

Incentives for ICT Adoption: *Canada and Major Competitors*



ITAC Paper

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ITAC is the voice of the Canadian information and communications technology industry. Together with its affiliated organizations across the country, the association represents 1300 companies in the information and communications technology (ICT) industry in all sectors including telecommunications and Internet services, ICT consulting services, hardware, microelectronics, software and electronic content. ITAC's network of companies accounts for more than 70 per cent of the 566,000 jobs, \$130 billion in revenue, \$5.2 billion in R&D investment, \$20.7 billion in exports and \$11.5 billion in capital expenditure that the sector contributes annually to the Canadian economy.

Highlights

- Tax incentives that Canada offers for ICT adoption are mainly channeled through the capital cost allowance system (CCA). Tax credits directed at ICT capital assets are not available in Canada.
- Canada's depreciation rates for ICT equipment waited for almost three decades to catch up with the reality of quick technological obsolescence. Canada's capital cost allowances now compare relatively favourably with the United States and United Kingdom but only when those countries' generous initial allowances, introduced on temporary basis to stimulate productivity and uptake of ICT in the economy, have lapsed.
- Still there are OECD countries that treat ICT capital investments more favourably than Canada. In particular Japan, Korea and Spain have tax credits for ICT equipment. Emerging economies of China and India also have a variety of tax incentives for ICT adoption.
- In general, Asian countries are leaders in providing tax incentives for ICT adoption in their domestic businesses.
- An emerging issue is investing in intangible assets such as skills and organizational effectiveness. These are seen as factors that would stimulate higher adoption and more effective use of ICT investments in the enterprise, as well as encourage the knowledge creation and dissemination necessary to effectively exploit ICT advancements and drive to organizational change.
- Canada lags competitor countries in the provision of incentives for activities that assimilate technology adoption at the firm level such as corporate training.
- A Japanese model providing an option of high initial depreciation allowance or investment tax credit could be applied in Canada, on a pilot basis, to stimulate adoption of ICT in small companies.
- Canada could also explore the models of tax incentives for training with a view to introducing such incentives to stimulate corporate investment in training and education.

Background

Innovation comes not only from R&D but also from the acquisition, adoption and use of new technologies embodied in capital investment. In particular, new information and communication technologies (ICT) are seen as enablers of innovation, productivity and economic growth in all industrial sectors of the economy.

The ICT portfolio of solutions includes all hardware and software associated with the operations of computer and communications equipment. And while ICT hardware and software are seen as key drivers to productivity, it is also widely recognized that training in the use and optimum exploitation of ICTs is also an important contributor to productivity.

According to the Organization for Economic Development and Cooperation (OECD), between 1980 and 2001, in a group of 18 countries, which includes Canada, the share of ICT investment in total non-residential gross fixed capital formation at least doubled and in some cases grew by a factor of four. ICT accounts for an increasing share of investment because of growing demand for ICT applications and rapid price declines.¹ Yet Canada's adoption of ICT significantly lags behind our major foreign competitors and is seen as an important contributor to our productivity gap.²

OECD analysis reveals that computers and the Internet are now widely diffused, but integrated e-business processes are only slowly being adopted. Many firms still use the Internet mainly for information search, supply and on-line banking. They haven't embraced the new trends yet, which include a shift to business-to-consumer e-commerce, greater internationalization and a move by small firms towards more complex electronic business applications. Thus one of the OECD key recommendations is to move beyond policies for basic connectivity and ICT readiness to facilitate more widespread uptake and *adoption* of complex ICT applications, in particular by small firms.³

Given the generally acknowledged link between ICT investment and productivity, not until recently and for the first time since 1976 – in 2004 federal budget – government recognized the importance of the ICT *adoption* to enhancing industrial productivity by increasing depreciation allowances for select ICT equipment.⁴

And in spring this year, the federal government set up a Telecommunications Policy Review Panel, with a special focus on reviewing and recommending measures to promote the development, *adoption* and expanded use of advanced telecommunications services across the economy and, in particular, to report on the appropriateness of Canada's current levels of investment in ICT. In their consultation paper, the panel views ICT *adoption* as an important factor in improving productivity and enhancing competitiveness.⁵ According to the panel, Canadian businesses have generally lagged behind the United States in introducing ICT

¹ *OECD Information Technology Outlook*, OECD, Paris, 2004, p.56

² Since 2000 Canada has experienced a much slower rate of growth in machinery and equipment investment and ICT investment than in the second half of the 1990s. See, Andrew Sharpe, Centre for the Study of Living Standards, *Six Policies to Improve Productivity Growth in Canada*, Testimony given to the Senate Standing Committee on Banking, Trade and Commerce hearings on productivity, May 11, 2005, Ottawa, Ontario, and Information Technology Association of Canada, *The Issue: ICT and Productivity*, March 2005

³ OECD, 2004, pp. 14-16 and 297

⁴ The 2004 Budget introduced faster depreciation write-offs for computer equipment from 30 to 45 per cent and for broadband, Internet and other data network infrastructure equipment from 20 to 30 per cent.

