

# Macroeconomic Effects of a Switch to Indirect Taxes: Some Evidence from the UK and the EC

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## Abstract

*This paper considers the evidence from simulations with major econometric models of the UK and EC relating to the effects on the main macroeconomic variables of a switch towards indirect taxation. The conclusion from this evidence is that a switch from income tax towards indirect taxation tends to increase the price level, the rate of inflation, the current account deficit, and the public sector borrowing requirement, and to reduce the country's net wealth, at any given level of real GDP. One especially important conclusion is that the increase in inflation is significantly due to the cut in income tax, and not only to the effects of the rise in indirect taxation; and that the effects on inflation of the cut in income tax tend to last longer than those of the rise in indirect taxation. If the government of the country making the switch in taxation tries to hold down the consequently higher inflation and the rise in the current account deficit by reducing economic growth, the adverse economic effects will be correspondingly greater - and this appears to be what happened in both Britain and New Zealand, the two OECD countries that have made a marked shift in tax structure in this direction over the past decade.*

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## 1. Introduction

The proposal to introduce a goods and services tax (in effect, a value-added tax) in Australia has been coupled with a proposal to reduce income taxation: that is, to make a partial substitution of indirect tax revenue for income tax, and to a smaller extent for payroll tax. It is therefore of interest to see what can be learned from simulations of these tax changes in available macroeconomic models for other countries, especially with a view to assessing the direction of the net impact on the main macroeconomic objectives of such a switch of the tax mix.

The most extensive set of such simulations appears to be those undertaken by the Macroeconomic Modelling Bureau at the University of Warwick using the main macroeconomic models of the UK. These have been carried out annually for some years with each year's revisions of the models in question, the most recent years being in articles in the August issue of the *NIESR Review* (1991 being the latest available at the time of writing).

Those simulations in fact relate to six models, but the simulations with one of them, Liverpool (LPL), are not on all fours with those conducted using the other models (mainly because interest rates are held constant by way of monetary policy in the simulations with the other models, whereas this apparently cannot be done using the Liverpool model).<sup>1</sup>

Attention is therefore here confined to the other five models; but of these the model of Oxford Economic Forecasting (OEF) (which has been more recently added to the other four) has a tendency to explode when interest rates are held fixed by monetary policy, and the assumption made about monetary policy in the simulations with this model is again not fully comparable to that for the other models. (See Church *et al* 1991, p. 61.)

In view of the politely dismissive remarks about the OEF model in the introduction to the article containing the most recent set of simulations undertaken by the Warwick group, I shall therefore give principal attention to the results from the four main models - London Business School (LBS), National Institute of Economic and Social Research (NI), Bank of England (BE) and Her Majesty's Treasury (HMT). But, to show that the omission of OEF is not done in order to give a more convincing result, I have also included in the tables the results using that model, and included a mean result not only for the principal four models but also for the five (including OEF).

The Warwick group have frequently said that their results may be used as a ready-reckoner to assess the effects of various packages of policies; and that the results are sufficiently close to being proportional (linear) for it to be defensible to use them for changes in policy instruments different in size (presumably within reasonable limits) to those actually used in the

simulations. The results for Britain are of special interest for our present purpose as Britain is a country that has had during the period from which the data-base used has been derived the sort of shift of tax structure we are considering. But I shall also draw upon simulations that were conducted by the secretariat of the European Community a few years ago, of the effects of changes in several different fiscal instruments, which included a cut in income tax and a rise in indirect tax.

## 2. Evidence from Simulations with UK Models

A shift of the mix of taxation from income tax to indirect tax that holds real GDP constant is likely (on the evidence in Table 1) to increase the price level over the average of years 1,3 and 5. (The results for years 2 and 4 in these most recent simulations have not been published; but, to judge from earlier simulations made by the Warwick group, the inclusion of those intermediate years would not make any appreciable difference to the conclusions.) Taking the average of the five models, the upward pressure on the price level resulting from the cut in income tax is about as great as that due to the rise in VAT; for the average of the four models excluding OEF, however, the effect on prices of the rise in VAT is more than twice as great as that of the cut in income tax. But the evidence from the different models on this point varies greatly in particular respects: sometimes the cut in income tax is the more powerful upward influence on prices and sometimes the rise in VAT. In one model, income tax cuts *reduce* prices, and in another an increase in VAT *reduces* them. But in every one of these models there is a net upward effect on prices at a given level of real output as a result of the change of tax mix. One would thus on this evidence expect to see a substantial rise in prices over the period in question; and one certainly cannot assess the likely effect by looking only at the impact of the VAT increase, as the upward effect of the income tax cut on prices is also significant in most of the models.

