› April **2011**

Having Their Cake and Eating It Too

Business Profits, Taxes, and Investment in Canada: 1961 Through 2010

Jim Stanford

CCPA
CANADIAN CENTRE for POLICY ALTERNATIVES
CENTRE CANADIEN de POLITIQUES ALTERNATIVES

CCPA
CANADIAN CENTRE
for POLICY ALTERNATIVES
CENTRE CANADIEN
de POLITIQUES ALTERNATIVES

Please make a donation... Help us continue to offer our publications free online.

We make most of our publications available free on our website. Making a donation or taking out a membership will help us continue to provide people with access to our ideas and research free of charge. You can make a donation or become a member on-line at www.policyalternatives.ca. Or you can contact the National office at 613-563-1341 for more information. Suggested donation for this publication: $10 or what you can afford.

ISBN 978-1-926888-60-6

This report is available free of charge from the CCPA website at **www.policyalternatives.ca**. Printed copies may be ordered through the National Office for a $10 fee.

205-75 Albert Street, Ottawa, ON K1P 5E7

TEL 613-563-1341 FAX 613-233-1458
EMAIL ccpa@policyalternatives.ca
www.policyalternatives.ca

CAW 567 OTTAWA

About the Author

Jim Stanford is an economist with the Canadian Auto Workers and a CCPA Research Associate. He is also the author of *Economics for Everyone*, published by the Canadian Centre for Policy Alternatives in 2008.

Executive Summary

This paper reviews longer-run empirical trends in fixed non-residential capital spending by Canadian businesses. Since the first of several rounds of business tax reforms and reductions was implemented in 1988, business investment has declined by 1 full percentage point of GDP — even though after-tax business cash flow has increased (in part as a direct result of the tax reforms) by 3 to 4 percentage points of GDP. The proportion of after-tax cash flow which Canadian firms re-invest in fixed non-residential capital has declined from near 100 percent before the tax reforms, to less than 70 percent today. Since 2001, Canadian corporations have received a cumulative total of $745 billion in after-tax cash flow which they have not re-invested into Canadian fixed non-residential capital projects. This growing wedge of excess corporate savings has translated into several outcomes which have undermined the vibrancy of Canada's recovery from the recent recession — including excess accumulation of cash and short-term financial assets, a noted increase in the rate of payout of corporate dividends, and a sustained reduction in leverage by non-financial corporations.

The paper conducts an original econometric analysis of historical Canadian data on business fixed non-residential investment, and confirms that tax rates have had no direct, statistically significant impact on investment. Moreover, the indirect impact of tax rates on investment (experienced via their enhancement of after-tax business cash flow) has become less important in recent years. Business investment is more sensitive to GDP performance, interest rates, exchange rates, and oil prices than to cash flow.

In recent years, after adjusting for these other investment determinants, only about 10 percent of additional business cash flow has been converted into incremental business investment. Thus the proposed 3-point reduction in corporate tax rates would stimulate only about $600 million of new investment. From a policy perspective, government would elicit ten times as much new investment by allocating the same amount of money directly to public infrastructure investment. In addition to the $6 billion in incremental public investment directly financed by such spending, this strategy would also elicit $520 million in new *private* investment thanks to the positive im-

pact of stronger GDP growth on business investment. As a means of stimulating growth, employment, and even private business spending, the historical evidence suggests that business tax cuts are both economically ineffective and distributionally regressive.

Introduction

Investment in fixed capital assets is a crucial driver of economic growth, job-creation, technological change, and productivity growth (DeLong and Summers, 1991). In a capitalist economy such as Canada's, most investment is undertaken by private businesses (although public investment spending plays an important supplementary role in capital accumulation). Hence the vibrancy and success of business investment spending is a central determinant of the overall state of the economy (Stanford, 2008, Chapter 12). When aggregate investment spending is high as a share of total GDP, economies tend to grow faster, experience faster productivity growth (Rao *et al.*, 2003; Sharpe, 2006), and rapidly growing incomes. This was true in Canada during the 1960s and 1970s (when total national capital spending accounted for over 20 percent of GDP), and it is true today in high-investment economies such as Korea, China, and Brazil.

The downturn in investment spending by Canadian businesses following the global financial crisis in 2008 was the most dramatic and important channel through which the effects of that crisis were "imported" into Canada, resulting in a sharp recession in our domestic economy. Business fixed investment spending (considering both structures and machinery & equipment) declined by 24 percent in real terms from the autumn of 2008 through the end of 2009. That decline was the worst since the Great Depression of the 1930s (Cross, 2011), and was the steepest decline in spending experienced in any sector of Canada's economy during the recession.

In the year since investment spending finally bottomed out, business capital spending has begun to recover, but by end-2010 had still recouped well under one-half of the decline experienced during the recession. The business sector is the only sector in Canada's economy still spending less in 2011 than in 2008 before the recession started. In contrast, consumer spending and government spending have both increased substantially (partly as a result of pro-active stimulus efforts by policy-makers, including lower interest rates and discretionary fiscal policy).

In short, business investment spending was the major source of Canada's recent downturn, and the slowness of the recovery in business spending is a key reason why Canada's recovery from the recession is still uncertain, sluggish, and incomplete. It is worth noting that this sharp

downturn in business investment occurred precisely coincident with another round of reductions in federal corporate income taxes, which were cut from 22.1 percent in 2007 (including the former 1.1 percent federal surtax) to 18 percent by 2010. In other words, whatever impact this 4-point reduction in federal corporate income taxes may have had (or not had) on business investment, it was vastly overwhelmed by macroeconomic factors which proved far more important in the determination of business investment spending.

The issue of further federal corporate income tax reductions has become important in the current federal election campaign. The Conservative party promises to reduce the rate by an additional one-sixth (from 18 percent last year to 15 percent next year). Other parties favour maintaining rates at 18 percent (which would require reversing the 1.5-point cut which was just implemented by the Conservatives three months ago) or higher.

Advocates of the tax cut claim it will spark increased business investment, thus generating jobs and incomes for all Canadians — and potentially generating more revenues for government (offsetting or even replacing the foregone revenue from the tax cut). This claim seems at odds with the very recent history of Canadian business investment spending, whereby business spending has declined substantially, and stayed lower than previous levels, despite a 4-point tax cut. The fact that tax reductions to business are highly regressive in their distributional effects (since most income on capital is received by the wealthiest segments of society) makes the Conservative proposals all the more controversial politically.[1]

This paper will consider the claim of the tax cut advocates from a longer-run perspective — stepping back from the immediate damaging effects of the recent crisis, to ascertain whether there is any longer-run empirical support for the claim that lower corporate taxes will elicit more business investment.

The paper is organized as follows. Section 1 reviews empirical data regarding the level and composition of business investment spending in Canada, the evolution of corporate tax rates, and the components of business cash flow. This section indicates that business investment spending has clearly declined in Canada (by several measures) in the quarter-century since successive federal governments began reforming and reducing corporate income taxes. Section 2 reviews published economic literature regarding the determinants of business fixed investment spending, including several of those studies invoked during the present debate by the advocates of further corporate tax cuts. Section 3 presents the results of original econometric research into the determinants of business investment spending in Canada. These results confirm that corporate tax rates have had no visible direct impact on business investment, and that the indirect impact on investment (experienced via higher corporate cash flow) is small and has become weaker over time. Canadian business investment is influenced more importantly by GDP growth trends, interest rates, exchange rates, and oil prices than by changes in corporate taxes. The implications of these results suggest that government should place more emphasis on stimulating GDP growth (including through a continued expansion of *public* investment); the effects of these expansionary measures (including their "crowding-in" impact on private business spending) are more effective than attempting to elicit more business investment via additional reductions in corporate taxes.

SECTION 1

Empirical Review of Business Cash Flow, Taxes, and Investment

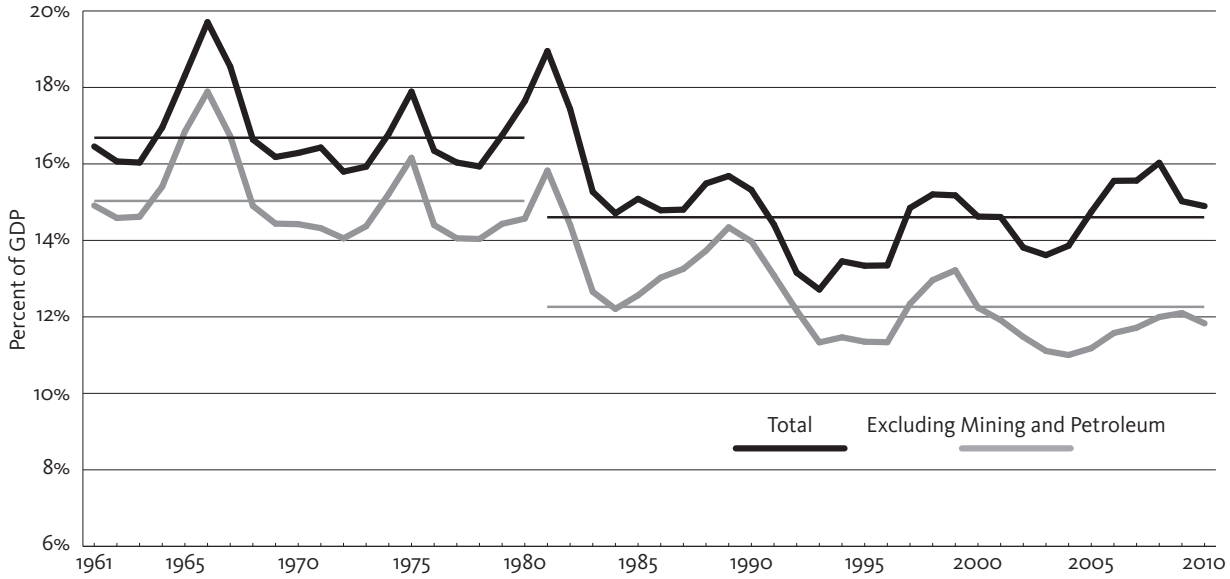
Statistics Canada provides several different sources of data regarding business fixed capital spending: its annual surveys of public and private investment intentions and expenditures (which provide the most sectoral detail regarding investment across different industries), its quarterly national income and expenditure accounts (which detail how investment spending by businesses, and government, contributes to the evolution of overall GDP), and its quarterly and annual surveys of business finances (based on corporate financial reports). Due to differences in methodology and definitions, there are variations between the data reported from these different sources and surveys. They do reveal a consistent overall finding, however: namely that the long-run rate of business investment spending slowed in Canada beginning in the 1980s, and has not rebounded since that time despite the repeated episodes of corporate tax reform that have occurred since. For more details on how to measure investment spending, see the Appendix.

Figure 1 illustrates data from Statistics Canada's annual investment intentions and expenditures survey. Through the initial postwar decades, fixed investment spending fluctuated (by this measure) between 16 and 18 percent of GDP, declining by about 2 percentage points of GDP after the 1980s. It has fluctuated between 14 and 16 percent of GDP since then. This is a gross measure of investment, which includes the spending required to offset depreciation of existing capital assets. Investment is highly cyclical, rising and falling with the overall state of economic growth.

Figure 1 also highlights another important trend in Canadian investment, the growing importance in recent years of the mining and petroleum industries in total business investment. These two sectors now account for around one-quarter of total direct investment spending.[2] Excluding these resource-oriented projects, total business investment spending in Canada is around 12 percent of GDP — and showed so sign of improvement during the 2000s (unlike petroleum and mining investment, which did grow during that decade in response to very high global commodity prices).

