

Inflation and capital taxes: A comment

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1. Introduction

Almost all countries tax nominal interest income, and allow firms to deduct nominal interest payments from their receipts when calculating taxable profits. Yet for nearly a century economists have questioned this practice, arguing that it is both inequitable and distortionary.¹ The basic argument is as follows. When an agent lends money at interest, part of the interest payment is to compensate the lender for the decline in the purchasing power of money due to inflation, and is not income. Consequently, only the inflation adjusted or real interest payment should be subject to *income* tax. If both the inflation component and real interest component of interest receipts are taxed, the effective tax rate on real interest receipts is much higher than the statutory income rate when the inflation rate is positive. In addition, since borrowers with businesses are allowed to deduct the inflation component of their interest repayments when calculating their taxable income, even though the inflation component of interest payments is a capital transfer, the borrower's taxable income is understated. Consequently, they pay an effective tax rate that is less than the statutory rate. Thus, because the inflation component of nominal interest receipts and payments is subject to taxation, lenders are increasingly over-taxed and borrowers are increasingly under-taxed as the inflation rate increases. Moreover, when inflation is positive, interest income is over taxed compared to other forms of income.

There is little disagreement amongst economists about this basic proposition. The decomposition of nominal interest payments into real and inflation components is standard and is the recommended way to treat interest payments in the National Accounts (United Nations, 1993; Hill, 1995). However, there is less consensus about the desirability of adjusting the income tax system for inflation.

The debate can be deconstructed into three main components.

- (1) How much does the interaction of inflation with the tax system affect
 - a. the quantity and type of physical and corporate assets in the economy;
 - b. the financial structure of the economy, particularly the incentive for corporations to use debt finance rather than equity finance;
 - c. the quantity and type of saving flows in the economy;
 - d. the quantity and type of investment flows in the economy;
 - e. asset ownership patterns in the economy?
- (2) How much does taxing the inflation component of interest payments and receipts affect the prices of financial and real assets in the economy, including nominal interest rates?
- (3) Is inflation high enough to bother about, particularly given evidence that there are biases in the measurement of inflation that mean inflation is overstated?

¹ One of the first papers to explicitly raise this question was Viner (1923)

This note describes the main issues in this debate. It argues that the way the Government should adjust the taxation of income from capital for inflation (if at all) will depend on whether it is primarily concerned about savings, about the quantity and type of assets in the economy, or about the moral equity of taxing different classes of assets differently. Clearly the ultimate decision will depend on the perceived benefits of making the adjustments, the additional costs (if any) of a potentially more complex tax system, and the revenue gains or losses that stem from altering the tax system. I have not analysed these aspects of the decision, although there are three detailed analyses of the likely costs of changing the tax system which provide a useful guide to the size of these costs (United States Treasury, 1984; New Zealand Government 1989; Shuldiner 1992).

2. The basic issue: inflation, income, and the tax system.

2.1 Inflation, and real and nominal profits.

Inflation has implications for the taxation of capital income primarily because nominal rather than real income is taxed. There are three major issues.

(1) Currently nominal interest receipts are counted as income and taxed, and nominal interest payments are deducted from income and thus lower taxable income. Since the inflation component of interest payments are a transfer of capital rather than real income, this means that when inflation is positive

- a. real interest income is overtaxed
- b. company profits are understated and so company income is undertaxed.

The effect can be large even when inflation is “modest”. When real interest rates are 5 percent and the inflation rate is 2 percent, the tax rate on real interest income is 42 percent higher than when the inflation rate is zero. Moreover, since company profits are understated by \$20000 for every \$1 million of borrowings, companies pay \$6600 less tax per million of borrowing than when the inflation rate is zero.

(2) Currently, firms calculate their depreciation allowances based on the nominal cost of capital. When there is positive inflation, the depreciation allowance is lower than the true cost of replacing the capital (assuming the price of capital equipment is rising at the inflation rate). This means their profits are overstated, and so they are over taxed.

The extent of the overstatement depends on the age of the lifespan of the capital equipment. In general, the overstatement of profits is lower the longer the lifespan of the capital equipment, and so the additional taxation is less. When inflation is 2% an asset generating a real pretax return of 10% will be taxed at between 36-39 % rather than 33% depending on the lifespan. (New Zealand Government 1989, chapter 3, Annex 3.4)

To make the example concrete, a company investing \$1million in plant with a 10 year life span that earns a real return (after depreciation) of 10% will pay \$33000 in tax when the inflation rate is zero and \$38000 in tax when the inflation rate is 2%. If they were to borrow the \$1million, their tax bill would

be reduced by an extra \$6600 when the inflation rate was zero, more than offsetting the increase in tax liability from the effect of inflation on depreciation allowances.