A cut in income tax clearly (on all this evidence except that from the Bank of England model) raises prices in the process of stimulating activity through its demand effects, by more than any cost-reducing effects it may have through restraining wage demands. But cuts in either of the two other forms of tax (employers' national insurance contributions and indirect taxes) have, on the balance of this evidence, more than enough downward effect on costs and wage demands to offset whatever upward effect they have on prices through stimulating aggregate demand.

If people are compensated by cuts in income tax only for the upward

**Table 1.** Simulated effects of various tax changes on prices and inflation, UK (Per cent change compared with base, average of years 1, 3 and 5 after the change in policy unless otherwise stated)

Model	LBS	NIESR	HMT	BE	Average of 4 models	OEF	Average of 5 models
<b>Effect on prices for</b>							
Rise in VAT to reduce real GDP by 1%	1.43	-0.30	2.06	1.62	1.20	0.62	1.08
Income tax cut to raise real GDP by 1% in year 3	0.19	2.44	1.13	-0.98	0.55	2.19	0.99
Net effect with constant real GDP	1.62	2.14	3.19	0.64	1.75	2.81	2.08
<b>Effect on average rate of inflation</b>							
Rise in VAT to reduce real GDP by 1%	0.24	0.00	0.40	0.37	0.25	0.00	0.20
Income tax cut to raise real GDP by 1% in year 3	0.36	0.47	0.62	-0.18	0.32	1.04	0.46
Net effect with constant real GDP	0.60	0.47	1.02	0.19	0.57	1.04	0.66
<b>Effect on rate of inflation in Year 3</b>							
Rise in VAT to reduce real GDP by 1% in Year 3	0.00	-0.51	0.21	0.00	-0.07	0.16	-0.03
Income tax cut to raise real GDP by 1% in Year 3	0.00	0.62	0.00	-0.50	0.03	0.83	0.19
Net effect with constant real GDP in Year 3	0.00	0.11	0.21	-0.50	-0.04	0.99	0.16
<b>Effect on rate of inflation in Year 5</b>							
Rise in VAT to reduce real GDP by 1% in Year 5	-0.83	-0.00	-0.30	0.00	-0.31	-0.62	-0.35
Income tax cut to raise real GDP by 1% in Year 5	0.61	-0.31	0.96	0.00	0.32	1.18	0.49
Net effect in Year 5 with constant real GDP in Year 5	-0.22	-0.31	0.66	0.00	0.03	0.56	0.14

Key to models: LBS = London Business School; NIESR = National Institute of Economic and Social Research; HMT = Her Majesty's Treasury; BE = Bank of England; OEF = Oxford Economic Forecasting.

Source: Derived from Church *et al.*, 1991.

price effect of the increase in indirect taxation, they will therefore still suffer a considerable fall in their real disposable income because of the upward effect on prices of the income tax cut - and the more they are compensated by further income tax cuts, the greater will therefore be the price rise and consequent fall in their real disposable income (so far as it depends on the price rises) if they are compensated only for the direct effect on prices of the rise in indirect taxation.

Table 1 also shows that much the same is true of the effect on the average rate of inflation over the five years following the change, except that for this measure the upward effect on the rate of *inflation* of the income tax cut is actually *greater* (except in the Bank of England model, in which it tends to reduce the rate of inflation) than that of the rise in indirect taxes. In year 3, the net effect on the observed rate of inflation is slightly downwards on the average of the four models (wholly as a result of the reduction shown in the Bank of England model), though not for the average of the five; but by Year 5 the net effect is upward for the average of the four models, as well as for the average of the five, even though the upward pressure on the rate of inflation resulting from the VAT increase (taken alone) will by then have worn off. In other words, the upward effect on inflation of the income tax cuts continues to increase in Years 4 and 5 (and by enough to leave a continued net upward effect on the rate of inflation taking the effects of the two tax changes together), on the average of four of the five models, and in three of them individually. (In the Bank of England model the net effect is zero.)

For a country with an average electoral cycle nearer to two years than three, the effect over the first two years may well be considered the most important politically. Over those first two years the likelihood of a net upward effect on prices and on the rate of inflation is presumably greater than it is for the average of Years 1 and 3, because there is a greater rise in prices or inflation in Year 1 than in Year 3.

The net effect on average earnings over the average of the three years is also upwards, as Table 2 shows, and there is an upward effect on average earnings for each of the two tax changes taken separately in two of these four (and in three of the five) models. (This conclusion - like those for the effects on prices and inflation - is also valid in general terms for the effects of a change in tax mix that holds employment, rather than real output, constant.)

