, the provision for minority shareholders' interest should be included as part of equity. Certain other items, however, such as deferred charges should be included as part of interest-bearing debt where charges may include already tax-deductible imputed interest accruing as a consequence of deferred repayment of liabilities. Unfortunately, the data do not permit us to break down the composition of these other current and noncurrent liabilities. Given that these liabilities should be included in both the measure debt and equity, we believe that debt-equity ratios across asset size would be little affected if the other current and noncurrent liabilities are excluded from the calculations.

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The second ratio that will be of interest from the tax point of view is the share of retained earnings to total shareholders' equity. Equity includes those funds of shareholders used to finance the acquisition of assets: (i) equity issues which are composed of the par value of outstanding common and preferred shares (paid in capital) and the contributed surplus (this account includes the premium gained on selling new shares net of selling

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costs when the market price is greater than par value of shares) and (ii) retained earnings reserves (earned surplus and revaluation surplus accounts).

In Table 5, we present the financing ratios of firms by asset size. It can be seen that small firms (less than \$1 million in asset size) tend to have higher debt-equity ratios compared to large firms (over \$10 million in asset size). The very smallest asset size group has a considerably higher debt-equity ratio than all other firms.¹⁰ We should note at this point that the debt-equity ratio in Table 5 does not suggest that small firms are rela - tively riskier than large firms or that small firms have relatively more diff-culty in obtaining equity financing since we have included interest-deductible liabilities due to affiliates in the calculation of debt and have excluded some liabilities owing upon bankruptcy. We will comment more on these latter points in a later section.

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In regard to the share of equity financed by retained earnings, the table shows that the very large firms tend to use new equity issues as a source of finance more than that used by small and medium sized firms except for the very smallest asset size class. This may be partly explained by the fact that the largest sized businesses have relatively easier access to equity markets by listing shares on Canadian and foreign stock exchanges. As can be seen from Table 1 the two largest size businesses have historically financed total assets proportionately more through new equity issues (paid in capital plus contributed surplus) compared to small and medium size businesses (less than \$10 million in asset size). On the other hand, it is apparent that the very smallest asset size class of businesses tend to use far less retained earnings to finance investment (and more debt) compared to other businesses. The reason why these small businesses use less retained earnings as a source of finance is a result of either (i) the firms passing dividends onto shareholders to a greater extent compared to other firms (higher dividend payout ratios) for the tax reasons as suggested in Chapter 1 regarding the CDA or (ii) a poor return to capital as indicated by the after tax return to shareholders' equity and the interest cost of debt. As illustrated in Table 6 the dividend payout ratio is much higher for the smallest sized firms but profitability (which is based on 1977 data available to us) seems approximately the same across asset sizes. Thus, it can be generally concluded that small businesses (less than \$1 million in asset size) rely less on new equity issues and retained earnings and more on debt as sources of finance compared to large firms.

2.3.4 Other Financial Characteristics

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The above discussion about the financial characteristics of businesses across asset size completes much of the description of the structure of assets and total liabilities needed for empirical work contained in later chapters. There are, however, a few additional characteristics of businesses that should be considered that are of importance to later discussion of tax policy. In particular, it will be of interest to determine how businesses differ with regard to (a) risk and (b) the term structure of their liabilities.

(a) Financial Characteristics and Risk

Risk can affect the financial cost of capital in two ways. First, lenders may require higher interest rates to be paid on debt to compensate for possible loss arising from bankruptcy. Second, owners of equity who also incur costs arising from bankruptcy would require a higher return to capital. As interest on debt is deductible from corporate taxable income then firms are

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Asset Size Group	Debt/ Equity	Retained Earnings/ Equity
(\$ mil.)		
0 - 14	4.11	.61
k₂ − 1	1.82	.79
1 - 5	1.91	.78
5 - 10	1.78	.76
10 - 25	1.50	.72
25 and over	1.07	.60

Table 5: FINANCING RATIOS OF FIRMS BY ASSET SIZE FOR THE YEAR 1977 (Mining Excluded)

Source: Statistics Canada.

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Asset Size Group	Dividends/ After Tax Profits	After Tax Profits/ Equity1	Interest_Paid/ Debt ²
(\$ mil.)	· ·		
$0 - \frac{1}{4}$.86	.12	.06
4-1	.44	.16	.07
1 - 5	.42	.13	.06
5 - 10	.41	.12	.06
10 - 25	.39	.12	.06
25 and over	.49	.11	.07

Table 6: DIVIDEND-PAYOUT RATIO AND RETURN TO CAPITAL FOR FIRMS BY ASSET SIZE FOR THE YEAR 1977 (Mining Excluded)

1. Equity is measured as end of year shareholders' paid-in capital and reserves.

2. Debt includes loans, mortgages, corporate bonds and liabilities due to affiliates (end of your figures).

Source: Statistics Canada.

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able to deduct some of their cost of risk for tax purposes. However, the cost of risk incurred by owners of equity is not tax deductible and the inability of owners of firms in deducting all costs for tax purposes can increase the overall cost of capital of firms.¹¹

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It is thus apparent that the differences between small and large firms with regard to risk can be important to determining the impact of taxation on small vis-à-vis large business. If one measures risk in terms of the likelihood of bankruptcy, then several financial ratios may be computed as indicators of risk.

The first ratio is a debt-equity ratio which measures the "leverage" of a firm. Firms with higher debt-equity ratios are liable for greater sized interest and principal payments which are to be repaid regardless of the level of revenues net of noncapital costs earned by firms. The higher the debt-equity ratio, the more likely the firm would become bankrupt. Unlike the debt-equity ratio computed in the previous section, we exclude from the calculation of debt and include as part of equity those liabilities that would not be repaid by shareholders upon bankruptcy until all claims to creditors, labour and the government are met and that do not need to be honoured by shareholders if bankruptcy threatens.¹² These liabilities are current and noncurrent liabilities due to affiliates, dividends payable and the provision for minority shareholders' interest. As discussed in the previous section, separate data for the latter two liabilities are unavailable as the amounts are included in "other current and noncurrent liabilities". We then compute two ratios for leverage. The first ratio excludes "other current and noncurrent liabilities" from debt and equity under the assumption that debt-equity ratio in this category is the same for other total liabilities. The second ratio includes "other current and noncurrent liabilities" as part of debt assuming that dividends payable and minority shareholders' interest is a small proportion of this category of liabilities.

A second ratio that may be computed as an indicator of risk is the "current" ratio: current assets divided by current liabilities. The higher the "current" ratio, the more likely firms are able to cover current liabilities payable within the year as current assets are relatively liquid.

A third ratio is the "quick" ratio which is calculated as current assets minus inventories divided by current liabilities. The "quick" ratio may be interpreted in a similar way as the "current" ratio except that inventories are considered as assets unlikely to be available to assist a firm with liquidity problems.

Table 7 presents leverage, "current" and "quick" ratios as indicators of risk for firms by asset size. As can be seen from the Table 7, all three types of ratios indicate that businesses of less than \$¼ million in asset size are riskier than all other businesses. The leverage and "current" ratios indicate that businesses of less than \$1 million in asset size are riskier than firms in the very largest asset size category. It is thus apparent that small businesses are riskier than large businesses as one would expect although the differences are not as great if one especially considered the "current" and "quick" ratios.

b) The Term Structure of Liabilities

As mentioned in Section 1 of this chapter the term structure of liabilities is important to consider in relation to the effects of inflation

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on the market value of debt and equity. Owners of firms that issue long term liabilities benefit (lose) from unanticipated increases (decreases) in rates of inflation as interest rates payable to holders of long term debt fail to incorporate these unanticipated changes. The market value of debt will fall (rise) if debt holders under (over) anticipate inflation. Thus there is a transfer of wealth from bond to equity holders (or vice-versa) when the inflation is wrongly predicted.

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In Canada, rates of inflation have been on a rising trend during the period 1960-1977. Businesses that issued corporate bonds of a term more than 20 years in the early 1960's when interest rates were at a level of 6%, have realized substantial capital gain income arising from the fall in the market value of long term debt after 1973 when interest rates were at a level of 10% or greater. Thus it would be expected that debt-equity ratios as calculated previously would overstate a debt-equity ratio based on the market value of debt and equity. The overestimate of debt-equity would depend on the degree to which long term liabilities are held.

While the term structure of liabilities is important in determining to the impact of inflation on the market value of debt and equity, it is less clear as to how the term structure of liabilities affects the decision of businesses in acquiring fixed assets (and hence, the financial cost of capital of firms). Investment in new assets could be financed by both short and long term newly issued debt. Interest to be paid on both types of debt would need to reflect inflation rates currently anticipated by debt holders in order for debt holders to choose to lend to the firm. Given that owners of equity have the same expectations as to future rates of inflation, then there is little advantage to equity owners in choosing long term compared to short term liabilities as a source of finance (except for considerations with regard to risk).

Asset Size	Levera	ge ¹	Current	Quick
Category (\$ mil.)	<u>(a)</u>	(b)	<u>Ratio³</u>	Ratio ⁴
$0 - \frac{1}{4}$	1.19	1.36	1.18	.74
1/4 -]	1.04	1.17	1.35	.80
1 - 5	1.09	1.22	1.37	.76
5 - 10	.90	1.04	1.41	.80
10 - 25	.75	.89	1.46	.81
25 and over	.76	.85	1.54	.82

Table 7: LEVERAGE, CURRENT AND QUICK RATIOS FOR FIRMS BY ASSET FOR THE YEAR 1977 (Mining Excluded)

- Current and Non current Liabilities Less, Other Current and Non current Liabilities and Liabilities Due to Affiliates Divided by Shareholders' Equity Plus Liabilities Eue to Affiliates.
- 2. Current and Non current Liabilities Less Liabilities Due Affiliates Divided by Shareholders' Equity Plus Liabilities Due to Affiliates.
- 3. Current Assets Divided by Current Liabilities.
- 4. Current Assets Less Inventories Divided by Current Liabilities.

Source: Statistics Canada.

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Table 8 presents the differences among firms by asset size with regard to the proportion of current liabilities held to the total of current and noncurrent liabilities held. We calculate two ratios, one including and one excluding liabilities due to affiliates. It would be appropriate to include liabilities due to affiliates as in the first ratio of the table since we wish to know how one of our calculations of debt (which includes liabilities due to affiliates) may be biased. On the other hand, where we include liabilities due to affiliates in equity, the second ratio is perhaps more appropriate to consider.

As can be seen from Table 8, there is little difference among businesses of less than \$25 million in asset size with regard to the term structure of liabilities. However, for both ratios, businesses of over \$25 million use long term liabilities as a source of finance to a greater degree. The reason for this is that the very largest firms rely less on bank loans and accounts payable, and more on corporate bonds as a source of finance.

The above suggests that the debt-equity ratios as computed previously for small and medium sized businesses are understated relatively less compared to the very largest firms if debt and equity are measured by market values rather than by book accounting values. This bias will be of importance to later parts of this study.

2.4 Conclusions

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In this chapter, small, medium and large businesses were compared with regard to their financial characteristics. These characteristics will be of importance to the analysis contained in the following chapters. In general, the following was concluded:

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- Small businesses hold more land and fewer buildings as assets relative to larger businesses. There are, however, no other systematic differences between small and large sized firms .with regard to their structure of real capital.
- Small businesses hold inventories, accounts receivable and accounts payable for a shorter period of time compared to larger businesses.
- Small businesses tend to use more debt and less retained earnings as a source of finance compared to large businesses.
- Smaller businesses seem to be riskier than larger businesses if risk is measured by the possibility of businesses becoming bankrupt.

In the next chapter, we will consider how taxation affects the cost incurred by firms in acquiring new assets. This cost and the effect of taxation will depend on the financial characteristics of different sized firms as described in this chapter. Many of the ratios calculated in this chapter will be used to determine the effects of taxation on business.

Asset Size	Including Due to Affiliates	Excluding Due to Affiliates
(\$ mil.) .	(%)	(%)
$0 - \frac{1}{4}$,61.7	71.0
1 ₄ -]	68.7	75.9
1 - 5	67.6	72.7
5 - 10	65.7	70.6
10 - 25	64.1	68.8
25 and over	49.1	47.8

Table 8: CURRENT LIABILITIES AS A PROPORTION OF CURRENT AND NON CURRENT LIABILITIES FOR FIRMS BY ASSET SIZE FOR THE YEAR 1977 (Mining Excluded)

Source: Statistics Canada.

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FOOTNOTES

1. The classification of businesses according to asset size is as follows: $0-\frac{1}{4}$, $\frac{1}{4}-1$, 1-5, 5-10, 10-25, and 25 and over million dollars. For a list of indústry groups, see tables in Appendix 1.

2. As an example, outstanding common and preferred shares per firm decreased for some of the smaller asset size classes when comparing 1977 with 1976 end of year data. This would not be expected if 1977 end of year data was compared with 1977 beginning of year data since the same sample of firms would be considered and firms generally do not buy back equity shares.

3. The accumulation of new issues of equity over time is the sum of paid-in capital issued at par value and the contributed surplus account where the latter is composed of the premium earned on selling new shares at market prices greater than par value (net of issuing costs). The contributed surplus account includes, as well, government grants. It is not appropriate for these grants to be considered as a part of new equity issues but since the contributed surplus account is small in relation to total assets and government grants would be a relatively small portion of contributed surplus, then no important bias in comparing new equity issues across firms of different asset size is expected.

4. Firms that claim the small business tax credit can earn over \$150,000 in taxable income as long as the limitations regarding accumulated retained earnings is satisfied. Thus in the first three asset size categories firms that earn more than \$150,000 are being taxed at the full corporate tax rate on income in excess of \$150,000. We calculate the average corporate tax rate for these which would be less than the full tax rate as the small business tax credit is claimed for income less than \$150,000.

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5. Of eighteen industries, the structure of capital has the same pattern across firms by asset size as in Table 3 for 7 industries (inventories), 11 industries (land), 8 industries (plant and equipment), and 14 industries (buildings) (see Tables Al.1 to Al.4).

6. This treats inventories as final goods rather than intermediate goods used for production. Taking the ratio of inventories to the cost of materials (purchases) rather than sales makes little difference to the pattern and size of holding periods across firms by asset size. Note also that the ratio as computed is an average holding period for the year.

7. Holding periods in 1977 for inventories and accounts receivable are longer for large compared to small asset size firms for all and 13 of 18 industries respectively. Holding periods for accounts payable are longer for large compared to small firms for 8 of 16 industries. See Table Al.6 to Al8 in Appendix 1.

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8. We include accounts payable as a source of debt financing. All firms, except those in agriculture, generally use the accrual system for taxation which requires that accounts receivable be taxed and accounts payable be written off immediately from taxable income. Given that the implicit cost of carrying accounts payable as a liability is the same as the interest cost for other forms of debt, then it would be appropriate to include accounts payable as part of debt (see Chapter 3).

9. Even though suppliers may not directly charge interest to firms for extending credit to them, it would be expected that higher prices on goods sold would reflect the cost of credit to the supplier. Such additional costs incurred by firms holding accounts payable are tax deductible.

10. This holds true for 14 of 18 industries as shown in Appendix 1, Table Al.

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11. A full loss offset tax allows firms to be subsidized by the government at the same rate as profits are taxed (or losses can be carried forward with losses increased by a rate of interest). A full loss offset tax can reduce "risk" in the sense that the variability of returns are reduced. However, this depends on the deductibility of all borrowing costs by equity owners. To the extent these costs are not deductible, the cost of risk can rise (Mintz (1980)).

12. If the debt-equity and leverage ratios are compared in Tables
5 and 7, it can be seen that excluding liabilities due to affiliates and including the liabilities as equity, considerably reduce the debt-equity ratio.

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Chapter 3

THE COST OF CAPITAL IN A THEORETICAL FRAMEWORK OF INVESTMENT DECISION MAKING

3.1 Introduction

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The purpose of this chapter is to derive expressions for the cost of capital to a business enterprise. Using a simplified theoretical framework we can find out how various factors including the provisions of the Canadian Income Tax Act influence the effective cost of acquiring and maintaining productive capital. We can then use calculated business and personal tax rates along with information about the financial characteristics of the firm presented in Chapter Two to quantify the cost of capital for firms of different sizes. This will be done in Chapter Four.

The organization of Chapter Three is as follows. In part 3.2 we derive the "real" cost of raising funds in order to acquire physical capital. Following this we derive expressions for the overall cost of acquiring plant and equipment, buildings, land and inventories in part 3.3. Indirect ownership of the firm through other firms and institutions is discussed in part 3.4. The results of the chapter are summarized in part 3.5.

3.2 The Cost of Finance

We consider a firm engaged in producing active business income by combining current inputs such as labour, intermediate goods and raw materials along with the services of durable capital such as plant and equipment, buildings and land in order to produce a commodity or service which is then sold to the household for final consumption or to other firms as an input into a higher stage of production. In addition, we assume the firm makes use of inventory capital consisting of stocks of materials used in the production process and/or final output. Inventory capital is assumed to facilitate the process of production and exchange, making possible larger revenues and/or reduced production costs for a given level of output.

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In order to focus on the costs of acquiring physical capital and the influence of taxation on this cost, we shall effectively ignore noncapital inputs into the production process. Financial assets such as cash and accounts receivable, are discussed in Appendix 2. The acquisition of capital by the firm is assumed to make possible a flow of final product which can be viewed as the total output of the production process less the costs of current inputs. The additional product made possible by an extra real dollar of capital in the firm is the marginal product or return to capital. The "cost of capital" represents the minimum value the marginal return must have in order for the additional capital to be worthwhile in acquiring by the firm. This cost of capital is two-fold. It includes both the cost of raising funds to purchase a physical capital asset and the costs incurred because of changes in the value of this capital asset or the goods it can produce due to depreciation and/or price level changes.¹

To derive the cost of capital it is necessary to define the objectives of the firm. We shall assume the firm wishes to maximize the net worth of its existing shareholders at each point of time. We shall further assume that households directly own the firm and that equity shares in the firm are freely traded in a competitive stock market. We also assume that shareholders

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are only concerned with the actuarial value of their receipts from ownership of the shares. Before proceeding to the cost of finance it will be useful to examine the valuation of a firm's share.