- (3) The third issue is similar to depreciation: it concerns the way firms treat the cost of their inventories when calculating profitability. In general, under current tax and accounting treatment, firms deduct the cost of inventories at cost price without making an allowance for inflation. When the inflation rate is positive, firms profits are overstated and so they pay too much tax. The effect is similar to the effect of inflation on depreciation allowances.

2.2 Implications for saving and the capital structure of the economy

When the inflation rate is positive, these three effects have implications for (i) the types of capital firms invest in (ii) the financial structure of firms and (iii) the ways people save.

(i) The capital structure of the economy.

When the inflation rate is positive, firms have an incentive to change the total quantity and the type of capital they use. In particular, they have an incentive to invest less in assets that depreciate (and within the class of assets that depreciate, to favour longer lived assets), and to invest more in assets that do not depreciate, such as land or intangible assets such as brands. Thus inflation serves to distort firm asset allocation in the economy, separately from its effect on saving.

(ii) The financial structure of the economy.

When the inflation rate is positive, firms have an incentive to change their financial structure, issuing new debt rather than new equity because firms can deduct the inflation component of interest payments (a capital transfer) from their profits and pay less tax. This means inflation is likely to induce firms to be more highly geared than they otherwise would be. It may also mean that firms in sectors that naturally prefer debt finance rather than equity finance will be favoured when there is inflation.

Note that because inflation produces incentives for local households to reduce their lending, firms wishing to borrow rather than raise equity are likely to source loans from foreign lenders. This raises the risk of internationally sourced liquidity crises affecting New Zealanders, if foreign shocks induce foreign lenders to withdraw their loans at maturity rather than roll their debt over.

(iii) The incentives to save.

When the inflation rate is positive, the real return to lending is excessively taxed. This has several possible effects.

- (a) People substitute away from interest earning assets to other forms of assets eg company equities, investments in their own businesses, investments in land, investments in residential property. Thus the portfolio of assets held by New Zealand residents is changed.
- (b) People purchase more durable goods, particularly their own residential housing, rather than lend to others. In aggregate, this is likely to lead to New Zealand households having bigger houses than they otherwise would have had, and fewer other assets. (A household choosing whether to lend

money and use the interest to purchase consumption goods will prefer to purchase additional housing, as the real interest income is excessively taxed.)

- (c) People who strongly favour interest earning assets over other types of assets, particularly less sophisticated investors and older investors, will face incentives to accumulate less savings, as the returns are lower.
- (d) People who simply reinvest funds as a rule of thumb (perhaps in a pension-fund or Kiwisaver account) and who invest in interest earning assets will accumulate less than they otherwise would, because they will have lower after tax returns and their capital will compound less quickly.

For these reasons, the interaction of inflation with the tax system seems likely to reduce the total quantity of saving, and to distort the composition of assets towards housing, property, and equity instruments. The effects may be quite large, for even 2 percent inflation can increase the tax rate on real interest earnings by fifty percent. The biggest effects are likely to be on less sophisticated investors who spurn formal equity markets. To the extent they still invest in interest earning assets – largely government debt, bank deposits, and deposits with finance companies – they are taxed excessively, earn less income, and compound their financial assets less quickly. Otherwise, they face incentives to save less, to spend more on durable assets, particularly their own house, or to accumulate other forms of assets, probably property.²

3. The tax system, inflation, and asset prices.

One of the main difficulties in ascertaining the overall effects of the interaction of inflation with the tax system is understanding how it affects asset prices. It is clear that taxing the inflation component of interest income means that, for any level of real interest rates, real interest income is more heavily taxed when inflation is positive than when it is zero. What is less clear is how the interaction of inflation with the tax system affects real interest rates, and, indeed, other asset prices in the economy.