As Table 3 shows, the same shift of tax mix appears likely on the average of these figures to have the effect of increasing the real current account deficit at a given level of real GDP. It increases the current account deficit in three of the models and reduces it in two of them. At the very least,

**Table 2.** Simulated effect of tax changes on average earnings, UK (per cent change compared with base, average of years 1, 3 and 5)

Model	LBS	NIESR	HMT	BE	Average (4 models)	OEF	Average (5 models)
Effect on average earnings to reduce real GDP by 1%	0.48	-1.72	0.87	1.00	0.16	0.56	0.24
Cut in income tax to raise real GDP by 1%	0.36	1.74	0.82	-2.59	0.08	2.15	0.50
Net effect with constant real GDP	0.84	0.02	1.69	-1.59	0.24	2.71	0.74

Source and notes as for Table 1

**Table 3.** Simulated effects on current account and private investment, UK (billion pounds sterling, 1990 prices, deflated by GDP price index, average of years 1, 3 and 5).

Model	LBS	NIESR	HMT	BE	Average (4 models)	OEF	Average (5 models)
Effect on real current account for 1% change in real GDP:							
rise in VAT	1.95	3.28	2.33	3.00	2.64	2.34	2.58
income tax cut	-2.42	-3.29	-2.94	-2.66	-2.83	-1.80	-2.62
Net effect with constant real GDP	-0.47	0.01	-0.61	0.34	-0.19	0.54	-0.04
Effect on private fixed investment for 1% change in real GDP:							
rise in VAT	-2.38	-2.16	-1.94	-1.69	-2.04	-1.47	-1.93
income tax cut	0.95	2.23	1.83	1.40	1.60	2.89	1.86
Net effect with constant real GDP	-1.43	0.07	-0.11	-0.29	-0.44	1.42	-0.07
Effect on net wealth for 1% change in real GDP:							
rise in VAT	-0.43	-1.06	0.30	1.31	0.60	0.77	0.65
income tax cut	-0.47	-0.40	-1.11	-1.26	-1.23	1.09	-0.76
Net effect with constant real GDP	-0.90	-0.46	-0.72	0.05	-0.63	0.32	-0.11

Key to models and source: as for Table 1. Figures for effect on fixed capital investment supplied by Macroeconomic Modelling Bureau, University of Warwick.

therefore, one could not, on these figures, argue that a shift of taxes in the direction in question (towards indirect taxes and away from income taxes) would tend to reduce the current account deficit at any given level of real output. On this evidence, therefore, a price-reducing stimulus that would improve the current account would be possible if there were a shift *away* from indirect taxation and *towards* income taxation.

It also seems likely, on this evidence, that a switch of mix towards indirect tax will have a net downward effect on private investment at a given level of real GDP. This occurs in three of the four main models (but not in OEF). Adding together the effect on the current account and that on private investment (to obtain an estimate of the effect on the country's net wealth), there is a clear downward effect in three of the four main models (but, again, not in OEF); and that effect is downwards on the average of either the four or the five models.

It has been suggested that part of the revenue from the introduction of a new indirect tax in Australia might be used to make possible a cut in payroll taxes - or, rather, to compensate the States for doing so. It is therefore worth while to examine the relative effects on the main macroeconomic objectives of a rise in indirect tax, coupled with a reduction in taxation on labour inputs. Taking the average of the four main models together, as Table 4 shows, a cut in employers' national insurance contributions (a tax on labour inputs)

**Table 4.** Simulated effects of changes in employers' national insurance contributions, UK (average of four main models, average of years 1, 3 and 5)

Effect on:	Prices %	Rate of inflation %	PSBR % of GDP	Current account (billion pounds at 1990 prices)	Net wealth
Cut in n.i.c.s to raise real GDP by 1%	-0.26	-0.10	4.08	-2.31	-1.80
Rise in VAT to reduce real GDP by 1%	1.20	0.25	-3.17	2.64	0.60
Cut in n.i.c.s plus rise in VAT (to leave real GDP constant on balance)	0.94	0.15	0.81	0.33	-1.20

Source: as for Table 1

coupled with a rise in indirect taxation on a relative scale that holds real GDP constant would tend to increase the price level and the rate of inflation over the period, though that upward effect would be only about half as great as it would be if the indirect tax increase were offset by cuts in income taxation.