3.2.1 The Valuation of Equity Shares

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Suppose a typical shareholder faces a personal tax rate of 0 on dividends received and an effective capital gains tax rate of c on capital gains as they accrue.² Also assume that capital losses are deductible at the capital gains tax rate. Let D_t denote the nominal (current dollar) value of dividends paid out by the firm at time t, V_t denote the price of a share at time t and S_t denote the number of shares outstanding. A dot above a variable denotes the change in that variable with respect to time (i.e., $x = \frac{dx}{dt}$). The net receipts to a shareholder from a single share will be $\frac{D_t}{S_t}$ (1-0) - c V_t at time t consisting of dividends per share after dividend taxation less capital gains taxes paid (saved) on increases (decreases) in the value of the share. If the shareholder can lend and borrow at a constant interest rate equal to ρ (net of personal interest taxes on receipts or tax deductions on payments) we can discount this flow to find the value placed on a share. Treating time as continuous and assuming taxes are paid continuously the value of a share at time t will be given by:

$$V_{t} = \int_{z=t}^{\infty} \left[\frac{D_{z}}{S_{z}} (1-0) - c \dot{V}_{z} \right] e^{-\rho(z-t)} dz$$
(3.1)

Differentiating (3.1) with respect to t we can find the rate of change in the share's value at time t and obtain an expression we shall call the capital market equilibrium equation. It is:

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$$(1 - c)\dot{V}_{t} + (1 - 0)\dot{U}_{t} = \rho V_{t}$$
 (3.2)

This equation states that the net of tax capital gains per share plus the net of tax dividends per share must equal the foregone interest on the value of the share. Equation (3.2) can then be manipulated and integrated to obtain an expression for the value of a share which incorporates the flow of capital gains taxes into the discounting formula. It is:

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$$V_{t} = \int_{z=t}^{\infty} \left(\frac{1-0}{1-c}\right) \frac{D_{z}}{S_{z}} e^{-\frac{D}{1-c}(z-t)} dz$$
(3.3)

We shall be interested in "steady state" investment policies of the firm. Thus, we consider a firm which is able to pay out a constant real dividend stream of D per share in perpetuity. Also suppose there is a constant inflation rate of π so that if P_t is the price level at time t then $P_t e^{\pi(z-t)}$ will be the price level at time z. Then $\frac{D_z}{S_z} = DP_t e^{\pi(z-t)}$ which can be substituted into equation (3.3) and the integration carried out to obtain

$$\frac{V_{t}}{P_{t}} = \frac{D(1-\theta)}{\rho - \pi (1-c)} .$$
 (3.3')

The left hand side of (3.3') is the real value of a share at time t. If the variables on the right hand side are constant as assumed, then V_t/P_t will be constant over time or, equivalently, the share value of V_t will rise at the general inflation rate of π . Expression (3.3') states that the real value of a share equals the perpetual flow of real dividends net of personal taxes divided by the "real" interest rate facing the shareholder. This real interest rate equals the nominal interest rate net of personal taxes facing the shareholder interest facing the shareholder.

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taxes $\pi(1-c)$. The capital gains tax enters because increases in the nominal value of shares due to inflation are taxed even though the real value of share remains constant.

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Using (3.3') we can now find the change in the net worth of existing shareholders resulting from incrementing the real dividend flow by x. Setting $P_t = 1$ for convenience we find from (3.3) the change in the share value $\Delta V_t = \frac{x(1-\theta)}{\rho - \pi(1-c)}$. However, this does not constitute the change in the net worth of the shareholder since the change in share value is taxable (or deductible if negative) at the effective capital gains tax rate of c. Letting NW denote net worth we have:

$$\Lambda NW = (1-c)\Lambda V_{t} = \frac{x(1-0)}{\frac{P}{1-c} - \pi} .$$
 (3.4)

Expression (3.4) will be useful in translating once and for all changes in net worth into equivalent perpetual flows and vice versa.

3.2.2 The Flow Cost of Financial Funds from Different Sources

In order to purchase a physical capital asset the firm must raise the necessary funds. These funds can be obtained from three sources: 1) issuing bonds or taking out loans, 2) issuing new equity shares and 3) retaining the firm's earnings rather than paying out dividends. We wish to derive a flow measure of the cost of raising funds to purchase capital from each of these sources. In doing so we shall ignore the transactions and underwriting costs of raising these funds although these costs may be significant especially to small firms attempting to float new share issues.³ (a) Issuing Debt. Suppose the firm fully debt finances its capital expenditures (that is, borrows by issuing bonds or by taking out a loan at a financial institution). We can now find the flow cost to the firm of having one real dollar of debt as a liability. We consider a real dollar since we wish the firm's nominal debt to keep pace with the nominal value of its physical assets otherwise equity in the firm will be increasing.⁴

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Suppose the firm borrows one dollar at time t. If prices are rising at rate π it is necessary for the nominal value of debt to be $e^{\pi(z-t)}$ at time z to maintain the real value of the debt. Thus the firm borrows an additional $\pi e^{\pi(z-t)}$ at time z. Let i denote the nominal interest rate facing the firm and assume i is constant over time. Since interest payments on bonds and loans are deductible from revenues in determining the firm's taxable profits,⁵ the net nominal interest payment by the firm at time z is $i(1-f)e^{\pi(z-t)}$ where u is the tax rate on the firm's profits.⁶ Subtracting from this the flow of funds raised by increasing the nominal debt at the inflation rate and deflating into "real" dollars by multiplying through by $e^{-\pi(z-t)}$ we obtain the real flow cost of a real dollar of debt as:

$$r_{\rm R} = i(1-u) - \pi.$$
 (3.5)

This r_B represents the reduction in the real dividend stream to existing shareholders resulting from the firm having a liability of one real dollar of debt.

(b) New Share Issues. Now suppose the firm raises funds by issuing new shares. To raise a dollar by issuing new shares the firm must offer a dividend stream to the new shareholders which they value at one dollar. Since the dividend stream of existing shareholders must be reduced by the dividend

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stream paid out to new shareholders the value of existing equity falls by one dollar.⁷ But since the capital loss is deductible from other capital gains the net worth of existing shareholders falls by l-c dollars. Using (3.4) we can translate this into a real perpetual flow cost of $r_{\rm NE}$ where $r_{\rm NF}$ satisfies

$$\frac{(1-0)r_{\rm NE}}{\frac{\rho}{1-c} - \pi} = 1-c.$$

Or,

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$$r_{\rm NE} = \frac{\rho}{1-0} - \pi \left(\frac{1-c}{1-0}\right) . \tag{3.6}$$

This r_{NE} represents the reduction in the real dividend stream to existing shareholders that has the same effect on their net worth as the issuing of a dollar of new shares. It denotes the real flow cost per dollar of new share issue.

(c) Retained Earnings. The cost to existing shareholders of retaining one dollar of current dividends is simply 1-0 which is the reduction in current receipts after personal taxes. The real perpetual flow cost to which this is equivalent is denoted r_{RE} where r_{RE} satisfies equation (3.4) so

$$\frac{(1-\theta)r_{RE}}{\frac{\rho}{1-c}} = 1 - 0$$

or,

$$r_{\rm RE} = \frac{\rho}{1-c} - \pi.$$
(3.7)

This represents the real flow cost of a dollar of retained earnings.

3.2.3 Tax Factors and the Cost of Finance by Source

It is apparent by examining expressions (3.5), (3.6) and (3.7) that the cost of financial capital can vary according to the source of funds. A number of special cases are of interest. First note that if 0=c, that is capital gains are taxed at the same effective rate as dividends, then the flow cost of new share issues (r_{NE}) equals the cost of retained earnings (r_{RF}) so we can talk about the "cost of equity" (r_F) . In the case where capital gains are preferentially taxed (c < 0), the cost of retained earnings will be less than the cost of new issue and vice versa if dividends are preferentially taxed. It might further be noted that if shareholders face the same market interest rate as firms then $\rho = i(1-m)$ where m is the personal tax rate on interest, then the cost of equity (assuming c = 0) will be $r_E = \frac{i(1-m)}{1-\theta} - \pi$ while the cost of debt will be $i(1-u) - \pi$. If interest and dividends are taxed at the same rate (m = 0) then it is clear that the cost of debt will be less than the cost of equity because interest payments on debt are deductible from corporate income in calculating the firm's tax liability whereas implicit interest on equity is not. Finally it might be noted that if there were no taxes and shareholders are faced with the same interest rate as firms, the cost of financial capital would be i for all three sources.⁸

We have shown in the above paragraph that the cost of finance is likely to differ among debt, new equity and retained dividends because of tax factors. In this case one would expect that firms would tend to raise funds using only the least cost source of finance. Tax factors alone make debt attractive since interest payments on debt are tax deductible.⁹ The recent liberalization of dividend taxation has eliminated some of the traditional

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advantage of debt finance although increased inflation has favoured debt finance due to the fact that allowing nominal interest payments as a tax deduction effectively allows repayments of real principal to be deducted. In particular, the change in r_B from a one percentage point increased in the inflation rate is $\frac{m-u}{1-m}$ while the change in r_E is $\frac{\theta}{1-\theta}$. Since it is generally the case that u m, the change in r_B is negative while the change in r_E is positive. That is, inflation reduces the real cost of debt and increases the real cost of equity.

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Tax factors make debt particularly attractive to small business. As discussed in the first chapter, small businesses can only maintain their low tax rate providing their cumulative deduction account (CDA) is less than \$750,000. Since only retained earnings augment their CDA firms have an incentive to pay out dividends, thus leaving new share issue and debt as sources of finance. Since there is some evidence that the underwriting costs of new share issue are prohibitive for small firms¹¹ this leaves debt. As the firm's CDA approaches its upper limit the incentive to pay out dividends increases since once the limit is passed it is not possible to bring the CDA down by dividend payout.¹²

3.2.4 The Financial Structure of the Firm and the Overall Cost of Finance

While the cost of finance might vary according to source because of tax factors among other things, it may still be desirable for the firm to diversify its financial structure rather than finance fully using the low cost source. The reason is that a large proportion of debt in the firm's liabilities can expose its creditors and shareholders to risks of costs associated with bankruptcy. The fixed interest payments associated with debt may

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force a liquidation of assets in the event of an unforseen interruption in revenues or a rise in costs. In addition to the direct costs associated with bankruptcy there may be capital losses on the firm's assets if liquidation was forced at an inopportune time. These costs and losses would be borne by the shareholders and possibly the creditors of the firm. Consequently there may be implicit or explicit contractual limitations placed on the firm's ability to issue debt, such as a given ratio of debt to equity which cannot be exceeded or a given fraction of investment which must be equity financed. Alternatively, the firm may have to pay a higher interest rate on debt or yield a higher return on equity as its debt-equity ratio rises in order to compensate its creditors and shareholders for increased risk. A similar set of conditions influence the choice between new equity issue and retained earnings. On the one hand, new equity issue may permit greater risk spreading over a larger number of shareholders while on the other hand it dilutes ownership control as compared to retained earnings.¹³

In order to determine the overall cost of funds we shall now assume the firm raises funds in fixed proportions from each source so as to maintain some desired debt-equity ratio of $b = \frac{B}{E}$. Thus $\dot{B} = b\dot{E}$ where \ddot{B} is new borrowing and \dot{E} is the change in the value of equity. It is further assumed out of every dollar of funds raised from equity, a proportion "a" comes from retained earnings and portion "1-a" from new share issue. We can now find the cost of funds for a firm which finances in this manner.¹⁴

Now consider the cost of financing one dollar of gross investment and let β be the proportion financed by issuing debt and 1- β be the proportion financed by equity (retained earnings plus new shares issued). By our assumptions above, (1- β)(1- α) is the value of new equity issued per dollar of

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investment and $(1-\beta)a$ is the value of retained earnings. The real cost of finance can be expressed as a weighted average of the cost of funds from these three sources. In particular,

$$r = \beta r_{R} + (1-\beta)(ar_{RF} + (1-a)r_{NF}).$$

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The cost of funds from each individual source is given by (3.5), (3.6) and (3.7) for r_B , r_{NE} and r_{RE} respectively and "a" is assumed to be a parameter. It remains to determine β .

The value of β can be determined from the assumption that the firm maintains a given debt-equity ratio of b and by using the capital market equilibrium equation (3.2).¹⁵ From (3.2) it can be seen that for a given value of V_t , a reduction of one dollar in current dividends per share must be accompanied by a rise in the value of an existing share of (1-0)/(1-c) dollars. Thus, raising $(1-\beta)(1-\alpha)$ dollars through new issues and $(1-\beta)\alpha$ dollars through retained earnings will raise the value of equity by $(1-\beta)[\alpha \left(\frac{1-\theta}{1-c}\right) + 1-\alpha] = (1-\beta)\alpha$.¹⁶ The fixed debt-equity ratio requires B=bE so $\beta=b(1-\beta)\alpha$ or $\beta=b\alpha/(1+b\alpha)$. Thus β is determined by the value of the debt-equity ratio b and the value of α .

Using (3.5), (3.6) and (3.7) the weighted cost of funds can be written:

$$\mathbf{r} = \beta \mathbf{i} (1-\mathbf{u}) + (1-\beta) \frac{\rho}{1-0} (\beta + \alpha (1-\beta) (\frac{1-c}{1-0})) \pi$$
(3.8)

We shall call r the <u>real cost of finance</u>. It represents the reduction in a perpetual real dividend stream before personal dividend taxes that is equi-

valent to the reduction in the net worth of existing shareholders of a firm which raises a dollar of funds in the manner described. It depends upon the firm's financial structure (b,a), tax rates (u, c, θ) and interest rates (i, ρ). Attention is drawn to the special case where $\theta=c$ (so the cost of new equity issue and retained earnings are the same) for which:

$$r = \beta i (1-u) + (1-\beta) \frac{\rho}{1-\theta} - u$$
 (3.8')

where $\beta = \frac{b}{1+b}$.

In this case the real cost of finance is just a weighted average of i(1-u) and $\frac{\rho}{1-\theta}$ less the inflation rate. Since, as we shall see in Chapter 4, the difference between 0 and c may be small this is a useful simple case.¹⁷

The usefulness of the weighted average cost of finance given by r in equation (3.8) or (3.8') derives from the fact that it can be used as a discount rate by the firm in evaluating the net present value of the stream of revenues and costs accruing to the firm as a result of some capital expenditure. If this net present value is positive when discounted at r then the net worth of the shareholders will be raised. This result is proved and discussed in Auerbach (1979) and Boadway-Bruce (1980).

3.3 The Overall Cost of Capital

For an asset such as land which does not depreciate and is not allowed a tax deduction for capital consumption, the real cost of finance as given in equation (3.8) is the total marginal cost of capital. However, for depreciable assets such as plant, equipment and buildings and assets which turn over such as inventories there are other considerations. Depreciable assets bear costs of replacing them as they wear out and permit tax deductions for such costs which may bear little resemblance to actual depreciation. In addition, firms are allowed to credit some proportion (5% in 1977) of expenditures on plant, equipment and buildings against taxes due. Inventory capital also has special considerations; under FIFO rules inventory is costed at its value when placed in inventory whereas its addition to revenues when sold is equal to its current value. Also, an allowance of the opening value of inventory (3% in 1977) is permitted as a tax deduction in calculating business income. We now incorporate these factors into the cost of capital.

3.3.1 The Cost of Plant, Equipment and Buildings

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Suppose a unit of such capital can be purchased for one dollar at time t=0 and for $e^{\pi t}$ at time t. We shall use t=0 as the base period for expressing all constant dollar or "real" values. Assume the capital actually wears out at the exponential rate of δ and that the capital consumption allowance for tax purposes is based on an exponential depreciation rate of d on the value of the capital asset at the time of purchase (historic depreciation allowance). Finally let 1- ϕ be the investment tax credit. A unit of capital acquired at time t involves an outlay of funds of $\phi e^{\pi t}$ at time t and the receipt of a nominal stream of tax deductions equal to $e^{\pi t} \cdot de^{-d(z-t)}$ at time z for all z from z=t to z= ∞ . We can express these values in constant dollars of base t=0 by multiplying through by $e^{-\pi t}$ and $e^{-\pi 2}$ to get ϕ and $ude^{-(\pi td)(z-t)}$ respectively. Discounting the real stream of tax deductions at the real cost of capital r yields present value at time t of $\frac{ud}{r+d+\pi}$.

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Therefore the effective cost in constant dollars of a unit of capital is $\phi = \frac{ud}{r+d+u}$.

Now suppose a unit of physical capital installed at t=0 produces a real stream of earnings (at period t=0 prices) of X. From this we deduct real business taxes of uX and the cost of maintaining the machine as it wears out. The latter requires real expenditure of δ (the depreciation on a unit of capital) times $\phi - \frac{ud}{r+d+\pi}$ (the effective cost of a unit of capital). Thus the net real flow of revenues from an extra unit of capital forever is X(1-u) - $\delta(\phi - \frac{ud}{r+d+\pi})$. The firm will increase the net worth of its shareholders in acquiring the machine if X(1-u) - $\delta(\phi - \frac{ud}{r+d+\pi}) \ge r(\phi - \frac{ud}{r+d+\pi})$ or:

$$X \ge R_1 = \frac{r+\delta}{1-u} (\phi - \frac{ud}{r+d+u}).$$
 (3.9)

The expression for R_1 in equation (3.9) represents the minimum real gross of tax return on a unit of capital that must be earned before the firm would wish to acquire it. It is referred to as the <u>implicit rental cost of</u> <u>capital</u>, and depends on the cost of finance as given by equation (3.8), the corporate tax rate u, the true depreciation rate δ , the allowed depreciation rate d, the inflation rate π and the investment tax credit 1- ϕ . This cost of capital will differ according to the type of capital since δ , d and u will vary by type of capital and according to the size of the firm since r and u will vary by size of firms.

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The following comparative statics results can be derived.¹⁸ By differentiating the implicit cost of capital expression in equation (3.9) it can be shown that R_1 is decreased when the investment tax credit (1- ϕ) or the allowed depreciate rate d is increased. R_1 is increased when the cost of

finance r is increased providing the purchase price of capital net of tax credits and depreciation allowances ($\phi - \frac{ud}{r+d+u}$) is positive. However an increase in the corporate tax rate u will have an ambiguous effect on R₁. The higher the corporate tax the lower the net revenues earned by the firm but the greater are the value of tax writeoffs to the firm: depreciation allowances and, as already mentioned in section 3.2.3, the deductibility of nominal rather than real rate of interest on debt. Moreover, inflation has an ambiguous effect on R₁ as well. Inflation reduces the value of historical depreciation deductions but it can lower the cost of finance r when the marginal tax rate on interest income is lower than the corporate tax rate. Thus it is quite possible (and as to be shown in Chapter 4, quite probable) that higher tax and inflation rates can reduce the cost of capital to the firm.