For reasons outlined above, the interaction of inflation with the tax system reduces the incentive to lend, and increases the incentive to borrow. In a closed economy, these two forces would be expected to generate an increase in real interest rates, until a new level was reached at which the amount of borrowing and lending amongst domestic residents was equal. In these circumstances, it is quite plausible that pre-tax real interest rates would increase as the inflation rate increased, so that after-tax real interest rates were constant. For example, if the top marginal tax rate was one third, nominal interest rates might rise by 1.5 percentage points for every 1 percentage point increase in the inflation rate, to keep the after tax real interest rate constant. Gordon

² Adam Smith nicely sums up the incentive to invest in property: “Upon equal, or nearly equal profits, most men will choose to employ their capitals rather in the improvement and cultivation of land than either in manufactures or in foreign trade. The man who employs his capital in land has it more under his view and command, and his fortune is much less liable to accidents than that of the trader, who is obliged frequently to commit it, not only to the winds and the waves, but to the more uncertain elements of human folly and injustice, by giving great credits in distant countries to men with whose character and situation he can seldom be thoroughly acquainted. The capital of the landlord, on the contrary, which is fixed in the improvement of his land, seems to be as well secured as the nature of human affairs can admit of.” *The Wealth of Nations* Book III I.3

(2004) argues that if this were the case, inflation would even be good for lenders, because most lenders are older people or people on lower incomes who are on low marginal tax rates. Consequently, their after tax real interest rate would actually increase as the inflation rate increased.

There is not much reason to believe that this is the case. First, the New Zealand economy is not closed, so there is no reason for the quantity of loans by domestic residents to equal the amount of domestic borrowing. Secondly, there is little international evidence suggesting that changes in the inflation rate induce more than one-for-one increases in nominal interest rates.

Even if the interaction of inflation with the tax system does not lead to an increase in real interest rates, it is unclear how and why it affects the prices of other assets. It is plausible that the decline in real after-tax interest rates leads to a change in the returns to other assets. In particular, in response to low real interest rates, and given the opportunity to borrow at tax-subsidised rates, the returns to other asset classes may decline. This can happen for a combination of reasons. First, the prices of other assets (eg shares or residential property) could be bid up, because of the cheap cost of borrowing. Secondly, more assets could be built, reducing their returns because of reducing scarcity value.

Coleman (2008) examines the effect of the interaction of inflation and the tax system in a model of the New Zealand housing market. He showed that if the supply of housing is inelastic, a rise in inflation leads to (i) a decline in real after tax interest rates; (ii) a rise in house prices but no change in the number of houses (iii) a decline in the ratio of rents to house prices, as house prices increase; (iv) a decline in the ongoing after-tax returns to residential housing, excluding the initial change in house prices; and (v) an increase in the fraction of housing that is rented and a decline in the fraction that is owner-occupied. Alternatively, if the supply of housing is elastic, a rise in inflation leads to (i) a decline in real after tax interest rates; (ii) no change in house prices but an increase in the number of houses, financed by offshore borrowing; (iii) a decline in the ratio of rents to house prices, because rents decline; (iv) a decline in the ongoing after-tax returns to residential housing; and (v) an increase in the fraction of housing that is rented and a decline in the fraction that is owner-occupied. These conclusions are likely to be similar for investment in other asset with very long lifespans (so that depreciation is a relative minor problem).

While some aspects of these results are similar, there is one major difference. When the asset supply is inelastic, there is a one-off gain to the owner of assets, and subsequent returns are low. When the asset supply is elastic, inflation causes firms to borrow offshore and increase the quantity of assets, leading to a reduction in the return to assets without an increase in asset prices. (The increase in assets will lower if the effect of depreciation allowances is important for a particular class of assets.) In each case, however, inflation reduces ongoing after tax real returns to *domestic* investors in both interest earning and other assets, and reduces the fraction of their aggregate asset portfolios in interest-earning assets. This seems to provide domestic agents with a reduced incentive to save, as well as lowering the consumption opportunities of lenders. The macroeconomic implications are not as bad when the supply of assets is relatively elastic as when it is elastic, for the additional foreign

provided assets presumably raise output, but in both cases there are negative implications for *domestic* saving and asset accumulation.

Coleman also suggests that an increase in inflation causes a significant change in the distribution of ownership away from younger owner-occupiers towards landlords, as landlords but not owner-occupiers receive a tax subsidy that lowers the cost of borrowing when inflation is positive. This is potentially important for welfare, because even if firms find that inflation overall has little effect on their profitability (because the miscalculation of depreciation allowances is offset by the miscalculation of interest deductibility), inflation still causes distributional issues.

