

APPENDIX FOR

Small Business Preferences as a Barrier to Growth: Not so Tall After All

KEY PARAMETERS FOR THE SMALL BUSINESS DEDUCTION AND THE ENHANCED SR&ED TAX CREDIT

Table A-1: Statutory Corporate Income Tax Rates and the Federal Business Limit

Firm Tax Year	General Rate			Small Business Rate			Small Business Advantage			Federal Business Limit
	Federal	Provincial	Combined	Federal	Provincial	Combined	Federal	Provincial	Combined	(dollars)
2014	15.0	11.0	26.0	11.0	4.3	15.3	4.0	6.7	10.7	500,000
2013	15.0	11.1	26.1	11.0	4.3	15.3	4.0	6.8	10.8	500,000
2012	15.0	11.1	26.1	11.0	4.3	15.3	4.0	6.8	10.8	500,000
2011	16.5	11.1	27.6	11.0	4.3	15.3	5.5	6.8	12.3	500,000
2010	18.0	11.4	29.4	11.0	4.5	15.5	7.0	6.9	13.9	500,000
2009	19.0	12.0	31.0	11.0	4.8	15.8	8.0	7.2	15.2	500,000
2008	19.5	11.9	31.4	11.0	4.7	15.7	8.5	7.2	15.7	400,000
2007	22.1	11.8	34.0	13.1	5.1	18.2	9.0	6.7	15.7	400,000
2006	22.1	11.8	33.9	13.1	5.2	18.3	9.0	6.6	15.6	300,000
2005	22.1	12.1	34.2	13.1	5.5	18.6	9.0	6.6	15.6	300,000
2004	22.1	12.3	34.4	13.1	5.6	18.7	9.0	6.7	15.7	250,000
2003	24.1	11.8	35.9	13.1	5.6	18.7	11.0	6.2	17.2	225,000
2002	26.1	11.9	38.0	13.1	6.2	19.3	13.0	5.7	18.7	200,000
2001	28.1	12.4	40.5	13.1	6.5	19.6	15.0	5.9	20.9	200,000
2000	29.1	13.3	42.4	13.1	6.9	20.0	16.0	6.4	22.4	200,000

Source: Organisation for Economic Co-operation and Development (2013) and Finance Canada (2014).

Table A-2: Selected Program Parameters for the Enhanced SR&ED Tax Credit

Years	Thresholds (Upper and Lower Limits of Phaseout Ranges)		Expenditure Limit	Small Firm Advantage		\$ Expenditure Limit Reduction per \$ Increase in:	
	Taxable Income	Asset		Credit Rate	User Cost	Taxable Income	Assets
2000-02	.2 - .4	10 - 15	2	15%	23.1%	10	0.400
2003-05	.3 - .5	10 - 15	2	15%	23.1%	10	0.400
2006-07	.4 - .6	10 - 15	2	15%	23.1%	10	0.400
2008	.4 - .7	10 - 15	3	15%	23.1%	10	0.600
2009-13	.5 - .8	10 - 50	3	15%	23.1%	10	0.075
2014	.5 - .8	10 - 50	3	20%	30.8%	10	0.075

Note: \$ million except as noted.

Source: Authors' calculations from Canada Revenue Agency form T661.

QUANTIFYING THE DISINCENTIVE EFFECTS OF THRESHOLDS

Impact on the required rate of return

The disincentive effects of the SBD on investment were quantified with a standard formula for the user cost of capital for a small firm:

$$(1) UC = \frac{(r_f - \pi + \delta)(1 - uz)}{1 - u}$$

The variable definitions and values are set out below:

Variable	Definition	Base Case Values
r_f	Financial cost of capital (risk-adjusted, including interest deductibility)	6.4%
π	Expected inflation rate	2%
δ	Economic depreciation rate of tangible assets	16.5%
u	Corporate income tax rate	15.3%
z	Present value of \$1 in depreciation allowances	.7459

Calculation of the financial cost of capital, r_f , requires some additional explanation. Following Chen and Mintz (2011), it is assumed that entrepreneurs obtain debt finance from financial institutions but supply most of the equity for their firms. The interest rate on debt is determined on world financial markets plus an adjustment for the higher costs of serving small business, but the supply of equity capital is affected by Canadian personal income taxes on equity income (dividends and capital gains). Lester and Warda (2014, p. 25) calculate a value of 5.8 percent for the worldwide return on risk-free debt. The cost of debt finance for small business is assumed to be 7.5 percent.