3.3.2 The Cost of Inventories

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Firms are assumed to hold stocks of raw materials, intermediate goods and final goods in order to facilitate the processes of production and exchange. We make a number of simplifying assumptions. The firm is assumed to hold a constant level of physical inventory equal to K units over time. Thus we abstract from fluctuations in the level of inventory due to variability in sales or production and consider only the costs of holding the average level of inventory. We ignore relative price changes and assume that the price of the goods in inventory rises at the same rate as the general price level. We further assume there are no direct holding costs in the form of storage or waste although such costs could be incorporated into the analysis (see Boadway, Bruce and Mintz, (1980)).

Suppose the firm's inventory is turning over at some constant -

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rate and the firm produces and sells M units of goods each period, thus the average holding period of a unit of goods in inventory (T) will equal K/M. Under the first-in, first-out (FIFO) accounting rule, the firm is treated for tax purposes as if it places M units of newly produced goods into inventory and sells the M oldest units out of inventory. Goods in inventory are valued at their cost or fair market value at the time they are placed into inventory. Thus if we let KV denote the accounting value of goods in inventory, it will satisfy the equation:

$$KV_{+} = Me^{\pi t} - Me^{\pi (t-T)}$$

This can be solved for the level of KV at time t as:

$$KV_{t} = \frac{M(1 - e^{-\pi T})e^{\pi t}}{\pi}$$

To derive the cost of holding inventory, assume for the moment that inventory is not turning over. The real cost of finance for the inventory stock is rK where r is the real cost of finance given by equation (3.8). Now consider the flows of receipts and payments by the firm resulting from the turnover of inventory. The nominal flow of revenues from sales after corporate taxes is $Me^{\pi t}(1-u)$ at time t. The cost of $Me^{\pi t}$ and the tax deduction permitted for the cost of inventory sold is $uMe^{\pi(t-T)}$. Note that the tax deduction is based on the value of the goods when they were placed into inventory T periods ago. Finally, the firm receives a tax deduction equal to some fraction v of the accounting value of the inventory stock KV_t . Thus at time t, the nominal flow cost of holding inventory not counting the cost of finance is $uMe^{\pi t}(1-e^{-\pi T})(1-\frac{v}{\pi})$.¹⁹ This is expressed in constant dollar or "real" values by multiplying by $e^{-\pi t}$. Adding the real cost of finance we obtain the real flow cost of holding K units of inventory as:

$$TC = rK + uM(1-e^{-\pi T})(1 - \frac{v}{\pi})$$

Substituting K/M=T we can find the marginal flow cost of adding an extra unit to inventory by differentiating with respect to K to obtain:

$$MC = r + u(\pi - v)e^{-\pi I}$$

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The firm will add goods to inventory as long as the real flow of revenues or cost reductions after taxes made possible by holding an extra unit of inventory exceeds MC. Thus we can divide MC by 1-u to obtain:

$$R_2 = \frac{r + u(\pi - v)e^{-\pi T}}{1 - u}$$
(3.10)

 R_2 is the <u>implicit rental cost of inventory capital</u> and equals the gross of tax real return on a unit of inventory required for the firm to hold that unit.

From equation (3.10) it can be seen that the implicit rental cost of inventory capital depends on the real cost of finance r, the corporate tax rate u, the inventory tax deduction v, the inflation rate π and the inventory holding period T. By differentiation equation (3.10) it can be established that R₂ is increasing in r and decreasing in v. Providing π -v>0, R₂ is also decreasing in T. The effects of u and π on R₂ are ambiguous although it can be shown that R₂ is increasing in u providing $\frac{r}{1-u}$ is increasing in u and π -v>0.²⁰ Finally, we saw in Chapter 2 that the average holding period for inventory is a quarter or less. This is less than the tax assessment period and since we are assuming taxes are being paid instantaneously we can let T be arbitrarily small. In this case, the cost of inventory capital simplifies to:

$$R_{1} = \frac{r+u(n-v)}{1-u} .$$
 (3.10')

This expression is used in Chapter 4 when quantifying the cost of inventory capital by firm size.

3.4 Financing of Debt and Equity by Corporations

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It has been assumed until now that the financing of corporate business activities was done directly by individuals who held the debt and equity capital of the firm. All our cost of capital expressions were based upon that assumption. However, not all financing of firms is done in this way. Some of the equity and/or debt issued by non-financial corporations is owned by other non-financial or financial corporations acting as intermediaries for their shareholders or creditors. The purpose of this section is to consider how this institutional ownership of debt and equity capital influences the cost of capital of small and large corporations.

From the point of view of desirability one could argue that institutional ownership of capital should make no difference to the cost of capital of the firm. Funds should effectively flow through these financing institutions free of tax since they are merely performing an intermediation function on behalf of their ultimate shareholders and creditors. If one accepts this point of view, then the present system of corporate and personal taxation will be found wanting for two reasons both alluded to in Chapter 1. First, equity funds flowing through intermediaries do not do flow tax free since, although dividends are tax free, capital gains are taxed in the hands of the intermediary (except for mutual funds) and no relief is given later on. This "double taxation" of capital gains increases the cost of financing to the non-financial firm. The second source of problem arises out of the fact that the intermediary and the firm being financed may face different corporate tax rates due, for example, to the small business tax deduction. As we shall see below, this causes the flow-through of funds to be less than perfect and will influence the relative cost of financing small businesses by alternative sources of finance (e.g. debt vs. equity, institutional vs. individual). This section will investigate the implications of these anomolies in the tax system for the cost of financial capital.

Before doing so it is worth pointing out an alternate view of the taxing of intermediating corporations. Economists often regard the corporation tax as a method of taxing the pure profits (over and above normal profits) of a corporation. If the corporate tax system allowed firms to deduct all the true economic costs of operating a business, including the marginal opportunity costs of equity capital, then the corporate tax would amount to a tax on pure profits. According to this view, there is no reason why financial intermediaries should not be subject to the same corporate tax rules as non-financial firms since, in principle, there is no reason why they should not be earning pure profits. Unfortunately, the present tax system cannot be viewed as a tax on pure profits owing mainly to the non-deductibility of the costs of equity finance. Instead it is partly a tax on pure profits, but partly a tax on equity capital. In arguing, as we shall in this section, that the corporate tax distorts the cost of capital flowing through intermediaries

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we are essentially concentrating on the view of the corporate tax as a tax on equity capital and ignoring its role as a tax on pure profits. Alternatively, we are simply assuming that the intermediary earns no pure profits (say, from monopoly power). Some of the results of this section would have to be tempered if, in fact, intermediaries earned sizeable pure profits which ought to be taxed. For then, the extra tax levied on financial intermediaries would come at the expense of those pure profits and not be passed forward in a higher cost of capital to non-financial firms. However, let us proceed by assuming competitive conditions and no pure profits in the hands of financial intermediaries. We shall also ignore those corporations such as pension funds whose funds are untaxed either at the corporate level or ultimately in the hands of their owner households.

Let us begin by considering six alternative ways in which nonfinancial firms may obtain finance ultimately from individuals. Figure 1 depicts these ways schematically, where the direction of the arrows indicate the direction of the flow of funds and each arrow is labelled according to the type of finance, whether debt or equity. We use H to represent individual households, N to represent non-financial firms and F to represent financing firms (whether financial institutions or other non-financial firms).

Ι	Н			debt		—> N	
II	Н			equity		> N	
III	Н	debt	~	F	debt	N	
IV	Н	equity	>	F	debt	N	
۷	Н	debt_	··· >	ŀ	equity	N	
VI	Н	equity	>	F	equity	> N	

FIGURE 1

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These six cases are a simplification of reality in two ways. First, we have not distinguished between two sources of equity finance - new issues and retained earnings. This we shall do in the course of the discussion. Second, we have assumed only one step of intermediation. In fact, funds could pass through more than one intermediary on the way to the non-financial corporation. This would merely compound the arguments set out in this section without adding any points of qualitative difference so we leave it out.

3.4.1 Double Taxation of Capital Gains

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The discriminatory treatment of capital gains flowing through financial intermediaries can best be illustrated by focussing on case VI in Figure 1. This is the case in which instead of the household directly holding shares of the non-financial firm (case II), it holds them indirectly through the financial intermediary. The cost of capital to N is ultimately dictated by the requirement to provide an after tax return on equity to the household of ρ . As discussed in preceding sections, if the firm is financed directly by households, the cost of equity capital is $\rho/(1-\theta)$ if new issues are used and $\rho/(1-\theta)$ if new issues are used and $\rho/(1-c)$ for retained earnings. (For the sake of simplicity, we are ignoring inflation in this section).

These are also the flow costs of capital incurred by the financial intermediary on equity capital raised by households, and hence the after tax

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return that financial intermediaries must earn on their equity capital at the margin. Let us denote by $\rho_{\rm F}$ the rate of return required by the financial intermediary. $\rho_{\rm F}$ will be either $\rho/(1-0)$ or $\rho/(1-c)$ depending upon whether the equity finance comes from new issues or retained earnings.

Now let 0_F and c_F be the tax rate the financial intermediary pays on dividends and capital gains respectively. Using exactly analogous arguments as before and a similar capital market equilibrium condition to (3.4), we find the financial cost of new issues to financial institutions to be

 $r_{NE}^{F} = \rho_{F}/(1-\theta_{F})$

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Similarly, the cost of retained earnings is:

$$r_{RE}^{F} = \rho_{F}(1-c_{F})$$

If both dividends and capital gains flowed through the intermediary untaxed, $0_F = c_F = 0$ and the opportunity cost of equity capital to N would be ρ_F and would be unaffected by the intermediation.

However, while $0_F = 0$ (dividends are tax-free), $c_F \ge 0$ since financial intermediaries must pay tax on capital gains. This implies that the cost of financing by new issues will be unaffected by the tax since $r_{NE}^F = \rho_F$. However, the cost of using retained earnings owing to financial intermediaries will be increased since $r_{RE}^F = \rho_F / (1 - c_F) \ge \rho_F$. Thus, firms will find the opportunity cost of institutional financing by retained earnings to be higher due to the double taxation of capital gains. There will be an incentive to obtain equity financing from institutions by new issues rather than by retained earnings.²¹

The double taxation of capital gains will only bear disproportionately on small businesses to the extent that they rely relatively more on retained earnings on institutional equity capital as a source of finance. As pointed out in Chapters 1 and 2, however, small firms do not use much retained earnings as a source of finance in order that the firms may continue claiming the small business tax credit. The other sort of distorting influence to be discussed now bears directly on small businesses since it arises out of differential tax rates between intermediaries and the non-financial corporation receiving the finance.

3.4.2 The Effect of Intermediation on the Cost of Finance when Tax Rates Differ

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Differences in corporate tax rates are important since, with interest deductibility provisions in the corporate tax, the cost of finance will differ according to the corporate tax rate. Let us denote by u_N and u_F the corporate tax rate of the non-financial and financial firms depicted in Figure 1 respectively. Let us begin by considering the ultimate cost to N of financing in the six ways shown in Figure 1. To make matters simple let us initially ignore the double taxation of capital gains problem by assuming that equity finance comes from new issues only. Figure 2 summarizes the cost of financial capital to the non-financial intermediary from finances obtained in the various ways.

Cases I and II are familiar from earlier sections. The cost of debt capital to the firm in the absence of inflation is simply $i(1-u_N)$ while that of new issues is p/(1-u). If retained earnings had been considered the

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cost of capital would have been p/(1-c).

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Cases III and IV involve the non-financial firm obtaining debt from a financial institution. In Case III, F obtains its finance by debt

Case	Return required by H	Cost	of Capita to F	1	Cost of Capital to N
I	i				i(1-u _N)
II	ρ			>	p/(1-0)
III	i	>	i(1-u _F)	>	i(1-u _N)
IV	ρ	>	p/(1-0)	·····> 1 <u>^</u>	(1-u _N) (1-u _F)
V – –	i	>	i(1-u _F)		i(1-u _F)
VI	ρ	>	p/(1-0)	>	p/(1-0)

FIGURE 2 Costs of financial capital ignoring inflation

issue to households. Since interest costs are i, and since interest is taxdeductible, the cost of debt capital to F is $i(1-u_F)$. When the firm F holds the debt of N, interest payments become taxable at the rate u_F . At the same time interest paid by the firm N is deductible for tax purposes at the rate u_N . Since N must pay F an interest rate of i in order that F can pay households i, the cost of debt capital to N is $i(1-u_N)$, exactly the same as if the debt had been obtained directly from II.

In Case IV, F must be able to pay out $\rho/(1-\upsilon)$ before tax to H in

order that the net return on equity to H be ρ . If F obtains its financial income from interest, it must receive $[\rho/(1-0)]/(1-u_F)$ as a rate of return on debt since its interest is taxed at the corporate rate u_F . Then, since interest is tax deductible to N, the cost of debt finance becomes $\rho(1-u_N)/[(1-0)(1-u_F)]$.

Cases V and VI represent the costs of equity capital to N. Since we are ignoring the double taxation of capital gains here, equity income flows through F untaxed. Thus, the cost of equity capital to N is the same as the cost of the capital generated by F. These are $i(1-u_F)$ and p/(1-0) for debt and equity capital of F respectively.

A number of interesting implications can be drawn from these results. First, suppose that F and N both have the same corporate tax rates so $u_F=u_N$. In this case, debt held by individuals has an ultimate cost to user firms of i(1-u) and equity has a cost of p/(1-0) regardless of whether the funds go through on intermediary or not. The cost of capital of funds obtained by non-financial firms will be a weighted average of the costs of debt and equity capital to individuals, the weights depending upon the proportions of the finance ultimately obtained from household ownership of debt and equity. The manner in which the funds are obtained from intermediaries is irrelevant.

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Notice that if $\rho/(1-\theta) > i(1-u)$, as we would expect when marginal tax rates on interest income is low, the cost of obtaining equity finance from institutions would be less than from households, while the cost of obtaining debt finance from intermediaries would be more than from households. For example, equity finance from households costs $\rho/(1-\theta)$. Equity finance from institutions has a cost equal to a weighted average of i(1-u) and $\rho/(1-\theta)$

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where the weights are the proportions in which the intermediary is itself financed by debt and equity.

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These tendencies are strengthened if $u_N < u_F$, which would be the case for a small business corporation obtaining funds from a taxable financial institutions (except credit unions which are taxed at a low rate). The sale of equity to intermediaries has a cost equal to a weighted average of $i(1-u_F)$ and $\rho/(1-\theta)$. This can be cheaper than the cost of obtaining equity from households, $\rho/(1-\theta)$ when the tax rate on interest income (m) is relatively low (as $i(1-m_F)$). By the same token, obtaining debt from individuals is cheaper than obtaining it from financial institutions. The differential incentive for institutional vs. household financing will be stronger for small businesses than for large businesses owing to the smaller value of u_N .

The tendency for equity capital to be cheaper when obtained from institutions rather than households is reduced by the double taxation of capital gains. However, this only applies to equity financing out of retained earnings and not out of new issues.

To summarize this section, the existing corporate tax system influences the cost of capital to non-financial corporations according to whether the funds flow through intermediaries or not. In addition, it provides firms with an incentive to finance in one way rather than another. First of all, because capital gains on financial income are taxed, the cost of obtaining retained earning finance from financing institutions is increased. This discourages the financing of firms by retentions. We have already pointed out that the Cumulative Deduction Account discourages retentions for small businesses. The double taxation of capital gains on intermediaries provides a further disincentive to retain income and it applies to all corporations, large or small.

Also, the present tax system makes it cheaper for firms to obtain equity funds from financial institutions than from households; and vice versa for debt. These incentives are stronger for small corporations than for large.²²

3.5 Conclusions

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In this chapter, expressions for the cost of capital were derived for depreciable assets and inventories. With these expressions, we will be able to assess the differential impact of the tax system on small and large businesses. As shown in this chapter, the effect of taxation depends on the structure of capital, the method of financing, corporate and personal tax rates, tax credits, depreciation allowances, and inflation.

We have shown in this chapter that the effect of taxing small businesses at the low rate of corporate tax has an unambiguous effect on the real cost of capital. This surprising result arises from the fact that small businesses can lose on marginal investments from reductions in certain tax writeoffs such as nominal interest deductibility on debt and liberal depreciation allowances even though the net revenues earned by small businesses are taxed at a low rate. Thus empirical investigation, using the data provided in Chapter 2 and Appendix 3, is needed in assessing the differential impact of taxation on small versus large businesses.

Footnotes

- We shall ignore changes in the relative price of capital goods in terms of final goods although this could be included in the theoretical model.
- 2. In practice capital gains/losses are taxed/deducted when they are realized, not when they accrue. This allows a postponement of taxes due. Consequently, analyzing capital gains taxes on an accrual basis requires that the effective tax rate incorporate this postponement by the means of some average holding time. The details are found in Appendix 3.
- 3. A study of the transactions costs incurred in floating new issue by Roger Héroux (1980) found these costs to be very high for issues of less than one million dollars.

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- 4. This occurs because the nominal value of the asset is rising while the nominal debt remains constant. Maintaining full debt finance requires the firm to borrow in each period an amount equal to the increase in value of its existing assets. We ignore any capital market imperfections which prevent such "debt indexing".
- 5. We assume throughout that the firm has sufficient taxable income against which to claim any eligible deductions.
- 6. The appropriate tax rate depends on whether the business is incorporated or not and whether it is eligible for the small business tax deduction. The rate also varies by province.
- 7. This assumes new and old shareholders have identical personal tax rates.
- 8. If firms can be classified into risk classes within which income streams are perfectly correlated, this yields the famous Modigliani and Miller (1958) theorem to the effect that leverage cannot affect the cost of finance.

- 9. For this reason Stiglitz (1973) argues that capital would be fully debt financed at the margin.
- 10. We assume the market interest rate i adjusts under a change in inflation so as to keep the real after tax interest rate $i(1-m)-\pi$ constant or $\frac{di}{d\pi} = \frac{1}{1-m}$. Then differentiating r_E and r_B yields these results.
- 11. The Héroux study quotes brokerage costs of 11.63% on issues of less than a quarter of a million dollars while for issues in excess of 50 million dollars brokerage costs amounted to 6.17% (Héroux (1980), tables 4 and 5).
- 12. The CDA is augmented by taxable income Y less 4/3 of dividends paid out. If the small business credit applies so the tax rate is 25% then full dividend payout of after tax income (.75Y) will leave the CDA unchanged (Y - 4/3 x .75Y = 0). Once the firm loses the small business credit and pays the full corporate rate (48%) then full payout of dividends will raise its CDA (Y - 4/3 x .52Y > 0).
- These issues may be irrelevant since the same effects on risk spreading and ownership can be obtained by retaining dividends and splitting stocks.
- 14. , It may be useful to consider the constraints linking the financial variables of the firm. The basic identity is:

 $D \equiv Y(1-u) + TXC + V \cdot \dot{S} + \dot{B} - I$

where $Y \equiv [REV - C - iB - CCA]$.

