ON THE EFFICIENCY EFFECTS OF AN ACCELERATED DECLINE IN THE DEBT TO GDP RATIO

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ABSTRACT

There is currently a debate on how to use the federal government's budget surpluses. Three influential Canadian studies suggest there are large efficiency gains to be had from reducing the debt to GDP ratio, and favour continuing the war against the debt through accelerated debt repayment. We point out that the results of these studies cannot be directly applied to the current policy debate because they estimate the gain from a change in the debt to GDP ratio relative to a constant ratio – a comparison usually referred to as a "permanent change". Today's context is one of falling debt to GDP ratios *without accelerated debt repayment.* Our main contribution is to translate the results of these studies into a form relevant for the current debate. We conclude that the efficiency gains from accelerated debt repayment are just a tiny fraction of the stated gains from a "permanent reduction" in the debt to GDP ratio of the size assumed in the three previous studies.

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I. INTRODUCTION

In the 1980s, policymakers, economists and the general public expressed concerns over persistently large deficits and the rapid growth of the national debt. Economists expressed their concerns through conferences, individual papers and separate monographs dedicated to the national debt issue. In response, the federal government took steps towards fiscal retrenchment through measures that included reductions in transfers to provinces and increases in tax burdens – overtly for consumption taxes and covertly for income taxes (by effectively eliminating inflation-indexing).

After winning the war on the deficit, the federal government has turned its attention to reducing the public debt. It began by setting a 50% target for the federal debt to GDP ratio, and more recently it has called for a 25% ratio within ten years (the Goodale Plan). To achieve this target, it has planned to devote part of the budget surplus to debt reduction.

Since balanced budgets are sufficient to shrink the debt to GDP ratio as GDP grows, the need for accelerating the rate of decline through debt repayment is not overwhelmingly obvious. Yet, there seems to be consensus in the profession that accelerated debt repayment is a good idea – though no consensus as to the reasons why.[1]

The issue has been considered from three main perspectives in the literature: (a) fiscal sustainability, (b) efficiency, and (c) equity.[2] There is general agreement that there is no necessity for accelerated debt repayment from a fiscal sustainability perspective because projected fiscal trends in Canada would lead to declining debt to GDP ratios, both federally and nationally, without debt repayment. For the long run, there are concerns about large unfunded government liabilities – especially the health costs of the aging baby boomer generation – that may require taxes to increase (as a share of GDP) to keep spending programs at their current per capita levels. We intend to address this question in a later paper and confine this paper to the efficiency arguments.

Expert opinion is divided about the efficiency rationale for debt repayment. For example, in his summary of the literature, Scarth (2004) argues that the efficiency rationale does not justify an accelerated decline in the debt to GDP ratio for two reasons: first, we cannot be very precise concerning the optimal size of the government debt – U.S. studies put it anywhere between 66 percent of GDP and negative 300 percent, depending on the exact specification of the model; second, there may be only small costs from divergences from this optimal size – again depending on the model specification. On the other hand, Scarth finds that there are persuasive arguments for accelerated debt reduction on the basis of inter-generational equity.
Scarth's view is somewhat of a minority opinion. Three influential studies (James (1994),

Macklem, Rose and Tetlow (1994), and Dahlby (2004)) suggest that, in the Canadian context, there are large gains to be had from reducing the debt to GDP ratio and favour continuing the war against the debt through debt repayment. However, the results of these studies cannot be directly applied to the current policy debate because they estimate the gain from a change in the debt to GDP ratio relative to a constant ratio – a comparison usually referred to as a "permanent change". Today's context is one of falling debt to GDP ratios *without continuing the war against the debt*. We need to emphasize that without any accelerated debt repayment, balanced budgets are sufficient to shrink the debt to GDP ratio as GDP grows. Therefore, the relevant question for the current debate is not what are the efficiency gains from a (one shot) large and permanent reduction in the debt to GDP ratio, but rather, what are the efficiency gains from having a lower debt to GDP ratio *than would materialize in the absence of debt repayment.*

Addressing this question is the main focus of this paper. Our main contribution is to translate the results of previous studies into a form relevant for the current debate on whether to partly use budget surpluses for debt repayment. The general conclusion is that the efficiency gains from continuing the war against the debt through debt repayment are just a tiny fraction of the stated gains from a "permanent reduction" in the debt to GDP ratio of the size assumed in the three studies mentioned above.