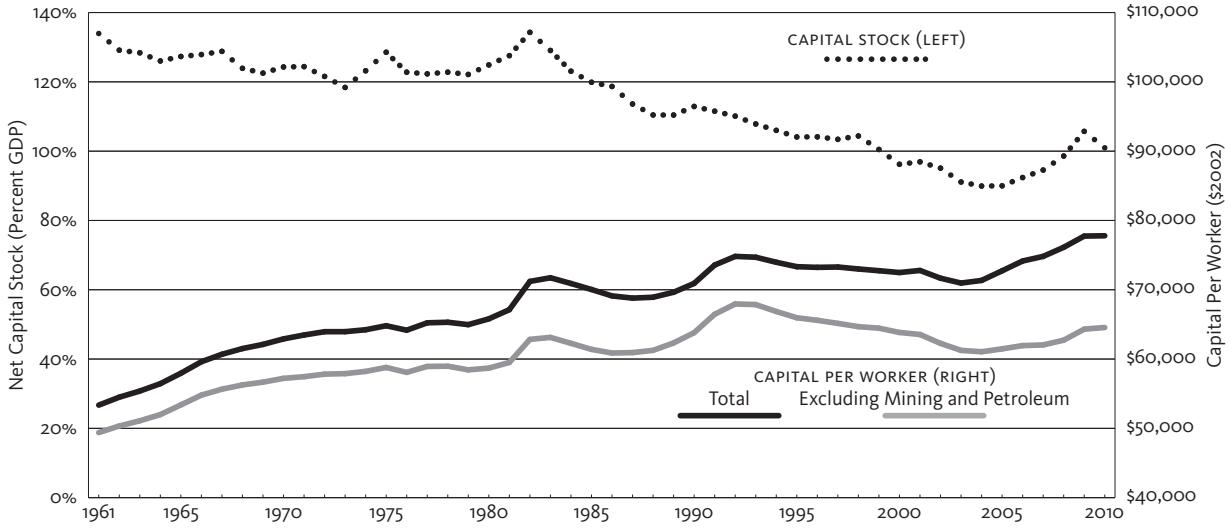
Given this slowdown in capital investment, Canada's overall economy has curiously become less capital-intensive in recent decades. Businesses are spending less; moreover, the more rapid na-

FIGURE 1 **Business Non-Residential Fixed Capital Spending** 1961–2010



SOURCE Author's calculations from Statistics Canada CANSIM data.

FIGURE 2 **Declining Capital Intensity in Canada's Economy** 1961–2010



SOURCE Author's calculations from Statistics Canada CANSIM data.

ture of technological change means that existing assets become outdated more quickly (and hence depreciation charges are higher). As a result of both factors, the net capital stock (that is, the stock of fixed capital assets after depreciation) has not kept up with the overall size of Canada's economy. As illustrated by the top line in Figure 2, the business fixed capital stock has declined from around 140 percent of GDP in the early 1980s, to only about 100 percent at present.[3]

Similarly, the capital stock is barely keeping up with the growth in Canada's working population as a result of the investment slowdown. Consider the capital-labour ratio as the total net capital stock divided by the number of employed Canadians; this constitutes a measure of the total value of "tools" with which each Canadian worker performs their duties (the two lower lines on Figure 2[4]). Economists consider this ratio (and the value of machinery and equipment assets, in particular) as a very important determinant of productivity growth. The capital-labour ratio grew rapidly in Canada in the initial postwar decades, but levelled off with the decline in business investment in the early 1980s. The overall ratio grew by 9.6 percent in the 20 years between 1990 and 2010 (compared with a 25 percent increase in the two decades ending in 1980). Moreover, all of that modest growth was due to increased investment in the petroleum and mining sectors; excluding those sectors, the average capital-labour ratio in Canada is actually *lower* than it was twenty years ago. This is an unexpected and worrying finding: given the importance of innovation and technology in the modern economy, we would expect the average Canadian worker (not just those in mines and tar sands facilitites) to be utilizing more capital in their daily work than two decades ago, not less.

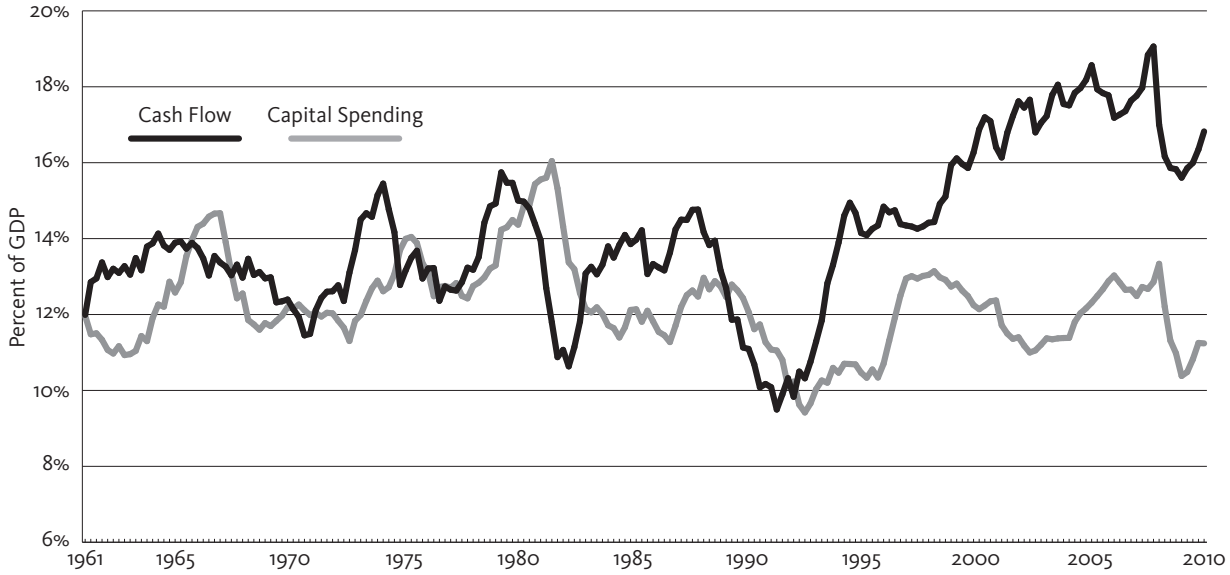
Most business investment is financed from the internal funds which are generated by a company's existing operations. A rapidly-growing company may turn to financial markets to raise additional funds for new investment (through loans, bonds, or new equity issues). But the bulk of most companies' new investments (both to replace depreciating assets, and to add to the net capital stock) is paid for from the funds generated by the company's existing operations.

In fact, cash flow generated by existing business operations in Canada is now well in excess of total business spending on non-residential fixed capital. Figure 3 illustrates the comparison between fixed non-residential capital spending by businesses, and the cash flow which businesses generate from their existing operations. Data for both sources is obtained from Statistics Canada's quarterly income and expenditure accounts (and hence differs somewhat from the data pictured in Figures 1 and 2). Business fixed non-residential spending fluctuated between 12 and 13 percent of GDP during the initial postwar decades, and then declined by about one point of GDP after the early 1980s. Initially, the after-tax cash flow of the business sector (equal to before-tax profits, less direct taxes paid to government, plus capital consumption allowances[5]) was broadly equivalent to business investment in non-residential fixed capital (also running at 12–13 percent of GDP).

Over the past quarter-century, however, after-tax cash flow received by the business sector in Canada has grown substantially relative to Canada's GDP. This reflects three different trends. First, the structural determinants of business profitability have improved markedly in Canada — as a result of factors such as stagnant labour compensation, declining unionization, the privatization of formerly public assets, and other policies implemented by successive business-friendly governments over this period. Secondly, corporate tax rates have been reduced repeatedly and significantly (as will be reported in more detail below). Finally, due to more rapid technological change and the resulting faster obsolescence of capital, depreciation charges have grown relative to GDP. For all three reasons, after-tax business cash flow has grown since the mid-1980s by 3 to 4 percentage points of GDP.

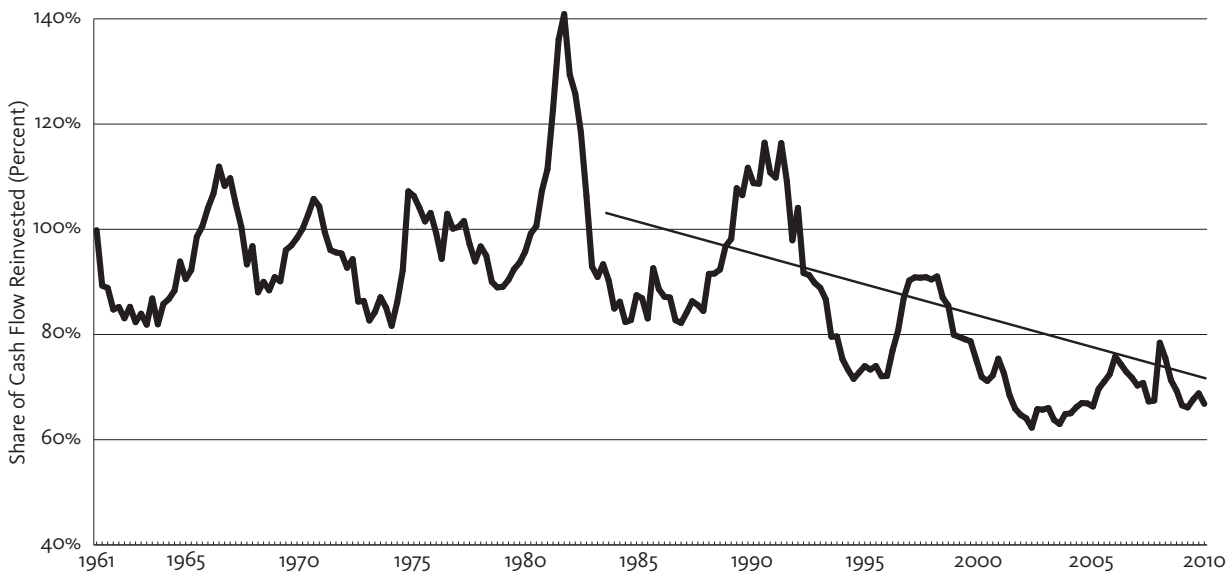
Since the mid-1980s, therefore, business investment spending has declined, but business cash flow has increased. The result is a growing gap between cash flow and business investment, illustrated in Figure 3. That gap cumulates to very large sums of uninvested after-tax corporate cash flow: funds received by companies which have not been ploughed back into new expenditures on fixed non-residential capital in

FIGURE 3 **Business Cash Flow and Business Investment** 1961–2010



SOURCE Author's calculations from Statistics Canada CANSIM data. Cash flow is after-tax, and equals before-tax profits less direct taxes plus capital consumption allowances, for all private and government business enterprises. Capital spending is non-residential fixed capital investment.

FIGURE 4 **Business Cash Flow Reinvestment Rate** 1961–2010



SOURCE Author's calculations from Statistics Canada CANSIM data. Reinvestment rate equals business fixed non-residential capital spending as a proportion of after-tax cash flow (before-tax profits less direct taxes plus capital consumption allowances), for all private and government business enterprises.

Canada.[6] Since 2001 alone, this uninvested cash flow totals to almost $750 billion. Even during the recession (which reduced sales and profits), uninvested cash continued to flow into corporate coffers: a cumulative total of $200 billion in uninvested cash flow was received by the busi-

ness sector since the recession began in the third quarter of 2008.

The contrast between stagnant or declining business investment, and rising business cashflow, can be summarized in Figure 4, which illustrates the aggregate re-investment rate of Canadian businesses. This is the share of after-tax corporate cash flow that is indeed reinvested in new fixed non-residential capital investment. This ratio hovered near 100 percent during the initial postwar decades (during which time it was reasonable to conclude that businesses generally reinvested their full cash flow into the Canadian economy). After the late 1980s, however, it has declined steadily, averaging below 70 percent through the entire last decade (in both good years and recessionary years).