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Here, Y is corporate income (the tax base), TXC is tax credits, S is number of new shares issued, I is gross investment expenditure, RLV is gross revenues, C is current costs, CCA is capital consumption allowances and other variables are as defined in the text of this chapter above. We also have

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$$NY \equiv Y(1-u) + TXC \equiv D + RE.$$

That is, net corporate income (NY) must be distributed or retained so:

 $VS + B + RE \equiv I.$

Using the capital market equilibrium equation (3.2) we can also obtain:

 $\dot{VS} = \frac{1-\theta}{1-C}$ (RE + PE - NY)

Thus a dollar of retained earnings out of given net corporate income will raise the value of existing shares by $\frac{1-0}{1-c}$ rather than one dollar. 15. Alternatively it could have been assumed that the firm finances some constant fraction of a dollar's investment through debt (i.e., β is a parameter). The qualitative nature of our results would not be changed. Since it is conventional to describe the firms financial policy in terms of the debt-equity ratio and since our data relate to this ratio, we have chosen to develop our theoretical framework in terms of a parametric debt-equity ratio.

16. Here α is the increase in the value of equity if a dollar of funds is raised by issuing new shares worth 1-a and retaining dividends of a. Notice that α =1 (a dollar of funds raised through equity raises the value of equity by one dollar) only if 0=c (the effective tax rates on dividends and capital gains are equal) or if a=0 (all equity finance is through new share issue).

17. This case is used in most of the theoretical literature. In particular, see Auerbach (1979) and King (1977). 18. Differentiating (3.9) we obtain:

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$$\frac{\partial R_{1}}{\partial (1-\phi)} = -\frac{dR_{1}}{d\phi} = -\frac{r+\delta}{1-u} < 0$$

$$\frac{\partial R_{1}}{\partial d} = -\frac{(r+\pi)u}{(r+d+\pi)^{2}} = 0$$

$$\frac{\partial R_{1}}{\partial r} = \frac{1}{1-u} \left(\phi - \frac{ud}{r+d+\pi} + \frac{(r+\delta)ud}{(r+d+\pi)^{2}}\right) \ge 0$$

$$if \phi - \frac{ud}{r+d+\pi} \ge 0.$$

$$\frac{\partial R_{1}}{\partial u} = \frac{R_{1}}{1-u} + \left(\frac{R_{1}}{r+\delta} + \frac{(r+\delta)ud}{(1-u)(r+d+\pi)^{2}}\right) = \frac{\partial r}{\partial u} - \frac{(r+\delta)d}{(1-u)(r+d+\pi)^{2}} \ge 0$$
where $\frac{\partial r}{\partial u} = -\beta i \le 0$

$$\frac{\partial R_1}{\partial \pi} = \frac{(r+\delta)ud}{(1-u)(r+d+\pi)^2} + \left[\phi - \left(\frac{ud}{r+d+\pi}\right)\right] \frac{1}{1-u} \frac{\partial r}{\partial \pi} \stackrel{>}{<} 0.$$

where $\frac{\partial \mathbf{r}}{\partial \pi} = \frac{\beta(\mathbf{m}-\mathbf{u})}{(1-\mathbf{m})} + \frac{(1-\beta)}{(1-\theta)} (1-\alpha(1-c)) \stackrel{>}{<} 0$.

- 19. The nominal flow of costs less receipts is $-(1-u)Me^{\pi t} + Me^{\pi t} uMe^{\pi(t-T)}$ $\frac{v}{\pi}(1-e^{-\pi T})e^{\pi t}$. Collecting terms this is equal to $uMe^{\pi t}(1-e^{-\pi T})(1-\frac{v}{\pi})$.
- 20. Differentiating R₂ in equation (3.10) yields:

$$\frac{\partial R_2}{\partial r} = \frac{1}{1-u} > 0$$

$$\frac{\partial R_2}{\partial v} = \frac{-u}{1-u} e^{-\pi T} = 0$$

$$\frac{\partial R_2}{\partial T} = \frac{-u(\pi-v)\pi e^{-\pi T}}{1-u} = 0 \text{ if } \pi-v \cdot 0.$$

$$\frac{\partial R_2}{\partial u} = \frac{1}{(1-u)^2} \left[(1-\beta) \frac{\rho}{(1-\theta)} - (\beta + \alpha(1-\beta) \frac{(1-c)}{(1-\theta)}) \pi \right] + (\pi - v) e^{-\pi T} \stackrel{>}{<} 0$$

$$\frac{\partial R_2}{\partial \pi} = \frac{1}{1-u} \left(\frac{\partial r}{\partial \pi} + u(1-(\pi - v)T) e^{-\pi T} \right) \stackrel{>}{<} 0$$

where $\frac{\partial \mathbf{r}}{\partial \pi}$ is equal to that shown in footnote 18.

21. This free flow through of new issues will no longer hold under inflation. Applying (3.6) to institutions and assuming θ_F =0, we obtain

$$r_{NE}^{F} = \rho_{F} - \pi(1-c_{F}).$$

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Since $c_F > 0$, the real return required on new equity issues to financial intermediaries will be increased in times of inflation.

22. In the past, financial institutions have not purchased equity shares of small businesses, most likely as a result of current regulations, limiting the ownership by financial institutions of the non-financial sector, in combination with the high transactions costs involved with the issuance of equity. In 1979, the federal government has allowed bonds (Small Business Development Bonds) issued by small firms to financial institutions to be treated as equity: interest would flow tax free to the bank but small firms would not deduct the interest from taxable income. This change in the tax law presumably overcomes any barriers associated with the issuance of equity.

Chapter 4

THE INFLUENCE OF TAXATION ON THE COST OF CAPITAL OF FIRMS IN CANADA

4.1 Introduction

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In this chapter we attempt to quantify the effect of corporate taxation on the implicit real cost of capital facing firms of different sizes using the theoretical framework of Chapter 3, the financial characteristics of firms by asset size as described in Chapter 2 and the effective tax rates and other relevant parameters from Appendix 3. As described in Chapter 3, the implicit real cost of capital is the minimum gross of tax rate of return that a capital investment must yield in order for the firm to find the investment profitable. We wish to establish whether the preferential taxation of small businesses appreciably reduces the cost of capital to them relative to larger firms under the assumption that, without taxation, all firms would have the same cost of capital. If the cost of capital is lower for small firms as a result of taxation, then we can conclude that taxation itself does not make financing of small business investment activities more costly compared to large firms.

There are several assumptions that we wish to make explicit before proceeding. Even though many of these assumptions have already been mentioned in previous chapters, it is appropriate in this introduction to review them and mention the limitations they impose on our analysis.

1. The cost of capital is based only on investments made in productive capital: land, buildings, plant and equipment and inventories. Financial capital such as cash and deposits, accounts receivable and other financial investments including those in affiliates are excluded.¹

2. All data are from the year 1977. We do not know whether the characteristics of firms in 1977 differ from those at present but there are several important changes in the tax law since 1977 that would affect the cost of capital calculations. For one, the dividend tax credit was increased substantially in 1978 which would reduce our measure of the effective tax rate on dividends.² For another, the investment tax credit was raised in 1978 from 5% to 7%. The present dividend tax credit would reduce the cost of new equity finance which is of more assistance to large compared to small firms as large firms rely more on new equity issues. However, our conclusions regarding the effect of taxation on the cost of capital will not be appreciably affected by these tax changes.

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3. The financial ratios (debt-equity and retained earnings-equity ratios) are based on end-of-year book data. The formulas derived in Chapter 3 for the cost of capital of firms require the use of ratios incorporating the changes in outstanding debt and equity components. As pointed out in Chapter 2, the end-of-year book data measures will overstate the debt-equity and retained earnings-equity ratios, but more so for large as compared to small firms. The effect of using this data would tend to understate the cost of capital for large firms but not to the extent to alter our final conclusions.

4. Firms are assumed to be owned by individuals resident in Canada. There is no institutional or foreign ownership of debt and equity issued by nonfinancial businesses. Moreover, large and small firms are as-

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sumed to be owned by the same shareholders so that the effective personal tax rate on each source of income is the marginal rate averaged over income classes.

5. Combined federal and provincial tax rates are used for corporate and personal income tax rates. Tax allowances and credits are based upon the Canadian Income Tax Act definition of taxable income.³ Provincial capital taxes and municipal property and business taxes are excluded from the calculations.

6. The calculations of the effective capital gains and dividend tax rates used in this chapter are based on the assumption that dividend and capital gains incomes are distributed identically across income classes and an adjustment has been made for the investment income deduction.⁴ In this particular case, the effective capital gains and dividend tax rates are equal so that the cost of equity is the same regardless of whether it is obtained by retained earnings or new share issue. Calculations based on other assumptions are given in Appendix 4.

7. Small and large firms are assumed to have the same risk characteristics and face the same market interest rate on debt and shareholders' discount rate on equity. This assumption is necessary since data on interest rate differentials by firm size were not available to us. Moreover, the assumption is useful as it allows us to isolate the effect of taxation on the cost of capital as the cost of capital would be the same for both small and large businesses in a world without taxation.

8. The prices of capital goods and output goods are assumed to

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rise at the same rate so relative price changes are ignored. Nominal capital gains or losses on the physical assets of the firm are excluded from profits.⁵

9. The direct costs of issuing debt and equity are ignored. Since these costs are likely to differ by size of firm, again the assumption will isolate the effects of preferential corporate taxation of small businesses.

On the basis of these assumptions we calculate the real cost of capital for large and small businesses. In section 4.2 we present the calculated values of the real cost of finance by source of finance and by firm size. In section 4.3 we present the calculated cost of productive capital by type of capital and by firm size. In order to determine the effect of the preferential corporate taxation of small businesses we compare the cost of capital calculated on the basis of the existing corporate tax rates to the values calculated on the assumption that all firms face the full effective corporate tax rate of 47% which was calculated for the largest sized firms in Appendix 3.

4.2 The Cost of Finance to Small and Large Businesses

In Chapter 3, expressions were derived for the flow cost of one real unit of debt (that is, one unit in terms of constant purchasing power), new share issue and retained earnings which are given by equations (3.5), (3.6) and (3.7) respectively. Assuming a constant debt-equity ratio and a constant proportion of retained earnings to the value of new shares issued, we can derive the average real cost of finance which is given by equation (3.8). We now calculate this real cost of finance from 1977 data in order

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to quantify the effect of preferential taxation of small businesses on this component of the cost of capital. Since the return on capital investments being financed is taxed at rate u, we divide the real cost of finance r by 1-u and calculate values of r/1-u.

In Table 4.1 the real cost of finance is given by type of finance (debt, equity, and average) and by firm size. Note that these costs are much smaller than the nominal interest rates faced by the firms since they take into account the declining real value of a given nominal debt due to inflation as well as the fact that the physical assets in which equity is held maintain their real value in the face of inflation. In fact, on the basis of nominal interest rates and inflation rates which existed in 1977, the real cost of debt was actually negative! Moreover, these negative debt costs were lower for large firms than for small firms. The flow cost of equity, on the other hand, increases by firm size from 5% for small firms to 7% for large. The average real cost of finance, which takes into account the relative importance of debt and equity in a firm's financial structure, is low (less than 2%) for all sized firms and does not change monotonically over firm size. As can be seen from Table 4.1, small firms have a lower real cost of equity finance but a higher real cost of debt finance as compared to large firms.⁶ The total impact of taxation on the cost of finance depends on the method of finance. Large firms have lower debt-equity ratios which tends to raise their cost of finance. The cost of finance is lowest for medium sized firms which have high debt-equity ratios and high corporate tax rates against which to deduct interest payments.

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TABLE 4.1: THE COST OF FINANCE (IN PERCENT) OF FIRMS BY ASSET SIZE FOR1977 (MINING FIRMS EXCLUDED).1

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	Asset Size of Firms							
	(\$ million)							
	0-1,	¹ ₄ -]	1-5	5-10	10-25	25+		
Debt $\left(\frac{r_{B}}{1-u}\right)$	2	7	-3.1	-4.4	-4.7	-4.7		
Equity $\begin{pmatrix} r_E \\ 1-u \end{pmatrix}$ (retained earnings or new issue)	5.0	5.2	6.3	6.9	7.0	7.0		
Weighted Average $\left(\frac{r}{\overline{1}-u}\right)$	1.22	1.42	.16	31	02	.99		
Weighted Average-Full tax rate or all firms	-2.37	51	64	45	02	. 99		

 Based on Case II (effective capital gains tax rate and dividend tax rate of 16%). Other cases are found in Appendix 4. In order to ascertain the net effect of the small business deduction we have also calculated the average real cost of finance by firm size when it assumed that all sized firms are taxed at the full effective corporate tax rate of 47% (which, in actuality, only applies to the two largest classes of firms) but assuming all other relevant parameters remain the same. In this case, the average real cost of finance would be negative for all sized firms except the largest. The smallest sized firms, which are the most highly levered, would have the lowest average real cost of finance.

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This result, that taxing smaller firms at the full tax rate would actually lower their real cost of finance, will seem surprising (and perhaps unbelievable) so it is important to explain exactly why it comes about. The reason is straightforward. In an economy where there is a positive expected inflation, the market interest will rise in order to compensate the lender for the expected reduction in the purchasing power of his principal that occurs over the interval. The borrower is willing to pay because the real value of his liability will be reduced by the same amount. Therefore the interest payments of the firm, which are deductible in calculating its taxable income, will include a component which is effectively repayment of real principal. As it turns out, firms which pay a high tax rate enjoy having the real value of their debt being paid off at the taxpayers' expense.

To see this, suppose that the market interest rate adjusts so that the expected after tax real interest rate given expected inflation π^* is the same as the after tax interest rate in the absence of inflation. That is,

$$i(1-m) - m^* = i_0(1-m)$$
 (4.1)

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where m is the marginal tax rate of the typical bond holder and i_0 is the market interest rate that would prevail if the expected rate inflation were zero. Solving for i and substituting into the real cost of debt finance given by equation (3.5), we obtain

$$r_{\mathrm{B}} = i_{0}(1-u) + \pi \star \begin{pmatrix} 1-u \\ 1-m \end{pmatrix} - \pi.$$

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Now let $\pi \equiv \pi^*$ since firms making ex ante decisions regarding investment expenditure assume that asset prices will rise by the expected rate of inflation and divide by l-u to get:

$$\frac{r_{B}}{1-u} = i_{0} + \frac{m-u}{(1-u)(1-u)} \pi^{*}$$
(4.2)

From equation (4.2), expected inflation will reduce the cost of debt finance providing the tax rate faced by the firm (u) exceeds the tax rate of the bond holders (m). The higher u and the higher π^* , the greater the reduction in $\frac{r_B}{1-u}$. In this case, the cost of debt finance is reduced at the expense of other tax payers. We also note that, if there is any unanticipated inflation, firms will realize pure profits that fail to be taxed (although unanticipated inflation does not affect decisions made ex ante).

This effect of high tax rates in reducing the cost of finance in the presence of expected inflation only applies to debt finance since only interest payments on debt are tax deductible. Lets consider the effect of expected inflation on $\frac{r}{1-u}$ for which the effective personal tax rates on dividends, capital gains and interest are all equal. In this case the average real cost of finance is given by:

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$$\frac{r}{1-u} = \frac{1}{1-u} \left[\beta i (1-u) + \frac{1-\beta}{1-0} \rho - u \star \right]$$
(4.3)

from equation (3.8) where $\beta = \frac{b}{1+b} \le 1$. Further assume that p=i(1-0) and recalling m=0 we substitute equation (4.2) into (4.3) to obtain:

$$\frac{r}{1-u} = \frac{1-ku}{1-u} i_0 + \frac{0-ku}{(1-u)(1-0)} \pi^*.$$
(4.4)

From this equation it can be established that when the expected inflation rate is zero, $\frac{r}{1-u}$ must rise as the tax rate u rises because $\beta \le 1$. Therefore, in an economy with a negligible inflation rate, the preferential taxation of small business will reduce their cost of finance relative to large firms. However, when π^* is positive and sufficiently large, a higher tax rate can actually reduce the real cost of finance. In this case, $\frac{0-\beta u}{(1-u)(1-0)}$ will fall as u rises. It can be shown that this will be the case when $0-\beta u = 0$.⁷

In order to see how high π * must be before this perverse case becomes likely, lets introduce some stylized facts. Let β =3/5 (a debt-equity ratio of 1.5) and u=1/2 for large firms and let β =3/4 (a debt-equity ratio of 3) and u=1/4 for small firms who are eligible for the small business deduction. Further assume that $i_0(1-0)=.02$ and $\theta=.2$. The data in Chapter 2 and Appendices 1 and 2 indicate that these are not unreasonable assumptions. Then for large firms

$$\left(\frac{r}{1-u}\right)_{L} = .035 - .25\pi *$$

while for small firms

$$\binom{r}{1-u}_{S} = .027 + .021u*.$$

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From these equations it is apparent that if $n^{*=0}$ small firms will enjoy a lower cost of finance as compared to large firms if they face the same interest rates. However, for large firms paying the full corporate tax rate, inflation reduces the real cost of finance in the order of .25 percentage points for each percentage point of inflation while inflation actually raises the cost of finance for small firms who are taxed at the preferential rate. If n^* exceeds .03 (an expected inflation rate of only 3%) the cost of finance for the large firms becomes lower than the cost of finance for small firms. Since actual and expected inflation rates in 1977 exceed 3% we can conclude that the lower tax rates faced by small firms will actually raise their real cost of finance $\frac{r}{1-u}$. It is for these reasons that the seemingly paradoxical results in Table 4.1 are obtained.

Finally, it should be noted that the deductibility of nominal rates of interest from corporate taxable income makes debt a more favourable source of finance for both large and small firms for the reasons just explained.⁸ Whether financing would tend to flow to large compared to small firms depends on the other tax write-offs such as the value of depreciation deductions which depend on the corporate tax rate. To evaluate this question, one needs to consider the implicit rental cost of physical capital.