The opportunity cost of investing equity in an owner-operated firm is assumed to be the expected rate of return available on public equity markets, as determined in world capital markets. This rate is not observable, but can be calculated assuming that the after-tax, risk-adjusted returns on debt and equity will be equal. Using estimates of average world tax rates on debt and equity in Lester and Warda, the pre-tax, risk-adjusted rate of return on equity is 5 percent. The weighted average tax rate on income from equity in a Canadian small business is assumed to be 22.5 percent,^a so the pre-tax return required by the entrepreneur is 6.4 percent.

The financial cost of capital is the weighted average of the cost of equity and the cost of debt, adjusted for interest deductibility. Following Chen and Mintz, small businesses are assumed to have a debt-asset ratio of 30 percent.

In the base case, when $u = 15.3$ percent, the user cost of capital takes on a value of 21.9 percent – the firm's marginal investment has to have an expected return of at least 21.9 percent before it will be undertaken. Note that this is the rate of return on capital including provision for economic depreciation. The return to the suppliers of capital (investors) is net of depreciation, which is 5.4 percent (adjusted for risk).

Evaluated with $u = 26$ percent, the user cost of capital takes on a value of 22.5 percent, which is an increase of 3 percent.

When assessing the enhanced SR&ED tax credit, equation (1) was modified as follows:

$$(2) UC = \frac{(1-c)(r_f - \pi + \delta)(1-uz)}{1-u}$$

In this formula, c is the SR&ED investment tax credit rate.

Since the phase-out rules are different for the expenditure limit and the business limit, it would be exceptional for a firm to lose both over the same asset range. Assuming that the firm loses access to the enhanced SR&ED credit while retaining the SBD means that the user cost gross of the credit will not change, so that the increase in the user cost is determined by the following expression:

a The dividend tax rate is assumed to be the average combined federal-provincial top marginal rate of income tax less the dividend tax credit on distributions from a small business. The effective capital gains tax rate was calculated as the combined marginal income tax rate reduced by the 50 percent inclusion rate and by a factor to capture an assumed 5-year holding rate on equities. Following Chen and Mintz, the holding-period adjustment is calculated as $n/2/(n/2+i)$, where n is the holding period and i is the interest rate. This calculation assumes that, on the margin, the entrepreneur cannot make use of the lifetime capital gains exemption.

$$(3) \quad \frac{\Delta UC}{UC} = \frac{(1 - c_r)}{(1 - c_e)} - 1$$

c_r and c_e are the regular and enhanced credit rates, respectively.

When c_r and c_e are 20 percent and 35 percent, the change in the user cost is 23.1 percent. With a value of 15 percent for c_r , the change in the user cost is 30.8 percent.

The impact of changes in the expenditure limit on the user cost of capital

The expenditure limit is calculated according to equation (1) below:

$$(4) \quad EL = 3 - 10(\rho A - .5)D_{TI} - .075(A - 10)D_A$$

Where EL is the expenditure limit, ρ is the rate of return on prior-year assets, A is prior-year assets, D_{TI} has a value of one when taxable income is greater than or equal to \$0.5 million and equals zero for all other values of taxable income. D_A has a value of one when assets are greater than or equal to \$10 million and zero when less than \$10 million.