II. OVERVIEW OF PREVIOUS CANADIAN STUDIES

The main elements of the three Canadian studies reviewed in this paper are identified in Table 1. The first two studies, by James (1994) and Maklem, Rose and Tetlow (1994), both use exogenous growth models, in an open economy framework, with heterogeneous agents. The more recent study, by Dahlby (2004) employs an endogenous growth model, in a closed economy, with a single representative agent. As stated above, all three studies consider the efficiency effects of a permanent change in the debt to GDP ratio.

Before embarking on a detailed consideration of these studies, we briefly consider three major implications of the different model structures. First, when economic growth is exogenous, changes in the debt to GDP ratio may affect the level of output but not its growth rate. With endogenous growth, changes in the debt to GDP ratio may have both level and growth rate effects. The magic of compound interest means that even small changes in a growth rate may translate into large future effects. So, in general, models of endogenous growth are potentially much more fruitful for finding efficiency gains from debt reduction. It is for this reason that we devote more attention to Dahlby's study.

Second, even though Canada is a small open economy, the open economy results of the two 1994 studies are not necessarily superior to the closed economy results of Dahlby's 2004 study. "Openness" changes the channel through which the effects of debt reduction are transmitted but may not change the dimensions of those effects. In calculating long run growth effects, closed economy models may provide useful benchmarks, even for open economies.

Finally, the reader should be cautioned that the results derived from representative agent models must be treated with care. Models with heterogeneous agents allow for at least two types of agents, those who hold bonds and those who do not. Therefore, they allow for intra-generational redistribution and provide a rationale for the existence of public debt. The lack of these elements in the representative-agent models raises three problems. First, as Kirkman (1972) points out, it is not clear who the representative agent represents. Second, as Osberg (2004) point out, it is not clear why there is a need to issue public debt in the first place. And third, as Musgrave (1992) points out, it is not clear how there can be a deadweight loss from taxation in a representative agent model. Since the authors cited above have addressed these issues, we do not discuss them here.

<Table 1 appears around here>

We begin our more detailed analysis by considering Dahlby's 2004 paper.

III. EFFICIENCY EFFECTS IN A CLOSED ECONOMY

III-1. Dahlby's Estimates

The most recent study on the efficiency effects of a lower debt to GDP ratio is that of Dahlby (2004), who uses an "AK" model of endogenous growth that incorporates distortionary taxation. The name of the model comes from the production function, which is written as:

(1) $Y_t = AK_t$

where Y_t is total output at time 't' resulting from capital, 'K', that yields a constant rate of return, 'A'; 'K' includes both human and physical capital, which are perfect substitutes. In order to focus on the effects of capital accumulation, Dahlby assumes a vertical unchanging labour supply curve.

The government is assumed to raise revenues through a proportional tax on income (the value of output), and to use these funds to finance government expenditures. All government expenditures are for consumption purposes (not investment), and are a constant proportion of income.

The key to the model is the proportional relationship between output and the capital stock. This makes the growth of real GDP entirely dependent on the share of investment in GDP. Furthermore, since it is a closed economy, domestic investment is entirely constrained by domestic saving. Clearly, the fundamental question is: how do savings behave in the face of an increase in government debt? Do private agents foresee the future taxes implied by the need to finance higher interest payments on this debt, and increase their savings rates to exactly maintain their future disposable incomes (the Ricardian equivalence assumption)? Or, for one reason or

another (rational or myopic), do they ignore the increase in debt, and keep their savings rates constant?

In the latter case, if the saving behaviour of private agents remains unchanged in the face of accumulations of debt, then an increase in the debt to GDP ratio will reduce the *net* saving rate, and hence the net investment rate. In effect, the higher deficits associated with the higher debt siphon off some of the private savings and crowd-out private investment. Total investment falls because the extra public borrowing is used for public consumption expenditures, and the whole process involves a shift from private investment (which stimulates economic growth) to public consumption (which does not).

