8

The Economic Opportunity Cost of Capital for Canada: An Empirical Update

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Alternative Approaches to Finding the Economic Net Present Value

Choosing the correct economic discount rate has been one of the most continuous issues in the field of cost-benefit analysis. This discount rate is used to calculate the economic net present value of the resource cost and the benefits that accrue over time from an investment or policy initiative according to the net present value criterion. If the net present value of a project is positive then from the perspective of a country the project is worthwhile to implement. If it is negative, the project should not be undertaken. Because the size of the discount rate is so important in determining whether the economic NPV of a project or program is positive or negative, the choice of rate is often a controversial issue. The economic discount rate is similar to the concept of the private opportunity cost of capital used to discount the financial cash flows of an investment for the estimation of its financial net present value. The issues

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raised in the determination of the economic discount rate are, however, fundamental to our understanding of how scarce resources are allocated within the economy.

People prefer to make payments later and receive benefits sooner. This is due to the fact that they have a time preference for current consumption over future consumption. Similarly, there is an opportunity cost of the resources used in an activity as they could have been invested elsewhere and produced a positive return that could be consumed later. This opportunity cost needs to be taken into consideration in the appraisal of any proposal that involves the creation of costs and benefits that occur in different time periods.

One approach to economic discounting is based on the fact that present consumption is valued different than future consumption. Following this approach all benefits and costs are first converted into quantities of consumption equivalents before being discounted. In this case, the discount rate is the rate of time preference at which individuals are willing to exchange consumption over time. To be analytically correct, all investment outlays must be multiplied by the shadow price of investment to convert them into units of consumption. Estimates of the shadow price of investment forgone are typically much larger than one and often in the range of two or three. After this is done all the benefits and costs, now expressed in consumption units, can be discounted by the rate of time preference for consumption (see, e.g., Sjaastad and Wisecarver, 1977).

Another approach considers what society forgoes in terms of the pre-tax returns of displaced investment in the country. Using this approach no account is made for time preference in terms of present versus future consumption. The discount rate is based purely on the opportunity cost of forgone investments.

An approach that captures the essential economic features of these two alternatives is to use a weighted average of the economic rate of return on private investment and the time preference rate for consumption (see, e.g., Sandmo and Dreze, 1971; Harberger, 1972). This opportunity cost of capital measures the economic value of funds forgone in all their alternative uses in the private sectors of the economy when resources are shifted into the public sector. It captures the repercussions

not only of the forgone consumption but also of the forgone investment due to the expenditures being undertaken.[1]

The social or economic discount rate is the threshold rate used to calculate the net present value of an investment project, a program or a regulatory intervention to see whether the proposed expenditures are economically feasible. The magnitude of the economic opportunity cost of the resources used by any public or private sector investment is of utmost importance given its role as a guide in the selection of projects or programs, including the choice of their timing and scale.

The size of the discount rate has been an issue in Canada for many years. The debate has been primarily concerned with empirical measurement of the economic opportunity cost of funds, and even that discussion has been concerned with a relatively narrow range of values. The main purpose of this paper is to reexamine what is the appropriate economic discount rate for Canada.

Background

The weighted average concept has been used previously in the measurement of the economic opportunity cost of capital for Canada (see, e.g., Jenkins, 1972, 1973; and Burgess, 1981). A 10% social opportunity cost of capital was first estimated using a detailed industrial data and macroeconomic environment over the period of 1965-69 (Jenkins, 1973) and it was endorsed by the Treasury Board in 1976 (Treasury Board Secretariat, 1976). Jenkins subsequently refined the estimates and extended the time period of the data base on the rates of return from investment in Canada from 1965 to 1974, but reaffirmed his 10% estimate (Jenkins, 1977).

Using the data for the same time period, the magnitude of the discount rate for Canada was questioned by Burgess for a variety of theoretical and empirical reasons. He suggested that the social opportunity cost of capital for Canada should be lowered to a real rate of 7%, due to a number of biases in the derivation of the 10% figure (Burgess, 1981). The main points of disagreement between Jenkins and

[1]As has been shown elsewhere, the weighted average approach and the approach by the time preference for consumption are similar, but the latter can lead to incorrect results in a number of situations (see Burgess, 2006).

Burgess lie in the use of different values for the parameters employed in the estimation of the economic opportunity cost of capital (Jenkins, 1981). In particular, the issues were related to (a) relative contribution of foreign funding and its social opportunity cost, (b) the interest elasticity of domestic saving and its social cost, and (c) the distortions associated with labour, foreign exchange and subsidies in the Canadian economy. The difference between using a discount rate of 7% and 10% is not small and could easily lead to a different recommendation of whether to accept or reject a project when using the net present value criterion to measure the expected efficiency of the resources employed.

Subsequently, the social discount rate of 10% real was reviewed by Watson in 1992 and it was again recommended for use in Canada by the Treasury Board in 1998 (Watson, 1992; Treasury Board Secretariat, 1998). In 2004, the social or economic discount rate was re-estimated for Canada by Starzenski who found it to be a real rate of approximately 8% (Starzenski, 2004). In 2005, Burgess also revisited his estimate of the social discount rate and proposed a rate of 7.3% using fairly aggregate economic data with alternative simulation scenarios (Burgess, 2005).

With the exception of Starzenski, the above empirical estimates were largely based on the data over the period 1965 to 1974. The effects of inflation and changes in business taxes and the structure of the Canadian economy since 1974 have not been fully taken into consideration. The estimation of the economic rates of return from investment that are derived from data for individual industries is a time consuming process. An alternative approach is to use aggregate national income accounts data to estimate the pre-tax returns of domestic investment, one of the key parameters in the estimation of the social discount rate (e.g., Harberger, 1977; Kuo, Jenkins, and Mphahlele, 2003). For the other components of the discount rate, the most recent available data are incorporated in the estimation of the economic discount rate.

An Empirical Update

While Canada operates in a global capital market, the intensity by which it finances its capital formation from abroad will affect the cost it pays for such funds. In such an economy, when funds are raised in the capital markets, the cost of funds will tend to rise. Because of the higher financial cost, the funds obtained to finance a project are normally

diverted from three alternative sources. First, funds that would have been invested in other investment activities have now been postponed or displaced by the expenditures required to undertake the project. The cost of these funds for society as a whole is the gross-of-income tax return that would have been earned on the alternative investments in the economy. Second, funds would come from different categories of domestic savers who postpone their consumption in the expectation of getting a higher net of tax return now so that they can purchase additional consumption later. Third, some funds may be coming from abroad, that is from foreign savers. The cost of these funds should be measured by the marginal cost of foreign capital inflows. This parameter is estimated by the direct cost of the incremental funds to the users of these funds plus any effects the additional foreign financing has on the future financing cost of other foreign capital already in Canada.