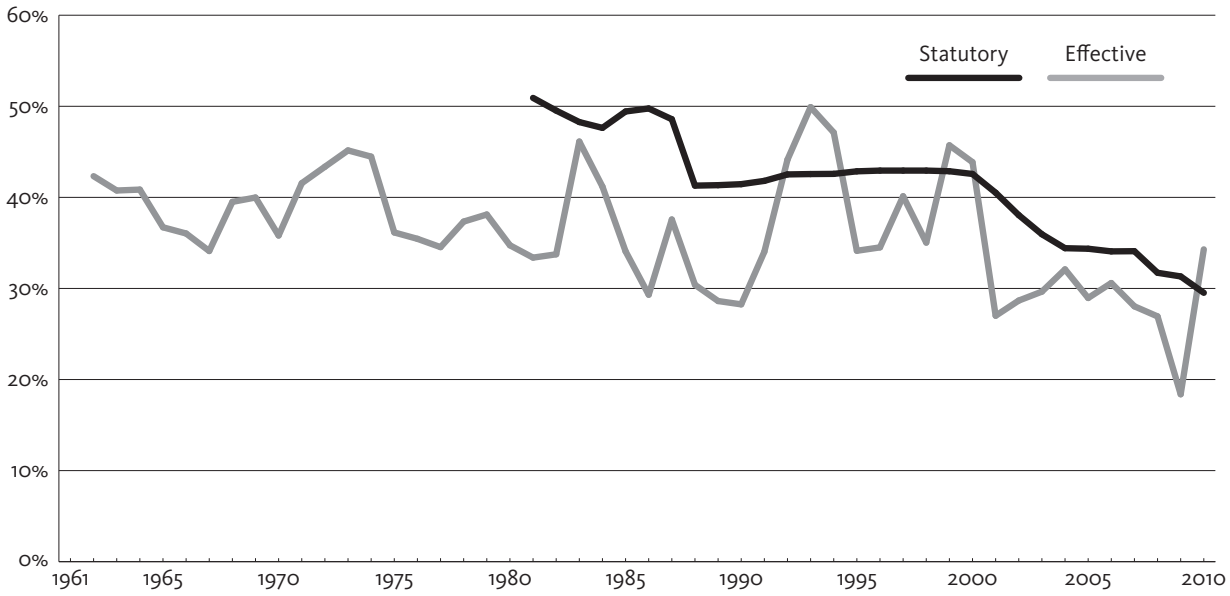
Canada has experienced several episodes of business tax reform over the past quarter-century. The first occurred in 1988, under the Conservative government of Brian Mulroney, when the federal statutory tax rate was reduced from 36 percent to 28 percent (not including a 1.1 percent surtax). At the same time, however, numerous tax loopholes which reduced effective business taxes were closed. The net impact on final taxes paid by business was therefore muted. Then, beginning in 2001 the Liberal government (of Prime Minister Jean Chrétien and Finance Minister Paul Martin) implemented a further reduction in the statutory rate to 21 percent by 2004. This was of main benefit to the services sector of the economy, since the manufacturing and resources sectors had earlier already been paying tax at a favourable 21 percent rate. Now the overall tax system was supposedly more neutral than before the first reform in 1988. Finally, following the election of a Conservative government under Stephen Harper, the statutory rate was cut again beginning in 2008, reaching 18 percent by 2010. A further 1.5 percentage point cut was introduced at the beginning of 2011, and under the Conservative platform, that reduction will be retained and the rate will fall further to 15 percent next year.

At the same time, many provincial governments have also reduced their own statutory tax rates (often pressed by companies which threaten to relocate reported profits from one province to another to take advantage of interprovincial tax differences). The combined federal-provincial statutory rate has thus declined from almost 50 percent in the early 1980s, to 29.5 percent in 2010, and will fall to an estimated 25 percent if the Conservative promise and all provincial reductions are fully implemented. In other words, combined federal-provincial statutory tax rates will have been cut in half by 2013, compared to the early 1980s.

The evolution of corporate tax rates in Canada is summarized in Figure 5. This graph illustrates the reduction in the combined federal-provincial statutory rate from 1981 through 2010. The graph is based on a comprehensive OECD database (OECD, 2010) which begins only in 1981; consistent federal-provincial annual statutory tax rates are not available for prior years, but those statutory tax rates did not significantly change during the initial postwar decades.

Due to the impact of various deductions and loopholes, the effective tax actually paid by corporations can vary significantly from the theoretical statutory rate. An approximate effective tax rate can be estimated by dividing the sum of direct taxes paid by business, by the pre-tax profit base. To reflect the lag times in processing and submitting tax returns, we divide taxes paid by the previous year's before-tax profit.[7] This effective tax rate is also illustrated in Figure 5. It is almost always lower than the statutory rate. It is interesting to note that the effective tax rate did not decline noticeably following the 1988 tax reform (which simultaneously reduced the rate and closed loopholes, apparently with little net impact on taxes paid). The effective rate did begin to decline following the Martin cuts of 2001, and then more steeply with the addi-

FIGURE 5 **Business Tax Rates** 1961–2010



SOURCE Author's calculations from Statistics Canada CANSIM data, and OECD (2010).

TABLE 1 **Business Profits, Taxes, and Investment** 1961–2010

	Tax Rates		*Business Investment*		*Business Profitability*		
	Statutory	**Effective[1]**	**As Share GDP**	**As Share After-Tax Cash Flow**	**Before-Tax**	**After-Tax**	**After-Tax Cash Flow[2]**
Pre-Reform (1961–87)	Approx. 50%	38.2%	12.7%	95.3%	11.4%	6.9%	13.4%
Mulroney Reforms (1988–2000)	42.4%	38.1%	11.7%	89.2%	9.5%	5.7%	13.3%
Martin Reforms (2001–07)	35.9%	29.3%	11.9%	68.4%	13.7%	9.2%	17.5%
Harper Reforms (2008–10)	30.9%	26.5%	11.7%	69.7%	12.2%	8.3%	16.8%
Change from Pre-Reform to Harper Years	-19.1 points	-11.6 points	-1.0 point	-25.7 points	+0.9 points	+1.4 points	+3.4 points

SOURCE Author's calculations from Statistics Canada CANSIM and OECD data, as described in text. Includes private and government business enterprises, fixed non-residential capital spending.
1 Effective tax rate is direct taxes on business profits as share of before-tax profits lagged one year.
2 After-tax cash flow equals before-tax profits less direct taxes plus capital consumption allowances.

tional across-the-board rate cuts implemented by the Harper government. The Harper rate reductions applied to a broader class of businesses than either of the previous reforms, and hence translated more powerfully into a lower effective tax rate.[8]

These longer-run developments in business profits and cash flow, business income taxes, and business capital spending are summarized in Table 1. This table divides the full 50-year period under consideration into 4 sub-periods. The initial postwar decades prior to the major Mulroney reforms of 1988 constitute the first sub-period. Then additional sub-periods are defined according to coverage by each successive set of

business tax reforms: the Mulroney, Martin, and Harper reductions.[9]

Table 1 indicates the decline in average statutory and effective tax rates over each period. The statutory rate fell significantly with each reform. The effective tax rate only began to fall significantly with the Martin and then the Harper reductions. Compared to the pre-reform era, the average statutory rate during the Harper reform years (2008 through 2010) was 19 points lower, and the effective rate was 12 points lower.[10]

As indicated in the preceding figures, however, business investment has actually declined relative to the pre-reform period. Using quarterly national income and expenditure data, business non-residential fixed capital spending declined by 1 full percentage point of GDP in the post-reform period, compared to the pre-reform period. The successive Martin and Harper rate reductions did not affect this performance. During this period, however, after-tax cash flow went up. So measured as a share of available cash flow, investment spending fell more dramatically, by about 25 percentage points (from 95 percent of cash flow before the reforms, to under 70 percent of cash flow during the Harper reform years).

Table 1 also indicates the three components of the increase in after-tax cash flow during this period. Before-tax profits grew by about 1 percentage point of GDP from the pre-reform years to the Harper period.[11] Thanks to lower effective taxes, after-tax profits increased by 1.5 percent points as a share of GDP. And larger depreciation allowances boosted after-tax cash flow even more substantially: by a cumulative total of some 3–4 points of GDP in the Harper era,[12] compared to the pre-reform era.

As noted, the gap between after-tax corporate cash flow and business fixed non-residential capital spending has given rise to a growing surplus of what we might call "excess corporate saving." Companies are taking in far more cash flow than they allocate to new investments in Canada. This excess saving reduces expenditure and purchasing power in the Canadian economy, and is especially damaging during times of recession — when the economy needs all sectors to borrow and spend, rather than save and accumulate.

As indicated in Table 2, the cumulative difference between after-tax cash flow and fixed non-residential investment spending by Canadian businesses has been $745 billion since 2001. What have companies done with all that money? Money is fungible, of course, and can be allocated and re-allocated into various compartments, so it is impossible to trace the uses of the actual dollars corresponding to a particular cash flow. We

TABLE 2 **Effective Distribution of Excess Corporate Cash Flow** 2001–10

Total Uninvested After-Tax Cash Flow	$744.9 billion
Excess accumulation of cash and short-term financial assets[1]	$144.1 billion
Excess dividend payouts[2]	$82.1 billion
Reduction in debt[3]	$232.7 billion
Net outflow of FDI	$89.8 billion
Other (share repurchases, mergers and acquisitions, etc.)[4]	$196.2 billion

SOURCE Author's calculations from Statistics Canada CANSIM data. Excess cash flow is the cumulative difference between after-tax cash flow (before tax profits less direct taxes plus capital consumption allowances) and fixed non-residential capital spending by businesses, from 2001 through 2010. Includes private and government business enterprises, fixed non-residential capital spending.

1 Currency and short-term assets owned by non-financial corporations only, in excess of the average proportion of GDP that prevailed prior to 2001.

2 Increase in dividend payouts by businesses above the average share of GDP that prevailed prior to 2001.

3 Reduction in corporate debt (short-term, loans, and bonds) as share of total business assets, relative to the ratio recorded at end-2000, times the total value of corporate assets at the end of 2010.

4 Residual.

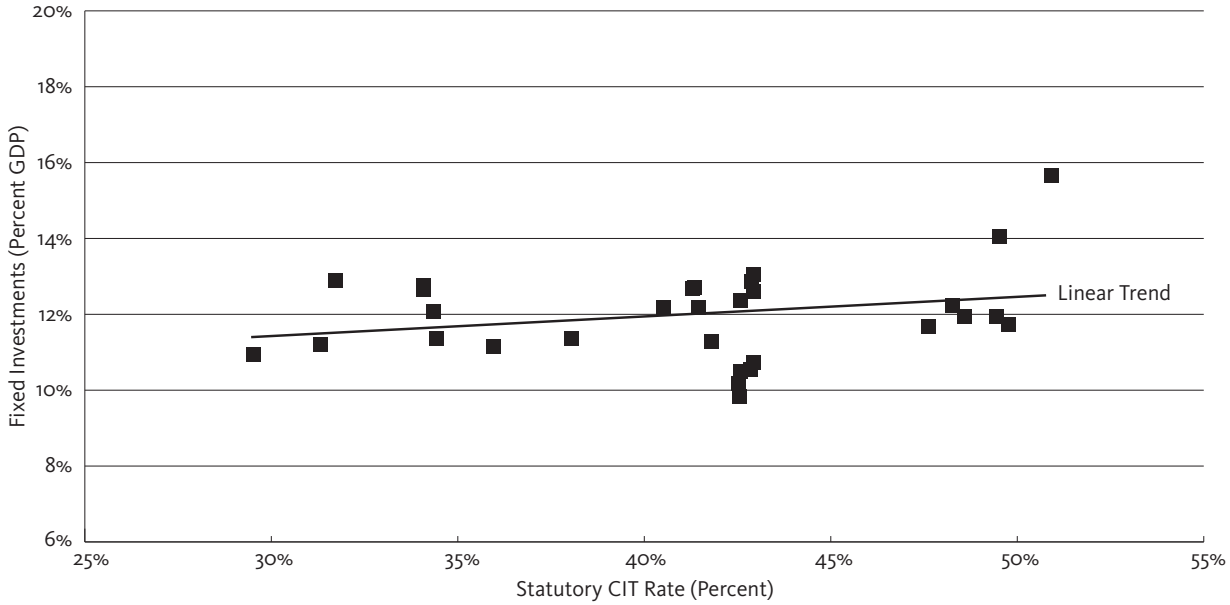
can illustrate, however, some of the alternative uses of cash which companies have undertaken during this era of excess corporate saving. Some of these uses are reported in Table 2.