On the other hand, if Ricardian equivalence is assumed, the reduction in savings implied by the higher debt is exactly offset by an increase in the private saving rate. In this case, net savings, net investment, and growth are all unaffected by greater government debt. In Dahlby's model, Ricardian equivalence is assured by the assumption of forward looking representative agents. The adverse affects on growth come from the assumption that the taxation necessary to finance interest payments on the debt, is distortionary. And since Dahlby assumes that labour supply is constant, the only distortion involves the private saving decision. Using a middle of the road estimate of this response, Dahlby estimates that doubling the debt to GDP ratio from 50% to 100% would reduce the growth rate "by just under one tenth of a percentage point" (p.226).

While this may seem small, we must bear in mind that annual growth rates in real per capita terms are often in the range of 1 to 1½ percent, so a change in one tenth of a percentage point may represent as much as a 10 percent improvement in the growth rate. Moreover, the magic of compounding means that even small growth gains can have a significant effect on standards of living.

To demonstrate this point, Dahlby transformed the change in the growth rate into changes in output levels by calculating the present value of the future output loss. According to his calculations, this loss would amount to $15 billion in 2002. Turning the result around, if the debt to GDP ratio was *reduced* permanently by 50 percentage points, the output gain over the infinite future would amount to $15 billion in 2002. Alternatively, if the infinite future is represented by 100 years, and we ignore the time value of money, the gain would be $150 million per year.

Stated like this, the efficiency gains from a permanent reduction in the debt to GDP ratio seem large. Especially since Dahlby has deliberately made things harder for himself by assuming: first, Ricardian equivalence; and second, only one distortion from taxation. We will address the importance of these assumptions momentarily. But first, the key question is how these results inform the current debate, in today's context, where balanced budgets are sufficient to allow the debt to GDP ratio to fall? What light does this shed on the question of whether to spend part of the budget surplus on accelerated debt repayment?

III-2. Translating a Faster Rate of Decline into a Permanent Change

The "Goodale Plan" recommends reducing the current federal debt to GDP from 44% to 25% over the next ten years through accelerated debt repayment. This plan presents us with two policy scenarios: the first scenario is a policy of no debt repayment, which leads to a decline in the debt to GDP ratio determined entirely by the growth of nominal GDP; the second scenario is the accelerated reduction in the debt to GDP ratio of the "Goodale Plan". The *difference* in the debt to GDP ratio under these two scenarios is the reduction due to accelerated debt repayment.

Of course, the reduction due to accelerated debt repayment will be a lot less than the 50 percentage points assumed by Dahlby. But whatever percent it may be, we can then use Dahlby's results to estimate the implied efficiency gain. If, for example, the accelerated debt repayment plan reduces the debt to GDP ratio by an added 10 percentage points, the growth effect of such a policy would be one-fiftieth of a percentage point.

<Table 2 appears around here>

In Table 2 we show projections of the debt to GDP ratio for three cases, based on projections of nominal GDP up to 2020 found in the Conference Board of Canada (2002) and on the assumption of a 4.2% nominal growth rate per year thereafter. "Case I" refers to the base case where there are balanced budgets, and no debt repayment; Case II refers to the "Goodale Plan"; Case III refers to the "Expanded Goodale Plan" which continues debt repayment by $7.5 billion in the following years until the federal debt is eliminated.

Inspection of Table 2 leads to the following observations. First, the federal debt to GDP ratio is projected to fall rapidly even without debt repayment. It falls below 25% in 2018, to 20% in 2023 and to 10% in 2040. Second, under the Goodale Plan, the 25% mark is reached four years earlier, and the 10% mark five years earlier. However, by 2040, the debt to GDP ratio is only 1.4 percentage points lower than in the base case. Third, the decline in the debt to GDP ratio is faster under the Expanded Goodale Plan because there is debt repayment throughout the entire period. The 25% mark is still reached in ten years, but the 10% mark is reached 11 years earlier than in the base case and by 2040 the debt to GDP ratio is down to 4.9% compared to 10% in the base case.

This table also shows that, when the debt to GDP ratio is declining without debt repayment, the extra reduction due to accelerated debt repayment does not follow a simple linear path through time. For example, the second to last column in Table 2 shows that the difference in the debt to GDP ratio between the base case and the Goodale Plan follows a marked inverted-U pattern, first increasing until 2014, when debt repayment ceases, and then falling asymptotically to zero over the very long-run. This pattern is plotted in Figure 1.