The social or economic discount rate will be measured as a weighted average of the economic costs of funds from these three sources: the rate of return on postponed or displaced investment, the social cost of newly stimulated domestic savings, and the marginal cost of additional foreign capital inflows. The weights are equal to the proportion of funds sourced from domestic private-sector investors, domestic private-sector savers, and foreign savers. They should be measured by the reaction of investors and savers to a change in market interest rates brought about by the increase in government borrowing. This can be written as:

$$EOCK = f_1\rho + f_2\,\gamma + f_3\,(MC_f) \qquad (1)$$

Where ρ stands for the gross-of-income tax return on domestic investments, γ for the social cost of newly-stimulated domestic savings, and MC_f for the marginal cost of incremental capital inflows from abroad; f_1, f_2, and f_3 are the corresponding sourcing fractions associated with displaced investment, newly stimulated domestic savings, and newly stimulated capital inflows from abroad. Obviously, $f_1 + f_2 + f_3$ should equal one.

The weights can be expressed in terms of the elasticities of demand and supply yielding the following,

$$EOCK = \frac{\varepsilon_r(S_r/S_t)*\gamma + \varepsilon_f(S_f/S_t)*MC_f - \eta(I_t/S_t)*\rho}{\varepsilon_r(S_r/S_t) + \varepsilon_f(S_f/S_t) - \eta(I_t/S_t)} \qquad (2)$$

where ε_r is the supply elasticity of domestic savings, ε_f is the supply elasticity of foreign funds, η is the elasticity of demand for domestic investment with respect to changes in the cost of funds, S_t is the total private-sector savings available in the economy, of which S_r is the contribution to the total savings by residents, S_f is the total contribution of net foreign capital inflows, and I_t is the total private-sector investment.

We begin by estimating the economic cost of each alternative source of funds in equation (1). It will be expressed as a percentage of the respective stock of reproducible capital.

The Gross-of-Tax Return to Domestic Investment

In this study, the rate of return on domestic investment is calculated based on the country's national income accounts. This is a comprehensive account of the full range of economic activities in the country. It covers not only manufacturing and non-manufacturing sectors but also the imputed rents for owner-occupied houses.

The economic return of capital on domestic investment is the contribution of capital to the economy as a whole, which can be measured by the sum of the private net-of-tax returns on capital and all direct and indirect taxes generated by this capital. There are alternative ways of estimating this gross-of-tax return to a country's reproducible capital. Our approach is to sum all the returns to capital and then divide the total by the value of the stock of reproducible capital including buildings, machinery and equipment. The return on capital consists of the sum of interest, rent and profit incomes that are recorded in the national accounts. However, some items, such as the surplus of unincorporated enterprises, do not separate out the return to capital explicitly. These are mainly small businesses and farm operations. Because the owners of the businesses and their family members are also workers and are often not formally paid with wages, the operating surplus of this sector includes the returns to both capital and labour. In this study, the labour content of this mixed income is assumed to be approximately 70% of the total. This is approximately labour's overall share of total value added for the economy.

Taxes include corporate income taxes, property taxes as well as the share of sales and excise taxes attributed to the value added of reproducible capital. In the case of sales tax, if it is a consumption-type value-added tax, the tax is applied to the sales of goods and services at

all stages of the production and distribution chain. At each stage, vendors are able to claim tax credits to recover the tax they paid on their business inputs, including capital goods such as machinery, equipment and building. As a result, the value-added tax is not embodied in the value added of capital; it is effectively borne by labour. In 1991 Canada introduced a federal Goods and Services Tax (GST) at a rate of 7% to replace the manufacturer's sales tax.[2] At the same time, the Government of Quebec also replaced its retail sales tax by the same GST at 8%. Later on April 1, 1997, the provincial retail sales taxes in Nova Scotia, New Brunswick, and Newfoundland and Labrador were also replaced and harmonized with the federal GST at a single rate of 15% on the same base of goods and services (The Governments of Canada, xxxx).

In addition, there has been a considerable amount of federal and provincial excise taxes and duties imposed on alcoholic beverages, tobacco products, motor vehicle fuels, and so on. These taxes are mainly levied on consumer goods. Excise taxes on business inputs such as fuels, are not creditable in the same way as is the GST paid on the purchase of inputs. The share of these excise taxes that are a component of the value added of capital needs to be estimated and included in the return to reproducible capital.

The value of the stock of reproducible capital excludes the value of land, so the income stream accruing to capital should also exclude the portion that is attributable to the unimproved land. This is significant only in the cases of agriculture and housing. All improvements to land, however, such as clearing, leveling, installation of infrastructure for utilities, fencing, irrigation, and drainage should be considered part of reproducible capital. Thus the share of unimproved land in the total capital stock is quite small. The precise data on the contribution of land are not readily available. From the analysis of farm budgets it is estimated that for Canada approximately 25% of the total value added of the agricultural sector could be attributed to land. In the case of the housing sector, information is not available on the value of land embodied in this sector, nor is the land component of the value added available for the sector. In the estimates of the total return to capital in the economy the value of net imputed rent on owner-occupied houses is included.[3] The value of imputed rent, however, excludes the contribution

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[2]Department of Finance Canada (1989). The current government lowered the GST rate to 6% now.

[3]It should be noted that the data obtained from Statistics Canada is the value of gross imputed rent on owner-occupied houses. The value is reduced by the

of land to the value added of the housing sector. By excluding from the income to capital the contribution of land in residential housing, we are able to derive the rate of return to reproducible capital alone.

To calculate the rate of return on reproducible private-sector capital, we use the values for the year-end residential and non-residential capital stock estimated by Statistics Canada. These values are derived by breaking down investment into its components such as buildings, machinery, and equipment. Different depreciation rates are applied yearly to the cumulated value of the stock of the capital for each of these categories while the value of the stock is augmented by the value of new gross investment made each year. The time path of capital stock, appropriate depreciation rates and new investment by categories are estimated for individual sectors to arrive the year-end values for the net capital stock.[4] Given the year-end net capital stocks, we can calculate the mid-year fixed capital stocks. We include in the stock of reproducible capital the value of the investment made by Canadian public-sector enterprises that operate as business firms. However, we exclude the capital used in the general public administration from the capital base since this part of the public sector involves activities such as public security, national defense, and public administration for which no valuation is made in the national accounts for the services they produce. Investment in these types of operations would generally not be affected by government borrowing in the capital markets. The figures are deflated by the GDP deflator and expressed in 1997 prices.