4.3 The Implicit Rental Cost of Physical Capital

While the real cost of finance may be actually raised to small businesses by the small business deduction, this cost is only part of the implicit rental cost of capital. We now use the cost of finance estimates from Table 4.1 along with other information in order to calculate the cost of

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capital by firm size and asset type. Recall from Chapter 3 that the cost of capital is the gross real return on capital needed for the firm to just break even. For a nondepreciating asset like land, the cost of capital is simply the cost of finance. For depreciating assets such as structures, plant and equipment the cost of capital is given by equation (3.9) while for inventories the cost of capital is given by equation (3.10). These equations and the definitions of symbols are repeated below as (4.5) and (4.6) respectively.

$$R_{1} = \frac{r+\delta}{1-u} \left(\phi - \frac{ud}{r+d+u} \right)$$

$$R_{2} = \frac{r+u(u-v)e^{-uT}}{1-u}$$
(4.5)

r = average real cost of finance

 δ = true physical depreciation rate

d = depreciation rate according to capital consumption allowance (CCA)

T = holding period

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 π = inflation rate

u = corporate tax rate

 ϕ = one minus the investment tax credit

v = inventory tax deduction

Qualitatively it cannot be determined how the differential taxation of large and small firms affects the cost of capital by firm size. While large firms pay a higher tax rate on revenues, the higher rate increases the value to the firm of the deductions of nominal interest, depreciation and the inventory cost allowance. We already have seen that in an inflating economy the interest deduction actually results in the cost of finance being reduced by higher tax rates. Similarly CCA deductions, which are known to be higher than the actual depreciation rate, will benefit firms with high tax rates by more. Also, the inventory tax deduction is more valuable to the firm with a higher tax rate.

We can get a better idea of the effect of taxation on the cost of capital by calculating the cost of capital by finm size and asset type. We use the cost of finance estimates as calculated in the previous section along with values of the effective tax rates, the investment tax credit, capital consumption allowances, and the inventory deduction as calculated in the Appendices to construct Table 4.2. Table 4.2, like Table 4.1, is based on Case II assumptions -- other cases are shown in Appendix 4 and show the same general pattern. The average cost of capital is calculated using the relative proportions of each asset type held by firms in each size category. Also shown are the real cost of capital estimates for the case where all firms are assumed to face the full effective corporate tax rate of 47%.

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Table 4.2 indicates that the real cost of capital varies by asset type and firm size although variations in the cost of capital by type of assets are much larger. While the cost of capital for the smallest sized firm is lower than that of the largest sized firm for all asset types except land, there is no general tendency for the cost of capital to be lower for smaller size categories even though the firms eligible for the small business deduction are concentrated in the two smallest size categories. In fact, the cost of capital tends to be lowest for medium large firms (asset size between 5 and 25 million dollars) for all asset types except inventories. The average cost of capital, which takes into account differences in asset

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TABLE 4.2: REAL IMPLICIT RENTAL COST OF PHYSICAL CAPITAL BY TYPE AND

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FIRM SIZE FOR THE YEAR 1977 (MINING EXCLUDED)

	(\$ million)							
Type of Capital	0^{-1}_{4}	1 ₄ -]	1-5	5-10	10-25	25+		
Plant and Equipment (actual)	9.0	9.2	9.5	8.4	8.5	9.2		
(assuming full tax rate)	7.3	8.4	8.2	8.3	8.5	9.2		
Buildings (actual)	6.0	6.3	7.2	5.9	6.2	6.9		
(assuming full tax rate)	4.9	6.0	5.9	6.0	6.2	6.9		
Land (actual)	1.2	1.4	1.6	3	2	1.0		
(assuming full tax rate)	-2.4	5		5	2	1.0		
Inventories (actual) (assuming full tax rate)	3.1 2.3	3.6	5.3 4.1	4.2	4.5 4.5	5.7 5.7		
Weighted Average (actual)	5.6	5.6	6.6	5.5	$5.8 \\ 5.8$	7.3		
(assuming full tax rate)	4.3	5.4	5.3	5.5		7.3		

 Based on Case II (effective capital gains tax rate and dividend tax rate of 16%).

Asset Size of Firms

structure by firm size, indicates that the cost of capital varies little by firm size except for firms in the third and sixth asset size categories.

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We can compare these figures to the cost of capital estimates calculated on the assumption that all firms face the full effective corporate tax rate of 47%. This comparison indicates that the preferential taxation of small businesses actually raises the implicit rental cost of capital to small firms for all types of capital except for inventories. The average real cost of capital is reduced in the full taxation case for the three smallest size categories (the three largest size categories remain unchanged since they are taxed or nearly taxed at the full corporate tax rate). In fact, the table indicates that the small business deduction raises the average real cost of capital by 1.3 percentage points for firms in the smallest size category. Since not all firms in this category are eligible for the small business deduction, the actual increase may be greater than 1.3 percentage points.

Finally it might be mentioned that the fact that the lower tax rate faced by a small firm will increase its cost of capital is not inconsistent with the fact that the higher tax rate might raise the current tax liability of the firm. First of all, the implicit rental cost of capital is the minimum return required on an investment to be profitable. To the extent that the firm invests in capital which yields higher returns than this minimum, the pure profits associated with these investments will be taxed at the corporate tax rate faced by the firm. Secondly, even on a marginal investment the current tax flow will be increased if offset by reduced taxes in the future. Recall that the implicit rental cost of capital is the con-

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stant return which has the same value to the firm as the actual return stream of the investment. The actual stream may vary over time. For example, if the actual stream exceeds the implicit rental cost in the early years of the investment and is less during the later years, then a higher tax rate can increase current taxes payable at the same time that it lowers the implicit rental cost (as taxes paid may be negative in the future). In an economy where net capital formation is continually occuring, the tax proceeds may be higher in every period. Third, in our analysis, we had assumed that a full loss offset is granted to firms such that taxable losses are written off against past or future taxable income or that the government pays negative taxes on taxable losses at the corporate tax rate. Actually, the full loss offset is imperfect in that losses are carried forward five years or back one year (with no adjustment for interest) and written off taxable income earned in those years. Firms that experience taxable losses over several years may not use the loss offset provisions provided in the tax law. Hence, current corporate taxes paid by all firms may remain positive as some firms cannot take advantage of loss offset provisions.

4.4 Conclusions

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The analysis in this chapter casts doubt on the hypothesis that the small business tax deduction will encourage the financing of investment by small firms eligible for the deduction. In fact the small business deduction in some instances raises the cost of capital to them relative to large firms and thus discourages investment by small firms.

The reason for this preverse result is that firms eligible for the

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small business tax deduction lose tax write-offs that happen to offset any gain to these firms in having their net revenues taxed at a low rate. In an economy where interest rates incorporate an inflation premium sufficient to maintain the real return to lenders, the deduction of interest payments by firms facing a high tax rate effectively means that their real liabilities are reduced at the expense of taxpayers. Highly-levered small firms would particularly gain from this phenomenon if they were fully taxed. Moreover, the higher corporate tax rate increases the value of depreciation tax allowances to the firm. When depreciation allowed for tax purposes is greater than the true rate of depreciation, firms can gain at the expense of the government. This has been of especial importance to firms owning plant and equipment capital which is liberally treated under tax law. Large firms facing higher corporate tax rates gain more from tax depreciation writeoffs compared to small firms. The above two tax write-offs are of sufficient importance that we cannot say the small business tax credit encourages the growth of small firms relative to large firms.

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Footnotes

1. Small businesses hold more cash and deposits and accounts receivable as a proportion of total assets compared to large firms while large firms hold more investments in affiliates than small firms. As discussed in Appendix 2, one can assess the impact of taxation on the cost of capital of holding financial assets if one knew the explicit or implicit interest paid on these assets. Cash and deposits create one particular problem. While inflation could act as a tax on cash and deposits, the impact depends upon the extent to which financial institutions pay explicit or imputed interest on deposit accounts. Canadian banks do pay interest on demand deposits held by corporations and imputed interest may be earned if institutions reduce service charges below cost in order to attract more deposits (see Santamerro and Barro (1972)).

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- 2. The gross-up of dividends was increased from $\frac{1}{3}$ to $\frac{1}{2}$ and the federal dividend tax credit was raised from 18.75% to 25% in 1978. (See National Finances (1977-78) and the 1977 Income Tax Guide).
- 3. For most provinces, the corporate and personal income tax base is the same as the federal tax base. In 1977, Ontario and Quebec had their own corporate income tax acts but both provincial acts' definitions of corporate taxable income was similar to that of the federal government with some exceptions such as incentives provided for certain types of capital in Ontario. Quebec has its own personal income tax base. The most important deviation from the federal tax base in 1977 was with regard to Quebec's personal income exemptions. While Quebec's exemption level for

a family of four was approximately \$1000 higher than that of the federal government, the effect of not making an adjustment for Quebec's taxable income in our estimate of the combined federal and provincial income tax rate is of very small consequence.

- 4. An allowance could also be made for those individuals who save income only through pension and registered retirement saving plans and have not reached the limit allowed for preferential tax treatment. While the correction for the investment income tax deduction may be overstated (see Appendix 2), including other forms of preferentially tax-treated income may make our estimates of tax rates seem high.
- 5. In Appendix 3, we indicated that the industry selling and plant and equipment price indices rose faster than the consumer price index during the years 1974-79. Thus real capital gains would have been earned on inventories and plant and equipment which would reduce the real cost of capital for both large and small firms.
- 6. Small firms have a lower real financial cost of capital than large firms in other cases reported in Appendix 4 although medium-sized firms still have the lowest financial cost of capital. See Tables A4.1 to A4.3.
- 7. Let $\eta = \frac{\theta \beta u}{(1 u)(1 \theta)}$. Then $\frac{d\eta}{du} = \frac{-\beta}{(1 u)(1 \theta)} + \frac{1}{(1 u)}\eta$. Thus, if $\eta < 0$ which will be the case if $\theta \beta u < 0$, then $\frac{d\eta}{du} < 0$.

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8. As explained in Chapter 3, institutional ownership complicates matters considerably. As small finus face a lower corporate tax rate compared to an institution, equity financing of small firms by institutions could be encouraged. On the other hand, the Cumulative Reduction Account dis-

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courages retained earnings as explained in Chapter 3, leaving new equity issues to institutions as the only favourable source of finance for small firms from a tax point of view.

CHAPTER 5

SUMMARY AND RECOMMENDATIONS

5.1 Introduction

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The purpose of this study has been to investigate the impact of the tax structure on the cost to small businesses of financing and carrying on its real investment activities. We have concentrated on income taxes, both corporate and personal, since these are the taxes which are most likely to have a differential effect upon small as opposed to large businesses. In addition, data on these taxes were readily available to us in a form compatible with the balance sheet data.

Our investigations have included both an <u>a priori</u> discussions of the manner in which the detailed income tax structure impinges upon the behaviour of firms as well as an analysis of the observed financial and real capital structures of firms of various sizes. Since our theoretical considerations suggested that the impact of taxes depended upon these characteristics of firms, the data made available to us has been useful for determining the order of magnitude of the effect of the tax treatment of small versus large businesses. Indeed, even if large and small businesses had faced exactly the same tax regulations, the relative tax impact would have differed as long as the structural characteristics of the firms differed.

In this concluding Chapter we shall begin by summarizing once again the observed characteristics of firms and our findings about the relative impact of the income tax system on small versus large businesses. Following this some discussion of the impact of the small business tax credit will be presented since this is the main policy tool intended to assist small businesses. Finally, some tentative policy recommendations will be suggested in the light of the results obtained in this study.

5.2 Summary of Results

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Our analysis was confined to considering how the tax system influenced the marginal costs and benefits of various courses of action available to firms, both as regards expenditure decisions and financing decisions. It will be useful to recall the major ways in which the tax system would be expected to affect costs and benefits at the margin. There will as well be infra-marginal effects especially since, with different tax rates for small and large businesses, less total tax liabilities would be incurred by small firms than if they had to pay the ordinary corporate tax rate. We shall return to these infra-marginal benefits later.

The main provisions of the tax system influencing the financing and investment decisions of firms are the following:

- 1. Nominal interest deductibility on debt.
- 2. Historic write-off for real capital and inventories.
- Differential tax rates for small businesses and the eligibility rules for the small business tax credit.
- Various incentives including accelerated depreciation, investment tax credits, and employment tax credits.

Each of these provisions of the tax system might be expected to have a differential impact on small versus large businesses for reasons to be discussed below. The fact that firms are allowed to deduct the nominal interest payment on debt has several implications. Ignoring inflation for the moment, if all firms had the same ratio of debt-to-equity, this write-off would be of more value to large than to small businesses as a means of reducing their cost of financial capital since the tax rate is higher for large businesses. However, this benefit is offset by the tendency of small businesses to have higher debt-equity ratios. Although their write-off is against a lower tax rate, a larger proportion of their liabilities are eligible. The benefit of these interest write-offs is increased in periods of expected inflation since it is nominal rather than real interest that is written off. This means that part of the interest written off represents a reduction in the real principal of the loan.

Our results indicate that these conflicting tendencies tend to be roughly offsetting. Tables 4.1 and A4.1 - A4.3 indicate that the combination of taxation and inflation has actually reduced the real cost of financial capital to firms. However, it does not appear to have reduced it any more for small than for larger firms (except for the very largest).

While our investigations must of necessity be confined to impact effects using observed debt-equity ratios, it is quite likely that the relative favouring of debt finance encourages firms to increase their leverage for tax reasons. We have no evidence to indicate that this should be greater for small relative to large firms, although the tax incentive would seem to be greater for the latter. Besides taxes, bankruptcy and transaction costs influence the choice of financing plus observed debt-equity ratios are affocted by these costs which may vary across firm size and help determine the

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optimal financing policy of firms. By the same token, the preferential treatment of capital gains over dividends may provide an incentive to finance by retained earnings rather than new equity issues. However, with the very generous dividend tax credit now in existence, it is unlikely that such an incentive be very large, if it exists at all.

The next category of tax effects at the margin concerns the requlations for the write-off of real capital and inventories. Depreciable assets are written off at rates in excess of their physical depreciation rate but on the basis of historic cost. In periods of inflation, the actual writeoff could be above or below "true replacement depreciation" depending on the strength of the offsetting influences at work. Also, inventories are written off at historic, or more accurately FIFO, rates which will be below replacement rates in periods of inflation. This is only partly compensated for by the inventory allowance of 3%. The relative impact of these rules upon large versus small businesses depends upon the relative proportions in which the assets of large and small businesses are divided among the different types of real capital, land, and inventories. In Chapter 2 we found that small businesses tend to hold more land and fewer buildings than large businesses. Thus, small businesses tend to hold relatively more of those assets which do not benefit from the excessively generous write-off rates for depreciation. As well, although they do not hold larger amounts of inventories, they hold them for a shorter period of time. As shown in Chapter 3, the marginal cost of holding inventories is reduced by the length of the holding periods as firms can postpone the payment of taxes longer. However this effect is miniscule due to the shortness of inventory holding periods by all firms as discussed earlier.

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Next, the lower tax rate for small businesses, while it reduces the value of write-offs, also reduces the gross return that the investments must yield to cover costs. As such it could provide a marginal benefit to small business over large business in terms of the incentive to invest. At the same time, the manner in which the small business tax credit is instituted causes certain distortions on the financial side of the firm. Since the CDA is increased whenever dividends are paid out there is a strong incentive for firms to substitute external financing (either debt or new equity issues) for retained earnings. This stipulation also has the effect of virtually eliminating the upper limit on cumulated profits of the firm which are eligible for the small business tax credit.

Finally, the various forms of tax credit and tax incentives available to corporations likely have a differential impact on small versus large firms. For those which operate by effectively increasing the deductions available to firms, such as depletion allowances and accelerated depreciation, the benefit is greater to firms with higher tax rates since the value of tax savings is higher. The same might be said for the employment tax credit the value of which is added to taxable income. On the other hand, true tax credits like the investment tax credit have values which do not vary with the tax rate. The investment tax credit will, however, be more valuable to more capitalintensive firms. Our data do not provide us with any information on the capital intensities of large versus small firms.

From this discussion it is apparent that the tax system influences the decision-making of small and large firms in many diverse and often conflicting ways. We have already remarked that there is no marked tendency

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for the cost of financing to be either higher or lower for small versus large firms on account of the tax system. On the other hand, the overall incentive to invest is influenced not only by the cost of finance but also by the sum total of other tax provisions affecting the marginal cost of investing including the differential tax rate itself. Here the evidence does indicate some favouring of small business. The appropriate comparison is among the user costs of capital for various types of capital by size of firm. This indicates the gross marginal flow costs that must be covered by investment expenditures undertaken. Tables 4.2 and A4.4 - A4.6 indicate that for inventory and buildings, the user cost of capital is lower for small firms than for larger ones. For plant and equipment and land, the user cost of capital for small business is about the same as large firms but higher than mediumsized firms. Overall, small businesses face a lower cost of capital. In all cases, except for inventories the real user cost of capital at the margin has actually been reduced by the tax system for small businesses. Thus, even though the cost of financing has not been reduced, the tax system still provides a positive stimulus to investment in small business relative to large businesses.

The differential effect of taxation on the marginal cost of capital of small and large businesses has not been due to the preferential tax rate afforded to small business as one would first expect. Indeed if small businesses faced a higher corporate tax rate, their user cost of capital would be reduced even more relative to large firms for all forms of capital (see Table 4.2). This surprising outcome is a result of the higher tax on net revenues being more than offset by the increase in nominal interest and capi-

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tal consumption allowances afforded to those firms. Small firms benefit more relative to large firms from nominal interest deductions as the former are more highly debt-financed. Thus we conclude preferential tax treatment of small businesses is a result of the provision for the deductibility of nominal interest costs from taxable income.

We should stress at this point that true cost of capital for small businesses may be higher than that for large businesses even though taxation has reduced the former's cost of capital relative to the latter. The reason is that we have not incorporated differences in risk and transactions costs that influence the costs of financing. We can say that if small businesses face a higher cost of capital compared to large firms (as evidence in Chapter 2 points to small firms being riskier), then taxation reduces to a degree the differences between large and small firms and makes financing more available to small firms.

5.3 An Assessment of the Small Business Tax Credit

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From the above results we see that the favourable treatment that small businesses receive from the tax system is due to the deductibility of nominal interest rather than the small business tax credit. The small business tax credit does not help cause the overall user cost of capital to be lower for small compared to large firms since much of the effect of the low corporate tax rate is mitigated by the reduced value of tax write-offs for nominal interest and depreciation. In this section, we investigate some of the consequences, adverse and otherwise, of government reliance on the small business credit as a means of assisting small business.