Companies have notably increased their stockpile of cash and short-term financial assets. According to Statistics Canada's national balance sheet data, these liquid holdings of non-financial businesses in Canada have increased notably as a share of GDP since 2001. That increase in cash holdings (measured relative to the pre-2001 average ratio to GDP) is equivalent to $144 billion.[13] Dividend payouts to shareholders have also increased (again measured as a share of GDP), relative to pre-2001 averages; this corresponds to an excess cumulative payout of dividends of some $82 billion. Companies have substantially reduced their debt (short-term debt, loans, and bonds), relative to their total assets; this is known as business "deleveraging," and it contributed importantly to the contraction in credit conditions which accompanied the recent recession. The decline in business debt as a share of total assets since end-2000 is equivalent to $233 billion worth of debt repayment. On a net basis, foreign direct investment (FDI) has left Canada over this period (despite the massive increases in FDI associated with recent takeovers of Canadian resource properties). This outflow of capital to foreign jurisdictions could be ascribed as the end use of another $90 billion of the excess savings. The remaining residual (just under $200 billion) could be attributed to a range of other non-productive uses of corporate cash that are more difficult to measure, including share buybacks (which have become common among companies generating more cash flow than they reinvest), acquisitions and takeovers (which result in a reduction of the equity base), and other activities which may make sense for individual companies, but do not translate into real investment in the Canadian economy.

This attribution of excess cash flow to various end-uses is by its nature approximate, given the impossibility of tracing the flow of particular money. It is undeniable, however, that corporate Canada has been consistently taking in far more after-tax cash flow — in part as a result of successive reductions in corporate taxes — than it is reinvesting in Canadian capital spending. In that context, accentuating that cash flow through further tax reductions certainly seems like pushing on a string. It is highly likely that these tax reductions would only add to the large sums of uninvested cash flow already being received by Canadian businesses.

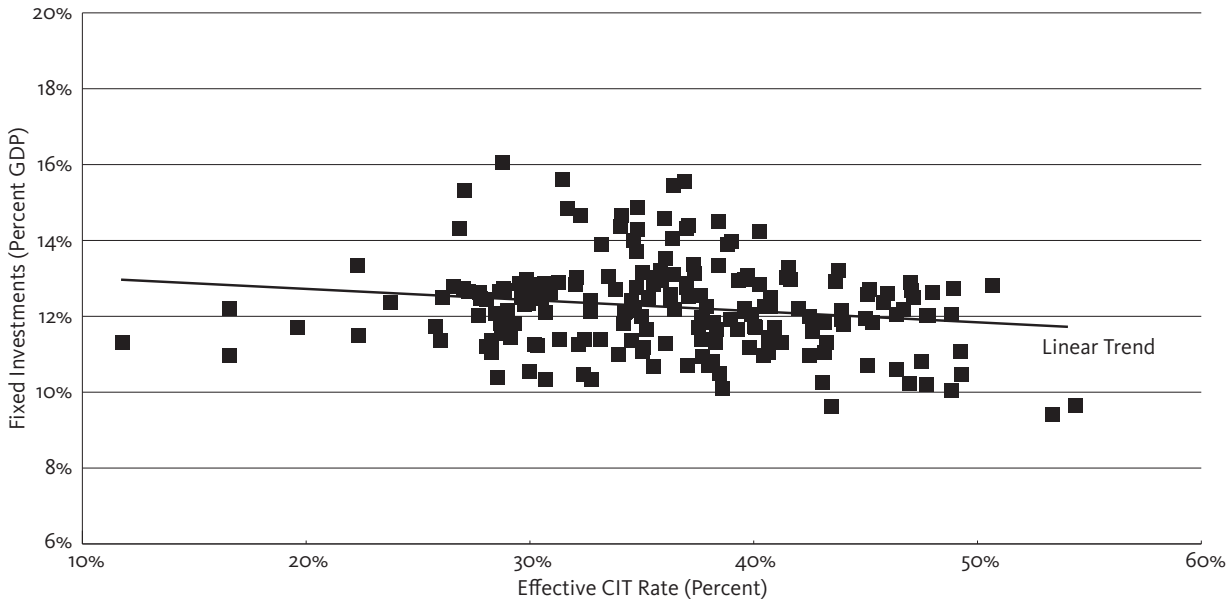
Finally, the apparent lack of correlation between the decline in business taxes (illustrated in Figure 5) and the stagnation or modest decline in business investment (summarized in Figure 3 and Table 1) can be visualized. Figures 6 and 7 present scatter plots which compare business tax rates in each period (total federal-provincial statutory rates in Figure 6, and effective rates in Figure 7, measured in both cases along the horizontal axis) with business non-residential fixed capital investment (as a share of GDP, measured along the vertical axis).[14] Each scatter plot appears as a "cloud" of seemingly randomly distributed points, indicating the lack of any meaningful correlation between business taxes and business investment. Attempting to impose a linear relationship onto this cloud is not particularly successful. Indeed, in the case of statutory tax rates, there would seem to be a slight *positive* (upward-sloping) relationship between tax rates and investment (contrary to expectations that higher taxes lead to lower investment); in contrast, there is a slight negative relationship between effective tax rates and investment spending. Neither relationship, however, is statistically significant.[15]

FIGURE 6 **Business Investment and Statutory Corporate Income Tax Rates** 1981–2010



SOURCE Author's calculations from Statistics Canada CANSIM data and OECD (2010). Investment is fixed non-residential capital investment by private and government business enterprises.

FIGURE 7 **Business Investment and Effective Corporate Income Tax Rates** 1961–2010



SOURCE Author's calculations from Statistics Canada CANSIM data. Investment is fixed non-residential capital investment by private and government business enterprises.

SECTION 2

Review of Previous Economic Studies of Business Investment

Given the importance of business investment spending to overall economic performance in a capitalist economy, economists have generated a vast literature on the determinants and effects of business investment. This literature reflects varying theoretical perspectives of the respective authors; Jorgenson (1971) and Chirinko (1993) provided the classic surveys. In the market-oriented neoclassical tradition of economics, businesses are expected to accumulate an optimal capital stock that reflects the varying productivity of different factors of production, relative factor prices, and the impact of technological change on the technical parameters of production. Investment is not limited by demand conditions (since the economy is assumed to self-adjust at a supply-constrained equilibrium), nor by corporate liquidity (since financial markets are assumed to efficiently allocate savings to their most productive real investments). In this view, measured flows of investment are seen as a movement towards this idealized "optimal" stock of capital. Therefore, they are modeled on the basis of the standard core variables of Walrasian general equilibrium (in particular factor supplies, relative factor prices, including composite measures of the cost of capital, and the relative cost of substitutes).

In Keynesian or heterodox traditions, on the other hand, business investment is understood more from the perspective of its aggregate macroeconomic role. Important attention is paid to the independent expectations and decisions of investing firms — what Keynes famously referred to as "animal spirits," and what other heterodox economists have interpreted as broad indicators of the inherent vibrancy and momentum of capital accumulation. Relevant variables in this approach would include macroeconomic growth (reflecting the impact of multiplier and accelerator effects on capacity utilization, demand, and hence investment), interest rates (through their impact on aggregate demand, in addition to as an indicator of relative factor prices), and even social and institutional factors (such as income distribution, investment stability, political-economy conditions, and other structural issues). More recent "neo-Keynesian" models (eg. Fazzari et al., 1988) place emphasis on the liquidity constraints limiting investment by particular firms that might arise from asymmetric information problems. Underpinning all these

approaches is the recognition that the economy is rarely supply-constrained, but rather normally expands in response to demand-side conditions (including purchasing power, credit creation, and business and consumer expectations). This creates complex two-way feedbacks between investment and growth, whereby investment causes growth, which in turn elicits more investment. These macroeconomic mechanisms are not analyzed within a neoclassical approach, which focuses on supply-side determinants, and is mostly concerned with optimal allocation of factor supplies (rather than the growth trajectory of capital accumulation).

Another class of empirical studies of investment behaviour has emphasized the interactions between the stock market and real business investment, following on the insights of Tobin (1969) regarding the contrast between the market value of business assets (reflected in stock prices) and the replacement cost of real capital. Numerous models have extended this approach, which can be interpreted through either a neoclassical cost-of-capital lens, or through a liquidity-constrained demand-side lens.

In addition to these varying theoretical perspectives, there are many choices to be made in terms of empirical methodology: using econometric methods (grounded in historical data) or mathematical simulations (including the general equilibrium simulations popular with analysts in the Walrasian tradition), using aggregate or firm-level data, and the precise specification of variables and relationships.

For many years, writers in the neoclassical or Walrasian tradition were frustrated by the apparent non-significance of their hypothesized explanatory variables (relative factor prices, and the distorting impact of policy interventions like taxes) in empirical studies of investment behaviour. This led many of them (pioneered by Jorgenson) to experiment with new ways of empirically modeling investment decisions. Rather than analyzing aggregate investment spending across an entire economy, this research often focused on firm-level data; and rather than tracking investment over longer periods of time, they often zeroed in on shorter, "before-and-after" snapshots of the effects of specific policy changes. These approaches are worth reviewing, but it should always be kept in mind that they are driven by the theoretical predisposition of their authors. Their hope is to empirically identify a strong coefficient on the cost of capital in an empirical study of investment behaviour; in their view this would validate the neoclassical interpretation of investment as an adjustment toward an optimal Walrasian capital stock. The relevance of this approach to understanding tax policy, is that if the cost of capital is seen to be the crucial determinant of investment, then policy measures to reduce that cost (such as reductions in corporate taxes, which increase the net cost of capital by siphoning off funds which would otherwise constitute a return to investment) should be effective in eliciting more investment (depending on the extent to which the tax reforms changed the cost of capital).[16] In contrast, cost-of-capital coefficients in aggregate macroeconometric studies tend to be small or non-existent. This approach, instead, points to the importance of growth, liquidity, and other demand-side mechanisms.[17]

This vast literature cannot be reviewed here. The main point to make in the context of the current debates over investment and tax policy in Canada is that there is a huge variation in the findings of different economic models of investment behaviour, depending on the perspective of the modeler and the precise methodology chosen. There is no consensus among economists regarding the determinants of investment, nor the impact of specific policy measures. Anyone who claims that their perspective is supported by "the literature" or by a "consensus" among economists, is reflecting an unduly narrow interpretation of the diverse and inconclusive literature that has actually been published regarding the determinants of investment spending. And

in many cases there is no need to make a firm "either-or" choice between the competing theoretical perspectives; a more flexible and eclectic model would allow for a range of supply-side and demand-side influences. The impact of capital-cost effects on investment spending (whether interpreted as the result of Walrasian-style flexibility in factor allocations, or as reflecting opportunity cost or liquidity channels which are not really consistent with the Walrasian model) can certainly be admitted, while still allowing for the macroeconomic and demand-side factors which seem to predominate in the longer-run historical macroeconomic evidence.[18]

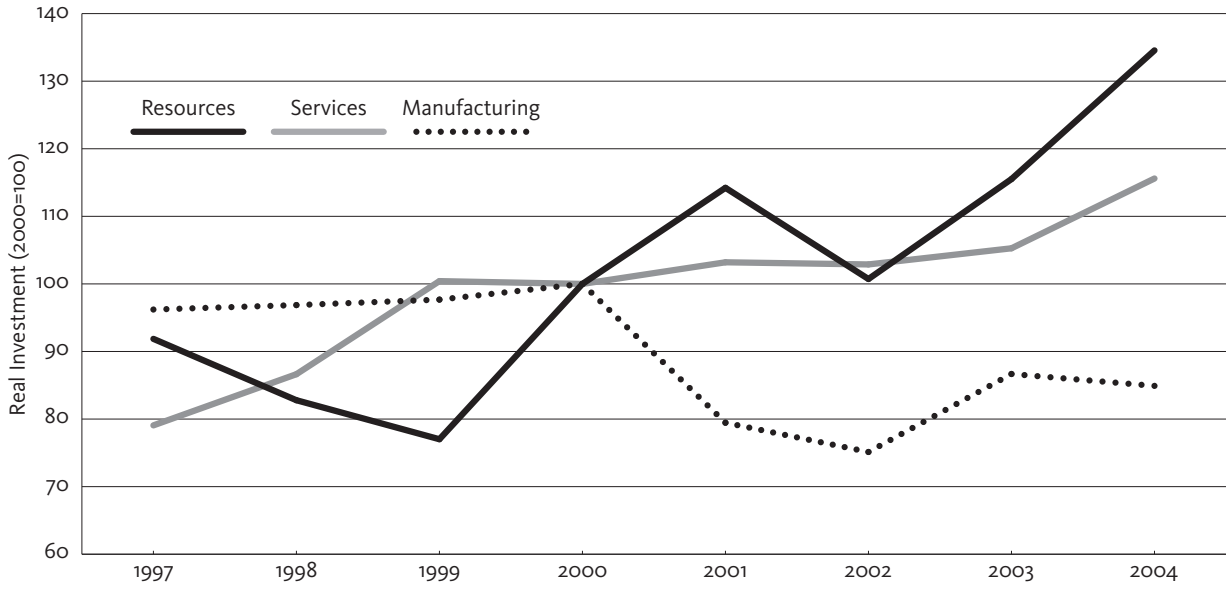
In addition to this short introduction to the many efforts by economists to understand the determinants of business investment, this section will also briefly review several specific studies that refer to Canadian investment experience. Some of these studies have been invoked by advocates of further business tax cuts in Canada as evidence that lower business taxes will lead to increased business investment. How do these studies conclude that lower taxes will generate increased investment, despite the seeming lack of correlation between tax rates and business investment in recent Canadian economic history?