The detailed computations for the estimation of the gross-of-tax rate of return on domestic investments are presented in Table 1. For the past 40 years, the average real rate of return on investment (ρ) in Canada has been about 12.29% in 1966–75, 12.57% in 1976–85, 10.86% in 1986–95, and 11.28% in 1996–2005. The rate of return ranges from 10.00 to 14.00% over these years with the exception of the recession years of 1991 and 1993. For the purpose of this analysis, we use 11.0% as the value of the economic rate of return on domestic investment. This estimate, however, contains some element of risk in the rate of return to the forgone domestic investment either displaced or postponed (see, for

amount of depreciation, which is estimated by the fraction of owner-occupied imputed rent in total imputed rent (including paid rent) times the residential stock in previous year and the depreciation rate (i.e., 2%).

[4]See, e.g., Huang (2004). It may be noted that changes in inventories are not included as part of the total net capital stock in this study.

example, Glenday, this volume). To estimate and remove the risk component, we will have to measure the rate of return to newly stimulated domestic savings and compare it with the return on risk-free financial instruments, which will be dealt with in the next section.

The Cost of Newly Stimulated Domestic Savings

When new project funds are raised in a country's capital market, it will result in an increase in the cost of funds that in turn stimulates additional private-sector savings. This additional savings comes at the expense of postponed consumption that has an average opportunity cost equal to the return obtained from the additional savings, net of all taxes and financial intermediation costs.

The opportunity cost of the newly stimulated domestic savings can therefore be measured by the gross-of-tax return to reproducible capital minus the amount of corporate income taxes paid directly by business entities, and minus the property taxes paid by these entities and homeowners. It is further reduced by the personal income taxes that are paid on the income generated from reproducible capital. This net-of-tax income received by individual owners of capital is further reduced by the costs of financial intermediations provided by banks and other deposit-taking institutions. These intermediation costs are one of the components that create a gap between the gross of tax return to investment and the net of tax return to savings. The final result is the net return on domestic savings. It also reflects the rate of time preference of individuals for consumption forgone.

Our empirical estimation of this parameter starts with the gross-of-tax return to reproducible capital generated in the previous section. As was shown in Table 2, the gross-of-tax return is reduced by the amounts of corporate income taxes and the property taxes paid by corporations and homeowners to arrive at the net-of-capital tax return to reproducible capital. The estimate is further reduced by the amount of the personal income tax on these capital incomes as well as intermediation services charged by financial institutions in order to derive the net return to domestic savings.

It should be noted that we estimate the costs of basic financial intermediation services such as lending and deposit-taking provided by banks, trust companies, credit unions and other deposit-taking institutions by deducting the total payments to labour as part of the general deduction for the value added of labour and deducting the value

of gross profits for the sector. The depreciation component of the gross value added of the financial sector has already been deducted in the calculation of net after tax profits, hence, only the net profits of the financial sector associated with intermediation services needs to be deducted. The proportion of non-intermediation services and even intermediation services in banks and other deposit-taking institutions that are charged for directly through fees has increased over time. For the purpose of this exercise, the financial intermediation services are assumed to account for 50% of the total net-of-tax profits in deposit-taking institutions.

To estimate the net return to newly domestic savers, one has to further subtract personal income taxes on capital income. Due to lack of data on taxes paid by savers exclusively on their capital income, we are making an estimation based on the assumption that the effective rate of income taxes on the income from capital is the same as the rate of income taxes on wages and salaries. This assumption might bias downward the amount of taxes paid on the income from capital as investors tend to be relative wealthy and are likely to be at a higher marginal rate of personal income tax than are wage earners. With these assumptions, an estimate of the annual amount of the personal income tax on capital is made.

The rate of time preference for consumption is then estimated by dividing the estimated net return income accruing to domestic savings by the stock of reproducible capital. This is presented in the last column of Table 2. Over the past 40 years, the economic cost of newly stimulated domestic savings for Canada would be on average 7.00% in 1966-75, 7.79% in 1976-85, 6.37% in 1986-95 and 6.53% in 1996-2005. For the purpose of this analysis, we use 6.50% as the rate of return to newly stimulated domestic savings. The estimate was derived beginning from ex-post value of return to gross-of-tax income to capital net of direct and indirect taxes and financial intermediation services. This implies that the value contains the risk premium over the study period. The question is what the magnitude of the risk premium is in order to estimate the rate of time preference.

Government of Canada bonds are conceivably a risk free financial instrument. The average yield of Government of Canada marketable bonds with maturity more than 10 years was about 5.78% issued in 2001, 5.66% in 2002, 5.28% in 2003, 5.08% in 2004, and 4.39% in 2005.[5] For

[5]Statistics Canada, CANSIM Vector V122487.

this study, we assume the average yield of long term bonds will remain around 5.25% with an inflation rate at 2%. Suppose the yield is subject to the personal income tax rate at 25% in the base case, then the real rate of return to risk-free bonds would be approximately 1.90%. Let us assume the average risk is around mid-point between the previous estimate of 6.5% and the risk-free rate of 1.9%; that is 2.3%.[6] For the purpose of this study, we assume a risk premium of 2% is contained in the previous estimates of the rate of return to domestic investment and newly stimulated domestic savings. In other words, we will use 9% and 4.5% as the values of ρ and γ, respectively, in the estimation of the EOCK.

Marginal Economic Cost of Foreign Financing

The last component of the EOCK from raising funds through the capital market is the marginal economic cost of newly-stimulated capital inflows from abroad. Foreign capital inflows reflect an inflow of savings from foreigners that augments the resources available for investment. When the demand for investible funds is increased, the market interest rates increase and as a consequence funds are attracted to the market. In the case of foreign borrowing, an additional cost is created. As the quantity of foreign obligations increases relative to the country's capacity to service these foreign obligations, one would expect the return demanded by foreign investors to rise. For the country as whole, the cost of foreign borrowing is not just the cost of servicing the additional unit of foreign funds but it is also the extra financial burden of servicing all other foreign financing where the cost of this financing is responsive to the market interest rate. As a consequence, the marginal cost of additional foreign borrowing increases as the proportion of the country's capital stock that is financed from foreign sources increases.

The marginal economic cost of foreign borrowing (MC_f) can be expressed as follows:

$$MC_f = i_f \times (1 - t_w) \times \{1 + \phi \times (1/\varepsilon_s^f)\} \qquad (3)$$

[6]Because individual investors have different risk preferences the marginal cost of risk that determines asset yields will overstate the average cost of risk in the market. If risk premiums demanded by individuals are linearly distributed, the average cost of risk will be approximately half of what of the differential are between the returns observed in the market and the riskless rate of return.

where i_f is the real interest rate on foreign borrowing by the project, t_w is the rate of withholding taxes charged on interest payments made abroad, ϕ is the ratio of [the total foreign financing whose interest rate is flexible and will respond to additional foreign borrowing] to [the total amount of foreign borrowing and foreign direct investment], ε_s^f is the supply elasticity of foreign funds to a country with respect to the interest rate the country pays on its incremental foreign capital flows.