⁵ *Telecommunications Policy Review Consultation Paper*, June 6, 2005, www.telecomreview.ca

investments, sometimes by a very significant margin. In almost every sector of the economy, Canadian business has invested significantly less in ICT, as a percentage of total investment, than is the case in the United States.⁶

As Canada's competitor countries increasingly target ICT investment by providing generous tax treatment to business for ICT adoption, there is a strong feeling in industry that selective incentives are required to markedly improve the uptake of ICT and increase the overall productivity in Canadian industry. This is particularly important in sectors that have the greatest potential for productivity improvement – the small and medium sized (SME) enterprises.⁷

This paper's objective is to strengthen policy discussion in Canada on the vital role of ICT adoption for innovation, commercialization and productivity growth by reviewing financial incentives for ICT adoption existing in the OECD and non-OECD countries and discussing implications for Canada.

About the Study

The study provides an international comparison of the incentives for ICT capital investments, including options for policy improvement. It identifies available incentives, performs international comparison, discusses the trends and Canada's difference and presents the findings in the context of policy implications for Canada.

The methodology is based on document review – an examination of available incentives and comparative analysis to define Canada's gaps and advantages, if any. The country coverage includes a range of Canada's major economic counterparts – the G-7 countries and a group of other OECD countries, where investment in ICT is high (e.g., Sweden, Finland) or countries that compete vigorously for ITC investment (e.g., Ireland, Korea and Australia, as well as the non-OECD countries - China and India). Incentives existing in the selected U.S. states and Canadian provinces are also examined, as applicable.

Models for the Support of ICT Adoption

Models for encouraging ICT adoption by business are diverse and policy initiatives combine many different elements. Adoption strategies include tax incentives, infrastructure development, procurement policies and R&D support initiatives. An important set of initiatives is aimed at the firm level. These comprise incentives for corporate training and organizational change, and information on and demonstrations of best practice and benefits from use. Most commonly the international policy focus has been on adoption of ICT by small companies.⁸

⁶ For example panel quotes the following numbers: In service industries, ICT investment, as a percentage of total investment, was 19 per cent in Canada and 32.2 per cent in the United States in 2000. The comparable figure for manufacturing was 6.3 per cent for Canada and 18.5 per cent for the United States

⁷ See, Information Technology Association of Canada, *Investing in Prosperity*, ITAC Pre-Budget Brief to the Commons Standing Committee on Finance, November 2004, pp. 3-4

⁸ OECD, 2004, p. 291

Based on the country policies reviewed for this study, ICT adoption tends to be supported by governments through the following models:

- Through incentives specifically designed for ICT capital equipment such as targeted tax credits and faster depreciation write-offs.
- Through building conditions for take-up of ICT investments at the firm level – e.g., training and skill development, and organizational change.

Tax Incentives for ICT Adoption

Tax incentives for ICT adoption are chiefly composed of two items:

- Tax credits or allowances from taxable income
- Depreciation allowances for ICT machinery and equipment

Of the 15 OECD countries examined (see Appendix 1 for country reviews), only two – Japan and Spain – have introduced tax credits for the acquisition of ICT machinery and equipment. In both countries, the ICT tax credit is offered at the rate of 10 per cent. Note that in Japan, the tax credit is offered as an alternative to 50 per cent initial depreciation. This gives flexibility to the firm depending on its financial situation – profitable companies will certainly go the tax credit route applying the credit against taxes payable, while companies not making a profit will be more inclined to utilize the depreciation and increasing their loss carryover. In addition, Korea, too, provides significant tax credits applicable for ICT applications, particularly by small business.

Outside the OECD, it is China that has a host of incentives for acquisition of machinery and equipment. These incentives are not specific, like the credits above, to ICT adoption but generally are defined as applying to advanced technology equipment. Chinese incentives are not tax credits per se – they are not deducted from the income tax payable – but represent an allowance against taxable income. Unlike China, India does not offer tax allowances on advanced technology assets. However, India possesses one of the most generous tax depreciation systems pertaining to ICT adoption. The applicable rates range from 60 per cent to 80 per cent per annum, for computers and other ICT assets (e.g., routers, data transmission equipment, etc.) respectively. In other words, Asian countries are leading the policy direction to investing in ICT adoption.

Within the second-tier of government, the U.S. states are often employing investment tax credits for purchases of machinery or equipment. These credits have several caveats. First, these are mainly non-ICT specific tax credits – out of 6 states analyzed in this paper, only two – New Jersey and Maine – offer ICT specific investment tax credits. Second, they largely represent an economic development policy tool thus in a number of states their use is restricted to development zones. The states selected for analysis have a statewide investment tax credit in place.

Tax credits directed at ICT capital assets are not available in Canada. Only Saskatchewan and Manitoba have in effect a general investment tax credit for manufacturing machinery and

equipment. These credits may affect ICT adoption but likely more by chance than by purpose as they aim at broader use of machinery and equipment.

Tax depreciation is the main channel for stimulating the investment in ICT equipment at the firm level – in Canada and in our major competitor countries. Tax incentives that Canada offers for ICT adoption take a form of capital cost allowances (CCA).

As of 2004, Canada offers an increased rate of CCA for ICT machinery and equipment: 45 per cent for computer equipment and 30 per cent for broadband and Internet equipment. Canada's depreciation rates took almost three decades to catch up with the reality of fast pace of ICT obsolescence. Canada's capital cost allowances now compare relatively favourably with the United States and United Kingdom but only when those countries' generous initial allowances lapsed. Until 2004, the United Kingdom and United States operated a very generous system of initial or bonus depreciation allowances of 100 per cent and 50 per cent, respectively. They were introduced on temporary basis to stimulate productivity and uptake of ICT in the economy. It is not known whether their impact has been evaluated.