<Figure 1 appears around here>

A much flatter inverted-U shape pattern is noticeable for the Expanded Goodale Plan: the extra

reduction in the debt to GDP ratio due to accelerated debt repayment first increases to 5.5 percentage points by 2026, stays at that level for six years and then starts declining.

The difference in the debt to GDP ratio between the base case and the Goodale Plan is, on average over the entire period, 2.3 percentage points; and that between the Extended Goodale Plan and the base case is 4.2 percentage points. However, if we lengthened the period, the average would be lower for the Goodale Plan, and slightly higher for the Extended Goodale Plan. So, in calculating the equivalent "permanent reductions" in the debt to GDP ratio that these plans correspond to, we rounded the averages to 2 percentage points for the Goodale Plan, and 5 percentage points for the Extended Goodale.

Since Dahlby estimates the efficiency effects of a permanent 50 percentage point reduction in the debt to GDP ratio, this means that the associated growth and output effects of the Goodale Plan and the Expanded Goodale Plan are, respectively, 4 percent and 10 percent of his estimates. And since he estimated that a 50 percentage point reduction in the debt to GDP ratio would raise the steady-state growth rate by slightly less than one tenth of one percentage point, the Goodale plan would increase the growth rate of GDP by 4/1000 of one percent and the expanded Goodale plan would raise output growth by 1/100 of one percentage point. Can these gains be made to appear more significant through the magic of compound interest?

Dahlby estimated that the present value of the future increases in output over the infinite horizon would amount to $15 billion in 2002. This amount would be reduced to $600 million for the Goodale plan and $1.5 billion for the expanded Goodale plan. Letting the infinite future be represented by 100 years, and ignoring the time value of money, these gains translate into $6 million per year under the Goodale Plan, and $15 million per year under the Extended Goodale. The general conclusion is that when we move from hyperbolic permanent reductions in the debt to GDP ratio to the reductions associated with announced policies or even realistic extrapolations of those policies, the net gains generated by Dahlby's model practically vanish.

III-3. Correcting for Dahlby's Underestimation

In assuming Ricardian equivalence, and a vertical labour supply curve, Dahlby deliberately biased his model to make it more difficult for him to find significant efficiency gains from a permanent reduction in the debt to GDP ratio. Since, he still does find significant gains, his results are stronger as a result. In our case, we are using his estimates to show that the efficiency gains from accelerated debt repayment plans are small and insignificant. Therefore, we need to address the question of Dahlby's underestimation. Could correcting for this underestimation restore a big effect for accelerated debt reduction?

First, consider the assumption of Ricardian equivalence. With full equivalence, private agents increase their saving by one dollar for every dollar increase in deficit financing; with zero equivalence there would be no increase in savings. The presence of Ricardian equivalence has been tested in a variety of studies, and while the results depend somewhat on the methodology

used and the way savings are measured, there is a surprising amount of consensus in the estimates. After reviewing the existing studies, Johnson (2004) concluded that each dollar of deficit financing is associated with an increase of between 50 to 60 cents in private savings.

Dahlby estimates that the total absence of Ricardian equivalence would double the effect of a permanent reduction in the debt to GDP ratio derived in his model. If we assume a 50% degree of Ricardian equivalence (the lower bound of Johnson's estimates), we end up with a growth rate effect of .15 of a percentage point for a permanent reduction of 50 percentage points in the debt to GDP ratio. Thus, adjusting for only partial Ricardian equivalence would increase the growth rate effect to 6/1000 of a percentage point for the Goodale plan and 15/1000 of a percentage point for the Extended Goodale – and these effects are still negligible.

Second, consider the assumption that increases in the tax rate have no negative effect on labour supply. The consensus of a very large labour supply literature is that the wage elasticity of desired labour supply is very small – see Killingsworth (1983) or Heckman (1993) or Osberg and Phipps (1993). A common "best guess" from the literature is that the wage elasticity of desired labour supply is about 0.1, but many studies cannot rule out zero or even negative estimates. This suggests that there is no real underestimate coming from Dahlby's assumption of a vertical labour supply schedule.