The Canadian capital markets are highly integrated with the rest of the world, especially with the United States. The real rate of return on total US direct investment net of any withholding tax that is either repatriated to the United States or reinvested in Canada was estimated to average 6.11% from 1964 to 1973 (Jenkins, 1977). The cost of the US foreign investment in Canada was subsequently re-estimated by Evans and Jenkins (1980) over the period from 1951–1978. They found that the net income received and accrued by the US owners of direct investment in Canada ranged from 5.75% to 6.03%. No further update has been made in recent years. For the purpose of this analysis, 6% will be assumed for the average rate of return for non-resident owners of investment in Canada.

It is also reasonable to assume that about 30% of foreign investment in Canada is represented by variable interest rate loans and thus ϕ is taken as .3. The supply curve of funds facing a country would generally be upward sloping. If we assume an elasticity of supply of 3.0, the marginal cost of foreign capital inflow would be about 6.60%.[7] As our estimate of the marginal cost of foreign financing includes only the cost of servicing Canada's direct investment, both debt and equity, and not the portfolio investment in Canada that might cost less, our estimated cost of foreign financing might be biased upward. To adjust for this bias we assume that the marginal cost of all foreign financing in Canada to be a real rate of approximately 6%.

Measurement of the EOCK

As was mentioned earlier, the economic opportunity cost of capital is estimated as a weighted average of the gross-of-tax rate of return on

[7]The elasticity of supply of foreign funds investment is measured with respect to changes in the stock of foreign investment for changes in the return to foreign investment.

domestic investment, the cost of newly stimulated domestic savings, and the marginal cost of newly induced foreign capital inflows as shown in equation (2). The marginal cost for each of the three components was estimated in the previous sub-sections. The weights associated with each source of funding at the margin depends upon the average contributions made from each source and their responses to the change in interest rate as a result of borrowing in the capital market.

The annual gross fixed investments made by private corporations and public corporations and general public administration services are shown in Table 3. Over the past 40 years, the contribution by the general public administration services has accounted for an average of 21.73% of national gross investment. This share, however, has declined to an average of 19.74% over the past 20 years and to 17.56% over the past 10 years. This is consistent with the cumulated reproducible capital used to calculate the rate of return on domestic investment and the cost of newly stimulated domestic savings.

Over the years the private-sector investment in Canada has been financed by private-sector savings. The situation has been quite different for the public sector. The Government of Canada was in deficit in 1980s and for a period the deficit was as high as one-third of the national budget. The fiscal situation later improved and in recent years the federal government has been running a surplus. As of January 31, 2007, the federal debt was approximately $526,697 million, which accounts for almost 35% of GDP. If the debt is expressed as the percentage of the current private- and public-sector reproducible capital, it would be about 11.7%.[8] In other words, investment by the general public administration has been financed in part by private-sector savings. For the purpose of this analysis, the ratio of the private-sector investments to the private-sector savings from residents and non-residents (I_t/S_t) is set at 0.9 in the base case. Taking into account the debt held by provincial and municipal governments, this ratio could be slightly lower.

During the period 1947 to 1973, on average approximately 20% of gross fixed capital formation in Canada was financed by foreign capital inflows. With the introduction of NAFTA in 1990 and the further integration of the Canadian capital markets with those of the rest of the world, one would expect a higher proportion of gross capital formation

[8]This is calculated by the ratio of the federal debt, $527 billion, to the total national reproducible capital, $4,500 billion, expressed in 2007 prices. See Table 1.

being financed by foreign savings.[9] For this analysis, we assume the percentage (S_f/S_t) to have increased to 25%. The remainder (S_r/S_t) will be financed by domestic savings.

Following equation (2), to estimate the weights assigned to each source of funding, we need to specify the elasticity of supply of each source with respect to the real cost of funds. The initial estimation is carried out using a value for the demand elasticity for domestic investment of -1.0, a supply elasticity of newly stimulated domestic savings of 0.4, and a supply elasticity of foreign savings of 3.0 (see, e.g., Boskin, 1978; Jenkins and Mescher, 1981; Leipziger, 1974). With these assumptions, the proportions of funds obtained from these three sources are 15.38% from domestic savings, 38.46% from foreign capital, and 46.16% from displaced or postponed domestic investment. Substituting these data into equation (2), one obtains a base-case estimation of the economic opportunity cost of capital for Canada of 7.15%.

Sensitivity Analysis

The above empirical estimates depend upon the value of several key parameters such as the rate of return on domestic investment (ρ), the supply elasticity of foreign capital inflow (ε_f), the ratio of the private-sector investments to the private-sector savings from residents and non-residents (I_t/S_t), time preference for consumption (γ), and risk premium embodied in the estimated rates of return on domestic investment and domestic savings. In the sensitivity analysis, we assess the impact of changes in the value of these key parameters on our estimate of the economic opportunity cost of capital for Canada.

The Rate of Return on Domestic Investment

If the average rate of return on domestic investment is 0.5 percentage point lower than the base case, it would imply a value of 8.5% instead of 9.0%. With this value, the economic opportunity cost of capital for

[9]In fact, more than 1.3 million corporations currently exist in Canada; of which about 8,000 are foreign controlled and account for 21.9% of the assets for the country as a whole.

Canada is about 6.92%, 0.23 of one percentage point lower than the base case.

The Supply Elasticity of Foreign Capital

We have assumed a value of 3.0 in the base case for the supply elasticity of the stock of foreign savings to Canada. Suppose the elasticity of foreign capital is as high as 6.0 instead of 3.0 assumed earlier, the share of financing from foreign funds to investment projects will be much larger. The sourcing of funds would become 11.11% from domestic savings, 55.56% from foreign capital, and 33.33% from displaced or postponed domestic investment. As a result, the economic opportunity cost of capital decreases to 6.83%, or 0.32 of one percentage point lower than the estimate for the base case.

The Ratio of the Private-Sector Investments to the Private-Sector Savings

As was discussed earlier, the 90% ratio for the private-sector investments to the private-sector savings was based on the federal debt alone. If the debt for the provincial and municipal governments is also taken into account, the 90% share could go down to 80%. Let us assume the ratio of I_t/S_t is 80%. The proportions of funds diverted to finance the investment project would become 16.22% from newly stimulated domestic savings, 40.54% from foreign savings, and 43.24% from displaced or postponed domestic investment. As a consequence, the economic opportunity cost of capital would decrease to 7.05%.