The change in the expenditure limit per dollar of investment is derived in equations (5)-(7):

$$(5) \quad EL_1 = 3 - 10(\rho A_1 - .5)D_{TI} - .075(A_1 - 10)D_A$$

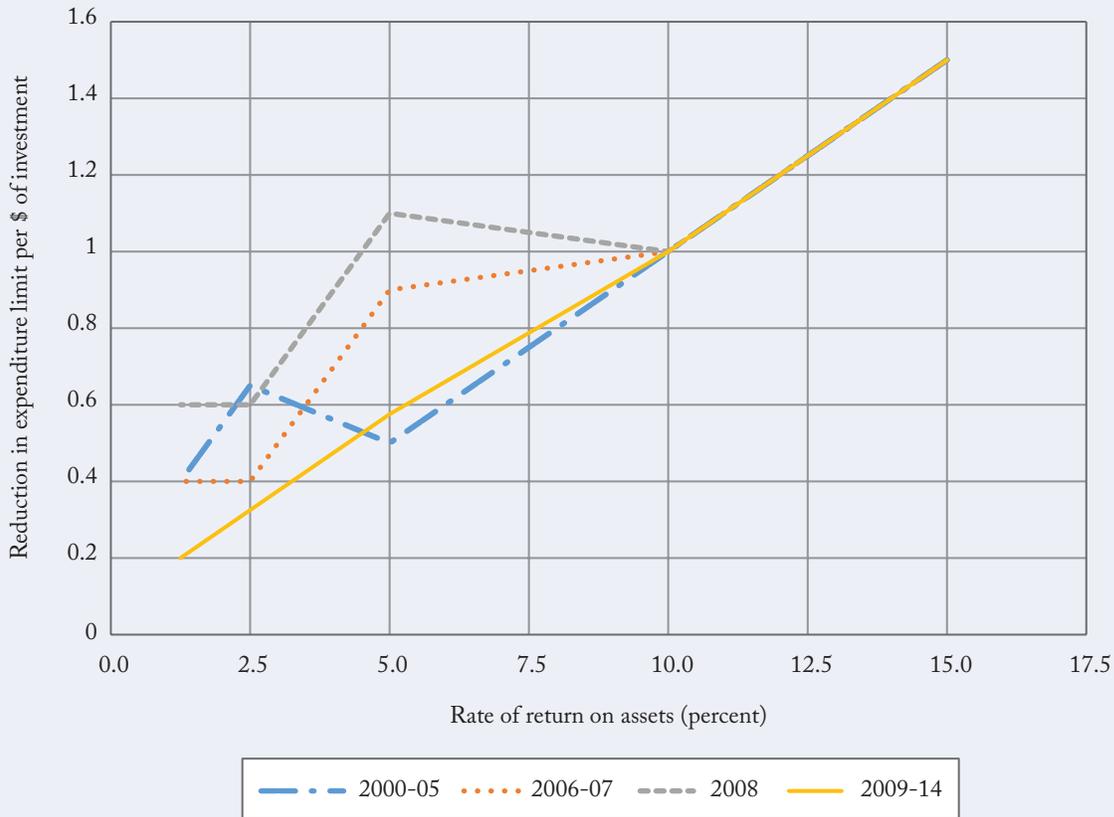
$$(6) \quad EL_1 - EL = -10\rho(A_1 - A)D_{TI} - .075(A_1 - A)D_A$$

$$(7) \quad \frac{\Delta EL}{\Delta A} = -10\rho D_{TI} - .075D_A$$

And the increase in the user cost arising from threshold effects (ΔUC^*) is given by equation (8):

$$(8) \quad \Delta UC^* = (10\rho D_{TI} + .075D_A)\Delta UC$$

Figure A1: Reduction in the SR&ED Expenditure Limit per Dollar of Investment



Source: Authors' calculations.

EVOLUTION OF SR&ED THRESHOLD EFFECTS

We calculated the SR&ED expenditure limit per dollar of additional investment as the rate of return on asset increases over the 2000 to 2014 interval for sub-periods when the threshold effects were different (Figure A-1). The expenditure-limit reduction per dollar increase in taxable income did not change over the entire period, while the reduction per-dollar increase in assets was 40 cents from 2000 to 2007, 60 cents in 2008 and has been 7.5 cents since 2009. As a result, the threshold effects in the 2009-2014 period were generally smaller than over the 2000 to 2008 period (Figure A-1). They reached a peak in 2008, when \$1 in additional investment earning a 5 percent return reduced the expenditure limit by \$1.10 compared to 57.5 cents over the 2009-14 period. Note that with a high rate of return on assets, the taxable income threshold dominates, so the expenditure loss per dollar of additional investment is the same in all periods when the rate of return on assets is at least 10 percent.