4. The Measurement of Inflation.

The average inflation rate in the decade to March 2010 as measured by the CPI was 2.67 percent. The average 90 day bank bill rate was 6.27 %. If the inflation rate was accurately measured by the CPI, the average real interest rate was 3.5 percent, and so effective taxes on real interest rates were nearly 80 percent higher than statutory rates³. It is not plausible that this rate of excessive taxation of interest income, or this rate of excessive subsidy to borrowers, is optimal.

A natural question concerns the extent to which the inflation rate is mismeasured. There is a long literature in economics that argues that the change in the consumer price index is an upwardly biased measure of the inflation rate, for a variety of reasons. The 1996 Boskin Commission suggested that the bias in the U.S. CPI was approximately 1.1 percent per annum, in part because of substitution bias (agents substitute to cheaper goods when relative prices change), outlet bias (the index did not properly reflect how agents substitute to cheaper outlets), quality bias (the CPI did not adequately adjust for quality improvements in goods) and new product bias (the index did not adequately capture the decline in prices of newly invented or introduced goods.) As a result of this report, and of changes already proposed, the methodology of the US CPI was changed in a manner to reduce the effect of CPI bias. Robert Gordon, one of the members of the commission, subsequently suggested that these changes reduced the size of the bias to 0.6 percent.

It is unclear how large the CPI bias is in New Zealand. Ha and Xie (2004) examined the extent to which the NZ CPI was calculated using international best practice methodology, and concluded that it was largely calculated using appropriate techniques. They estimated that substitution and outlet bias was approximately 0.2 percent a year, and that other forms of bias were minimized by having frequent reweightings. Based on this evidence, there seems little reason to suspect that the bias is much in excess of the estimate of US bias, 0.6 percent per year.

There is an alternative literature that has estimated CPI bias by examining Engel's curves, that is graphs showing the fraction of income spent on food. The methodology, developed by Hamilton (2000), argues that if Engels's curves are constant through time, the CPI bias can be estimated by ascertaining the difference in food expenditure patterns by people ostensibly earning the same real amount at

³ $6.27/3.5 = 1.79$

different times.⁴ Gibson and Scobie (?) used this technique on New Zealand data to suggest the CPI bias could be as high as 1.4 percent per annum. This estimate seems high, however, particularly as it rests on the assumption that Engel's curve are constant during a period during which there was a dramatic increase in the number of new goods available that may have led to an across the board decline in expenditure on food at all income levels.

If the CPI bias were 0.6% per year, the average inflation rate would have been 2.1% not 2.7%, and the average real interest rate would have been 4.1% not 3.5%. In this case the excessive taxation of real interest income would have been 53%, not 80%. If the CPI bias were 1.4%, the average real interest rate would have been 4.9% not 3.5%, and the excessive taxation of real interest income would have been 28%. Consequently, even in this case – which must be an upper estimate - the interaction of inflation with the tax system has meant real interest were substantially over-taxed in the last decade.

5. Policy options

The appropriate policy response to the inflation-tax issue obviously depends on the objectives of the Government. Is the Government primarily concerned about the distortions to the size and the structure of the capital stock in New Zealand? Is it concerned that the tax system provides firms an incentive to choose a financial structure with too much debt? Is it concerned that New Zealand resident households save too little, and choose to invest too much in property assets? Is it concerned that the simplest savings products favoured by older or relatively unsophisticated investors – interest earning accounts – are excessively taxed when the inflation rate is positive?⁵ Or is it concerned that the interaction of inflation with the tax system is inadvertently causing a decline in home-ownership among younger households?

These distinctions are important. If the government is mainly concerned about saving, it could simply adopt policies that exempt the inflation component of interest earnings from tax, and that only allow real interest payments to be deducted. (It could also adopt other policies outlined below.) If the government was also concerned about the incentives facing firms to invest, it may also want to introduce changes to depreciation and inventory allowances.

The 1989 New Zealand Government report “The Consultative Document on the Taxation of Income from Capital” strongly suggests that adjusting depreciation and inventory allowances for the effects of inflation is relatively straightforward. As such, if the Government decides to adjust interest earnings and payments for the effects of inflation, there is little reason not also make adjustments to depreciation and inventory

⁴ Suppose in 1990 a household earning \$20000 spent 30% on food, while a household earning \$22000 spent 28 percent. Further suppose a person in 2000 earning \$20000 in 1990 CPI adjusted dollars spent 28% of the budget on food. Then this technique would conclude that in 2000 the person was really earning \$22000, and the CPI had been overstated by a cumulative amount of 10 percent over ten years. The technique is more sophisticated than this example suggests, taking into account relative price changes and changing household size, and other such factors that affect food demand.