As the federal and several provincial governments in recent years have had budget surpluses, we may assume the ratio of I_t/S_t would be equal to unity. In this scenario, the sourcing of funds directed from the private sectors to the government borrowing would be 14.63% from domestic savings, 36.59% from foreign capital inflow, and 48.78% from displaced or postponed domestic investment. This suggests that the economic opportunity cost of capital would rise to 7.24%, approximately 0.09 of one percentage point higher than the base case.

Time Preference for Consumption

The time preference for consumption is measured by the cost of newly stimulated domestic savings. The 4.5% estimate was based on average rate over the past 25 years. As a matter of fact, it has been declining over years. In the past 15 years, it was averaged at 4.3%. Suppose it is 4.0% instead of 4.5% assumed for the base case, the economic opportunity cost of capital would become 7.07%, about 0.08 of one percentage point lower than the base case.

Risk Premium

The 2.0 percentage point estimate of risk premium is influenced by the assumption on the marginal personal income tax rate applied to yields on government bonds received by newly stimulated domestic savers. Suppose the marginal income tax rate for these savers is 35% instead of 25%, the after-tax real rate of return on the government bonds would be 1.38%. Thus, the risk premium contained in the estimates of the rate of return to domestic investment and newly stimulated domestic savings would be about 2.56%. For this analysis, it is assumed at 2.5%. As a consequence, the rate of return to domestic investment and savings after removing risk premium would become 8.5% and 4.0%, respectively. The economic opportunity cost of capital would then decrease to 6.85%.

From the above sensitivity analyses, we find that the economic opportunity cost of capital ranges from 6.83% to 7.24%. We can conclude that a conservative estimate of the economic opportunity cost of capital for Canada would be a real rate of 7.00%.

Concluding Remarks

The economic or social discount rate is a key parameter used for investment decision-making. The value of this variable has been controversial and debated for years. The issue is even more critical when applied to the social sector projects and programs such as health, education, environment and regulations.

This paper has reviewed some theoretical issues and described a practical framework for the estimation of the economic cost of capital for

Canada. It is in the framework of a small open economy in both commodity and capital markets. When funds are raised in the capital markets for use in an investment project, these funds are obtained from three sources: displacement or postpone of private domestic investment, newly stimulated domestic savings, and newly stimulated inflows of capital from abroad. Employing this framework, we estimate that the real economic opportunity cost of capital would be approximately 7.15% in the base case.

We have preformed a sensitivity analysis by allowing the key parameters that have an impact on the measurement of the economic discount rate. These parameters include the rate of return on domestic investment, the supply elasticity of foreign capital inflows, the ratio of the total private investment to the total private savings, the time preference for consumption, and risk premium contained in the rates of return on domestic investment and domestic savings. The results suggest the discount rate can range from 6.83% to 7.24% real. As a consequence, we conclude that for Canada a 7% real rate is an appropriate discount rate to use when calculating the economic net present value of the flows of economic benefits and costs over time.

Table 1: Return to Domestic Investment, 1965-2005

Year	*Corporation Profits before Income Taxes*	*Public Enterprise Profits before Income Taxes*	*Interest and Other Investment Income*	*Accrued Net Income of Farming*	*Net Income of Non-Farming*	*Net Imputed Rent*	*Real Property Taxes*	*Gross-of-Tax Income to Capital without Having Indirect Taxes*
				(millions of dollars)				
1965	6,543	453	1,917	1,450	4,185	2,802	2,024	15,321
1966	7,031	424	2,130	2,000	4,391	3,034	2,250	16,636
1967	7,211	486	2,360	1,272	4,671	3,363	2,478	17,586
1968	8,079	514	2,796	1,367	5,112	3,765	2,771	19,767
1969	8,579	673	3,158	1,503	5,505	4,177	3,074	21,650
1970	8,089	771	3,493	1,342	5,721	4,669	3,315	22,355
1971	9,092	786	3,959	1,442	6,116	5,107	3,537	24,640
1972	11,237	857	4,700	1,349	6,529	5,468	3,839	28,363
1973	15,939	949	5,845	2,828	7,076	5,891	4,129	35,512
1974	20,738	1,241	8,594	3,593	7,331	6,481	4,600	44,662
1975	20,220	1,153	10,407	3,731	8,149	7,549	5,314	47,927
1976	21,009	1,658	12,961	3,111	9,077	9,176	6,366	54,593
1977	21,922	2,148	15,489	2,420	10,139	11,146	7,253	61,545
1978	26,409	2,694	18,877	3,015	11,573	13,029	7,937	73,097
1979	34,927	3,895	23,185	3,103	12,744	14,582	8,260	89,370
1980	38,382	4,334	27,256	3,167	13,585	16,544	9,436	100,741
1981	35,831	4,954	33,277	2,823	14,680	19,075	10,706	108,883
1982	26,697	2,509	37,991	2,191	16,984	21,657	11,500	105,942
1983	36,730	4,432	37,062	1,827	20,901	24,352	12,232	121,490
1984	45,686	4,936	39,618	2,099	23,473	26,437	13,050	137,241
1985	49,728	4,937	40,763	2,839	25,904	28,610	13,897	146,345
1986	45,217	4,564	39,481	3,825	28,574	31,237	15,024	144,956
1987	57,888	5,126	38,841	1,985	30,761	33,787	16,286	161,603
1988	64,891	6,829	42,188	3,283	33,113	36,928	17,675	179,184
1989	59,661	7,246	48,013	1,986	34,856	40,953	19,534	186,310
1990	44,936	6,460	54,874	2,053	35,544	44,375	21,304	183,074
1991	32,920	5,179	54,486	1,853	37,022	47,683	22,974	174,766
1992	32,648	5,993	52,742	1,727	39,406	50,717	24,604	178,914
1993	41,102	4,694	52,381	2,017	42,068	53,047	25,512	189,810
1994	65,464	5,827	52,000	1,255	44,931	56,249	25,469	218,770
1995	76,270	6,709	50,981	2,702	46,363	58,545	25,737	232,759
1996	80,335	6,143	50,477	3,825	49,278	60,581	26,322	239,502
1997	87,932	6,653	48,881	1,663	54,663	62,619	27,125	249,983
1998	86,132	7,080	47,134	1,724	57,936	64,906	28,795	251,815
1999	110,769	8,401	47,249	1,819	61,466	66,981	29,809	282,058
2000	135,978	11,329	55,302	1,243	64,944	69,680	29,898	321,950
2001	127,073	10,787	52,579	1,675	68,857	72,515	30,721	314,709
2002	135,229	11,661	46,693	1,101	74,292	76,014	31,461	323,594
2003	144,821	12,290	49,679	1,373	77,014	79,110	33,557	342,870
2004	171,323	12,508	54,084	3,256	80,828	82,465	35,442	380,803
2005	189,455	14,481	60,403	1,706	84,500	85,493	37,106	412,671