A study by the Canadian Manufacturers and Exporters (2010) suggests that a 1-percent reduction in effective federal taxes will stimulate a relatively modest 0.11% increase in investment spending. Consequently, the 17% reduction in effective federal taxes associated with the proposed 3-point reduction (along with the final elimination of capital taxes) would generate an increase of about 2% in business investment.[19] This claim is based on the simple assumption that the proportion of after-tax cash flow which businesses reinvest in Canadian capital projects remains roughly fixed over time; there is no empirical evidence reported to suggest that lower business taxes have actually increased investment spending in practice. Hence the impact of lower taxes on investment can be estimated arithmetically, based on the proportional effect of lower taxes on after-tax cash flow and hence on investment. However, as seen above, this is clearly not true: the re-investment rate is variable, and has declined markedly over the last two decades. If the re-investment rate declines further, then by this methodology there could be no impact on investment.

Following a neoclassical optimal capital stock approach, Chen and Mintz (2010, 2011) suggest that a 10 percent decline in the cost of capital will lead to a 7 percent increase in the capital stock. Allowing for several years of adjustment (the authors suggest at least seven), the 3-point tax rate reduction, converted into a 2.5 point reduction in the marginal effective tax rate, would eventually generate $49 billion in increased capital accumulation.[20] In somewhat of a departure from the neoclassical principles of this approach, this new investment is also predicted to be associated with the creation of 233,000 new jobs in Canada — which implies that employment in Canada is currently constrained by inadequate investment, whereas Walrasian models are premised on market-clearing outcomes in factor markets.[21] As with the CME report, this research provides no new empirical evidence to support the link between tax cuts and investment; rather, the 0.7 elasticity estimate is supported only by secondary references, to Parsons (2008) in particular. The Chen-Mintz papers simply utilize this 0.7 elasticity in a numerical simulation to calculate the expected change in investment if that estimate were valid.

Let us then consider the paper for the federal Department of Finance by Parsons (2008), since it underpins the Chen-Mintz numerical simulations, and differs from the CME and Chen-Mintz studies in that it actually analyzes Canadian empirical evidence regarding the impact of corporate tax cuts on investment. Parsons utilizes sectoral data on business fixed investment from 43 manufacturing and service sector industries over the period from 1998 through 2004. Recall that the

FIGURE 8 **Investment Indices by Sector** 1997–2004, 2000=100



SOURCE Author's calculations from Statistics Canada CANSIM data.

Paul Martin tax cuts (reducing the statutory rate from 28 percent to 21 percent) were introduced beginning in 2001, and phased in by 2004 — but those reforms did not benefit the manufacturing and resource sectors (which were already paying taxes at a preferential 21 percent rate). Parsons' so-called "natural experiment" thus consists of comparing investment behaviour in the services industries (which did benefit from the tax cuts) to manufacturing sectors (which did not), as a way of imputing the effects of the tax cut. Importantly, he excludes resources industries from his analysis,[22] on questionable grounds that investment in those sectors "is affected by different factors than other industries." Parsons uses two different methodologies to estimate the impact of tax cuts, which produce two different estimates of the sensitivity of investment with respect to tax cuts: ranging from 0.3 to 0.7.[23] Parsons' results can be interpreted as implying that a 10 percent reduction in what he calls the "tax wedge" (resulting from lower corporate income taxes) would increase the investment rate (measured as a proportion of the starting capital stock) by 3 to 7 percent. Applied retroactively to the post-2001 period, this should imply an increase in the overall Canadian investment rate (investment measured as a share of starting capital) of 10 to 25 percent (based on the Martin and Harper business tax cuts).[24]

There are obvious methodological issues with Parsons' approach. First, there may be many other factors which explain why investment diverged between services and manufacturing industries over the short four-year post-tax-reform period which he analyzed. 2001 was marked, of course, by the terrible events of 9-11, followed by the effective closing of the Canada-U.S. border, massive disruptions in the manufacturing supply chain, and then a short recession in the U.S. which reduced Canadian manufacturing exports to our largest international customer. Beginning in 2002, then, world commodity prices began to rise substantially, pushing up the Canadian dollar, and this caused further problems for Canada's manufacturing sector, as did the tribulations that

were experienced in the North American auto industry beginning about the same time. Services, on the other hand, being oriented mostly to the domestic market, did not experience similar consequences from the U.S. recession or the appreciating Canadian currency. Nominally, Parsons attempts to take account of these additional causal factors by including other variables in his regression (namely output growth in each sector and the relative price of capital), but those variables were not significant and hence were dropped from his model. Moreover, by excluding resources, Parsons excluded several sectors from his analysis where the tax rate did not decline — but where investment spending *did* increase (in response to rising global commodity prices). Figure 8 illustrates the contrasting trends in aggregate investment over the period considered by Parsons, over the 1997–2004 period. Manufacturing investment fell (for reasons noted), and services investment grew, but resources investment grew even more strongly. The Parsons elasticity is based on comparing investment trends between manufacturing and services only, without controlling adequately for additional factors, and arbitrarily excluding a set of sectors (resources) whose experience did not mesh with the model. Little wonder, then, that the strong response of business investment that Parsons posits between investment and tax rates, based on an unduly narrow set of industries over a short period of history, is not visible in data covering the broader Canadian economy over longer periods of time.

Another federal Department of Finance report (ab Iorwerth and Danforth, 2004) also attempts to identify a stronger elasticity of investment with respect to its user cost in historical data on Canadian business investment. In this research, the authors initially find no econometric evidence that investment is sensitive to its user cost. But then they exogenously impose certain neoclassical assumptions on their regression model (in particular, the assumption of a unitary elasticity of investment with respect to output, in order to curtail the macroeconomic multiplier and accelerator effects that typically dominate most econometric results). Once these assumptions were imposed on the model, then investment was seen to be more sensitive with respect to its cost (including, presumably, the tax component of that cost). However, their finding of an even larger elasticity than Parsons (equal to almost 1) is once again entirely contingent on the validity of the initial constraints imposed on the model (namely that capital expands only proportionately with output); without those constraints, the data do not support the hypothesis that investment is so sensitive to its user cost.

A couple of international studies also make reference to Canadian experience. A recent report by several economists associated with the World Bank makes very strong predictions regarding the impact of tax cuts on business investment (Djankov *et al*., 2008). After analyzing in firm-level data the impact of various tax reforms in a number of countries, this study estimates that a 10 percent reduction in effective business taxes leads to a 2.2 percentage point increase in investment measured as a share of GDP (a very substantial increase in the investment share). The data reviewed in Section 1 above confirm clearly that this result was not attained in Canada: the investment rate fell, rather, despite a decrease in effective tax rates of over one-quarter. Similarly, Cummins et al. (1996) review the impact of specific tax reform instances in a range of countries, including Canada's 1988 reform, using a model that combines Tobin-style and neoclassical precepts. Among other findings, they find that investment spending in Canada is constrained by corporate cash flow, with a coefficient of 0.23 (ie. 23 cents of each dollar in incremental cash flow is translated into new business investment).

There are several other published studies of Canadian investment behaviour which do not directly touch on the related issues of cost-of-capital and business taxes, including Schaller

(1993), Landon and Smith (2006), Christensen and Dib (2008), Kalyvitis (2006), Faroque and Minor (2003), and Aivazian *et al*. (2005). The overall literature on Canadian investment behaviour, therefore, is as eclectic and inconclusive as the international literature. While some studies conclude that user costs of capital (and, by extension, corporate tax rates) are significant determinants of business investment, these studies typically rely on the imposition of strong prior theoretical or empirical assumptions and exclusions in order to find that result. And many studies of the Canadian data find that other investment determinants (ranging from macroeconomic growth to corporate liquidity to accelerator effects) are the crucial determinants of investment spending. At any rate, it is certainly not reasonable to claim that the notion that business tax cuts will stimulate significant investment expenditure is supported by any kind of consensus in the economic literature.

SECTION 3

Econometric Analysis of Business Investment and Business Tax Rates

In order to cast some independent light on the significance (or not) of business taxation in the determination of business investment, this section will use econometric techniques to analyze the actual historical data regarding Canadian business investment spending and its potential determinants. Econometric regressions were conducted on quarterly data regarding business fixed non-residential investment spending (as a share of GDP), and a range of its potential determinants. Some of the explanatory variables are non-stationary, and hence the regressions are performed in first-differenced form (all variables are stationary in first differences). With quarterly data, independent variables can exhibit unpredictable lag patterns in their relationship to the dependent variable. We adopt an agnostic approach to capturing these lag patterns, by including lags of 1, 2, 4, and 8 periods in initial specifications, and then excluding the lags which were least significant. For those explanatory variables which could be considered truly exogenous (such as statutory taxes and the oil price), current values are also included in the tests; otherwise, we use only lags of the independent variables in order to avoid simultaneity problems. For every specification considered below, the regressions were conducted for the entire sample period (1961 through 2010, before adjusting for the impact of lagged variables on sample size), and then separately for the pre-reform and post-reform periods (before and after the first quarter of 1988), in order to test for structural shifts in relationships in the wake of the successive tax reforms.

We first tested directly for the significance of corporate tax rates by performing simple single-variable regressions of the investment share on both statutory and effective tax rates. Effective tax rates are based on national income accounts data and hence are available in quarterly form. In contrast, our data on statutory tax rates is annual; these rates were thus applied to all four quarters in each calendar year.

Table 3 summarizes the findings of these simple regressions.[25] As was hinted by the weak relationships visible in the scatter plots above (Figures 6 and 7), there is no robust evidence of a direct relationship between tax rates and business investment. The effective tax rate was not significant in any of the three regressions (total sample, pre-reform, and post-reform). The statu-

TABLE 3 **Tests for Significance of Tax Variables in Regressions of Business Fixed Non-Residential Investment**

	Full Sample Period (1961:1–2010:4)	Pre-Reform (1961:1–1987:4)	Post-Reform (1988:1–2010:4)
Simple Regressions			
Effective tax rate	None	None	None
Statutory tax rate	None	None	10% level (negative)
Multiple Regressions (Fully-Specified Model[1])			
Effective tax rate	5% level (positive)	None	None
Statutory tax rate	None	None	10% level (positive)

SOURCE Author's calculations based on Statistics Canada CANSIM and OECD data, as described in text. Dependent variable is first difference of business fixed non-residential capital spending as share of GDP. Full regression results available from author.
1 Coefficients of fully specified model are reported in Table 4.

tory rate was weakly significant (at the 10% level) with the expected negative sign in the full sample period, but not in either of the truncated samples.