Still there are countries that treat ICT capital investments similarly favourably or better than in Canada. In particular, these are Japan and Spain, both employing tax credits for ICT equipment. France and Germany may even be more competitive than Canada in the tax treatment of ICT equipment – with their depreciation rates of 40 per cent declining balance and 33⅓ per cent straight line, respectively. Finally, despite that it has terminated a 100 per cent write-off for ICT equipment, the United Kingdom now offers for small companies an initial depreciation allowance of 50 per cent on *all* technology capital investment, which will also include ICT equipment. Canada's CCA rates are also much less generous than depreciation rates offered in India.

Tax Incentives for Skills and Training

Firm-level evidence suggests that effective diffusion and use of ICT are key factors in broad-based growth when combined with effective human resource strategies involving education and training and organizational change. An emerging issue is laying down the conditions for effective adoption of ICT in the company through investing in intangible assets such as skills and organizational change. These are seen as factors that would stimulate the adoption of ICT in the enterprise.

Firm-level studies confirm that the Skill-ICT combination improves productivity performance. Organizational change is also a benefit accruing from ICT investment and is closely linked to the need for skilled human resources. These studies note, however, that skills and organizational effectiveness are long term contributors – their benefits only emerge over time, as firms take time to adjust.⁹

As this study reports, there is a global trend to gear the tax incentives to corporate training that would assimilate a greater rate of ICT adoption. Indeed, an increasing number of countries provide tax incentives for corporate training, some emphasizing training in new ICT methods and equipment. (See Appendix 2 for country summaries.)

⁹ OECD, 2004, pp. 56 and 60

Despite that the current corporate performance in employee training calls for policy support¹⁰, Canada doesn't employ any tax incentive for corporate training at the federal level. Limited tax credits, however, are provided in Ontario for apprenticeship training and Quebec for on-the-job training.

The United States (federal level) and United Kingdom alike do not have tax incentives for corporate training. In the U.S., the 'slack' is taken up by the states, which frequently provide training tax incentives to corporations. However, these tax incentives, in most cases, are not statewide programs – they pertain to job creation initiatives rather than to corporate training, specifically.

In the United Kingdom, there is a pressure by the ICT industry to introduce the corporate training tax credit. U.K. private sector organizations, for example The British Chambers of Commerce (BCC), have called on the government to encourage electronic business by introducing tax credits for technology training.¹¹ According to Richard Barrington, head of government affairs and public policy at Sun Microsystems, the government is missing an opportunity: "We need a lot of training and re-training to keep up the U.K. skills base..."¹²

Leaders in applying corporate training incentives can be found in Europe and Asia. As Table 1 indicates, six countries – Austria, France, Japan, Korea, Netherlands and Spain – provide a tax credit or allowance from taxable income for expenditures incurred on employee training. The rates of the tax credit are pretty generous ranging from 10 per cent in Spain to 35 per cent in France, although the latter offers an incremental tax credit. However, the most innovative approach can be found in Japan, which offers a mix of volume-based and incremental tax credit for training. The rate of the tax credit depends on training intensity and size of the company. Small companies are offered a more generous rate of the tax credit.

¹⁰ The Conference Board Of Canada, *Learning and Development Outlook 2005: Moving Beyond the Plateau—Time to Leverage Learning Investment*, Ottawa, 2005

¹¹ <http://news.bbc.co.uk/1/hi/business/1247372.stm>

¹² Ron Coates, *Brown gives IT much of the same, Small IT nuggets hidden away*, March 17, 2004 www.silicon.com

Analytical Observations

To analyze Canada's position in the provision of tax incentives for ICT adoption, we have contrasted Canada's ICT tax treatment against a broad range of tax incentive regimes and other incentives available internationally. Based on this comparison, adoption of new technologies, specifically ICT, has only recently become an emerging theme of Canada's innovation policy. We have also analyzed the motivations of the government policy makers in introducing ICT adoption related incentives. Although the motivations are broad ranging, the most prevalent themes are productivity and economic growth catalyzed by increased uptake of ICT. (See Appendix 3 for further discussion on motivations.)

Canada's tax incentives for ICT adoption are solely channeled through capital cost allowances. Since the 2004 increase in the depreciation rates for ICT equipment, Canada's gap to its major competitors for ICT investment has narrowed. (That doesn't say that Canada's ICT adoption gap has yet thinned.) Still there are countries that lead Canada in the provision of tax incentives for ICT adoption. Specifically, these are Japan, Korea and Spain which offer ICT investment tax credits and generous tax depreciation alike. But foremost, these are the new emerging economies – China which offers a host of tax allowances for advanced technology acquisition, and India which provides unequivocally generous tax depreciation rates for ICT-specific assets.

Canada also lags in providing tax incentives for creating a milieu for effective take-up of new information and communication technologies in the enterprise, such as corporate training and skill development. An increasing number of OECD countries provide tax incentives for corporate training and education, with Japan leading the way.

How can we more effectively stimulate the ICT adoption in Canadian companies? Based on the financial models for ICT adoption, it appears that no single solution is available. The solution to meeting Canada's ICT adoption needs must be based on private sector investment, bolstered by well-designed government support such as tax incentives and innovative financing mechanisms such as government procurement. These two financing approaches can co-exist and complement each other.