The effect on the current account of a switch from payroll tax towards indirect tax would be positive, but the effect on net wealth would be negative (the downward effect on private investment exceeding the positive effect on the current account), and the PSBR would be increased. If the government of the day were concerned about its net borrowing requirement or the country's net wealth, therefore, it might consequently be tempted to hold down economic growth in order to minimize those effects - even though the effect of the switch from taxes on labour inputs towards indirect taxes on the current account balance, taken alone, would be positive.

In short, although the adverse effects of a switch from payroll taxes towards indirect taxes upon the sort of macroeconomic objectives with which the government might be concerned would not be as great as those of a switch from income tax towards indirect taxation, they would (apart from the effect on the current account) be likely to cause some problems for macroeconomic policy. The implication is, however, that cuts in either indirect taxation or in taxation on labour inputs could be expected to have more favourable effects on the total macroeconomic outcome (that is, to reduce inflation and raise net wealth at a given level of real GDP) than are cuts in income tax; and that there are therefore, on this evidence, macroeconomic benefits to be won from *reducing* both indirect taxation and taxes on labour inputs, even if income taxation is simultaneously *raised* in order to avoid unwanted effects by way of increases in the PSBR or in the current account deficit, or through reductions in net wealth.

### 3. Evidence from Simulations with the European Community Model

The evidence from the EC simulations, summarized in Table 5, is consistent with the broad conclusions to be drawn from the simulations with models of the UK. (In the EC simulations, monetary policy is held constant in the sense that tax changes are assumed not to change the quantity of money - a tax cut being financed by bond sales, and a tax increase being used to redeem government debt; whereas in the simulations for the UK interest rates are held constant.) In the EC simulations (as well as on the average of those for the UK) the net effect of the results from a cut in income tax and a rise



in indirect tax - in effect, a switch from income tax towards indirect taxation - tends to increase both the average level of prices over the five years following the change and also the average rate of inflation over the period; and this is true also for the EC in the fifth year following the change.

**Table 5.** Simulated effects of certain tax changes, European Community (Change compared with base, average of five years after the change, with effect in Year 5 in parentheses).

	Price level	Rate of inflation*	Current account balance	Private investment	Net wealth	Fiscal**
	%	%		% of base GDP		
Rise in indirect taxes for 1% fall in real GDP	1.45 (1.0)	0.22 (-0.18)	0.25 (0.18)	-0.23 (-1.36)	0.02 (-1.18)	+0.75 (+0.36)
Cut in household direct taxes for 1% rise in real GDP	1.07 (1.71)	0.24 (0.29)	-0.47 (-0.57)	0.21 (0.25)	-0.26 (-0.32)	-1.23 (-0.86)
Net effect (with constant GDP)	2.52 (2.71)	0.46 (0.11)	-0.22 (-0.39)	-0.02 (-1.11)	-0.24 (-1.50)	-0.48 (-0.50)

\* Consumption deflator. \*\* Positive sign signifies a movement towards budget surplus.

# Net wealth = change in private investment less any movement in the current account towards (increased) deficit or plus any movement of the current account towards (increased) surplus. In the original data the changes in private investment are expressed as a percentage of baseline investment: they have here been converted to a percentage of GDP using the ratio of Gross Fixed Capital Formation to GDP in 1986 derived from OEC *Historical Statistics*.

Note: these simulations are made on the assumption of a fixed quantity of money.

Source: A Dramais, 1986.

Moreover, on this evidence also, the upward effect on prices and inflation of the cut in income tax is significant, as well as that of the rise in indirect taxation; and by Year 5 the effect on the rate of inflation of the income tax cut is still upwards, even though the upward effect on inflation of the cut in indirect tax has by then worn off. Again, the switch towards indirect taxation results in a clear increase in the current account deficit at a given level of real GDP, both over the average of the five years and also

during the fifth year after the change. This evidence also suggests, therefore, that a switch *away from* indirect taxation and *towards* income tax would reduce inflation, the current account deficit, and the budget deficit, at any given level of (and thus for any given degree of real stimulus to) real GDP, and would also increase net wealth.