This single-variable approach can miss the potential impact of tax rates on investment spending, however, since it excludes the other major determinants of business investment. So we also test for the significance of the tax variables (both statutory and effective) within the context of a fully-specified investment equation. Based on previous econometric studies of business investment, we considered the following explanatory variables in these regressions (all included in first-difference form):

- The rate of growth of real GDP (measured as the change in the log of real GDP). In a demand-constrained macroeconomic system, business capital spending will depend importantly on the growth path of output and sales. Stronger growth generates additional investment (the so-called "accelerator" effect) via impacts on capacity utilization and expected sales potential.
- After-tax business cash flow (measured as a share of GDP). This variable captures both incentive effects (higher after-tax profits eliciting more investment), and the potential impact of liquidity constraints on business investment (as investigated by Fazzari *et al.*, 1988, and by Schaller, 1993, in a Canadian context).
- Real interest rates (equal to prime corporate lending rates less the year-over-year growth in consumer prices in Canada). Interest rates affect business investment via opportunity cost effects (symbolizing returns that could be captured via purely financial investments), and cost-of-capital channels.
- Oil prices (U.S. average price expressed in Canadian dollars). Given the importance of energy-related projects in Canada's overall investment, oil prices may have an independent impact on investment spending.
- The exchange rate can impact investment spending in complex and contradictory ways, by affecting the cost of imported capital equipment, the cost competitiveness of Canadian investment locations, and through other channels (Landon and Smith, 2007).
- Relative prices of capital goods (measured by the ratio of the chained deflator for non-residential fixed capital spending to the chained deflator for GDP as a whole). Some economists have theorized (such as Tevlin and Whalen, 2003) that the decreasing cost of some types of capital equipment

TABLE 4 **Coefficients of the Fully Specified Regression Model**

		Full Sample Period (1961:1 through 2010:4)		*Pre-Reform (1961:1–1987:4)*	*Post-Reform (1988:1–2010:4)*
Explanatory Variables	**Lag Structure**	**Sum of Coefficients**	**Single or Joint Statistical Significance[1]**	**Sum of Coefficients**	**Sum of Coefficients**
Constant	n.a.	-0.0005	not sig.	-0.0004	-0.0009
Change in log of real GDP	1	0.0782	1%	0.0686	0.1252
Change in after-tax cash flow[2]	4,8	0.1714	1%	0.2031	0.1001
Change in real interest rate	0,8	-0.000724	5%	-0.001050	-0.000242
Change in oil price	1,4	.000210	1%	.000379	.000174
Change in exchange rate	0,1,2	-0.00440	5%	0.01932	-0.01089
Control variables:	n.a.				
1981		-0.0079	1%	-0.0087	n.a.
2001		-0.0068	5%	n.a.	-0.0063
2009		-0.0050	5%	n.a.	-0.0040

SOURCE Author's calculations based on Statistics Canada CANSIM and OECD data, as described in text. Dependent variable is first difference of business fixed non-residential capital spending as share of GDP. Full regression results available from author.
1 Wald test for joint significance of coefficients.
2 As share of GDP.
R^2: 0.382. Adj. R^2: 0.337. S.E. of regression: 0.00278. F-statistic: 8.413. D-W: 1.537. R^2 scores of this order are common and acceptable in regressions of first-differenced variables.

(especially information technology) has stimulated more investment.

- Foreign direct investment inflows and outflows (measured as the change each period in the stock of inward and outward foreign direct investment, as a share of GDP). Various hypotheses are posited (Hejazi and Pauly, 2003; Rao *et al.*, 2009; Waldkirch and Tekin-Koru, 2010) regarding the positive impact of inward FDI on total real capital investment in Canada, and the potential negative or positive impacts of outward FDI on domestic investment. We test for all possibilities by including inward, outward, and net FDI flow variables in the regressions, using the data reported in Statistics Canada's international investment accounts.
- Changes in unit labour costs (represented as changes in labour's share of total GDP). This variable may supplement cash flow as an indicator of the structural profitability of business.
- Three control variables are also included in the regressions to help capture the impact on investment of the dramatic events of 1981–82 (interest rate shock), 2001 (9-11 attacks), and 2008–09 (financial crisis).

Table 4 summarizes the results of the fully-specified equation of business investment, derived from the search procedure described above. The first five explanatory variables listed above were found to be statistically significant (at at least the 5% level), with the expected signs. The capital goods price index, all the FDI variables, and the unit labour cost variable were not significant. The coefficient on real GDP growth indicates relatively strong multiplier and accelerator effects on investment spending. The coefficient on after-tax cash flow in the full-sample regression indicates that something close to 20 percent of incremental cash flow is reinvested (thanks to the relaxation of liquidity constraints), in line with the findings of other studies (such as Cummins et al., 1996; Stanford, 1999, p. 164). It is noteworthy, however, that the relationship between cash flow and investment weakened

notably in the post-reform period (consistent with our findings above of a widening gap between cash flow and investment spending). The exchange rate variable demonstrated a complex impact on investment: positive initially (perhaps due to correlation between the exchange rate and oil prices, or perhaps via the impact of a stronger dollar on the price of imported capital goods), and then negative in subsequent lags, with a small ultimate net negative impact on investment. Oil prices and real interest rates were significant with the expected signs.

From this new "base" of a fully-specified investment equation, the significance of the tax variables was once again tested by their incremental inclusion into the regressions. These results are summarized in the lower half of Table 3. Even with due attention given to the other determinants of investment, the tax rate variables do not play their expected explanatory role. The effective tax rate is significant at the 5% level in the full-sample regression — but with a *positive* sign (implying that higher effective taxes elicit more investment). This finding does not make intuitive sense; it is probably capturing an indirect correlation of higher effective taxes with stronger profits and/or economic growth. The effective tax rate variable is not significant in either of the two smaller sub-samples. Similarly, the statutory tax variable is weakly significant in the post-reform regression, but again with a *positive* sign; it is not significant in either the full-sample or the pre-reform regressions. On the basis of both univariate and fully-specified regression analysis, therefore, there is no evidence in actual Canadian economic data that changes in business tax rates have a measurable, direct, positive influence on business investment spending.

Remember, however, that even without any direct significance in the regression for tax rates, tax policy can still affect investment in this model via its impact on after-tax cash flow (which is a significant determinant of business investment). The coefficients on GDP growth and after-tax cash flow in the post-reform regression allow us to simulate the likely impacts of the $6 billion tax cut on business investment spending. The sum of cash flow coefficients is just 0.1001 in the post-reform sample regression. The 3-point reduction in tax rates, given current pre-tax business profits (of about $200 billion per year) will enhance business after-tax cash flow by about $6 billion. According to the coefficient, this will translate into new business investment of only $601 million per year; just ten cents of each dollar in tax savings, in other words, is translated into incremental investment spending. Given the large cash hoards which businesses already carry in Canada, muting the impact of additional cash flow on incremental investment, this conclusion seems quite reasonable.

Interestingly, the government would stimulate almost as much *private* business investment, according to this model, by spending the full $6 billion on new *public* investment projects (such as infrastructure construction), instead of business tax reductions. According to the Department of Finance, infrastructure spending carries a relatively large GDP multiplier effect of 1.6-to-1 (reflecting the spin-off impact of construction projects on upstream supply purchases and downstream consumer spending).[26] As indicated in these regression results, another positive spin-off effect is the "crowding in" of private business spending (Esfahani and Ramirez, 2003; Kalaitzidakis and Kalyvitis, 2005). Public investment increases private investment thanks to the resulting expansion of the overall economy. Indeed, the indirect spin-off impact of the resulting boost of GDP (of almost $10 billion) on private business spending is almost as great ($520 million, according to the coefficients from the post-reform regression) as the direct boost to investment if the $6 billion had been fully allocated to business tax cuts. However, in this case, the economy also benefits from the initial $6 billion direct increase in public invest-

ment. In other words, the *total* increase in investment resulting from a $6 billion allocation to infrastructure ($6.52 billion, public and private) is over *ten times as great* as the increase in private investment only ($601 million) resulting from a $6 billion allocation to business tax cuts. The reallocation of fiscal "room," therefore, from financing business tax cuts to financing direct public infrastructure investments, would provide a much bigger direct boost to economic growth and job creation — and, perhaps surprisingly, would actually stimulate comparable increases in *private* investment, as well.

Conclusion

This paper has reviewed the historical evidence regarding business investment in Canada, and its various determinants. It is certainly true that fixed capital spending in Canada (both private and public) is an essential source of spending power, job-creation, and productivity growth. It is also clear that business investment spending (outside of the petroleum and mining sectors, at any rate) has declined, and is inadequate relative to Canada's needs for more capital. Business investment fell deeply in the recent recession, and has recovered slowly and incompletely. The issue is how to best stimulate more of this crucial economic activity. Historical evidence regarding the effects of successive rounds of business tax reductions (in 1988, 2001, and more recently under the Harper government) do not support the claim that these tax reductions will provide a major boost to business capital spending.[27] Particularly given the growing divergence between after-tax cash flow and business non-residential capital spending, and the resulting accumulation of uninvested cash, additional reductions in corporate tax rates are like "pushing on a string." On the basis of the evidence assembled here, government would have a more direct and powerful impact on investment spending (both private and public) by emphasizing direct increases in expenditure (directed especially at public capital and infrastructure expansion), rather than additional tax reductions for businesses — which are both economically ineffective and distributionally regressive.

APPENDIX

A Note on Nominal and Real Investment Spending

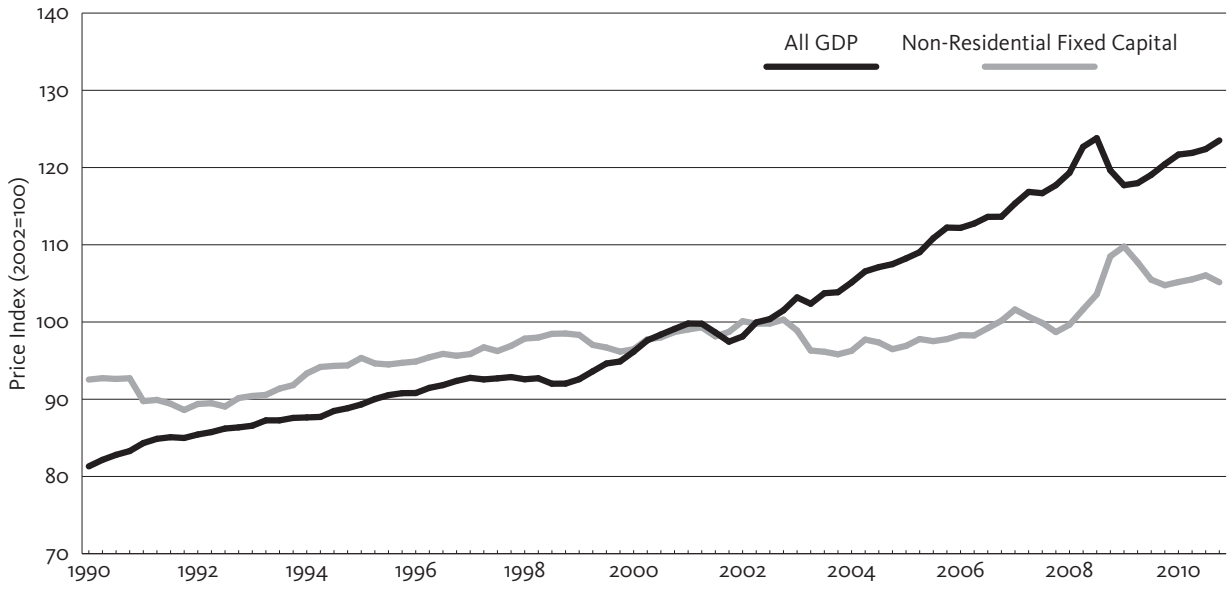
Like any economic variable, the amount of real capital that can be purchased with a certain nominal sum of investment expenditure depends on the prices of those capital goods. If the price level of capital goods increases, then the real volume of capital goods purchased with a given amount of nominal expenditure would decrease, and vice versa if the price level falls.