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How one assesses the success of the small business tax credit depends upon how one views the special needs of small businesses that call for discriminatory treatment. We shall argue in this section that at best the small business tax credit is an inefficient way to achieve what we perceive to be the aims of assisting small businesses.

The overall impact of the small business tax credit is twofold. First it does not seem to reduce the marginal cost of investing for small businesses nor the cost of financing. Thus the intention of assisting the small business through the small business tax credit has not been to assist in financing investment. Second, the small business tax credit presumably has infra-marginal benefits to small businesses. Since they face a lower tax rate, after-tax profits for infra-marginal investments will be higher than they otherwise would be. These after-tax profits can be viewed as providing a useful source of finance to small businesses which otherwise might find it more difficult than larger firms to tap outside sources of funds due to riskiness, transactions costs, etc.

There are however two reasons for downplaying these benefits of higher infra-marginal profits. First, because of the way in which the CDA operates firms are encouraged, indeed obliged, to pay out profits rather than to retain them. This will be especially so for fast-growing, highly profitable small businesses which are the sort that one would wish to assist most. Second, the funds made available by the higher after-tax profits come at a point in time when positive cash flow is being generated by the firm from an investment rather than when financing is needed for the initial investment as any losses are carried forward and firms may not be able to borrow against their tax write-offs. Thus, they are most useful for ongoing

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concerns rather than for firms heavily engaged in new investment and generating negative cash flows. It seems to us that to the extent that small businesses deserve special attention, they require assistance in obtaining finance when investments are undertaken rather than when returns are coming in. The small business tax credit does not provide any assistance with the financing of new investments by small firms with good growth potential. What assistance it provides comes after the fact.

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In addition, the existence of the preferential rate for small businesses gives rise to a number of distortions in the economy, especially on the financing side.

a) We have already mentioned the fact that the CDA discourages financing by retentions and effectively perpetuates eligibility for small business deductions.

b) The dividend tax credit provides a valuable fillip to small businesses since it greatly over compensates shareholders for taxes paid on their behalf.

c) The existence of two different rates on financial institutions and small businesses gives an additional incentive to obtain equity finance through institutions rather than individuals. In addition, the taxation of capital gains on intermediaries introduces an element of double taxation which could be avoided.

d) Because of the joint effect of the CDA encouraging external finance and the high transaction costs of obtaining new equity finance, small firms have had to rely more on debt finance. If the problem facing small firms is the difficulty of obtaining external finance to begin with, encouraging external finance hardly seems appropriate. The induced higher

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leverage also increases the probability of bankruptcy which in itself is socially wasteful and increases the difficulty of obtaining finance.

In summary, while the small business tax credit helps small businesses to increase infra-marginal profitability, it does nothing to stimulate investment by small firms and to assist in the financing of small firms at the time in which the financing is most needed. On the contrary, it makes that financing more difficult to obtain by strongly discouraging retentions.

5.4 Recommendations

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Small businesses are not adversely treated under the tax system. On the contrary, they are treated more beneficially than are other firms. However, as argued above, the form that this preferential treatment takes is 'hard to justify on economic grounds. It is hard to think of any clear cut economic arguments for treating small businesses preferentially. In making our recommendations we take the view that to the extent that such arguments exist they arise out of difficulties small businesses face in obtaining finance for profitable ventures vis-à-vis large firms. Consequently our recommendations will be geared to making the tax system more conducive to the financing problems of small businesses rather than to their profitability as is now the case.

It is apparent that the small business tax credit is unsuitable for this job and in addition introduces other distortions into the decisionmaking of firms. We would abolish it. If it were desired to undertake special policy measures to assist the financing of small businesses, two alternative sorts of measures suggest themselves both of which are designed to get funds into the hands of small businesses in times of negative cash flows:

1. Direct loans, guarantees or equity participation by governments. By these methods the government selectively places funds in the hands of business or guarantees them when investments are being undertaken. The problem with this approach is that it is essentially discretionary in the hands of the government and thus may involve relatively heavy administrative costs, especially since most loans will be of relatively small scale since they will be intended for small businesses. Whether or not it is desirable to extend the use of discretionary provision of loans to small businesses is a matter for political judgement.

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2. Full loss offset cash flow taxation as well as other forms of tax credit: A particularly attractive way of getting funds to small businesses when they need it (without necessarily subsidizing them) would be to tax small businesses on a cash flow basis and allow a full loss offset in the form of negative taxes. We have elsewhere argued the merits of applying the principle of cash flow taxation to corporate taxation in general on the grounds that it is an administratively simple way of taxing corporate profits neutrally or economically-efficiently.¹ Its applicability to small business would be particularly appropriate. Under cash flow or flow-of-funds taxation firms would deduct all expenses when incurred, whether of a current or a capital nature. As well, all revenues would be included in the tax base when received (rather than when imputed as under the current system). This has important implications on the time pattern of tax liabilities (though not necessarily on their present value). In particular, in periods of rapid investment and growth, when firms are generating negative cash flows tax liabilities would be negative. If these liabilities were actually made available to firms

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a valuable source of finance would be available. The amounts could be sizeable if small businesses were liable for full corporate tax rates.

Such a scheme has the advantage of being non-discretionary and of helping the śmall businesses when they need it most. As well, it would impose no additional costs to the government in present value terms. It would be virtually analogous to the government acquiring a share of the corporation since it would share in both the costs and revenues generated by the latter. But at the same time control would rest with the corporation itself. It seems to us that this would be the most sensible way to assist in the financing of small businesses. If further assistance of a discriminatory nature were desired, and it is hard to see why it should be, investment or employment tax credits could also be used, once again with the provision of full loss offset.

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It is worth stressing in closing that full loss offsetting is an essential element of this package since it is through it that finance actually gets to the hands of the firm. It is all the more important under a cash flow system of taxation in which tax liabilities naturally tend to be negative in early years of heavy investment. One difficulty for the government in providing negative taxes when losses are initially incurred is that it may encourage business enterprises to start up and fail as a result the lack of effort put forth by entrepreneurs as such effort imposes costs on entrepreneurs in terms of the time taken to evaluate and execute investments. These entrepreneurs may not take care to ensure that investments are profitable because the government pays for a portion of the investment (the portion being determined by the tax rate) without any direct control over

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decision-making. This "moral hazard" problem can be solved if the government ensures that it has a claim along with secured creditors on the physical assets of the firm since the government finances the acquisition of capital through the tax system.

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APPENDIX 1: FINANCIAL CHARACTERISTICS OF FIRMS BY ASSET SIZE AND BY INDUSTRY

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Footnotes

1. See Boadway, Bruce, and Mintz (1981).

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Industry	Asset Size Category (\$ Mil.)						
	0-0.25	.25-1	1-5	5-10	10-25	over <mark>2</mark> 5	
Mining & Mine Products	0.27	0.26	0.23	0.15	0.14	0.17	
Forest Products & Other	0.30	0.35	0.38	0.48	0.42	0.53	
Furniture	0.27	0.29	0.21	0.39	0.29	0.25	
Business Services	0.61	0.62	0.62	0.61	0.62	-	
Hotel	0.44	0.50	0.56	0.58	0.66	0.79	
Construction	0.62	0.72	0.74	0.74	0.72	0.65	
Retail Trade II	0.07	0.04	0.03	0.04	0.05	0.03	
Food and Beverage	0.49	0.51	0.54	0.57	0.56	0.51	
Agriculture	0.23	0.19	0.27	0.38	0.34		
Other Services	0.08	0.19	0.21	0.13	0.16	0.22	
Retail Trade III	0.55	0.54	0.52	0.49	0.51	0.32	
Retail Trade I	0.02	0.05	0.03	0.03	0.01	0.01	
Machinery & Electrical	0.42	0.31	0.51	0.68	-	0.62	
Textile II	0.39	0.43	0.44	0.40	0.40	0.24	
Chemical & Rubber	0.78	0.74	0.74	0.63	0.76	0.58	
Fabricating	0.63	0.71	0.71	0.63	0.53	0.50	
Transport	0.58	0.63	0.67	0.63	0.67	0.61	
Leather & Textile I	0.66	0.74	0.76	0.75	0.70	0.65	

Table A1.1: THE PROPORTION OF INVENTORIES TO THE TOTAL OF INVENTORIES AND NET FIXED ASSETS FOR FIRMS BY ASSET SIZE AND INDUSTRY GROUP FOR THE YEAR 1977

Source: Statistics Canada

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Industry	Asset Size Category (\$ Mil.)							
	0-0.25	.25-1	1-5	5-10	10-25	over 25		
Mining & Mine Products	0.06	0.04	0.03	0.02	0.01	0.01		
Forest Products & Other	0.06	0.05	0.04	0.03	0.03	0.02		
Furniture	0.03	0.03	0.04	0.02	0.01	0.01		
Business Services	0.05	0.03	0.04	0.03	0.02			
Hotel	0.05	0.07	0.04	0.04	0.03	0.02		
Construction	0.05	0.04	0.03	0.03	0.03	0.04		
Retail Trade II	0.13	0.18	0.18	0.16	0.15	0.10		
Food & Beverage	0.02	0.05	0.03	0.03	0.02	0.02		
Agriculture	0.23	0.36	0.26	0.23	0.41	-		
Other Services	0.11	0.15	0.07	0.05	0.04	0.04		
Retail Trade III	0.02	0.04	0.03	0.03	0.03	0.02		
Retail Trade I	0.04	0.06	0.14	0.06	0.04	0.03		
Machinery & Electrical	0.12	0.15	0.13	0.06	-	0.04		
Textile II	0.03	0.04	0.04	0.05	0.03	0.03		
Chemical & Rubber	0.02	0.03	0.02	0.05	0.01	0.05		
Fabricating	0.04	0.05	0.04	0.04	0.05	0.04		
Transport	0.02	0.02	0.02	0.02	0.02	0.02		
Leather & Textile I	0.02	0.01	0.01	0.02	0.02	0.03		

Table A1.2: THE PROPORTION OF LAND TO THE TOTAL OF INVENTORIES AND NET FIXED ASSETS FOR FIRMS BY ASSET SIZE AND INDUSTRY GROUP FOR THE YEAR 1977

Source: Statistics Canada

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Industry	Asset Size Category (\$ Mil.)							
	0.025	.25-1	1-5	5-10	10-25	over 25		
Mining & Mine Products	0.45	0.42	0.41	0.31	0.29	0.41		
Forest Products & Other	0.42	0.42	0.37	0.34	0.37	0.30		
Furniture	0.60	0.59	0.50	0.44	0.51	0.56		
Business Services	0.25	0.20	0.22	0.19	0.22	-		
Hotel	0.43	0.33	0.31	0.28	0.22	0.14		
Construction	0.24	0.17	0.14	0.13	0.15	0.21		
Retail Trade II	0.38	0.27	0.21	0.25	0.23	0.24		
Food and Beverage	0.39	0.31	0.32	0.28	0.29	0.35		
Agriculture	0.38	0.30	0.26	0.19	0.10	-		
Other Services	0.56	0.45	0.41	0.57	0.54	0.66		
Retail Trade III	0.37	0.28	0.31	0.32	0.27	0.47		
Retail Trade I	0.86	0.78	0.72	0.79	0.85	0.80		
Machinery & Electrical	0.32	0.27	0.16	0.13	-	0.23		
Textile II	0.48	0.38	0.39	0.39	0.40	0.54		
Chemical & Rubber	0.13	0.13	0.13	0.17	0.13	0.18		
Fabricating	0.25	0.15	0.16	0.24	0.30	0.35		
Transport	0.34	0.27	0.21	0.22	0.21	0.26		
Leather & Textile I	0.24	0.19	0.16	0.14	0.16	0.21		

Table A1.3: THE PROPORTION OF PLANT AND EQUIPMENT TO THE TOTAL OF INVENTORIES AND NET FIXED ASSETS FOR FIRMS BY ASSET SIZE AND INDUSTRY GROUP FOR THE YEAR 1977

Source: Statistics Canada

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Table A1.4: THE PROPORTION OF BUILDINGS TO THE TOTAL OF INVENTORIES AND NET FIXED ASSETS FOR FIRMS BY ASSET SIZE AND INDUSTRY GROUP FOR THE YEAR 1977

Industry	Asset Size Category (\$ Mil.)						
	0-0.25	.25-1	1-5	5-10	10-25	over 25	
Mining & Mine Products	0.0/	0.09	0.10	0.07	0.07	0.13	
Forest Products & Other	0.21	0.17	0.20	0.15	0.18	0.15	
Furniture	0.09	0.05	0.07	0.11	0.14	0.14	
Business Services	0.09	0.07	0.12	0.17	0.14	-	
Hotel	0.07	0.10	0.08	0.09	0.08	0.05	
Construction	0.08	0.07	0.09	0.10	0.10	0.10	
Retail Trade II	0.42	0.52	0.58	0.54	0.56	0.62	
Food and Beverage	0.10	0.13	0.11	0.12	0.11	0.12	
Agriculture	0.16	0.16	0.20	0.20	0.15	-	
Other Services	0.18	0.20	0.18	0.25	0.20	0.09	
Retail Trade III	0.07	0.13	0.15	0.17	0.19	0.18	
Retail Trade I	80.0	0.11	0.10	0.12	0.10	0.16	
Machinery & Electrical	0.14	0.27	0.20	0.12	~	0.09	
Textile II	0.10	0.15	0.13	0.16	0.16	0.20	
Chemical & Rubber	0.06	0.10	0.10	0.14	0.09	0.18	
Fabricating	0.08	0.09	0.09	0.09	0.11	0.11	
Transport	0.06	0.09	0.10	0.12	0.10	0.11	
Leather & Textile I	0.08	0.06	0.06	0.09	0.12	0.11	

Source: Statistics Canada

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Industry	Asset Size Category (\$ Mil.)						
	0-0.25	.25-1	1-5	5-10	10-25	over 25	
Mining & Mine Products	0.15	0.19	0.23	0.45	0.49	0.28	
Forest Products & Other	0.00	0.00	0.00	0.00	0.00	0.00	
Furniture	0.01	0.04	0.03	0.04	0.05	0.04	
Business Services	0.00	0.00	0.00	0.00	0.00	-	
Hote]	0.00	0.00	0.00	0.01	0.01	0.00	
Construction	0.00	0.00	0.00	0.00	0.00	0.00	
Retail Trade II	0.00	0.00	0.00	0.01	0.00	0.00	
Food and Beverage	0.00	0.00	0.00	<mark>0.00</mark>	0.01	0.01	
Agriculture	0.00	0.00	0.01	0.00	0.00	-	
Other Services	0.05	0.00	0.13	0.00	0.05	0.00	
Retail Trade III	0.00	0.00	0.00	0.00	0.00	0.01	
Retail Trade I	0.00	0.00	0.00	0.00	0.00	0.00	
Machinery & Electrical	0.00	0.00	0.00	0.00	-	0.00	
Textile II	0.00	0.01	0.00	0.00	0.01	0.00	
Chemical & Rubber	0.00	0.00	0.00	0.00	0.00	0.00	
Fabricating	0.00	0.00	0.00	0.00	0.00	0.00	
Transport	0.00	0.00	0.00	0.00	0.00	0.01	
Leather & Textile I	0.00	0.00	0.00	0.00	0.00	0.00	

Table A1.5: THE PROPORTION OF NET DEPLETABLE ASSETS TO THE TOTAL OF INVENTORIES AND NET FIXED ASSETS FOR FIRMS BY ASSET SIZE AND INDUSTRY GROUP FOR THE YEAR 1977

Source: Statistics Canada

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Industry	Asset Size Category (\$ Mil.)						
	025	.25-1	1-5	5-10	10-25	over 25	
Mining & Mine Products	0.08	0.11	012	0.12	0.13	0.18	
Forest Products & Other	0.05	0.07	0.08	0.11	0.13	0.16	
Furniture	0.07	0.11	0.15	0.19	0.15	0.18	
Business Services	0.14	0.17	0.19	0.18	0.23		
Hotel	0.09	0.12	0.23	0.26	0.26	0.68	
Construction	0.04	0.11	0.12	0.15	0.16	0.12	
Retail Trade II	0.02	0.02	0.02	0.04	0.05	0.04	
Food and Beverage	0.13	0.07	0.20	0.23	0.24	0.22	
Agriculture	0.08	0.19	0.19	0.21	0.35	т. Т	
Other Services	0.01	0.03	0.02	0.02	0.04	0.11	
Retail Trade II	0.17	0.16	0.17	0.18	0.19	0.20	
Retail Trade I	0.00	0.02	0.01	0.01	0.00	0.01	
Machinery & Electrical	0.05	0.13	0.16	0.20	-	0.19	
Textile II	0.08	0.12	0.12	0.14	0.15	0.11	
Chemical & Rubber	0.16	0.23	0.22	0.17	0.23	0.23	
Fabricating	0.06	0.13	0.16	0.15	0.16	0.07	
Transport	0.19	0.17	0.26	0.25	0.28	0.25	
Leather & Textile I	0.13	0.16	0.21	0.22	0.23	0.23	

Table A1.6:INVENTORY TO SALES RATIO FOR FIRMS BY ASSET
SIZE AND INDUSTRY GROUP FOR THE YEAR 1977

Source: Statistics Canada

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Industry	Asset Size Category (\$ Mil.)						
	025	.25-1	1-5	5-10	10-25	over 25	
Mining & Mine Products	0.11	0.15	0.16	0.16	0.29	0.12	
Forest Products & Other	0.05	0.07	0.07	0.07	0.09	0.07	
Furniture	0.06	0.12	0.09	0.06	0.08	0.08	
Business Services	0.15	0.16	0.17	0.19	0.23	-	
Hotel	0.13	0.17	0.25	0.22	0.21	0.21	
Construction	0.04	0.09	0.10	0.14	0.13	0.09	
Retail Trade II	0.01	θ	0.04	0.05	0.07	. 0.08	
Food and Beverage	0.14	0.15	0.17	0.17	0.17	0.15	
Agriculture	0.04	0.07	0.09	0.06	0.05	-	
Other Services	0.08	0.23	0.22	0.25	0.22	0.14	
Retail Trade II	0.13	0.15	0.15	0.13	0.15	0.14	
Retail Trade I	0.07	0.12	0.12	0.14	0.13	0.13	
Machinery & Electrical	0.03	0.06	0.04	0.02	- 1	0.03	
Textile II	0.14	0.14	0.16	0.15	0.14	0.12	
Chemical & Rubber	0.03	0.05	0.06	0.09	0.04	0.08	
Fabricating	0.02	0.04	0.03	0.06	0.07	0.01	
Transport	0.17	0.15	0.17	0.16	0.15	0.15	
Leather & Textile I	0.11	0.15	0.16	0.19	0.13	0.08	