Small companies, in particular, may require a tax treatment that would more radically stimulate their uptake of ICT. A mix of incentive (i.e. higher) depreciation rates, strengthened by federal ICT investment tax credit (possibly refundable), is a scenario to consider.

Countries such as Japan can serve as a model. In such scenario, there could be a number of variants to discuss. For example, both incentive depreciation and tax credit could be made available to small firms or made alternative as in Japan. Depending on the financial situation, for example level of profitability, an SME could choose to claim the tax credit or incentive depreciation. Such program could first be introduced on a pilot basis, with its effectiveness monitored, and evaluated for continuation before the program's expiry.

Canadian government and business could also explore the models of tax incentives for training with a view to strengthen corporate investment in training and education. Again, many countries can offer a starting base for the choice of the model, but possibly Japan's model which rewards training intensity and small company training could be the one to begin with.

Conclusions

The international review of the tax treatment for ICT adoption shows that the topic of ICT adoption hasn't been on the minds of Canada's policy makers until recently. Canada has been rather slow to respond while other countries have been introducing policies to stimulate the demand for ICT, particularly by the small and medium-sized companies.

As this paper shows, more needs to be done for ICT adoption. As pervasive general-purpose technologies, the take-up of ICT by all companies and industries in Canada is vital to economic growth and well-being of the country.

Table 1: International Map of Tax Incentives Relevant for ICT Adoption: 2004-2005

Country	CIT rate Large/SME %	Depreciation ICT Equipment	Tax Credits for ICT Equipment	Tax Incentives Corporate Training
Australia	30	approx.5 years		
Austria	34	5 years		20% education allowance
Canada – federal	22.12/13.12	30-45%		
Quebec				30% tax credit
Ontario				20-30% apprenticeship tax credit
Manitoba			10% general ITC	
Saskatchewan			7% general ITC	
Finland	26	25%		
France	34.33	40%		35% tax credit
Germany	38.29	3 years		
Ireland	12.5	8 years		
Italy	33	20% and double that in first 3 years		
Japan	42/32	50% alternative to tax credit	10% targeted ITC	20-25% tax credit
Korea	29.7/16.5	approx. 5 years	3% ITC 7% ITC for ICT facilities	15-50% tax credit
Netherlands	31.5/29	3 years		20% allowance
Spain	35	4 years	10% targeted ITC	5-10% tax credit
Sweden	28	30%		
United Kingdom	30/19	50% first year and 25% after		Contemplated but not passed
United States –federal	35	5-year MACRS property		Many states have various incentives for training and jobs development, but often limited to economic development zones, so vaguely ICT related.
California			6% ITC for manufacturers	
New Jersey			10% high-tech tax credit	
Massachusetts			3% ITC	
North Carolina			4-7% ITC	
Maine			Up to \$100K ITC	
New York			4-5% ITC	
China	33	5 years	Investment allowance 40% Allowance for technological innovation 50%	
India	33	60-80%		
		Semiconductor plant 30%		

Notes: Incentives that are ICT-specific are underlined in **bold** font. ITC=investment tax credit

Source: Compiled by JPW Innovation Associates Inc. from various international tax sources, notably International Bureau of Fiscal Documentation, Amsterdam and Federation of Tax Administrators, Washington D.C., www.taxadmin.org

A Country Review: Supporting ICT Adoption – Through Tax Incentives

This section details the elements of the corporate income tax system that directly affect various types of ICT investment in the tax jurisdictions selected. These items include tax credits, depreciation deductions, and various income tax exemptions. As a general rule, the description of the pertinent tax incentives is based upon most recent (2004) information available for the comparator countries.¹³

OECD Countries

Canada

The current capital cost allowances (CCA) for ICT machinery and equipment are 45 per cent for computer equipment and 30 per cent for broadband and Internet equipment. These allowances were introduced in the 2004 Federal Budget. They were raised by 50 percentage points: from 30 per cent for computers and 20 per cent for broadband infrastructure, in apparent testimony to the rapid pace of technological change and resulting obsolescence of ICT equipment and the fact that the CCA rates have not been ‘touched’ since 1976.

The increases in the CCA rates are expected to reduce the cost of ICT investments, by allowing the private sector to write them off more quickly, thus encouraging more investment in ICT. The introduction of increased CCA rates has made Canada’s ICT tax treatment relatively more generous internationally. However, it is clear that Canada’s competitors are not ‘sleeping’ as they too provide attractive tax environment for ICT investment and, in general, have provided these incentives earlier and more aggressively. And no other incentives tailored to ICT adoption are offered in Canada – at the federal level or by provinces.

Provinces: Currently two Canadian provinces – Saskatchewan and Manitoba – offer an investment tax credit for machinery and equipment purchased by manufacturing and processing sector in the province. The rates of the credit are 7 per cent and 10 per cent, respectively. Although these credits are for general capital investment, ICT equipment will be eligible provided it is used in manufacturing. Still a whole range of industries are excluded, for example services which are significant adopters of ICT. Note that the Manitoba Manufacturing Investment Tax Credit is partially refundable – one-fifth or 2 percentage points can be converted to a refundable credit. The Saskatchewan investment tax credit is non-refundable.

However, a passing of the increased CCA rates in Canada has to be viewed as an important step forward compared with our two most important competitors – the United States and the United Kingdom. The appendix discusses ICT incentives available in the United States first, moving next to the United Kingdom and other countries.