Figure A1 illustrates the trend in the average price level of non-residential fixed capital goods (including both machinery and equipment and the cost of structures — mines, buildings, factories, stores, etc.). Average prices for non-residential fixed capital have grown very slowly, more slowly than average prices in the overall economy (represented by the GDP price deflator). (Both deflators are measured in chained 2002 dollars, which is a price index calculated from an annually adjusted basket of products and services.)

Figure A2 then illustrates differential trends in non-residential fixed capital investment spending in Canada, measured in nominal and real ($2002 chained) dollars. Average investment prices have increased, but very slowly. So there is not much difference between nominal and real investment spending.

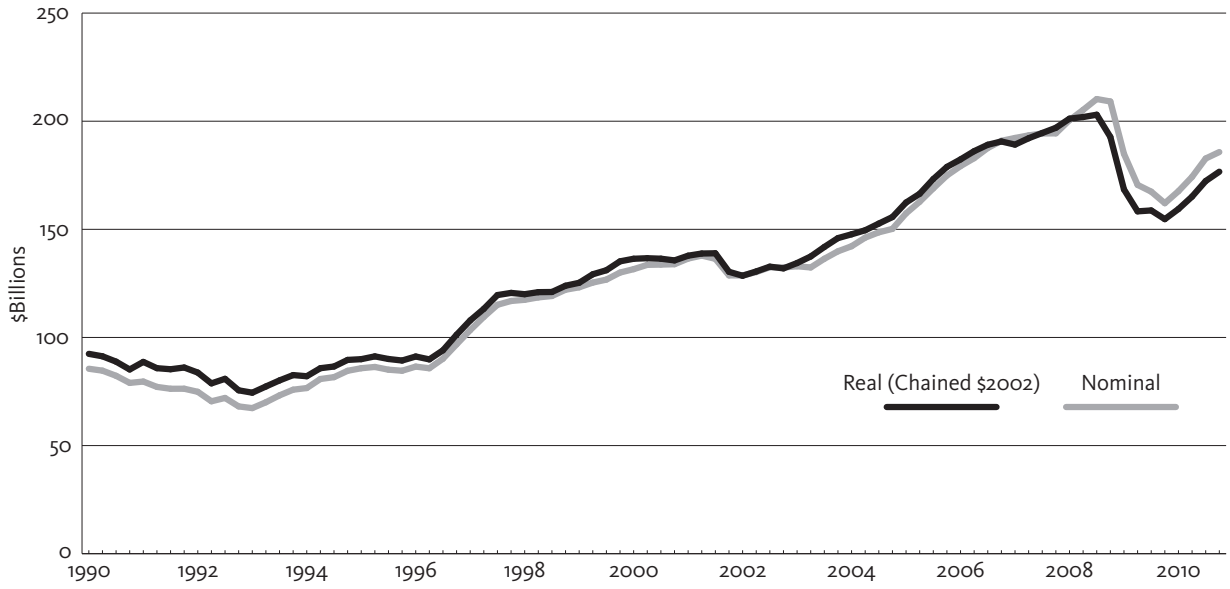
Within the broader category of fixed non-residential capital goods, there are different trends for machinery and equipment, and for structures. Machinery and equipment prices have declined, driven solely by the falling apparent quality-adjusted prices of computers (Stanford, 2007). It is very difficult to calculate a price index for a rapidly-changing bundle of goods such as "computers," since it is difficult for the statisticians who calculate these indices to control for massive quality changes; moreover, due to rapid obsolescence, the apparent dramatic decline in the price of older vintages of computer equipment (say, a 64KB processor!) are irrelevant, since those vintages are no longer effective in applied use. In essence, then, the decline in average machinery prices really reflects advances in the quality of computer technology — not the fact that computer technology in general is cheaper (since advances in the quality and capability of computer technology will broadly offset the decline in apparent price for any specific vintage of computers). Prices for other types of machinery, for structures, and (as noted in Figure 1) for overall non-residential fixed capital have all grown, and hence real investment spending

FIGURE A1 **Price Indices for Non-Residential Fixed Capital and Total GDP** 1990–2010



SOURCE Author's calculations from Statistics Canada CANSIM data.

FIGURE A2 **Real and Nominal Fixed Non-Residential Investment** 1990–2010



SOURCE Author's calculations from Statistics Canada CANSIM data.

across these broader categories is *lower* than nominal spending.

Measuring investment as a share of nominal GDP, as a share of nominal cash flow, or as a proportion of the existing capital stock are all legitimate ways to understand the course of investment spending over time in an economy which is expanding. In time-series analysis, measuring investment in dollars (whether real or nominal) is inappropriate because of the normal increases in investment that accompany economic growth, population growth, and rising prices. In economic studies of investment behaviour over time (surveyed briefly above in Section 2), investment is measured as a share of GDP, a share of cash flow, or a rate of growth with respect to a starting capital stock; it is never measured in dollars (whether real or nominal).

There are some purposes for which measuring investment or capital in real terms is valid: namely, when the goal is to understand the true quantity of physical capital which has been accumulated, or is added to the capital stock in any given year. For this reason, Figure 2 above illustrates the trend in the capital-labour ratio in Canada over time using the real capital stock. The same figure, however, illustrates the capital stock relative to GDP using nominal figures for both (because in this case it is the relative value of the capital stock compared to the total economy that is of interest).

The distinction between real and nominal investment spending has been invoked recently by some advocates of corporate tax cuts to refute the evidence that business investment spending has declined, despite the significant reductions in corporate taxes that have been implemented since 1988. For example, Gordon (2011) measures trends in real machinery and equipment spending, which has increased due to the apparent decline in the price of computers; he therefore argues reasonably that the real investment effort in machinery is stronger than is implied by nominal investment data. But he then argues that the *share* of machinery and equipment investment in total GDP has actually grown, not decreased, because of the decline in computer prices; he produces a graph of real machinery and equipment investment as a share of real GDP to support this argument. This latter claim is invalid. Deflating a nominal expenditure of investment by a price index is valid; but comparing that deflated series to a series deflated by a completely different deflator (in this case, real GDP) is meaningless, as the numerator and denominator are constructed with different deflators. Moreover, the notion that investors will allocate a share of GDP (or of their own after-tax cash flow) based on a reckoning of chain-linked 2002 dollars is nonsensical: corporations receive nominal dollars in cash flow, and the relevant decision they make is what share of those nominal dollars to allocate to new investment. The decline in the relative prices of some investment goods (specifically computers) might be a factor in explaining why that investment share has in fact declined (as evidenced by the empirical data). On the other hand, the more rapid obsolescence of computers, and their growing necessity to modern production in all parts of the economy, might encourage companies to spend a *larger* share of their budgets on this type of equipment; the logic could go in either direction. (The regressions reported in Section 3 above in fact tested for the impact of relative investment good prices on the investment share, and found no statistically significant relationship in either direction.) But the decline in computer prices cannot be invoked to pretend that investment spending has actually *increased* (despite data shown that it has declined), as a share of GDP or cash-flow. Indeed, if that methodology (dividing each component's deflated real value, by the separately deflated value of GDP) were applied to all the components of GDP expenditure, the sum would not normally add to 100 percent of GDP, reinforcing the point that expenditure shares calculated in this manner are not meaningful.

Even less meaningful is the effort by some analysts (eg. CME, 2010, p.29) to adjust a nominal expenditure by the deflator for investment goods, and then compare that to the underlying flow of *nominal* GDP or *nominal* cash flow. This is truly an apples-to-oranges comparison, and carries no analytical relevance. Companies receive cash flow in nominal dollars, and allocate that spending in nominal dollars. Expenditure shares can only appropriately be calculated, therefore, in nominal terms.

In sum, apparent quality-adjusted prices of computer goods have declined because of rapid advances in computer technology. In a sense, this means that newly purchased investment goods are more "valuable" than their current prices indicate. This might cause companies to spend less on computers (or, as noted, it could cause companies to spend more). The real quantity of investment in any given year, or the real value of the accumulated capital stock, is different from its nominal value (and for non-residential fixed capital in general, not just computers, real values are *smaller* than nominal values). But none of this changes the analysis presented in this paper that corporate investment spending by business has declined markedly (as a share of GDP, and as a share of corporate after-tax cash flow), despite repeated phases of corporate tax reductions.

Bibliography

ab Iorwerth, Aleb, and Jeff Danforth (2004). "Is Investment Not Sensitive to its User Cost? The Macro Evidence Revisited," Department of Finance Canada, Working Paper 2004-05.

Canada Revenue Agency (2010). Income Tax Statistics for Individuals, Final Statistics, 2008 Tax Year, available at http://www.cra-arc.gc.ca/gncy/stts/fnl-eng.html.

Canadian Manufacturers and Exporters (2010). *Invest to Grow: Technology, Innovation and Canada's Productivity Challenge*, October.

Chen, Duanjie, and Jack Mintz (2010). *Canada's Tax Competitiveness After a Decade of Reforms: Still an Unfinished Plan*, University of Calgary, School of Policy Studies.

Chen, Duanjie, and Jack Mintz (2011). *Federal-Provincial Business Tax Reforms: A Growth Agenda with Competitive Rates and a Neutral Treatment of Business Activities,* University of Calgary, School of Policy Studies.

Chirinko, Robert S. (1993). "Business Fixed Investment Spending: Modeling Strategies, Empirical Results and Policy Implications", *Journal of Economic Literature* 31, pp. 1875–1911.

Chirinko, Robert, Steven M. Fazzari, and Andrew Meyer (1999). "How Responsive is Business Capital Formation to its User Cost? An Exploration with Micro Data," *Journal of Public Economics* 74(1), pp. 53–80.

Christensen, Ian, and Ali Dib (2008). "The Financial Accelerator in an Estimated New-Keynesian Model," *Review of Economic Dynamics* 11(1), pp. 155–178.

Cross, Philip (2011). "Recent Trends in Business Investment," *Canadian Economic Observer,* March, pp. 3.1–3.12.

Cummins, Jason, Kevin Hassett, and Glenn Hubbard (1996). "Tax Reforms and Investment: A Cross-Country Comparison," *Journal of Public Economics* 62(1-2), pp. 237–273.

DeLong, Bradford, and Lawrence Summers (1991). "Equipment Investment and Economic Growth," *Quarterly Journal of Economics* 106(2), pp. 445–502.

Department of Finance Canada (2010). *Canada's Economic Action Plan Report #6*, September.

Djankov, Simeon, *et al*. (2008). "The Effect of Corporate Taxes on Investment and Entrepreneurship," NBER Working Paper No. 13756.

Faroque, Akhter, and Ryan Minor (2002). "What Determines Business Fixed Investment? Evidence from the Canadian Economy," *Applied Economics Letters* 9, pp. 497–500.

Fazzari, Stephen M. (1999). *Capital Income Taxes and Economic Performance*, Levy Institute, Policy Note 1999/7.

Fazzari, Steven M., R. Glenn Hubbard, and Bruce Petersen (1988). "Investment, Financing Decisions, and Tax Policy," *American Economic Review* 78(3), pp. 200–205.

Gordon, Stephen (2011). "Corporate Tax Cuts: A Look Under the Hood," *Globe and Mail* Economy Lab, http://www.theglobeandmail.com/report-on-business/economy/economy-lab/stephen-gordon/corporate-tax-cuts-a-look-under-the-hood/article1972965/, posted April 2.

Hejazi, Walid, and P. Pauly (2003). "Motivations for FDI and Domestic Capital Formation," *Journal of International Business Studies* 34(3), pp. 282–289.

Jorgenson, Dale (1971). "Econometric Studies of Investment Behaviour: A Survey," *Journal of Economic Literature* 9(4), pp. 1111–1147.