Nonetheless, we tested for the potential effects of distortionary taxation on labour by assuming that the magnitude of this effect is twice that of allowing for only partial Ricardian equivalence. After all, we could regard "labour supply" distortions are as 'grab-bag' standing for all sorts of omitted distortions. Since the effect of partial Ricardian equivalence was to add another .05 of a percentage point to the growth effect, we are supposing that other distortions and omitted factors are adding a further 0.1 of a percentage point to the growth effect. Including the initial 0.1 from Dahlby's model, this gives us a gain in the growth rate of 0.25 percentage points, from a 50 percentage point permanent reduction in the debt to GDP ratio. We can agree that this is huge. But it is coming from a huge permanent reduction in the debt to GDP ratio.
When we allow for the fact that the Goodale Plan only produces a permanent reduction of 2 percentage points rather than 50, the gain to the growth rate is reduced to 0.01 of a percentage point. In the case of the Extended Goodale, we have a permanent reduction of 5 percentage points rather than 50, and so an implied efficiency gain to the growth rate of 0.025 of a percentage point.

In terms of the present value of the output gain over an infinite horizon, the amount in 2002 would be $37.5 billion for a 50 percentage point reduction, $1.5 billion for the Goodale Plan and $3.75 billion for the Extended Goodale. Letting the infinite future be represented by 100 years, and ignoring the time value of money, these gains translate into $15 million per year under the Goodale Plan, and $37.5 million per year under the Extended Goodale. These are very small gains for the accelerated decline in the debt to GDP ratio.

III-4. Biases of A Different Direction

In commenting on Dahlby's paper, Macklem (2004) emphasizes that Dahlby's estimates are biased downwards. We have shown that, even when these biases are corrected, the efficiency effects of the Goodale plan and the expanded Goodale plan are very small. But Dahlby assumes that all government spending is for consumption purposes, with no beneficial impact on growth. Doesn't this suggest bias of a different direction? To evaluate this question, Table 3 presents data on the percentage distribution of consolidated (federal, provincial, territorial, and local) government spending in 2001.

<Table 3 appears around here>

We notice that a number of spending categories have large investment components – either by increasing productive capacity, or by providing a stream of benefits over a long period of time. For example, spending on transportation and communications is largely in the form of physical capital, and components of this type of capital are also found in spending on the environment, education (schools, colleges and university buildings) and health care (clinics and hospitals). Spending on education and research establishments is an investment in human capital. Spending on culture and recreation, and some components of health care and social services, may also be considered as investment in human and social capital.

It is well established that the private returns to education are large. Indeed, a huge literature has developed discussing the increase in the earnings differential between those with a university degree and those without. Nevertheless, high private returns to human capital do not necessarily translate into high social returns.

In the 1970s the filter-theory of education (e.g. Arrow, 1973) suggested the possibility that education might merely be giving out credentials for pre-existing (but otherwise unobservable) ability. In other words, education might not genuinely create human capital, and the high private returns to education might coexist with zero (or very low) social returns.

Two types of empirical evidence have alleviated these fears. First, cross-country empirical studies on the determinants of economic growth have definitively shown that "countries with a better-educated work force tend to grow faster" (Sala-i-Martin, 1994, page 746). And second, empirical studies have shown the existence of substantial social externalities associated with education. According to Davies (2003), the education externalities alone may be equivalent to a rate of return of 8%!

It is for these reasons that the endogenous growth literature emphasizes the importance of human capital. Indeed, this is the general theme of the entire literature. Given this emphasis, and the empirical evidence on the importance of human capital to growth, Dahlby's assumption that all public spending is for consumption purposes may give a serious upward bias to his estimates of the efficiency gains from debt reduction. This is especially so since a major alternative to debt repayment is federal investment in human and social capital.

While modelling this effect is beyond the scope of the present paper, suffice to note that in Dahlby's model, physical and human capital are perfectly substitutable. To the extent that any extra government revenue is used to finance public investment in physical and human capital, there is no crowding out of total investment, but simply a shift from private to public investment. In this case, negative efficiency effects would be generated only if the ratio of public to private investment was optimal to begin with.

Before concluding this section, we should mention that there is another feature of public debt that may generate positive efficiency effects. It may provide investors with safe and widely traded securities, and help to stabilize the capital market. To our knowledge, no estimates of the size of this effect are available in the literature.