#### 4. Policy Implications

The adverse macroeconomic implications of a substitution of indirect taxes for part of the revenue from income taxation that could be expected to result (on the basis of the various simulations discussed above) would not be so bad if one could be sure that the government making the change of taxation would not suffer from a current account balance fetish. But if it does so, the risk of adverse macroeconomic consequences would be still greater, for it would then be likely to try to offset the adverse effects (as it would see them) of the consequent rise in the current account deficit, by tolerating higher unemployment and a lower rate of economic growth than it would otherwise have felt to be possible. The rise in the budget deficit might also lead it to reduce government outlays (for a given level of tax revenue), and that might be expected also to reduce employment. Furthermore, there is the risk that the upward pressure on prices for some years after the change of tax structure, as well as on the rate of inflation, would lead such a government to accept higher unemployment than it would otherwise have done, in the misguided belief that this would be the only way to hold down inflation. In fact, however, this would be irrational: for there are better ways of reducing inflation than tolerating higher unemployment - one of the principal such remedies being to reduce indirect taxes (and payroll taxes) even if income taxation is simultaneously increased. But this would involve refraining from the shift towards indirect taxation that we have been considering. If, instead, it shifted the tax structure in the direction of higher indirect taxes and lower income taxes, and was committed to adhering to that mix, the temptation for it to resort to tolerating higher unemployment in the hope of offsetting the consequent upward effects on inflation would be considerable.

The danger that the government might react to the consequently higher inflation by tolerating higher unemployment is increased by the fact that it would not know how much of the upward pressure on prices was due to the change of tax mix, especially if it were so misguided as to take account of only the expected upward effect on prices and inflation of the rise in indirect taxes; whereas, as we have seen, the effects of the income tax cuts on

inflation could, on the evidence discussed above, also be expected to be significant, and probably longer lasting. This attitude would make it especially unlikely that such a government would tolerate the higher rate of inflation resulting from the switch of tax mix, and correspondingly more likely that it would tolerate a higher level of unemployment in the hope of thereby alleviating the inflation.

It is at the very least highly suggestive that in both Britain and New Zealand - the two OECD countries that have had a substantial switch of the tax mix towards indirect tax and away from income tax during the past decade or so - there was a period of low or even negative growth in real output following that switch of the tax mix, and that this retardation or reversal of growth was at least in part due to a determination on the part of the governments of those countries to hold down inflation. Obviously, other factors were at work as well as the deflationary policies directed at reducing inflation; and much of the inflation was due to factors other than the switch of tax mix. But the common experience of low growth in those two countries following the switch of tax mix should serve as an awful warning to be pondered by any other country contemplating a similar change of tax structure. If any government is nevertheless determined to make the sort of tax switch in question it should, therefore, take particular care not to combine it with deflationary policies.

If a change in the tax structure from income tax towards indirect taxation brought about a shift from unrecorded output (in the 'black' economy) into recorded transactions (which has often been suggested as an argument for making such a change of tax mix), this would have given an artificial stimulus to *recorded* real GDP. If this happened, it would mean that there would also have been a fall in *actual* (recorded plus unrecorded) GDP (for any given level of *recorded* GDP) after the change of tax mix, so that the real net macroeconomic outcome would be more unfavourable than the foregoing results suggest: that is, there would be a higher rate of inflation, or more deterioration in the current account balance and in the budget balance, for any given level or rate of increase in real GDP, than that suggested by the results of the simulations given in the above tables (based as they are on recorded GDP). Any advocate of a change in taxation towards indirect taxation in the hope that this would reduce the size of the 'black' economy would thus do well to bear in mind that if there were any such effect the actual adverse macroeconomic effects would be greater than those suggested by the results in the tables.<sup>2</sup>

Finally, even if the macroeconomic consequences of the switch in question appear (on the available evidence) to be seriously adverse, one might, of course, still decide to make the change for other reasons. But, if one did so, one would need to be very confident that any welfare benefits

resulting from the change would exceed the macroeconomic costs; and one would need also to be determined to avoid as much as possible of the adverse macroeconomic consequences by taking particular care to adopt policies that maximized real output and employment during the aftermath of the switch; and to ensure that policy-makers were cured of any budget balance fetishes or current account balance fetishes before making the switch. If one is not confident that those fetishes have been banished, the dangers of making such a switch would be correspondingly greater.

## Notes

1. In their words, 'The monetary policy stance that accompanies fiscal policy in these simulations is assumed for comparative purposes to be that of constant nominal interest rates, approximating to money financing of any tax cut. This assumption is not applied to the LPL model, however, where permanent changes in the PSBR can lead to explosive growth of the money stock and hence accelerating inflation, and instead we adopt the default LPL assumption that changes in the PSBR are offset by changes in lump sum taxation. Since these results are not comparable with the other models, we do not discuss them in detail.' (Church *et al*, 1991, p.63.)
2. I am indebted to Neville Norman for this point.

## References

- Church, K.B., *et al* (1991), 'Comparative Properties of Models of the UK Economy', NIESR Review, August.
- Dramais, A. (1986), 'COMPACT - A Prototype Macroeconomic Model of the European Community in the World Economy', *European Economy*, March.