Kalaitzidakis, Pantelis, and Sarantis Kalyvitis (2005). "'New' Public Investment and/or Public Capital Maintenance for Growth? The Canadian Experience," *Economic Inquiry* 43(3), pp. 586–600.

Kalyvitis, Sarantis (2006). "Another Look at the Linear q Model: An Empirical Analysis of Aggregate Business Capital Spending with Maintenance Expenditures," *Canadian Journal of Economics* 39(4), pp.1282–1315.

Kopcke, Richard W. and Richard S. Brauman (2001). "The Performance of Traditional Macroeconomic Models of Businesses' Investment Spending," *New England Economic Review*, pp. 3–39.

Landon, Stuart, and Constance E. Smith (2005). "The Exchange Rate and Machinery and Equipment Imports: Identifying the Impact of Import Source and Export Destination Country Currency Valuation Changes," *North American Journal of Economics and Finance* 18(1), pp. 3–21.

Organization for Economic Cooperation and Development (2010). *Taxation of Corporate and Capital Income* (Paris: OECD).

Parsons, Mark (2008). "The Effect of Corporate Taxes on Canadian Investment: An Empirical Investigation," Department of Finance Canada, Working Paper 2008-01.

Rao, Someshwar, Malick Souare, and Weimin Wang (2009). "The Economics of FDI: A Canadian Perspective," *Transnational Corporations Review* 1(4), pp. 28–41.

Rao, Someshwar, Jianmin Tang, and Wiemin Wang (2003). "Canada's Recent Productivity Record and Capital Accumulation," *International Productivity Monitor* 7(Fall), pp. 24–38.

Schaller, Huntley (1993). "Asymmetric Information, Liquidity Constraints, and Canadian Investment," *Canadian Journal of Economics* 26(3), pp. 552–574.

Sharpe, Andrew (2006). "The Relationship Between ICT Investment and Productivity in the Canadian Economy: A Review of the Evidence," Centre for the Study of Living Standards, Research Report 2006-05.

Stanford, Jim (1999). *Paper Boom: Why Real Prosperity Requires a New Approach to Canada's Economy* (Ottawa: Canadian Centre for Policy Alternatives and James Lorimer & Co.).

Stanford, Jim (2007). "More on Investment: 'Real' and Real," Progressive Economics Forum blog, http://www.progressive-economics.ca/2007/01/21/more-on-investment-real-and-real/, January 21.

Stanford, Jim (2008a). *Economics for Everyone: A Short Guide to the Economics of Capitalism* (Ottawa: Canadian Centre for Policy Alternatives).

Stanford, Jim (2008b). "Staples, Deindustrialization, and Foreign Investment: Canada's Economic Journey Back to the Future," *Studies in Political Economy* 82, pp. 7–34.

Tevlin, Stacey, and Karl Whelan (2003). "Explaining the Investment Boom of the 1990s," *Journal of Money, Credit and Banking* 35 (1), pp. 1–22.

Tobin, James (1969). "A general equilibrium approach to monetary theory," *Journal of Money, Credit and Banking* 1(1), pp. 15–29.

Tomas, Allan (2006). "Recent Trends in Corporate Finance: Some Evidence from the Canadian System of National Accounts," Statistics Canada Catalogue 13-604, March, 21 pp.

Waldkirch, Andreas, and Ayca Tekin-Coru (2010). "North American Integration and Canadian Foreign Direct Investment," *B.E. Journal of Economic Analysis and Policy* 10(1), pp. 1–38.

Notes

1 According to data published by Canada Revenue Agency (2010), two-thirds of all taxable dividend income, and three-quarters of all taxable capital gains, were received by tax-filers with income in excess of $100,000 in 2008 (a group which represents just over 5 percent of all tax-filers).

2 Cross (2011) reports that if ancillary investment spending related to petroleum and mining projects (such as petroleum refineries and pipelines, and primary metal processing facilities) are included, then the energy and mining sectors will account for a record 45 percent of total business non-residential fixed capital spending in 2011. This is a further indication of the dramatic extent to which Canada's economy is becoming dependent on the extraction of non-renewable resources, discussed further in Stanford (2008b).

3 The net capital stock data in Figure 2 is calculated on a geometric (infinite depreciation) basis; this ratio compares nominal capital stock to nominal GDP.

4 The capital-labour ratios in Figure 2 are equal to the real net capital stock (geometric depreciation, in chained $2002) divided by total employment.

5 Capital consumption allowances (CCA) represent charges which are deducted from a company's profits to reflect the wear-and-tear of existing capital, but are not paid in actual cash. Hence a company's cash flow is not reduced by CCA charges, only its reported profits.

6 Business investments in non-tangible assets have also declined during this period. For example, business R&D expenditures in Canada have declined by about one-third as a share of GDP since 2001.

7 Because of sharp fluctuations in before-tax profits (such as associated with recessions and recoveries), this estimate of the effective tax rate can fluctuate significantly even without any changes in tax policy, but the longer-run average is still a reasonable measure of the ongoing actual tax burden on business.

8 The increase in the apparent effective tax rate in 2010 is an anomaly reflecting the sharp decline in 2009 business profits associated with the recession; in this case, our method of relating taxes paid to previous year's profits produces a misleading estimate.

9 Note that the period of time covered by each subperiod does not correspond to the period of time each government was in office; they correspond, rather, to the period of time until the next successive tax reform was implemented.

10 Of course, since these rates continued to fall through the Harper reform period, the end-points for tax rates were even lower than the 2008–10 averages would indicate.

11 Note that most of the 2008–10 period covered by the Harper era we have defined, consisted of the 2008–09 recession and subsequent slow recovery (when business profits shrank). This average level of profits, therefore, understates the underlying structural improvement in before-tax profits; prior to the recession, before-tax profits reached 16 percent of GDP — the highest in Canadian history, and a peak increase of over 4 percentage points of GDP compared to the pre-reform average (rather than the 1-point increase reported in Table 1).

12 Again, the recession pulled down these averages for the 2008–10 Harper era, and hence understate the improvement in longer-run profitability and cash flow.

13 The total stock of liquid assets held by non-financial businesses in Canada was almost one-half trillion dollars at end-2010. Businesses normally require a stock of cash and liquid assets to conduct their affairs, however, so we have defined the "excess" as only the amount corresponding to the increase in the share of liquid assets as a proportion of GDP, compared to pre-2001 averages.

14 Figure 6 utilizes annual data from 1981 through 2010, based on OECD (2010); Figure 7 uses quarterly effective tax rates estimated from Statistics Canada data as described earlier, from 1961 through 2010. Figure 7 thus contains many more data points than Figure 6.

15 The coefficient of correlation is +0.250 for the statutory tax rate, and -0.174 for the effective tax rate; neither is statistically significant.

16 Fazzari (1999) explores three specific links in the chain of economic logic required to claim that lower business taxes will elicit more business investment, and finds all of them to be weak.

17 Even many microeconomic-based studies find that neoclassical optimizing behaviour is difficult to find in regression analysis; for example, Chirinko *et al.* (1999) find very low responsiveness of investment to the cost of capital even in micro data.

18 This eclecticism might be less welcome within a strict Walrasian framework.

19 This is a very modest impact; the same CME study predicts that more focused investment measures, such as the permanent implementation of two-year depreciation rules on new machinery, would have much larger positive impacts on investment.

20 A simple estimate of the foregone revenue associated with the 3-point tax reduction suggests that the cumulative cost of the tax reduction would at least match the $49 billion in new investment anticipated by Chen and Mintz, implying that even in their model the tax cut elicits at most one dollar in investment for each dollar in tax cut savings. To see this, consider that current before-tax corporate profits currently equal about $200 billion; assume conservatively that they grow at 5 percent per year (equal to anticipated nominal GDP growth). Over a seven-year period, the cumulative foregone taxes from the 3-point tax reduction sum to $49 billion. In reality, profits will grow faster than GDP as business profitability continues to recover form the recession, and hence the foregone revenue loss will be greater than the predicted increase in cumulative capital investment.

21 The simulation further assumes that the relationship between investment and employment is determined according to a Cobb-Douglas production function, which in turn requires that factor shares of national income are fixed over time. We have already seen that this is not the case: the corporate income share of GDP has grown notably since the 1980s, while the labour share of GDP has correspondingly declined.

22 Erin Weir first pointed out this problems after Parsons' study was published.

23 The Chen-Mintz work cites only the higher 0.7 estimate, without noting that Parsons' work reported possible elasticities as low as 0.3.

24 But in observed experience, the investment rate (investment as a share of starting capital) declined from 2000 through 2010.

25 A set of tables fully describing the regression results of all scenarios reported in this paper is available on request from the author.

26 Dept. of Finance Canada (2010), Table A.1, p. 142.

27 While we have not modeled them directly in the regression results reported above, it is likely that more focused fiscal measures (such as investment tax credits and/or accelerated depreciation provisions),which require businesses to increase investment before they receive the resulting fiscal incentives, are more effective in stimulating incremental investment spending than across-the-board no-strings-attached reductions in the general corporate tax rate.

> ABOUT THE CENTRE

The Canadian Centre for Policy Alternatives is an independent, non-profit research institute funded primarily through organizational and individual membership. It was founded in 1980 to promote research on economic and social issues from a progressive point of view. The Centre produces reports, books and other publications, including a monthly magazine. It also sponsors lectures and conferences.

> AU SUJET DU CENTRE

Le Centre canadien de politiques alternatives est un institut de recherche indépendant et sans but lucratif, financé en majeure partie par ses membres individuels et institutionnels. Fondé en 1980, son objectif est de promouvoir les recherches progressistes dans le domaine de la politique économique et sociale. Le Centre publie des rapports et des livres, ainsi qu'une revue mensuelle. Il organise aussi des conférences et des colloques.

CCPA
CANADIAN CENTRE for POLICY ALTERNATIVES
CENTRE CANADIEN de POLITIQUES ALTERNATIVES

www.policyalternatives.ca

> NATIONAL OFFICE

205-75 Albert Street, Ottawa, ON K1P 5E7
TEL 613-563-1341 FAX 613-233-1458
ccpa@policyalternatives.ca

BC OFFICE

1400-207 West Hastings Street, Vancouver, BC V6B 1H7
TEL 604-801-5121 FAX 604-801-5122
ccpabc@policyalternatives.ca

MANITOBA OFFICE

309-323 Portage Avenue, Winnipeg, MB R3B 2C1
TEL 204-927-3200 FAX 204-927-3201
ccpamb@policyalternatives.ca

NOVA SCOTIA OFFICE

P.O. Box 8355, Halifax, NS B3K 5M1
TEL 902-477-1252 FAX 902-484-6344
ccpans@policyalternatives.ca

SASKATCHEWAN OFFICE

Suite B 2835 13th Avenue, Regina, SK S4T 1N6
TEL 306-924-3372 FAX 306-586-5177
ccpasask@sasktel.net

> BUREAU NATIONAL

205-75 rue Albert, Ottawa, ON K1P 5E7
TÉLÉPHONE 613-563-1341 TÉLÉCOPIER 613-233-1458
ccpa@policyalternatives.ca

BUREAU DE LA C.-B.

1400-207 rue West Hastings, Vancouver, C.-B. V6B 1H7
TÉLÉPHONE 604-801-5121 TÉLÉCOPIER 604-801-5122
ccpabc@policyalternatives.ca

BUREAU DE MANITOBA

309-323 avenue Portage, Winnipeg, MB R3B 2C1
TÉLÉPHONE 204-927-3200 TÉLÉCOPIER 204-927-3201
ccpamb@policyalternatives.ca

BUREAU DE NOUVELLE-ÉCOSSE

P.O. Box 8355, Halifax, NS B3K 5M1
TÉLÉPHONE 902-477-1252 TÉLÉCOPIER 902-484-6344
ccpans@policyalternatives.ca

BUREAU DE SASKATCHEWAN

Pièce B 2835 13e avenue, Regina, SK S4T 1N6
TÉLÉPHONE 306-924-3372 TÉLÉCOPIER 306-586-5177
ccpasask@sasktel.net