⁵ There is a significant literary tradition in western culture that it is morally offensive to take actions that disadvantage the elderly or helpless. For example, Exodus chapter 22 has the admonition “*Do not take advantage of a widow or an orphan. If you do and they cry out to me, I will certainly hear their cry. My anger will be aroused, and I will kill you with the sword.*”

allowances. Failure to do so would mean that firms are over-taxed; if the compensatory offsetting-adjustments they get from being able to deduct the inflation component of interest payments from income were removed, but depreciation allowances were not adjusted, investment in New Zealand would be deterred.

If there are no real difficulties in indexing depreciation and inventory allowances for inflation, the most sensible policy option to explore is that proposed in the 1989 Consultative document, which primarily comprises the adjustment of interest payments and receipts for inflation, and the indexation of the depreciation and inventory allowances. There are various technical issues to be solved, particularly in the treatment of hybrid debt-equity instruments, but most detailed treatises on the subject suggest these can be overcome (US Treasury, 1984; New Zealand Government 1989; Shuldiner 1992). Adopting this approach would simultaneously solve most of the distortions arising from the interaction of inflation with the taxation of capital income.

It is noteworthy that most countries do not adjust their tax systems for inflation – although there are some exceptions, such as Mexico and Venezuela (and formerly Chile, Argentina, and Iceland) where inflation adjustments are made to interest income and payments, and to depreciation allowances. One possible reason is that international accounting standards generally do not make adjustments for inflation (and thus do not conform to the national accounting standards recommended by the United Nations and the OECD), so a country adopting an inflation adjustment regime will not be in accordance with the major international accounting standards. A second reason is that many countries have tax systems which either tax nominal capital income at lower rates than other income, or which enable investors to take actions to avoid paying taxes on the inflation component of interest income.

Many OECD countries, including most European member states and the United States offer their citizens EET (Exempt-Exempt-Taxed) retirement income schemes. Under these schemes, households can put aside part of their incomes into approved retirement schemes, and (a) this component of their income is exempt from tax (E); (b) all accumulations, either dividends, interest or capital gains, are exempt from tax (E); and (c) the whole amount, both principal and accumulated earnings are taxed when the funds are paid out (T). These schemes mean that there are no tax incentives distorting the allocation of assets within the funds, although, as they are taxed less than investments held privately, they provide an incentive to invest funds in an approved scheme. Moreover, the effective tax rate imposed on these schemes is not affected by the inflation rate. Consequently, most people in the OECD have the ability to accumulate funds in ways that are *not* affected by the inflation rate. For this reason, the need to adjust the tax system for the distortionary effects of inflation are less in these countries than in New Zealand.

(It should be further noted that an EET tax system has the same properties as a TEE system: where income is taxed, then any earnings from an investment made with saved funds are exempt and the final sum is exempt from tax. In New Zealand there is one major class of TEE investments: a household's own home. Thus in New Zealand the tax system is structured so that the most tax advantaged class of assets is residential property, while in most other OECD countries households can use EET pension schemes to structure their investments in all asset classes in this manner.

Given these differences between New Zealand and most other countries in the OECD, it is possibly not surprising that New Zealand residents have a much greater fraction of their investments in residential property than residents of other countries.)

The widespread use of EET tax systems in other countries suggests an alternative solution to the problem of inflation and capital income taxation. If the Government is primarily interested in the distortions on savers caused by inflation, it could introduce an EET pension scheme. This would provide households with a means of investing in interest earning assets, in foreign assets, in commercial property, and in domestic equities which is not only unaffected by the inflation rate, but which is similarly taxed to their own home. While this scheme would not solve the issue of inflation and depreciation or inventory allowances, it would provide households with a tax neutral way of investing that is unaffected by inflation, if they choose to make these investments in an approved pension fund rather than hold them privately. It is quite likely that most households that are currently working and saving for retirement would find such schemes provide adequate means to prevent them from suffering from the distortionary effects of inflation on the tax system.

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