United States

Introduced by May 2003 *Jobs and Growth Act*, U.S. businesses were eligible for a first year bonus depreciation of 50 per cent of the acquisition cost of ICT capital assets. This special allowance was temporary and expired at the end of 2004.

¹³ See publications of the International Bureau of Fiscal Documentation, e.g., *Taxation of Companies in Europe and Taxes and Investment in Asia and the Pacific*, Amsterdam.

In the absence of the special first year allowance, the United States provides a regular accelerated depreciation scheme – the Modified Accelerated Cost Recovery System (MACRS), under which computers and broadband equipment would likely qualify as a *5-year property*, meaning the effective depreciation over 6 years, which takes into account a half-year rule.

There is no tax credit under the general business tax credits umbrella, specifically destined for ICT adoption.¹⁴ However, there are pressures for the implementation of an ICT tax credit. For example, the rollout of national broadband has been sponsored by Senators John D. Rockefeller IV (D-W.V.) and Olympia J. Snowe (R-Maine), seeking tax incentives for service providers. The proposed legislation specifically targets rural and underserved areas.

The proposed *Broadband Internet Access Act of 2005*, (S. 1147), would allow providers to expense 50 per cent of their investments on current-generation technology and 100 per cent on next-generation technology. The bill defines current-generation broadband as DSL and cable modems, whereas next-generation broadband refers to such ultra high-speed services as fiber-to-the-home. To ensure that funds are concentrated on competitive market solutions, credits will be earned only after a service provider achieves 10 per cent market penetration.¹⁵ If passed as law, the Act will restore some of the luster to the incentives offered at the federal level, that now comprise regular (i.e., non-ICT specific) accelerated depreciation write-offs.

Unlike Canadian provinces, the U.S. states do fill the federal gap in provision of adoption tax incentives, if only to some extent. Virtually each state has in place a sort of an investment tax credit for purchases of machinery and equipment. Some states limit application of these credits to specific economic zones, and some are statewide. In most cases, they apply to general business operations in the state and include ICT equipment. Some states have high-technology or ICT specific tax credits such as Maine and New Jersey. But in all cases they stimulate technology adoption at the local level which includes ICT adoption. And this is unlike Canadian provinces which generally do not operate any investment tax credits of their own, beyond R&D tax credits.¹⁶ Below we examine seven states among the host of others that offer some kind of an incentive.

California: In addition to the 15 per cent incremental R&D credit, California offers corporate taxpayers a manufacturer's investment tax credit (MIC) of 6 per cent for certain tangible personal property used in manufacturing and research. This level-based and taxable credit is applicable to ICT machinery and equipment and specific-purpose structures such as a research or storage facility used primarily in connection with a manufacturing process. Note that the MIC is targeted to a broader range of investment assets than ICT.

Massachusetts: A manufacturing corporation, or a business corporation engaged primarily in research and development, may take a credit equal to 3 per cent of the cost or other basis for federal income tax purposes of qualifying tangible property acquired, constructed or erected during the taxable year. Qualifying tangible property includes machinery, equipment and buildings and other tangible property. Again, note that the investment tax credit is non-ITC specific, but will include these assets.

New York: General business corporations may claim an investment tax credit for tangible property placed in service in the state. Any portion of the credits that cannot be used to reduce

¹⁴ See CCH Limited, *Financial Planning Toolkit*, <http://www.finance.cch.com/text/c60s15d795.asp>

¹⁵ Roy Mark, *Deep Tax Breaks Offered For Broadband Access*, June 3, 2005, www.internetnews.com

¹⁶ Saskatchewan is the only province that has in place an investment tax credit of 7 per cent on equipment purchased for manufacturing and processing in place.

current year tax liability may be carried over for 15 tax years. Standard rate of the credit ranges from 4 to 5 per cent depending on the size of the investment credit base.¹⁷ The investment tax credit is non-ITC specific but includes ICT capital assets in the base for the credit.

New Jersey: A small New Jersey-based high-technology business may claim a tax credit in an amount equal to 10 per cent of the qualified investment made by the taxpayer during the tax year. The maximum allowable credit for each tax year is \$500,000 (CDN\$625,000) for each qualified investment made by the taxpayer. The small high-technology business must employ less than 225 employees, of which 75 per cent must have jobs in New Jersey. The small high-technology business must conduct pilot scale manufacturing or qualified research in New Jersey in the fields of advanced computing, advanced materials, biotechnology, electronic device technology, environmental technology and medical device technology.

North Carolina: An incremental tax credit for investing in machinery and equipment is available to businesses in North Carolina. The credit is on the excess of the eligible investment over the applicable base year and ranges from 4 to 7 per cent depending in which development area the investment is placed in service. The base year for the credit is that year, of the three immediately preceding taxable years, in which the taxpayer had the most machinery and equipment in service in North Carolina. The credit is non-ICT specific but covers ICT capital assets.

Maine: The high technology investment tax credit rewards eligible high tech firms for investments in a range of computers and related equipment. The credit applies to purchases or leases of computer equipment, electronics components, communications equipment and computer software placed in service in the state. Unlike the previous ones, this is the only ICT-specific tax credit identified. Only firms engaged in a "high technology activity" may claim the credit. Businesses eligible for the credit include those that design, create or produce computer software, computer equipment, supporting communications components and certain other computer accessories. Businesses that provide Internet or e-communications access services, support access to electronic media, data and associated communications support, or advanced telecommunications capabilities also qualify. The credit amount is equal to the adjusted basis of eligible equipment placed in service in Maine less any lease payments received during the taxable year; the credit cannot reduce the tax liability to less than the preceding tax year's liability after the allowance of any credits, and it cannot reduce the tax liability in the current year below zero; unused portions of the credit may be carried forward five years; the credit cannot exceed \$100,000 (CDN\$125,000) in any one year; income must be increased by any credit base amount claimed as a business expense.