IV. EFFICIENCY EFFECTS IN AN SMALL OPEN ECONOMY

A determining feature of a small open economy is that firms can borrow in international markets at the world interest rate. This eliminates the constraint on domestic investment from domestic savings. Since Dahlby's growth effects are generated entirely from the response of domestic savings to distortionary taxation, placing that model within a small open economy framework would entirely eliminate the efficiency effects of a permanent reduction in debt – at least as far as GDP and its growth rate are concerned. Instead, efficiency effects would be generated through the creation of a wedge between GDP and GNP, as part of domestically produced output must be used to pay interest to foreign lenders. These effects translate into reduced lifetime utility of private agents, as taxation distorts the choice between current and future consumption.

In this section we review two studies on the efficiency effects of debt reduction that use small open economy models. One is by James (1994) and the other by Macklem, Rose and Tetlow (1994). Both use calibrated, dynamic, overlapping-generations models of the Canadian economy, and both assume that the trend growth of total factor productivity is exogenous – implying that changes in the debt to GDP ratio can only have level effects on domestically produced output, not growth effects. Further, both allow changes in public debt to affect output and consumption through three channels: (a) partial Ricardian equivalence, (b) distortionary taxation, and (3) foreign borrowing, which creates a wedge between output and consumption through the payment of interest to foreign lenders.

Despite these similarities, there are many minor differences between these two studies. For example, James incorporates imperfect substitutability of domestic and foreign assets due to a strong preference for domestic assets; whereas Macklem et. al. assume perfect substitutability between domestic and foreign assets. It is also worth noting that the experiments performed are slightly different. James measures the short-term and long-term effects of having higher taxes today in order to finance debt repayment, which allows a lower debt burden and lower taxes in the future; whereas, Macklem et. al. estimate the efficiency effects of a permanent change in the

debt to GDP ratio, and trace the path from one steady-state to another.

In the first of James' experiments, wage taxes are raised in order to finance a ten percent reduction in the government debt. The general conclusion is that "initial agent welfare declines significantly…while steady state welfare increases marginally" (p. 292). It takes 67 years for the wage tax to fall below its pre-experiment level and the reduction is very small, namely, 0.3 percentage points. The steady-state increase in the level of GDP is one-tenth of one percent. In the second experiment, James replaces the wage tax by a corporate tax. In this case, the negative initial effects are smaller and the steady-state increase in GDP is double that under the wage tax.

Macklem, Rose and Tetlow estimate the real effects of raising or lowering the debt to GDP ratio. When the public debt is financed by changes in lump-sum taxes or transfers, a 20 percentage point reduction in the debt to GDP ratio, say, from 60% to 40%, raises the level of output in the steady-state by 0.2 percent, but raises consumption by 1.4 percent. The large difference between the output and consumption effect indicates that most of the real effects are generated by reduced payments to foreign lenders.

In the context of the current situation, James' experiments are equivalent to assuming that the federal revenue that would be used for debt repayment under the two Goodale plans would otherwise be used to reduce wage taxes or corporate taxes. James' estimates may be translated into the efficiency effects of the above two plans with the help of comparisons made by Macklem (2004). He estimates that in 30 years (which is his view of the long-term) reducing the debt to GDP ratio from 80% to zero would raise the level of consumption by 8 percent in Dhalby's model and by 9 percent in James' model. Since the permanent reduction equivalent of the Goodale plan is 2 and 5 percentage points, the associated increase in the level of consumption in thirty years is 8/40 or two-tenths of a percentage point under Dahlby's model, and 9/40 or 2.2 tenths of a percentage point in James' model. For the expanded Goodale plan, the respective increase in consumption in thirty years are 8/16 or half a percentage point, and 9/16 or 0.56 of a percentage point.

A similar calculation may be made for the Macklem-Rose-Tetlow paper. In Macklem (2004), the results from Maclem-Rose-Tetlow are compared to those obtained by Dahlby (2004). Macklem points out that lowering the debt to GDP ratio from 80% to zero in the Macklem-Rose Tetlow model, would raise consumption in 30 years (an approximation of the long-run) by 7.4 percent compared to 8 percent in Dahlby's model. For the Goodale plan, this increase in consumption would amount to 7.4/40 or less than two-tenths of a percentage point, and for the expanded Goodale plan it would amount to 7.4/16 or less than half of a percentage point.