Table 1: Return to Domestic Investment, 1965-2005 (Cont'd)

Year	*Gross-of-Tax Income to Capital without Having Indirect Taxes*	*Labour Income of Incorporated*	*Total Labour Income including unin-corporated Businesses*	*Federal Manu-facturer's Sales Tax*	*Federal Goods and Services Tax*	*Federal Excise Taxes*	*Provincial Retail Sales Tax*	*Provincial Goods and Services Tax*	*Provincial Excise Taxes*	*Gross-of-Tax Income to Capital Taking into Account Indirect Taxes*
					(millions of dollars)					
1965	15,321	29,630	33,575	1,343		2,560	818		1,030	17,123
1966	16,636	33,507	37,981	1,468		2,788	1,000		1,168	18,593
1967	17,586	37,065	41,225	1,580		2,923	1,252		1,251	19,681
1968	19,767	40,297	44,832	1,580		2,997	1,414		1,463	22,047
1969	21,650	45,065	49,971	1,712		3,182	1,678		1,625	24,128
1970	22,355	48,851	53,795	1,696		3,214	1,832		1,794	24,861
1971	24,640	53,556	58,847	1,912		3,533	1,989		1,933	27,405
1972	28,363	60,108	65,623	2,246		3,970	2,320		2,177	31,596
1973	35,512	69,243	76,176	2,496		4,510	2,894		2,400	39,423
1974	44,662	82,571	90,218	2,962		6,699	3,603		2,598	49,914
1975	47,927	96,305	104,621	2,971		6,042	3,655		2,784	52,782
1976	54,593	111,413	119,945	3,911		6,503	4,661		3,152	60,294
1977	61,545	123,390	132,181	4,284		6,718	5,034		3,523	67,758
1978	73,097	134,216	144,428	4,766		6,984	4,773		3,700	79,892
1979	89,370	150,946	162,039	4,593		7,136	5,812		3,971	97,017
1980	100,741	170,643	182,369	5,173		8,007	6,366		4,410	109,265
1981	108,883	196,716	208,968	6,279		10,276	7,270		5,288	118,856
1982	105,942	210,083	223,506	5,926		10,118	7,844		6,481	115,708
1983	121,490	220,283	236,193	6,491		10,022	9,166		7,111	132,627
1984	137,241	237,248	255,148	7,434		10,867	10,454		7,613	149,961
1985	146,345	255,825	275,945	9,096		12,736	11,816		8,195	160,846
1986	144,956	272,755	295,434	11,841		16,128	13,198		8,853	161,420
1987	161,603	296,442	319,364	12,726		18,508	14,548		9,460	180,164
1988	179,184	325,250	350,727	14,329		20,303	16,925		10,277	200,092
1989	186,310	350,743	376,532	16,253		23,188	18,468		10,930	209,097
1990	183,074	368,891	395,209	14,288		21,577	18,668		11,383	203,942
1991	174,766	379,092	406,305		17,379	25,295	14,412	4,280	11,653	190,213
1992	178,914	387,788	416,581		17,786	25,655	13,066	5,519	12,671	194,355
1993	189,810	394,816	425,676		18,153	26,346	13,386	5,488	13,383	206,191
1994	218,770	404,918	437,248		19,058	25,434	15,347	5,099	13,928	237,015
1995	232,759	418,825	453,171		19,650	26,810	16,357	4,964	14,673	252,386
1996	239,502	428,792	465,964		20,613	28,022	16,008	5,137	15,343	259,659
1997	249,983	453,073	492,501		22,559	30,566	15,921	6,113	16,528	271,199
1998	251,815	474,335	516,097		23,159	31,443	17,481	6,100	17,678	273,656
1999	282,058	502,726	547,026		25,053	33,339	18,477	7,065	18,817	306,087
2000	321,950	545,204	591,535		27,090	35,369	19,994	7,388	19,389	348,295
2001	314,709	570,008	619,380		27,915	36,487	20,108	8,092	20,482	340,677
2002	323,594	593,307	646,082		30,072	39,417	21,014	8,284	22,244	351,183
2003	342,870	621,003	675,874		31,564	41,247	21,498	9,044	23,355	371,848
2004	380,803	651,888	710,747		32,989	42,594	21,999	9,795	24,613	411,924
2005	412,671	688,150	748,494		34,819	44,541	23,234	10,186	25,519	445,828

Table 1: Return to Domestic Investment, 1965-2005 (Cont'd)