Japan

The most comprehensive ICT investment promotion scheme can be found in Japan. The 2003 tax reforms introduced tax incentives designed to stimulate investment by companies in Japan in information and communication technology assets and software. Firms investing in ICT solely for their own use have an option of either 10 per cent credit from corporate tax or special depreciation equivalent to 50 per cent of the acquisition cost.

The coverage of ICT assets by the scheme is large. The following types of assets potentially qualify, when acquired for business use: large memory electronic calculators, digital copying

¹⁷ New York State Department of Taxation and Finance, *CT-46 Claim for Investment Tax Credit*

equipment, facsimiles, IC card-using equipment, digital communication equipment, Internet telephone equipment, router switches, digital circuit connection systems, and software.

There are a number of factors that may weaken the effectiveness of the incentive. First, the tax credit is limited to 20 per cent of the company's tax liability, and any excess tax credit may be carried forward only for one year. That limits the use of tax credit only to profitable companies. Second, there is a minimum amount set for ICT assets to qualify for the incentive – the assets' total acquisition cost must be over 6 million yen (CDN\$67,000) for large companies and 1.4 million yen (CDN\$15,000) for small companies. Finally, the scheme is temporary – it is due to expire as of 2006 budgetary year.¹⁸

Spain

Spain is another country that offers an ICT tax credit. As a special measure for small companies, a tax credit of 10 per cent is available. It includes the costs incurred for the acquisition of equipment to enable Internet Access (hardware, software), design web sites, e-commerce and information and communications technologies. Training to carry out these activities is also included in the tax credit base.¹⁹

United Kingdom

An extremely generous tax incentive scheme for ICT adoption was available for a short period for a few years only in the United Kingdom. It was designed to stimulate demand for ICT by small companies. The incentive allowed 100 per cent first year allowance for capital expenditure on ICT incurred by a small enterprise in the period April 1, 2000 to March 31, 2004. In other words, it allowed current expensing of the capital cost of acquired ICT.

With the UK Budget 2005, the rate of first year allowance that can be claimed by small businesses is 50 per cent on plant and machinery expenditure. Unlike the previous incentive, the new relief is not ICT-specific, but, of course, will include ICT capital assets.

Other OECD countries

There are no specific ITC adoption-oriented incentives in other countries examined in this comparison. The only incentive they rely on is depreciation allowance.

The only countries offering ICT-specific depreciation allowances are Germany, Spain and Netherlands, in addition to the previously discussed Canada and Japan. In particular, Germany and Netherlands' depreciation allowances compare well with those applicable to ICT adoption in Canada. Both countries offer a 3-year straight-line write-off that is likely more generous than the 45 per cent declining balance CCA in Canada available for computers. Spain offers somewhat less generous depreciation write-off of 4 years straight-line.

In the remaining countries, the depreciation allowances applicable to ICT capital assets range from 6 years to 8 years straight-line or from 25 per cent to 40 per cent declining balance. For example, in Australia, the rate of depreciation that will likely be applicable to ICT assets is 5 years straight line. And in Ireland, the largest producer of software in the world, it is 8 years straight line – a general plant and machinery depreciation allowance of 12.5 per cent per annum – that is applicable to ICT capital assets. Interestingly enough, purchased computer software is treated in the same way as plant and machinery in Ireland.

¹⁸ PriceWaterhouseCoopers, *Japan Tax Update*, No 6, December 15, 2004

¹⁹ *Innovation as the Explicit Target of Spanish Tax Incentives*, Presentation of the Ministry of Finance, Spain, 2001

Asia Economic 'Tigers'

China

In the People's Republic of China, the more significant tax incentives are granted only to enterprises which qualify as export-oriented or technologically advanced. If an enterprise qualifies under both categories, it may choose whichever treatment is more advantageous.

Chinese government provides numerous and attractive tax incentives specifically for foreign invested enterprises (FIEs) and, in general, for foreign owned enterprises. This includes various tax holidays and reduced rates of corporate taxation. Three kinds of incentives most closely related to ICT investment include depreciation allowance, investment allowance and tax allowance for technological innovation.

Depreciation: Depreciation for fixed assets is computed annually on a straight-line basis on the assumption that there will be a residual salvage value of 10 per cent of the original cost. In other words, only 90 per cent of the cost of an asset may be written off.

The closest to ICT is 'electronic equipment' category which qualifies for a 5-year depreciation period (as opposed to the 10-year depreciation period applicable to other machinery and equipment). Electronic equipment includes all equipment consisting of electronic elements such as integrated circuits, transistors, etc., and the performance of which relies on electronic technology (including software), including computers, computer-controlled robots, digital control systems, program control systems, etc.

Investment allowance: Generally, investment allowances are not granted. However, Chinese authorities grant a tax credit to FIEs and foreign owned enterprises which purchase equipment or machinery made in China for investments listed in the Catalogue of Industries for Guiding Foreign Investment. The tax credit is equal to 40 per cent of the purchasing price of the equipment or machinery. The credit is subject to certain limitations although the excess amount can be carried forward for 5 years. The tax credit has no impact on the depreciation of the equipment or machinery.