V. CONCLUSIONS

This paper has reviewed three recent studies on the efficiency effects of a permanent reduction in the debt to GDP ratio, and used the estimates in those studies to determine the net output gains

from an accelerated decline in the naturally declining debt to GDP ratio. We point out that the results of those studies cannot be directly applied to the current policy debate because they estimate the gain from a change in the debt to GDP ratio relative to a constant ratio – usually referred to as a "permanent change". Whereas, in today's context, the alternative to accelerated debt repayment is balanced budgets, which implies that the debt to GDP ratio will fall automatically as nominal GDP increases. The relevant policy question in this case is: what is the net gain of speeding up this rate of decline?

Two options are evaluated. The first reproduces the recently announced federal plan (the "Goodale Plan") to reduce the federal debt to GDP ratio to 25% in ten years. The second is an expanded version of this plan (the "Expanded Goodale Plan") whereby debt repayment continues at the rate of $7.5 billion per year until the federal debt is eliminated. We show that, using the efficiency estimates from the above three studies, the potential net gains in both output level and growth are minuscule.

We also show that no realistic changes in model structure and behavioural responses by economic agents can make the efficiency effect meaningfully large because the realistic policy options available to generate faster rates of decline (in the debt to GDP ratio) translate into very small "permanent change" equivalents. We conclude that accelerated reductions in the debt to GDP ratio through annual debt repayment plans cannot be justified on efficiency grounds.

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TABLES, FIGURES, and ENDNOTES

Table 1: Main Elements of Studies Reviewed

	James (1994)	Maklem, Rose, & Tetlow (1994)	Dahlby (2004)
Growth Model	Exogenous	Exogenous	Endogenous
Economic Structure	SOE†	SOE	Closed Economy
Type of Agent	Heterogeneous	Heterogeneous?	Representative
Ricardian Equivalence	Partial	Partial	Complete
Tax Distortions	Savings, Labour Supply	Savings	Saving

†SOE stands for small open economy. In James, this assumption is associated with imperfect substitutability between domestic and foreign assets.