Year	*Gross-of-Tax Income to Capital Taking into Account Indirect Taxes*	*GDP Deflator [1997=100]*	*Real Gross-of-Tax Income to Capital Taking into Account Indirect Taxes [$1997]*	*Year-End Real Non-residential Capital sSock [$1997]*	*Year-End Fixed Residential Capital Stock [$1997]*	*Year-end Capital Stock for Public Administra-tion [$1997]*	*Year-End Real Capital Stock Net of Public Administration [$1997]*	*Mid-Year Real Capital Stock net of Public Administration [$1997]*	*Real Rate of Return to Capital*	*10-Year Average Return to Capital*
				(millions of dollars)					(%)	(%)
1965	17,123	18.51	92,508	666,687	219,181	150,265	735,604	367,802	12.58	
1966	18,593	19.42	95,740	705,683	228,048	157,582	776,149	755,876	12.34	
1967	19,681	20.29	96,998	742,946	237,091	164,821	815,216	795,682	11.90	
1968	22,047	21.13	104,342	777,811	248,029	171,807	854,033	834,624	12.22	
1969	24,128	22.16	108,881	812,671	261,240	179,098	894,813	874,423	12.17	
1970	24,861	23.13	107,485	849,038	272,873	186,137	935,774	915,293	11.49	
1971	27,405	24.25	113,009	886,412	287,027	194,296	979,143	957,459	11.54	
1972	31,596	25.68	123,039	923,433	302,687	202,957	1,023,163	1,001,153	12.03	
1973	39,423	28.17	139,946	963,977	319,469	211,312	1,072,133	1,047,648	13.05	
1974	49,914	32.45	153,818	1,007,225	336,658	219,596	1,124,286	1,098,210	13.68	
1975	52,782	35.92	146,942	1,053,439	352,712	228,175	1,177,976	1,151,131	12.47	12.29
1976	60,294	39.33	153,303	1,097,450	373,359	236,030	1,234,778	1,206,377	12.42	
1977	67,758	42.01	161,291	1,141,524	393,622	243,996	1,291,150	1,262,964	12.49	
1978	79,892	44.78	178,410	1,185,390	413,377	251,526	1,347,241	1,319,195	13.24	
1979	97,017	49.25	196,989	1,235,370	432,013	258,506	1,408,877	1,378,059	13.98	
1980	109,265	54.21	201,559	1,292,781	447,951	265,154	1,475,579	1,442,228	13.66	
1981	118,856	60.05	197,928	1,360,731	465,828	272,848	1,553,712	1,514,645	12.74	
1982	115,708	65.15	177,603	1,416,399	479,168	280,298	1,615,270	1,584,491	11.00	
1983	132,627	68.69	193,081	1,462,207	496,571	287,128	1,671,650	1,643,460	11.55	
1984	149,961	70.94	211,392	1,506,562	513,844	294,507	1,725,899	1,698,774	12.25	
1985	160,846	73.14	219,916	1,553,298	533,011	302,708	1,783,601	1,754,750	12.33	12.57
1986	161,420	75.36	214,198	1,596,208	556,010	310,079	1,842,139	1,812,870	11.63	
1987	180,164	78.83	228,548	1,641,104	584,993	317,547	1,908,550	1,875,345	11.97	
1988	200,092	82.37	242,919	1,695,129	613,798	324,878	1,984,048	1,946,299	12.24	
1989	209,097	86.11	242,826	1,751,518	643,943	332,894	2,062,567	2,023,308	11.77	
1990	203,942	88.84	229,561	1,803,230	670,134	341,025	2,132,338	2,097,453	10.77	
1991	190,213	91.47	207,951	1,847,236	689,164	348,658	2,187,742	2,160,040	9.51	
1992	194,355	92.67	209,728	1,881,169	710,009	356,018	2,235,160	2,211,451	9.38	
1993	206,191	94.01	219,328	1,911,096	728,756	362,573	2,277,279	2,256,219	9.63	
1994	237,015	95.09	249,253	1,947,075	748,568	369,714	2,325,930	2,301,604	10.72	
1995	252,386	97.24	259,549	1,984,251	762,479	376,870	2,369,860	2,347,895	10.95	10.86
1996	259,659	98.81	262,786	2,023,949	778,243	383,010	2,419,182	2,394,521	10.86	
1997	271,199	100	271,199	2,079,298	797,597	387,625	2,489,270	2,454,226	10.89	
1998	273,656	99.57	274,838	2,138,742	815,622	391,608	2,562,756	2,526,013	10.72	
1999	306,087	101.31	302,130	2,206,295	834,389	395,686	2,644,997	2,603,877	11.42	
2000	348,295	105.5	330,138	2,277,928	855,171	400,859	2,732,239	2,688,618	12.08	
2001	340,677	106.68	319,345	2,348,605	879,571	407,521	2,820,655	2,776,447	11.32	
2002	351,183	107.82	325,713	2,411,844	909,666	414,620	2,906,889	2,863,772	11.20	
2003	371,848	111.45	333,645	2,482,241	942,421	421,624	3,003,039	2,954,964	11.11	
2004	411,924	114.77	358,913	2,559,240	978,687	428,817	3,109,111	3,056,075	11.54	
2005	445,828	118.46	376,353	2,646,432	1,015,902	436,909	3,225,425	3,167,268	11.67	11.28

Table 2: Return to Domestic Savings, 1965-2005

Year	*Gross-of-Tax Income to Capital with no Indirect Taxes*	*Corporate Income Tax*	*Real Property Taxes*	*Total Personal Income Taxes*	*Total Labour Income Including Unincorp-orated Businesses*	*Personal Income Taxes Paid on Capital Income*	*Profits after Taxes for Deposit-Taking Institutions*	*Return to Domestic Savings*	*GDP Deflator [1997=100]*	*Mid-Year Real Capital Stock Net of Public Administration [$1997]*	*Real Return to Domestic Savings*	*10-Year Av. Real Return to Savings*
					(millions of dollars)						(%)	(%)
1965	15,321	2,197	2,024	3,563	33,575	1,001	166	10,016	18.51	717,574	7.54	
1966	16,636	2,355	2,250	4,114	37,981	1,124	186	10,814	19.42	755,876	7.37	
1967	17,586	2,396	2,478	5,106	41,225	1,375	210	11,232	20.29	795,682	6.96	
1968	19,767	2,852	2,771	6,145	44,832	1,683	250	12,335	21.13	834,624	6.99	
1969	21,650	3,221	3,074	7,697	49,971	2,074	303	13,130	22.16	874,423	6.78	
1970	22,355	3,070	3,315	9,069	53,795	2,393	334	13,410	23.13	915,293	6.33	
1971	24,640	3,346	3,537	10,417	58,847	2,768	374	14,802	24.25	957,459	6.38	
1972	28,363	3,920	3,839	11,611	65,623	3,151	426	17,240	25.68	1,001,153	6.71	
1973	35,512	5,079	4,129	13,618	76,176	3,887	540	22,146	28.17	1,047,648	7.50	
1974	44,662	7,051	4,600	16,602	90,218	4,885	438	27,907	32.45	1,098,210	7.83	
1975	47,927	7,494	5,314	18,538	104,621	5,167	835	29,534	35.92	1,151,131	7.14	7.00
1976	54,593	7,128	6,366	21,400	119,945	6,067	940	34,562	39.33	1,206,377	7.28	
1977	61,545	7,238	7,253	23,811	132,181	6,934	1,169	39,535	42.01	1,262,964	7.45	
1978	73,097	8,188	7,937	24,728	144,428	7,667	1,220	48,694	44.78	1,319,195	8.24	
1979	89,370	10,038	8,260	27,774	162,039	9,129	995	61,446	49.25	1,378,059	9.05	
1980	100,741	12,078	9,436	32,139	182,369	10,514	1,399	68,013	54.21	1,442,228	8.70	
1981	108,883	12,796	10,706	38,565	208,968	12,147	2,188	72,139	60.05	1,514,645	7.93	
1982	105,942	11,755	11,500	43,098	223,506	12,777	2,108	68,856	65.15	1,584,491	6.67	
1983	121,490	12,320	12,232	45,667	236,193	14,435	2,347	81,329	68.69	1,643,460	7.20	
1984	137,241	14,984	13,050	48,721	255,148	15,783	2,292	92,279	70.94	1,698,774	7.66	
1985	146,345	15,563	13,897	53,262	275,945	17,126	2,476	98,521	73.14	1,754,750	7.68	7.79
1986	144,956	14,573	15,024	61,618	295,434	18,867	2,107	95,438	75.36	1,812,870	6.99	
1987	161,603	16,990	16,286	69,288	319,364	21,596	702	106,380	78.83	1,875,345	7.20	
1988	179,184	17,586	17,675	77,568	350,727	24,467	3,691	117,611	82.37	1,946,299	7.34	
1989	186,310	18,566	19,534	83,222	376,532	25,649	3,500	120,812	86.11	2,023,308	6.93	
1990	183,074	16,834	21,304	96,171	395,209	28,475	4,806	114,058	88.84	2,097,453	6.12	
1991	174,766	15,015	22,974	97,154	406,305	27,419	4,828	106,944	91.47	2,160,040	5.41	
1992	178,914	14,517	24,604	97,283	416,581	27,528	3,068	110,731	92.67	2,211,451	5.40	
1993	189,810	16,263	25,512	96,379	425,676	27,913	5,264	117,490	94.01	2,256,219	5.54	
1994	218,770	19,342	25,469	100,311	437,248	31,421	5,484	139,797	95.09	2,301,604	6.39	
1995	232,759	22,138	25,737	106,190	453,171	33,694	9,289	146,545	97.24	2,347,895	6.42	6.37
1996	239,502	26,239	26,322	113,608	465,964	35,671	9,494	146,523	98.81	2,394,521	6.19	
1997	249,983	32,250	27,125	120,790	492,501	37,030	11,325	147,915	100	2,454,226	6.03	
1998	251,815	30,800	28,795	128,935	516,097	38,660	8,447	149,337	99.57	2,526,013	5.94	
1999	282,058	39,410	29,809	134,197	547,026	41,236	9,960	166,623	101.31	2,603,877	6.32	
2000	321,950	48,175	29,898	143,951	591,535	45,545	11,303	192,681	105.5	2,688,618	6.79	
2001	314,709	36,352	30,721	145,926	619,380	45,247	10,277	197,251	106.68	2,776,447	6.66	
2002	323,594	35,746	31,461	138,655	646,082	42,735	11,650	207,827	107.82	2,863,772	6.73	
2003	342,870	39,158	33,557	139,301	675,874	43,189	14,022	219,955	111.45	2,954,964	6.68	
2004	380,803	44,132	35,442	150,813	710,747	48,476	16,687	244,410	114.77	3,056,075	6.97	
2005	412,671	48,514	37,106	165,983	748,494	54,324	17,306	264,074	118.46	3,167,268	7.04	6.53