Allowance for technological innovation: If the expenses incurred by profitable enterprises for new technology have increased by 10 per cent or more from the previous year, the current year's taxable income of the enterprise can be reduced by 50 per cent of its current year's expenses, provided permission is obtained from the competent tax authority. This provision applies only to profitable companies – there is no carryover in case of losses.

There are two separate corporate income tax regimes. For Chinese domestic companies the rate is 33 per cent and for FIEs the tax is 30 per cent. A local tax of 3 per cent is also payable (although waived by most local governments) bringing the effective rate to 33 per cent for FIEs. Although, the corporate income tax rate seems high for a country whose main policy thrust is to attract foreign investment, it is rare that the top rate is ever paid. There are numerous corporate income tax exemptions, including tax holidays and reduced tax rates (from 24 per cent to 15 per cent to even 10 per cent) thereafter that apply to FIEs and other foreign companies.

India

India doesn't have the variety of tax incentives that China offers. In fact, some incentives, for example a total (100 per cent) exemption from income tax payable for companies engaged in exports of software, have been phased out.

In essence, what pertains to ICT adoption is tax depreciation, calculated on a declining balance basis. But the depreciation allowance system is extremely generous. Effective from assessment year 2006-2007, it includes:²⁰

- Depreciation allowance of 60 per cent per year for computers including computer software (recorded on any disk, tape or other information storage device)
- Depreciation allowance of 80 per cent for ICT electrical and electronic equipment such as remote terminal units, intelligent electronic devices, computer hardware/software, router/bridges, other required equipment and associated communication systems for supervisory control and data acquisition systems
- Depreciation of 30 per cent is available for machinery and equipment used in the semiconductor industry.

The corporate income tax rate for domestic companies has been reduced from 35 per cent to 30 per cent. A 10 per cent surcharge is also applicable on the corporate income tax bringing it to 33 per cent.

Korea

There are many investment incentives in Korea that apply to small companies. The two tax incentives relevant to ICT adoption include:

- Tax credit for acquisition of machinery and equipment and a tax given to small firms at a rate of 3 per cent
- Tax credit for investment in facilities for productivity enhancement given at a rate of 7 per cent to small companies (3 per cent for large firms)

While the first credit is of general nature, the credit for productivity enhancing facilities is targeted to ICT. It includes facilities for process improvement and automation, advanced technology and skills, electronic corporate resources management, and for electronic commerce. Both credits are available until end of December 2006 when they will likely be reviewed for continuation.

²⁰ *Table of Rates at Which Depreciation is Admissible*, Income Tax Department, Department of Revenue, Ministry of Finance, Government of India

Appendix 2

A Country Review: Assimilating ICT Adoption – Through Training Tax Credits

ICT adoption will not happen unless organizations possess capabilities that would assimilate the take-up of new technology. An important part of this capability is having a knowledgeable workforce with appropriate skills and training. According to the OECD, the use of ICT is beneficial to firm performance when part of strategies for raising skills and improving organization; firms that invest in a range of intangible and tangible assets experience superior growth. OECD points out the complexity of adoption strategies and the role of policy in enhancing diffusion of new applications through skill formation to corporate training and education.²¹

In this context, corporate training is of particular significance today, as Canada has fallen on an international scale that measures corporate training and development, lagging countries such as Finland, Denmark, and Japan. According to the Conference Board of Canada, Canadian organizations are under-investing in employee training and development, and they are failing to allocate their training dollars in ways that lead to stronger business performance.²² Thus incentives to encourage corporate training and education appear an option to consider by government.

A number of countries have introduced training tax credits to help the ICT industry, among others address the shortage of ICT professionals and competitiveness issues. Corporate training tax credits for the ICT sector are increasingly seen as a measure for promoting both ICT adoption and industry competitiveness. Below, we present a brief summary of training tax credits available to corporations in various OECD countries, including selected Canadian provinces as the federal level doesn't yet offer such incentives.

Canada

There is no tax credit for company training at the federal level. However, two provinces – Quebec and Ontario – offer tax credits that pertain in some way to corporate training.

As part of the system of refundable innovation, Quebec offers corporations on-the-job training credit at the rate 30 per cent of the training costs. The credit is broad in its application and may include ICT training.

Ontario offers much narrower in scope tax credit specifically designed to cover the company costs of apprenticeship – the Apprenticeship Training Tax Credit (ATTC). Its aim is to encourage employers to hire and train apprentices in skilled trades.²³ Corporations and unincorporated businesses are eligible for a 25 per cent refundable tax credit on wages and salaries paid after May 18, 2004 to eligible apprentices during the first 36 months of the apprenticeship. Businesses with total payroll costs not exceeding \$400,000 are eligible for a higher tax credit rate of 30 per cent. The maximum tax credit per apprentice is \$5,000 per year over the first 36 months of the apprenticeship.