Table 2: Projections of Federal Debt to GDP Ratios under Alternative Scenarios

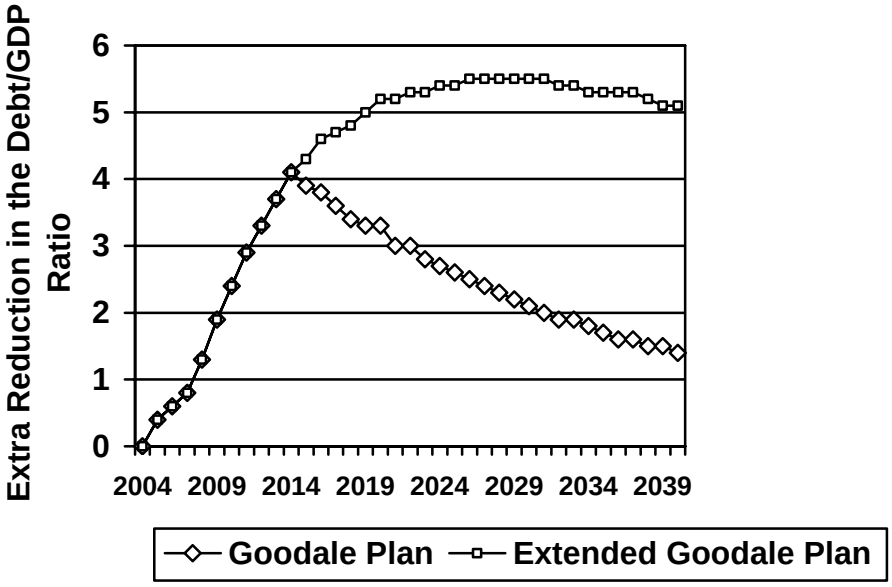
		Case I		Case II		Case III		Ratio Difference	
Fiscal year ending March 31	Nominal GDP (billions $)	Federal Debt	Debt/ GDP ratio	Federal Debt	Debt/ GDP ratio	Federal Debt	Debt/ GDP ratio	(I)-II)	(I)-(III)
2004	1217.3	533.5	43.8	533.5	43.8	533.5	43.8	0	0
2005	1269.9	533.5	42	528.9	41.6	528.9	41.6	0.4	0.4
2006	1321.1	533.5	40.4	526.2	39.8	526.2	39.8	0.6	0.6
2007	1376.9	533.5	38.8	522.2	37.9	522.2	37.9	0.8	0.8
2008	1438.7	533.5	37.1	515.3	35.8	515.3	35.8	1.3	1.3
2009	1499	533.5	35.6	505.8	33.7	505.8	33.7	1.9	1.9
2010	1560.8	533.5	34.2	496.3	31.8	496.3	31.8	2.4	2.4
2011	1622.9	533.5	32.9	486.8	30	486.8	30	2.9	2.9
2012	1688.4	533.5	31.6	477.3	28.3	477.3	28.3	3.3	3.3
2013	1757.9	533.5	30.3	467.8	26.6	467.8	26.6	3.7	3.7
2014	1833.2	533.5	29.1	458.3	25	458.3	25	4.1	4.1
2015	1912.1	533.5	27.9	458.3	24	450.8	23.6	3.9	4.3
2016	1994.5	533.5	26.8	458.3	23	443.3	22.2	3.8	4.6
2017	2080.3	533.5	25.6	458.3	22	435.8	20.9	3.6	4.7
2018	2166.2	533.5	24.6	458.3	21.2	428.3	19.8	3.4	4.8
2019	2258.8	533.5	23.6	458.3	20.3	420.8	18.6	3.3	5
2020	2355.2	533.5	22.7	458.3	19.4	413.3	17.5	3.3	5.2
2021	2454.1	533.5	21.7	458.3	18.7	405.8	16.5	3	5.2
2022	2557.2	533.5	20.9	458.3	17.9	398.3	15.6	3	5.3
2023	2664.4	533.5	20	458.3	17.2	390.8	14.7	2.8	5.3
2024	2776.3	533.5	19.2	458.3	16.5	383.3	13.8	2.7	5.4
2025	2892.9	533.5	18.4	458.3	15.8	375.8	13	2.6	5.4
2026	3014.4	533.5	17.7	458.3	15.2	368.3	12.2	2.5	5.5
2027	3141	533.5	17	458.3	14.6	360.8	11.5	2.4	5.5
2028	3272.9	533.5	16.3	458.3	14	353.3	10.8	2.3	5.5
2029	3410.4	533.5	15.6	458.3	13.4	345.8	10.1	2.2	5.5
2030	3553.6	533.5	15	458.3	12.9	338.3	9.5	2.1	5.5
2031	3702.9	533.5	14.4	458.3	12.4	330.8	8.9	2	5.5
2032	3858.4	533.5	13.8	458.3	11.9	323.3	8.4	1.9	5.4
2033	4020.5	533.5	13.3	458.3	11.4	315.8	7.9	1.9	5.4
2034	4189.3	533.5	12.7	458.3	10.9	308.3	7.4	1.8	5.3
2035	4365.3	533.5	12.2	458.3	10.5	300.8	6.9	1.7	5.3
2036	4548.6	533.5	11.7	458.3	10.1	293.3	6.4	1.6	5.3
2037	4739.6	533.5	11.3	458.3	9.7	285.8	6	1.6	5.3
2038	4938.7	533.5	10.8	458.3	9.3	278.3	5.6	1.5	5.2
2039	5141.2	533.5	10.4	458.3	8.9	270.8	5.3	1.5	5.1
2040	5257.1	533.5	10	458.3	8.6	263.3	4.9	1.4	5.1

Note: “Case I” refers to the base case where there is no debt repayment; Case II refers to the “Goodale Plan”; Case III refers to the “Expanded Goodale Plan”.

Table 3: Percentage Distribution of Consolidated Government Spending by Major Category

Category	Percent of Program Spending
Social Services	30.26
Health Care	19.55
Education	17.38
Protection of Persons and Property	9.18
Transportation and Communications	4.73
General Government Services	4.62
Resource Conservation and Industrial Development	3.85
Recreation and Culture	2.81
Environment	2.52
Foreign Affairs and International Assistance	1.3
Housing	1.14
Labour, Employment and Immigration	0.81
Research Establishments	0.68
Regional Planning and development	0.6
Other Program Spending	0.57

Figure 1: The "Permanent Change" Equivalents of the “Goodale Plans”



ENDNOTES

[1] Of course, there have been vocal dissenters from this consensus. See, for example, Osberg (2004).

[2] Myatt and Ruggeri (2004) argue that *inter-governmental fiscal relations* are an important aspect that has been relatively neglected in the literature.