Table 3: Gross Fixed Investment, 1965-2005

Year	*The Amount of Investment*				*Percentage Distribution*			
	Private Corporations	*Public Corporations*	*Government Public Administrations*	*Grand Total*	*Private Corporations*	*Public Corporations*	*Government Public Administrations*	*Grand Total*
	(millions of dollars)				(%)			
1965	6,352	1,640	2,804	10,796	58.84	15.19	25.97	100.00
1966	7,464	1,877	3,289	12,630	59.10	14.86	26.04	100.00
1967	6,423	1,997	3,457	11,877	54.08	16.81	29.11	100.00
1968	6,557	1,881	3,627	12,065	54.35	15.59	30.06	100.00
1969	8,106	1,977	3,553	13,636	59.45	14.50	26.06	100.00
1970	8,316	2,186	3,625	14,127	58.87	15.47	25.66	100.00
1971	9,034	2,304	4,292	15,630	57.80	14.74	27.46	100.00
1972	10,234	2,386	4,472	17,092	59.88	13.96	26.16	100.00
1973	12,532	3,419	4,454	20,405	61.42	16.76	21.83	100.00
1974	16,814	4,289	5,967	27,070	62.11	15.84	22.04	100.00
1975	15,341	6,475	7,035	28,851	53.17	22.44	24.38	100.00
1976	17,354	7,057	6,904	31,315	55.42	22.54	22.05	100.00
1977	17,414	8,499	7,925	33,838	51.46	25.12	23.42	100.00
1978	19,050	8,852	7,905	35,807	53.20	24.72	22.08	100.00
1979	28,424	9,180	8,406	46,010	61.78	19.95	18.27	100.00
1980	31,777	8,377	9,487	49,641	64.01	16.88	19.11	100.00
1981	40,694	11,507	10,987	63,188	64.40	18.21	17.39	100.00
1982	25,171	13,436	12,510	51,117	49.24	26.28	24.47	100.00
1983	30,022	12,797	12,269	55,088	54.50	23.23	22.27	100.00
1984	38,831	12,264	13,173	64,268	60.42	19.08	20.50	100.00
1985	44,024	11,500	15,470	70,994	62.01	16.20	21.79	100.00
1986	47,596	9,448	15,031	72,075	66.04	13.11	20.85	100.00
1987	56,700	8,696	15,534	80,930	70.06	10.75	19.19	100.00
1988	63,984	11,056	16,634	91,674	69.80	12.06	18.14	100.00
1989	68,776	11,862	18,989	99,627	69.03	11.91	19.06	100.00
1990	57,256	12,966	20,748	90,970	62.94	14.25	22.81	100.00
1991	49,164	13,639	21,047	83,850	58.63	16.27	25.10	100.00
1992	46,531	11,191	20,656	78,378	59.37	14.28	26.35	100.00
1993	51,671	9,542	19,887	81,100	63.71	11.77	24.52	100.00
1994	64,505	8,123	21,251	93,879	68.71	8.65	22.64	100.00
1995	74,645	9,117	21,661	105,423	70.81	8.65	20.55	100.00
1996	73,887	9,069	19,368	102,324	72.21	8.86	18.93	100.00
1997	100,411	7,376	20,317	128,104	78.38	5.76	15.86	100.00
1998	104,432	7,487	20,188	132,107	79.05	5.67	15.28	100.00
1999	113,938	6,937	20,133	141,008	80.80	4.92	14.28	100.00
2000	124,911	6,892	24,710	156,513	79.81	4.40	15.79	100.00
2001	109,581	7,967	27,448	144,996	75.58	5.49	18.93	100.00
2002	107,126	8,196	28,544	143,866	74.46	5.70	19.84	100.00
2003	114,078	9,350	30,100	153,528	74.30	6.09	19.61	100.00
2004	126,471	9,354	31,574	167,399	75.55	5.59	18.86	100.00
2005	140,884	12,513	34,264	187,661	75.07	6.67	18.26	100.00

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