Table A1.7:ACCOUNTS RECEIVABLE TO SALES RATIOS FOR FIRMS BY ASSET
SIZE AND INDUSTRY GROUP FOR THE YEAR 1977

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Source: Statistics Canada

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Industry	Asset Size Category (\$ Mil.)						
	025	.25-1	1-5	5-10	10-25	over 25	
Mining & Mine Products	0.26	0.27	0.27	0.29	0.26	0.29	
Forest Products & Others	0.06	0.11	0.07	0.09	0.10	0.09	
Furniture	0.19	0.32	0.20	0.17	0.14	0.20	
Business Services	0.23	0.24	0.24	0.22	0.22	-	
Hotel	0.22	0.21	0.38	0.31	0.31	0.33	
Construction	0.04	0.10	0.09	0.10	0.11	0.07	
Retail Trade II	0.11	0.28	0.17	0.30	0.35	0.29	
Food and Beverage	0.26	0.23	0.22	0.18	0.17	0.17	
Agriculture	0.07	0.16	0.15	0.10	0.06	-	
Retail Trade II	0.26	0.21	0.18	0.17	0.15	0.16	
Machinery & Electrical	0.05	0.21	0.13	0.14	0.10	0.26	
Textile II	0.01	0.18	0.21	0.26	0.18	0.26	
Chemical & Rubber	0.11	0.16	0.17	0.14	0.14	0.16	
Fabricating	0.04	0.06	0.06	0.07	0.07	0.07	
Transport	0.27	0.21	0.19	0.17	0.18	0.17	
Leather & Textile I	0.19	0.20	0.20	0.22	0.20	0.15	

Table A1.8: ACCOUNTS PAYABLE TO SALES RATIOS FOR FIRMS BY ASSET SIZE AND INDUSTRY GROUP FOR THE YEAR 1977

1. For the retail trade I and other services industries, cost of materials was unavailable for some of the asset sizes.

Sources: Statistics Canada

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Industry	Asset Size Category (\$ Mil.)						
- x	025	.25-1	1-5	5-10	10-25	over 25	
Mining & Mine Products	_1	1.54	1.72	0.91	1.35	0.66	
Forest Products & Other	2.90	1.57	1.46	1.63	1.45	0.90	
Furniture	2.21	2.19	2.61	2.14	1.59	0.96	
Business Services	3.62	1.76	1.53	1.13	1.58	-	
Hotel	3.24	2.55	2.52	2.18	2.51	2.34	
Construction	9.00	2.00	2.28	1.94	2.28	2.25	
Retail Trade II	4.29	3.36	4.14	2.86	4.75	2.77	
Food and Beverage	3.93	2.03	1.52	1.06	0.90	0.91	
Agriculture	4.38	1.53	2.50	2.34	0.92	-	
Other Services	2.38	1.91	1.83	2.11	1.05	-	
Retail Trade II	4.86	1.82	1.38	1.11	0.66	1.16	
Retail Trade I	2.68	2.29	2.79	1.82	2.01	1.02	
Machinery & Electrical	2.26	1.81	2.46	3.12	_	0.95	
Textile II	3.00	1.91	1.16	1.18	0.90	1.03	
Chemical & Rubber	2.52	1.29	2.09	1.60	1.43	1.27	
Fabricating	2.56	1.96	3.08	4.60	2.05	1.00	
Transport	5.79	2.18	1.38	0.95	1.11	0.69	
Leather & Textile I	_1	1.19	1.46	1.41	1.16	0.67	

Table Al.9: DEBT-EQUITY RATIOS FOR FIRMS BY ASSET SIZE AND INDUSTRY GROUP FOR THE YEAR 1977

1. Equity negative as reserves were negative.

Source: Statistics Canada

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APPENDIX 2: ACCOUNTS RECEIVABLE, CASH AND ACCOUNTS PAYABLE

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In this appendix, we analyze the impact of taxation on the costs of holding accounts receivable as assets and accounts payable as liabilities. We shall also consider the holding of cash which can be treated similarly to accounts receivable under certain assumptions. Several assumptions are made to simplify the analysis. First, it is assumed firms sell units of goods at a constant rate and extend credit to other firms for given periods of time. Second, the holding period for accounts receivable, and accounts payable are less than one year (see Chapter 2) and any taxes to be paid by the firm is at the end of the holding period. Third, the cost of credit for accounts receivable and payable is reflected in explicit interest charges or higher prices charged for goods sold or materials purchased, both of which the income is taxed. It is not known what is the contracted cost of credit among firms but it is assumed that the imputed interest charged is a per year which is the same for all firms.

Accounts Receivable (and Cash)

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The analysis in this section will closely follow that used for inventories in Chapter 3. We first examine accounts receivable. Firms sell a constant number of goods, M, each period and extend credit for T_R years. At each point of time there are A units held as accounts receivable. Firms receive payment on the M units held as accounts receivable for a period T_R and extend new credit on M units of goods sold at that time. The total number of accounts receivable, A, held at each instance of time is equal to T_R^M .

It is assumed that initial price of goods sold at t 0 is \$1. By extending trade credit at time t, the firm reduces its cash flow by $Me^{\pi t}$, where π is the rate of inflation. Under the accrual system, which applies to all firms except agricultural businesses corporate taxes would have been paid on M units of goods sold regardless of whether credit is given. Thus there is no additional change in cash flow resulting from corporate taxes paid.

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The units of goods sold which are held as accounts receivable are not paid until the time, t=I_R. The firm receives as payment, e^{nt}, plus the nominal interest charge ω which is compounded over the period. The total nominal payment when t=T_R is e^{ω T_R} · Me^{π t}. The firm has to pay corporate taxes at the rate u on interest charges accumulated over the period, the total tax payment being u(e^{ω T_R} - 1)Me^{π t}. The total value of the payment received at time, t+T_R, in constant dollars (when t=0), is e^{ω T_R} · M and the value of tax payments is u(e^{ω T_R} - 1)e^{$-\pi$ T_R} · M.

The real cost of financing each unit of accounts receivable for each period of time (r) is as derived in (3.8) of Chapter 3. The total cost of holding a constant amount of accounts receivable is rA. We can now define the real total cost of holding accounts receivable as

$$TC_R = rA - (e^{(\omega - \pi)T_R} - 1)M + u(e^{\omega T_R} - 1)e^{-\pi T_R}M$$
 (1)

The marginal cost of adding an additional unit of accounts receivable is (by taking the derivative with respect to A in (1)):

$$MC_{R} = r - (\omega - \pi)e^{(\omega - \pi)T_{R}}(1 - u) + \pi ue^{-\pi T_{R}}$$

If the holding of accounts receivable realizes other benefits (such as reduced costs) which are taxable at the rate u, then one can obtain the gross implicit cost of holding accounts receivable as

- 2 -
$$R_{R} = \frac{r - (\omega - \pi)e}{1 - u} \frac{(\omega - \pi)T_{R}}{1 - u}$$
(2)

As found in Chapter 2 and other appendices, π and T_R are much less than one. If ω is the same order as well, we can approximate (2) as

$$R_{R} = \frac{r - [\omega(1-u) - \pi]}{1 - u}$$
(3)

 R_R has a natural interpretation. The real cost of holding an additional unit of accounts receivable is real financial costs less the after tax real income earned after credit charges. It might be instructive to see how the above can be affected if it is assumed that a firm extends trade credit to other firms who hold liabilities as accounts payable which are a form of debt. Firms would be willing to accept to hold accounts payable as liabilities if, barring no transaction costs, ω =i, i being the payment made on debt. If it is assumed, for simplicity, 0=c for the calculation of r in (3.8) of Chapter 3, then (3) becomes

$$R_{R}' = \left[\frac{1}{(1-0)(1-u)} - i\right] (1-B)$$

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The marginal cost of holding accounts receivable depends on the extent to which firms are equity financed (1-B) and whether the nominal cost of equity financing gross of tax $\left[\frac{\rho}{(1-\theta)(1-u)}\right]$ is more (or less) than the nominal cost of debt (i).

In Appendix 3 and as suggested in Chapter 4, the nominal cost of equity financing faced by finus is greater than the nominal cost of debt. Moreover, because corporate tax rates (u) are greater for large firms than for small firms, and large firms are relatively more equity financed (B is

- 3 -

small) than small firms (see Chapter 2), R_R is greater for large firms. Hence, we conclude that taxation raises the marginal cost of financing accounts receivable gross of taxes for large firms in comparison to small firms (under the assumption ω =i).

The above analysis of accounts receivable may be used for analyzing the impact of taxation on the holding of cash under certain assumptions. If cash held for transactions purposes is proportional to the sales of the firm, then a holding period for cash can be defined as cash divided by sales. The return to holding cash is any explicit or imputed interest (reduced service charges) paid by banks on demand deposits (which are part of cash) and any additional revenues earned by the firms to compensate for the holding of cash. Under this characterization of the demand for cash by businesses, the formulae derived in (2) and (3) may be used to study the differential effect of taxation on small and large businesses holding cash as a financial asset. As pointed out in Chapter 2, small firms hold more cash per dollar of assets than do large firms. However, large firms cannot deduct the cost of equity financing from taxable income (as with accounts receivable) and it becomes unclear, without knowing the return to cash, as to whether small firms face a higher cost when holding cash as an asset.

Accounts Payable

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As previously mentioned in Chapter 2, we shall treat accounts payable as a form of debt. In analyzing the impact of taxes on the costs of holding accounts payable as liabilities, it is assumed that firms, maintaining their debt-equity ratio, reduce a dollar's worth of other debt for each

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dollar accounts payable held.

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A firm purchases N units of goods for production. It is given T_p years to pay the account incurring a nominal interest charge ω at each instance of time. At each point of time the number of goods held as accounts payable is P which is equal to T_pN . At time t=0, the firm is given credit for \$N worth of accounts payable and retires \$N of debt. No changes in tax liabilities are realized. If the firm would have paid the account by borrowing money, it would have deducted from taxable income the cost of materials purchased.

At time t=T_p, the firm pays to its suppliers the principal and accumulated credit charges: $e^{\omega T_p}N$. It writes off from taxable income the accumulated interest at the end of the period which is equal to $u(e^{-1}P - 1)N$. As the firm retired other debt initially, the firm need not pay interest accumulated on other debt as well. The total amount of interest paid net of tax write $iT_p N - u(e^{-1})N$, where i is the nominal interest charged on other debt.

We can now add up the above costs which are perturbations in the dividend stream received by shareholders. Given a nominal after tax discount rate ρ , the additional real cost of holding accounts payable rather than other forms of debt is:

$$C = (e^{\omega T_{P}} - e^{iT_{P}})e^{-\rho T_{P}}N - u(e^{\omega T_{P}} - e^{iT_{P}})e^{-\rho T_{P}}N$$
(4)

It is clear that the cost of holding accounts payable depends on the relationship between ω and i. If ω includes all imputed credit costs incurred by the firm and if accounts payable and other forms of debt are perfect sub-

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stitutes, then in equilibrium ω =i. This implies that C=O.

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It is thus our conclusion that taxation does not influence the real cost of holding accounts payable as a substitute for debt when the accrued system is used for accounts payable. Only the agricultural sector can elect to use the cash system for both accounts receivable and payable. APPENDIX 3: CALCULATION OF VARIOUS RATES NEEDED FOR MEASURING THE COST OF CAPITAL

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This appendix outlines the derivation of various parameters required for the calculation of the cost of capital of firms in addition to those presented in Chapter 2. Below we specify the method used to obtain (i) tax rates (ii) depreciation rates for various forms of capital (iii) rates of inflation and (iv) rates of interest and discount rates of shareholders.

1. Tax Rates

1.1 Corporate Tax Rates (u)

Corporate tax rates vary according to the type of industry (manufacturing and nonmanufacturing), size (small and large business) and the province in which taxable income is earned. It is thus necessary, in calculating effective corporate tax rates for businesses in each asset size category, to know the distribution of taxable income amongst small and large, manufacturing and nonmanufacturing industries and the distribution of such taxable income amongst provinces. Data was available providing the distribution of small and large business income by province and manufacturing and nonmanufacturing taxable income by province. No published data was available, however, providing a separate distribution of taxable income for small manufacing businesses by province. Nonetheless, in the derivation of corporate taxes, a correction was made for the distribution of small and large business taxable income by province assuming that proportion of manufacturing and nonmanufacturing corporate taxable income to total provincial corporate taxable income is the same for both small and large businesses in that province.

The calculation of effective tax rates for each asset size category in 1977 proceeded as follows. First, four combined federal and provincial corporate tax rates were calculated for small and large, manufacturing and nonmanufacturing businesses. The following formulae was used to calculate each rate:

$$u^{ik} = \sum_{j} \begin{bmatrix} \gamma_{j}^{i} & n_{j}^{k} \\ \frac{\gamma_{j}^{i} & n_{j}^{k}}{\sum_{j} \gamma_{j}^{i} & n_{j}^{k}} \end{bmatrix} u_{j}^{ik}$$

where

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u^{ik} = average corporate tax rate for the ith size of business
(small or large) by the kth type of industry (manufacturing
and nonmanufacturing)

 Y_j^i = jth province's share of total provincial taxable income for the ith asset size category (small or large).

It may be noted that the weight in the parentheses is the ith size and kth industry's provincial taxable income to total taxable income for that class. For the calculation of γ_j^i from Revenue Canada, <u>Taxation Statistics</u>, 1977, it was assumed that small businesses receiving the small business tax credit were of less than \$1 million in asset size. The calculation of n_j^k was available from the same publication. Provincial tax rates, u_j^{ik} , for each type of industry were obtained from <u>National Finances</u> (Canadian Tax Foundation, 1977-78).

The second step of the procedure was to calculate an average effective tax rate for each asset size category. To do this, we calculated the share of corporate taxes paid by manufacturing industries to total corporate taxes paid in each asset category. For each size (small and large businesses),

corporate tax rates averaged for manufacturing and nonmanufacturing industries were computed for each asset size category. From the estimated portion of firms claiming the small business tax credit in each asset size category, an-average effective corporate tax rate was computed.

In Table A3.1 we present the calculation of tax rates for each asset size category of businesses.

1.2 Personal Tax Rates

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Two personal tax rates of special interest is the effective tax rate levied on dividends (0) and on accrued capital gains income (c). To estimate these tax rates the following assumptions were made: (i) the effective tax paid by an individual is based on his marginal rate of personal tax applied to his last dollar of income, (ii) firms, when raising a dollar's worth of financing for the purposes of purchasing capital, do so by raising debt and equity from all individual income classes according to portion of dividend or capital gain income earned by the income class to total capital gain or dividend income.

As for institutional ownership of equity of firms it was suggested in Chapter 3 that such ownership can alter to the cost of capital of firms since institutions pay a capital gains tax on selling shares held in nonfinancial businesses and these institutions cannot only deduct the cost of debt financing from taxable income. However, institutional ownership of equity and debt of firms by asset size is unavailable. Moreover, it is not known that larger nonfinancial firms would be proportionately owned differently by institutions compared to small-sized nonfinancial firms. For

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Asset Size Category	Effective Corporate Tax Rate
(\$ million)	(%)
$0 - \frac{1}{4}$	26
¹ ₄ - 1	29
1 - 5	41
5 - 10	46
10 - 25	47
25 and over	47

1. Based on (i)

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average combined federal and provincial corporate tax rates

Small	businesses	-	manufacturing	21%
		-	nonmanufacturing	25%
Large	businesses	-	manufacturing	42%
		-	nonmanufacturing	48%

(ii) proportion of taxes paid by manufacturing and nonmanufacturing industries by asset size category (Table 2 in Chapter 2).

(iii) estimated proportion of businesses claiming small tax credit (Table 2 in Chapter 2).

Source: Statistics Canada, <u>Corporate Taxation Statistics</u>, 61-208, <u>National</u> Finances, Canadian Tax Foundation 1977-78, and Statistics Canada.

Table A3.1: ESTIMATED EFFECTIVE CORPORATE TAX RATES FOR FIRMS BY ASSET SIZE FOR THE YEAR 1977 instance, the equity and debt of small sized firms are owned by nonfinancial large sized firms and banks but large sized firms issue equity and bonds that are purchased by financial and other institutions. Thus it is not possible to determine, the differential effect of taxation on the cost of capital of firms by asset size when debt and equity is owned by institutions. It is expected that small firms which rely mainly on debt financing would face higher interest costs to the degree that institutions owning the debt are equity financed. Banks are mainly debt financed but parent companies of small firms do rely to a significant degree on equity finance. As for large firms which are relatively more equity financed it is expected that the cost of equity finance by institutions could be reduced because of the deductibility of financial costs of debt from corporate taxable income. On balance institutional ownership would raise the cost of financing for small firms relative to large firms. This would not affect the conclusions of Chapters 4 and 5.

In regard to foreign ownership which seems especially prevalent amongst large sized firms, we assume that all dividends and capital gains income are paid to Canadians only. This assumption is convenient for this study since only small businesses that are Canadian controlled may claim the small business tax deduction.

The data from Revenue Canada, <u>Taxation Statistics</u>, 1977 provides the distribution of dividend and capital gains (net of losses) according to assessed income category (income before the deduction of personal tax exemptions). Using the average deduction per tax return (approximately 5000 in 1977), and subtracting this amount from assessed income, we estimated taxable income for each assessed income category in order to determine the appropriate marginal rate of personal tax. Marginal rates of personal tax

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were estimated by taking an average of combined federal and provincial tax rates, the weights based on personal taxable income of each province to total Canadian taxable income.

In 1977, the first \$1000 of investment income (less carrying charges) in the form of capital gains, dividends and interest income on Canadian securities and deposits were tax exempt. While it is possible that all individuals in each assessed income category earned more than \$1000 in investment income the data suggests that for almost all except for the top income classes, average investment income per taxpayer was less than \$1000. Hence, it is possible for some individuals to have investment income below the \$1000 limit and hence a marginal rate of personal tax of 0%. To allow for the investment income \$1000 deduction, it was assumed that the proportion of investment income in each assessed income category that was exempted from taxation can be approximated by the total of income claimed under the \$1000 investment income deduction to total investment income earned by the assessed income category. This proportion based on the average deduction per dollar of investment overstates the number of individuals claiming the investment income deduction on the last dollar of investment income. Thus the actual tax rate would lie between two values based on whether the above correction is made for the \$1000 investment deduction or not. Hence, we provide two estimates of tax rates, one based on a correction for some individuals whose last dollar of investment income is below the \$1000 investment deduction, the other assuming all individuals have more than \$1000 in investment income.