²¹ OECD, p. 291

²² Roma Luciw, *Canada Lags in Job Training*, The Globe and Mail Update, June 28, 2005
www.globeandmail.com based on The Conference Board Of Canada, *Learning and Development Outlook 2005: Moving Beyond the Plateau—Time to Leverage Learning Investment*

²³ <http://www.gov.on.ca/FIN/english/tax/2004/tb04e2.htm>

It appears that the ATTC is only loosely connected to ICT training, as it applies to qualifying skilled trades in designated industries such as construction, industrial and motive power trades, and has an annual cap per employee. Nevertheless, the ATTC could serve as a model for a new program focused on developing innovative skills for the knowledge economy, which could offer training and education in the use of ICT in small business environment.

Austria

An education allowance is granted for expenses incurred for the education and training of employees. The allowance is equal to 20 per cent of expenses directly related to education and training. Expenses paid to institutions offering education and training and from 2002 expenses incurred within a company qualify for the incentive. A ceiling of €2,000 (CDN\$3,000) per employee per year applies to in-house training.

France

A tax credit is available for small and medium-sized enterprises for employee training expenditure. The credit is equal to 35 per cent of the difference between the training expenses incurred during the relevant year and the training expenses of the previous year. The credit may not exceed €150,000 (CDN\$225,000). The credit is *refundable* subject to the above ceiling.

Japan

Starting April 1, 2005, a tax credit for corporate training is in effect in Japan.²⁴ The amount of the credit is linked to the company's training intensity. The credit formula is designed to encourage companies to increase and improve training. The training tax credit consists of two parts – an incremental tax credit of 25 per cent and volume-based tax credit of up to 20 per cent depending on the training intensity of the enterprise. The training intensity is measured by the increase of current training expenditures over the average training expenses for the past two years and has been introduced on a temporary basis for three years. Overall, Japan's training tax credit targets small firms and rewards those that have intensified their training of employees. If it persists, the design of the program can be considered 'best practice' for any national tax jurisdiction contemplating similar tax credit in the future.

Korea

A tax credit for the development of technology and human resources (that includes training) is available to domestic corporations. The level based credit rate is 15 per cent of current expenditures. Alternatively, a company may claim a 50 per cent incremental tax credit available for companies whose current-year technology and human resources expenditures exceed the average of the four preceding business years.

Netherlands

A deduction for training expenses is available from tax authorities upon company request. Qualifying training expenses are those incurred for professional training courses. The deduction is 20 per cent of the training expenses in addition to taking the normal 100 per cent deduction for these costs. A 40 per cent training deduction applies on first €31,000 (CDN\$47,000), which largely benefits small companies. There is a ceiling of roughly €2.5 million (CDN\$3.8 million) per company per year.

²⁴ KPMG Tax Corporation, *Japan Tax Newsletter*, December 2004, p.2

Spain

A tax credit is available equal to 5 per cent of expenses incurred in training, including training in new technology. If the expenses incurred in the current tax year exceed the average expenses incurred in the preceding 2 years, a credit of 10 per cent is available for the excess. The base for the credit is reduced by 65 per cent of any related subsidies received.

Appendix 3

Motivations for Introducing ICT Adoption Tax Incentives

Motivations behind policy decisions to introduce ICT adoption tax incentives were collected from various assessments and commentaries. They illustrate, to some degree, what was on governments' mind when making such decisions. Below are the selected country summaries:

Japan: The 2003 tax reform introduced tax incentives designed to increase investment in ICT equipment and software by companies in Japan and get the first crack at developing the new commercial applications, products, services and content of the high-speed-broadband era.

United Kingdom: The objective of the UK 100 per cent initial depreciation allowance for ICT investment was to stimulate demand for ICT by small companies.²⁵ The incentive was in effect during 2000-2004 and was replaced in 2004 by a general initial depreciation of 50 per cent applicable to broader range of technology investments by small companies. The rationale for the U.K. government to introduce the incentives is recognition that small businesses make a vital contribution to the productivity of the U.K. economy and encouraging high technology investment is a key driver of productivity and growth. The depreciation measures were designed to assist small businesses' cash flow and provide enhanced funding for new investment.²⁶

United States: the rationale behind the temporary bonus first-year depreciation of 50 per cent investments introduced in 2003 by Congress and the Administration was to help reverse the stagnating trend and provide a real-time boost to American businesses, technology investments in order to create renewed incentives and opportunities for investing in IT equipment and software.²⁷

Korea: Investing in technology is in the national interest (i.e. it is sort of a national sport). Investment by small business in knowledge based-industries, such as information technology, biotechnology, nanotechnology and other industries like the film, game and media industries, is considered to improve Korea's international competitiveness and will, therefore, enjoy the same tax incentives as those granted for large-scale investment.²⁸

²⁵ These allowances, which enable businesses to deduct the amount of money they spend on ICT from their total taxable income for that year, were estimated by U.K. government to encourage 3.7 million small businesses to invest in ICT. [http://archive.cabinetoffice.gov.uk/e-envoy/reports-pmreports-2003/\\$file/6may03.htm](http://archive.cabinetoffice.gov.uk/e-envoy/reports-pmreports-2003/$file/6may03.htm)

²⁶ Monthly Reports UK Online, and http://www.spencerfellows.co.uk/Budget2004/bus_tax_inves.html

²⁷ Information Technology Industry Council, *Accelerated Depreciation of Assets: The Need to Modernize the Tax Code is More Critical Than Ever*, http://www.itic.org/reports/economy/tax_exp.htm and <http://www.itic.org/2003prs/030516.htm>

²⁸ *Taxes and Investment in Asia and the Pacific: Korea*, International Bureau of Fiscal Documentation, Amsterdam