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Dividend Income Tax Rate (0)

The effective tax rate on dividend income can be calculated from the following formula (as stipulated in tax law):

 $0 = [m_{p} - (1 + 0_{p})S_{r}](1 + 0_{q})$

- m_D = average combined federal and provincial marginal rate of personal tax based on the proportion of total dividend income earned by each taxable income class to total dividend income earned S_F = federal tax credit rate (18.75% in 1977)
- 0_g = gross up rate applied to each dollar of dividends received. (1/3 in 1977)
- 0_p = provincial tax surcharge as a proportion of federal taxes paid averaged for all provinces where each weight is based on each province's share of total personal taxable income earned in Canada (in 1077, 0_p =.484).

For 1977, it was estimated that the maximum personal tax rate on dividend income (i.e.: no correction for investment income deduction) was 47.1% and minimum personal tax rate was 40.1% (allowing for the investment income deduction). The values for 0 in 1977 was calculated as 25.7% and 16.4% respectively.

Capital Gains Accrued Rates of Tax

Taxation authorities levy a tax on capital gains when realized upon the selling of equity but much of the theory in Chapter 3 is based on taxation of accrued capital gains (income earned regardless of whether shares are sold or not). For empirical measures of the cost of capital in Chapter 4, it is necessary to convert a tax rate on realized capital gains into an effective tax rate on accrued capital gains.

Let g be the percentage increase in the price of equity and assume that g is constant over time. The original price of the share is \$1. Let c be the effective marginal tax rate on capital gain income earned by individuals or institutions. If a shareholder of a firm holds a share of equity for Y years, then the end of period lifetime wealth if taxed on an accrued basis is

$$W_A = e^{g(1-c)Y}$$

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where c is the accrued capital gains tax and Y is holding period for shares.

For realized capital gains, a tax is levied once the share is sold in period Y. Only the proportion (which is equal to $\frac{1}{2}$) of capital gain income is included in the tax base, where capital gains income is then taxed at the rate m_c . Thus the end of period wealth of an individual holding \$1 of a share for Y years which is taxed on a realized basis is:

$$W_{R} = e^{gY} - \frac{m_{c}}{2} (e^{gY} - 1)$$

To compute the effective tax on accrued capital gains, c, let $W_A = W_R$ and find c. This yields

 $c = -\frac{\ln[1 - \frac{m_c}{2}(1 - e^{-gY})]}{gY}$

To estimate c, the following assumptions were made (i) the holding period, Y, for equity shares is on average 5 years (this holding period was

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suggested by Bossons in ("Indexing Financial Instruments for Inflation", <u>Cana-</u> <u>dian Tax Journal</u>, Vol. 22, 1974, pp. 107–117), (ii) the average annual growth in prices of equity is based on the 1975-79 quarterly growth rate in the Toronto Stock Exchange index (assuming some individuals in 1977 held shares until 1979 before selling them), (iii) the distribution of capital gains income across income classes is (a) the same as the distribution of dividend income or (b) in accordance with the distribution of capital gains income earned on shares net of capital losses.

With the assumption (ii) above, it was calculated that g=12% which is about two percent higher than the average rate of inflation, π , for the same period. However, it was assumed in our theory that real dividends remained constant requiring prices of shares to rise at the rate of inflation. While it is possible that risk might explain the difference in g and π , it is believed that g is somewhat overestimated and thus c to be underestimated. On the other hand if the holding period is longer than 5 years (King (1977) suggested 10 years for the United States and Britain), then g would be smaller, Y larger, but overall, c would be about the same.

As for the third assumption, it was found that almost all capital gains income (net of losses) in 1977 was earned by taxpayers with more than 2500 income. For assessed income below 25000 net capital gains was relatively small and at times negative. Hence, the effective capital gains tax, m_c, based on marginal personal tax rates for income classes of 25000 and over is much higher than the personal income tax rate on dividends (before allowance of tax credits and gross up), which was based on a more even distribution of dividend income across income classes. It is possible that higher income in-

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dividuals who are willing to take more risk compared to lower income individuals would invest in shares that have a low dividend yield and a high capital gains rate. However, the distribution of capital gains net of capital losses may be a poor proxy of equity ownership in shares yielding capital gain income. We consider two cases for the calculation of the capital gains tax, one based on distribution of net capital gains income by assessed income class and the other based on the distribution of dividend income by assessed income class. The first case assumes that lower income individuals invest more in high dividend yielding stock compared to high income individuals. The second case assumes that there is no difference in the propensity to hold dividend yielding stock amongst individuals in some classes.

There are four accrued capital gains tax rates that we calculated for 1977. There were as follows:

(i)	m based on distribution of dividend income and no	<u> </u>
	correction for the investment income deduction	19%
(ii)	m ² based on distribution of dividend income with a	
	correction for the investment income deduction	161
(iii)	m ³ based on distribution of net capital gain income	
	with no correction for the investment income deduction	23%
(iv)	m ⁴ _c based on distribution of net capital gain income	
	with a correction for the investment income deduction	21 1

2. Depreciation Rates - δ

Depreciation rates, 6, were estimated from Statistics Canada, <u>Fixed</u> <u>Capital Flows and Stocks</u>, 13-523, which provides service lives of various types of capital by industry. Service lives for machinery (plant and equipment) and buildings were each estimated for both manufacturing and nonmanufacturing industries. The weights used to calculate average service lives of capital were based on the portion of capital stock (net of depreciation) of each industry to total net capital stock. To make our depreciation rate consistent with data on assets and liabilities of firms by asset size, we included only those industries (except for mining) that are in the data base made available to us from Statistics Canada (see Tables in Appendix 1 for a list of industries.

To convert a service life I into a declining balance depreciation rate, δ , we used the formula as derived in Chapter 1:

 $\delta = \frac{2}{\overline{T}}$

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The estimated services lives and physical depreciation rates are presented below along with the depreciation rate (capital consumption allowance) allowed for tax purposes (d)

		(Years)	<u> </u>	d
Manufacturing	- Plant and Equipment	25.6 years	7.8%	50% ¹
	- Buildings	46.0 years	4.3%	5%
Nonmanufacturing	- Plant and Equipment	23.2 years	8.6%	20:3
	- Buildings	46.8 years	4.3%	5:3

The average true depreciation (δ) rate for machinery and equipment and that used for tax purposes, d, for businesses in each asset size category was

 This is based on the straight-lined accelerated depreciation allowed for machinery purchased by manufacturing companies after 1972. The write off of investment expenditure in a 2 year period on a straight line depreciation rate basis implies a declining balance depreciation rate of 100% using the formula suggested above. As an approximation, we use d=75% which implies that 94% of capital is written off in 2 years. calculated by using the share of the machinery and equipment held by manufacturing and nonmanufacturing industries respectively in each asset size category. Table A2.2 presents average depreciation rates for plant and equipment and buildings for businesses in each asset size category.

3. Rates of Inflation - n

Rates of inflation for inventories and physical capital are important in determining the cost of capital for businesses. It would be expected that price increases during the lifetime of assets are important, not simply the 1977 rate of inflation. As a proxy, the 1975-79 rate of inflation is taken as the long term underlying rate of inflation. For output prices, the rate of inflation was calculated to be 9.6% (aggregate industry selling price) and for physical capital, the rate of inflation for machinery and equipment was calculated to be 9.2%. The 1975-79 average rate of inflation using the consumer price index was 8.3%.

4. Rates of Interest and Discount Rates - i and p

The interest cost of debt (i) incurred by firms was estimated by using the McLeod, Weir, Young corporate bond rate series as reported in the Bank of Canada, <u>Review</u>. As we used a five year average for a long term rate of inflation, we calculated a five year average interest cost of debt which was computed as approximately 11%.

To estimate the discount rate used by equity owners, ρ , we used the capital market equilibrium equation, ignoring risk,

 $\mu = (1-m)i'$

Table A3.2:	AVERAGE RATES	OF DEPRECIATION FOR	PLANT AND
	EQUIPMENT AND	BUILDINGS FOR FIRMS	BY ASSET SIZE
	FOR THE YEAR 1	977	

	Plant and	Plant and Equipment				
Asset Size (\$ Million)	Manufacturing P&E • Assets as a Proportion of Total P&E Assets (Excluding Mining)	ر الالالي (الالالي الم	d ² (%)	م <mark>ا</mark> (٪)	d ² (%)	
$0 - \frac{1}{4}$.20	.08	.31	4.3	5.0	
1 ₄ - 1	.24	.08	.33	4.3	5.0	
1 - 5	.27	.08	.35	4.3	5.0	
5 - 10	.27	.08	.35	4.3	5.0	
10 - 25	.27	.08	.35	4.3	5.0	
25 and over	.21	.08	.32	4.3	5.0	

1. True physical rate of depreciation.

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2. Allowed rates of depreciation for tax purposes.

Source: Statistics Canada, Fixed Flows and Stocks, 13-523, Master Tax Guide CCH, and data made available from Statistics Canada. where

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m = marginal rate of tax on interest income

i' = borrowing interest rate for individuals

 ρ = discount rate of shareholders

To calculate i', it was assumed that individuals who own shares of corporations cannot borrow at the same interest rate as large corporations. As a proxy for the borrowing rate of individuals, we add the interest rate differential charged on conventional mortgages over the prime rate to the corporate bond rate as many individuals increase the mortgage on their house for purchasing equity assets. We do not use the conventional mortgage rate itself as the mortgage rate does not include a premium for risk faced by individuals owning the firm (the only premium for risk included in the mortgage rate is that faced by institutions should the house be sold). As the mortgage rate is on average 2 percentage points above the prime rate during the years 1975-79, we let i=13% for the purposes of calculating ρ .

As borrowing costs incurred by individuals are tax deductible, then a marginal rate of personal tax on interest needs to be estimated. The marginal rate of tax on interest income was computed by taking the distribution of interest income by assessed income class and allowing for the personal tax exemptions to arrive at taxable income. As outlined previously with the calculation of c and 0, we also allow for the \$1000 investment income deduction. These calculations yield m=22%, and $\rho=10.1\%$. This implies a real rate $(\rho-\pi)=1.8\%$.

In our estimates of ρ , i', π and m there is room for error. A higher rate of inflation could have been used, a lower borrowing rate and a higher marginal rate of personal tax calculated on the basis of the distribution of

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carrying charges on borrowed funds. All these adjustments would imply negative real rates of discount (ρ - π <0) for shareholders. While negative real discount rates are a possibility based on the observation of historical data, it is unclear that shareholders base ex ante decisions or expected returns yielding negative real rates of discount. Moreover, the allowance for pension and retirement savings deductions (\$5500) could reduce tax rates in a substantial way.

In using our estimates of i and ρ , the only important factor as to the effects of taxation on the financial cost of capital for businesses across asset size is the real rate of discount used by shareholders. It may be pointed out that to the extent that the real rate of discount is higher (lower) than 1.8%, then the financial cost of capital for large businesses that are relatively more equity financed rises (falls) in relation to small businesses. This will, however, not affect our main conclusions in any appreciable way.

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Appendix 4

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4 The Real Cost of Capital of Firms for Cases I, III and IV.

TABLE A4.1: FINANCIAL COST OF CAPITAL OF FIRMS BY ASSET SIZE FOR THE YEAR 1977 (EXCLUDING MINING) - CASE I

	A	sset S	ize Cate	gory (\$	mil)	
	0-1, (%)	1	1-5 (%)	5-10 (12)	10-25 (%)	25 and over (%)
Real Financial Cost of Capital						
Debt $\frac{r_B}{(1-u)}$	2	7	-3.1	-4.4	-4.7	-4.7
Retained Earnings (^r RE 1-u)	5.6	5.9	7.1	7.4	7.9	7.9
New Equity (<mark>^rNE</mark>)	6.2	6.4	7.7	8.4	8.6	8.6
Average Real Rate (<u>r</u>)	1.0	1.9	0.6	0.3	0.7	1.7
Increase (Decrease) in the						
Real Rate Resulting from Taxation ²	(.8)	0.1	(1.2)	(1.5)	(1.1)	.(.1)

- 1. Based on an effective capital gains tax of 19% and dividend tax rate of 26%.
- 2. Average Real Rate calculated as above less real rate without taxation (1.8%).

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TABLE A4.2:FINANCIAL COST OF CAPITAL OF FIRMS BY ASSET SIZEFOR THE YEAR 1977 (EXCLUDING MINING)- CASE III

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	Asset Size Category (\$ mil)							
	$\frac{0-\frac{1}{4}}{(\%)}$	(%)	1-5 (%)	5-10 (%)	10-25 (%)	25 and over (%)		
Real Financial Cost of Capital								
Debt $\frac{r_B}{(1-u)}$	2	7	-3.1	-4.4	-4.7	-4.7		
Retained Earnings (^r RE 1-u)	6.5	6.8	8.2	8.9	9.1	9.1		
New Equity (<mark>1-u</mark>)	6.8	7.1	8.5	9.3	9.5	9.5		
Average Real Rate $\binom{r}{1-u}$	1.2	2.0	.9	.5	1.0	2.1		
Increase (Decrease) in the								
Real Rate Resulting from Taxation ²	(1.6)	.2	(0.9)	(1.3)	(0.8)	0.3		

Based on an effective capital gains tax of 23% and dividend tax rate of 26%.

2. Average Real Rate calculated as above less real rate without taxation (1.8%).

TABLE A4.3: FINANCIAL COST OF CAPITAL OF FIRMS BY ASSET SIZE FOR THE YEAR 1977 (EXCLUDING MINING)¹

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		Asse	(\$ mil)	mil)		
	0-! <u>4</u> (%)	1 ₄ -1 (%)	<u>1-5</u>	5-10 (%)	<u>10-25</u> (%)	25 and over (%)
Real Financial Cost of Capital						
Debt $\frac{r_B}{(1-u)}$	2	7	-3.1	-4.4	-4.7	-4.7
Retained Earnings $(\frac{r_{RE}}{1-u})$	6.1	6.3	7.6	8.3	8.5	8.5
New Equity (^r NE]-u)	5.7	5.9	7.2	7.8	8.0	8.0
Average Real Rate (<mark>r_</mark>)	1.0	1.7	0.5	0.0	.3	1.5
Increase (Decrease) in the			•			
Real Rate Resulting from Taxation ²	(.8)	(.1)	(1.3)	(1.8)	(1.5)	(.3)

1. Based on effective capital gains tax of 21% and dividend tax rate of 16%.

2. Average Real Rate calculated as above less real rate without taxation (1.8%).

TABLE A4.4:COST OF CAPITAL FOR VARIOUS COMPONENTS OF CAPITAL OF FIRMSBY ASSET SIZE FOR THE YEAR 1977 (MINING EXCLUDED)- CASE I

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	Asset Size Category (\$ mil)							
	0-1a (%)	1a-] (%)	1-5 (%)	5-10 (%)	10-25 (%)	25 and over (≝)		
Real Cost of Capital								
Plant and Equipment - with taxes	8.8	9.6	8.8	8.8	9.1	9.7		
- no taxes	9.8	9.8	9.8	9.8	9.8	9.8		
Buildings - with taxes	5.8	6.8	6.3	6.4	6.9	7.7		
- no taxes	6.1	6.1	6.1	6.1	6.1	6.1		
Land - with taxes	1.0	1.9	0.6	0.3	0.7	1.7		
- no taxes	1.8	1.8	1.8	1.8	1.8	1.8		
Inventories - with taxes	2.8	4.1	4.3	4.8	5.4	6.4		
- no taxes	1.8	1.8	1.8	1.8	1.8	1.8		
Average - with taxes	4.7	6.1	5.7	6.0	6.6	8.0		
- no taxes	5.5	5.0	4.8	4.8	5.0	6.2		

1. Based on an effective capital gains tax of 19% and dividend tax rate of 26%.

TABLE A4.5: COST OF CAPITAL FOR VARIOUS COMPONENTS OF CAPITAL OF FIRMS BY ASSET SIZE FOR THE YEAR 1977 (MINING EXCLUDED)¹ - CASE III

		Asset Size Category (\$ mil)				
	0-1, (%)	14-1 (%)	1-5 (%)	5-10 (%)	10-25 (%)	25 and over (%)
Real Cost of Capital						
Plant and Equipment - with taxes	9.0	9.6	9.1	8.9	9.2	9.9
- no taxes	9.8	9.8	9.8	9.8	9.8	9.8
Buildings - with taxes	6.0	6.9	6.7	6.6	7.1	8.0
- no taxes	6.1	6.1	6.1	6.1	6.1	6.1
Land - with taxes	1.2	2.0	1.0	0.5	1.0	2.1
- no taxes	1.8	1.8	1.8	1.8	1.8	1.8
Inventories - with taxes	3.1	4.2	4.7	5.0	5.7	6.8
- no taxes	1.8	1.8	1.8	1.8	1.8	1.8
Average - with taxes	5.6	6.1	6.1	6.2	6.8	8.3
- no taxes	5.5	5.0	4.8	4.8	5.0	6.2

1. Based on an effective capital gains tax of 23% and dividend tax rate of 26%.

TABLE A4.6: COST OF CAPITAL FOR VARIOUS COMPONENTS OF CAPITAL OF FIRMS BY ASSET SIZE FOR THE YEAR 1977 (MINING EXCLUDED)¹ - CASE IV

	Asset Size Category (\$ mil)						
	$\frac{0-1_{4}}{(\%)}$	1.4-1 (%)	1-5 (%)	<u>5-10</u> (%)	<u>10-25</u> (%)	25 and over (%)	
Real Cost of Capital							
Plant and Equipment - with taxes	8.8	9.4	8.7	8.6	8.8	9.5	
- no taxes	9.8	9.8	9.8	9.8	9.8	9.8	
Buildings - with taxes	5.8	6.6	6.2	6.2	6.5	7.5	
- no taxes	6.1	6.1	6.1	6.1	6.1	6.1	
Land - with taxes	1.0	1.7	0.5	0.0	0.3	1.5	
- no taxes	1.8	1.8	1.8	1.8	1.8	1.8	
Inventories - with taxes	2.9	3.9	4.2	4.5	5.0	6.2	
- no taxes	1.8	1.8	1.8	1.8	1.8	1.8	
Average - with taxes	5.4	5.9	5.6	5.8	6.2	7.8	
- no taxes	5.5	5.0	4.8	4.8	5.0	6.2	

1. Based on an effective capital gains tax of 23% and dividend tax rate of 16%.

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