

The Economics of a Temporary VAT Cut*

THOMAS F. CROSSLEY,[†] HAMISH LOW[‡] and MATTHEW WAKEFIELD[§]

[†]*University of Cambridge; Institute for Fiscal Studies
(thomas.crossley@econ.cam.ac.uk)*

[‡]*University of Cambridge; Institute for Fiscal Studies
(hamish.low@econ.cam.ac.uk)*

[§]*Institute for Fiscal Studies; University College London; University of Bologna
(matt_w@ifs.org.uk)*

Abstract

This paper analyses the likely implications of the temporary cut in VAT in the UK to 15 per cent, with a return to 17.5 per cent in place for the end of 2009. We distinguish between the income effect of the cut and the (intertemporal) substitution effect. The former is likely to be small because the change in lifetime income is minimal. The second effect is likely to be much more important because the reduction in the price of goods bought in 2009 compared with 2010 gives an incentive to increase consumer spending this year. With an elasticity of intertemporal substitution of about 1, we would expect the cut in VAT to boost consumer spending by about 1.2 per cent over what it would otherwise be. The distributional consequences of the VAT cut are regressive because goods subject to VAT tend to be luxuries. Unlike a cut in interest rates, there is no difference in the distributional consequences for borrowers compared with savers.

*Submitted December 2008.

The authors are grateful for helpful comments from and discussion with colleagues at the Institute for Fiscal Studies, particularly Stuart Adam, Richard Blundell, Carl Emmerson, David Phillips and Ian Preston, as well as Sami Berlinski, Martin Weale and an anonymous referee. All errors are the authors' own. They are grateful to the ESRC-funded Centre for Microeconomic Analysis of Public Policy at the Institute for Fiscal Studies (grant number RES-544-28-5001) for funding this work. Thanks go to Tesco for allowing the use of the web image reproduced in Figure 4.

Keywords: VAT, consumption, fiscal stimulus, intertemporal substitution.

JEL classification numbers: E62, H31, E21, D91.

© 2009 The Authors

Journal compilation © Institute for Fiscal Studies, 2009. Published by Blackwell Publishing Ltd, 9600 Garsington Road, Oxford, OX4 2DQ, UK and 350 Main Street, Malden, MA 02148, USA

I. Introduction

The UK government has recently announced a temporary VAT cut – from 17.5 per cent to 15 per cent for 13 months – as an economic stimulus. Similar measures are under discussion in other countries. When formulating its forecasts for the UK macro-economy, the Treasury made the following assumptions:

With respect to stimulating spending, the forecast assumes that approximately half of the increase in real purchasing power translates into an increased volume of spending, with the remainder used by households to bolster their finances.

HM Treasury, 2008, paragraph 2.25

We interpret this as saying that for each 1 per cent reduction in prices that is caused by the policy change, consumption is assumed to increase by half a per cent; and the described mechanism through which this change operates is an *income effect* whereby the reduction in the price level increases the value of resources today and this extra value can be shared between consumption today and future consumption (saving).

In this paper, we argue that economic analysis strongly supports the view that the response of consumption to price changes due to the temporary VAT cut will be larger than a half a per cent increase for each 1 per cent fall in prices; indeed, we believe that the response might be approximately one-for-one. A crucial part of our argument is that the response of individuals who do not face binding credit constraints is driven primarily not by an income effect, but rather by a *substitution effect* due to the impact of the policy on the relative prices of current and future consumption.

The next section discusses the size of the implied change in the intertemporal price of consumption. Section III compares a temporary cut in VAT and a cut in the interest rate. Section IV reviews the evidence on the size of intertemporal substitution effects, while Section V discusses credit constraints and income effects. Section VI covers a number of further issues, including the implications for VAT revenue and the distributional consequences of the cut. It also discusses the importance of the counterfactual in evaluating the effect of the VAT cut. Section VII concludes.

II. The implied change in relative prices

We begin by assuming *full pass-through* – that prices will fall by exactly the amount of the VAT cut. We return to this in Section VII. However, note that some goods (food and water, passenger transport, the construction of new dwellings, reading materials, children's clothing and prescription drugs being the most important in terms of expenditure) face a zero rate of VAT,

while home heating fuel and a few other items are charged at a reduced (5 per cent) rate. Thus a 2.5 percentage point cut in the main rate of VAT does not reduce the price of all consumption today by 2.5 percentage points.

About 55 per cent of (gross) expenditures are on products taxable at 17.5 per cent (Adam and Browne, 2006). This means that about 51 per cent of (net) consumption is taxed and that the average tax rate is about 8.9 per cent.¹ Assuming limited within-period substitution possibilities, full pass-through of the VAT cut then leads to a change in the average tax rate of about -1.275 percentage points. Note that this is a proportional change in the tax rate, t , of $-1.275/8.9 = -14.3$ per cent, but a much smaller proportional change in the relative price of consumption. This is because, as we shall elaborate in Section VI(1), the latter depends on the proportional change in $1+t$. Assuming full pass-through, the proportional change in the relative price of current consumption is $-1.275/108.9 = -1.2$ per cent.

III. A temporary VAT cut versus an interest rate cut

When thinking about whether the *temporary* VAT cut will stimulate consumption in the current period, it is important to recognise that this temporary change reduces the price of consumption in the current period *relative to* the price of consumption next period. A cut in the interest rate would have the same effect on relative prices.

These relative price changes can be illustrated with the intertemporal budget constraint of a consumer with a two-period planning horizon:

$$(1) \quad Y_1 + \frac{1}{1+r} Y_2 = W = (1+t_1)c_1 + \frac{1}{1+r} (1+t_2)c_2$$

where Y_1 and Y_2 are income in period 1 and 2 respectively, W is wealth (in present value), c_1 and c_2 are consumption in period 1 and 2 respectively, t is the tax rate, r is the interest rate and subscripts index periods. Because W reflects the discounted flow of future income, the value of W will be affected by changes in r but not by changes in t . The price of consumption in period 1 is $1+t_1$ and the price of consumption in period 2, from the perspective of period 1, is $(1+t_2)/(1+r)$. Thus the price of consumption in period 1 relative to that of consumption in period 2 is

¹Normalising total gross spending to be 1, net expenditure on the taxed portion of spending is given by $x_{net} = 0.55/(1+t)$, where 0.55 is the fraction of total gross spending that is spent on taxed goods and t is 17.5 per cent. The fraction of net spending that is taxed is therefore $x = x_{net}/(x_{net}+0.45) = 0.51$ and the average tax rate is $ATR = t \times x_{net}/(x_{net}+0.45) = 0.089$.

$$(2) \quad \frac{p_1}{p_2} = \frac{1+t_1}{(1+t_2)/(1+r)} = \frac{(1+t_1)(1+r)}{1+t_2}.$$

An interest rate cut lowers this relative price, and so does a VAT cut in period 1.

This change in relative prices induces a substitution effect: households will want to respond to the change in relative prices by substituting consumption out of the future and into the current period, since this has become cheaper.

Note that

$$(3) \quad \Delta \ln \left(\frac{p_1}{p_2} \right) = \Delta \ln(1+t_1) + \Delta \ln(1+r) - \Delta \ln(1+t_2),$$

so that equal proportional changes in $1+t_1$ and $1+r$ have the same proportional impact on the relative price of consumption. This in turn implies that we can calculate the cut in the (real) interest rate, Δr , that has the same effect on the relative price of current consumption as a temporary cut in VAT of $\Delta t = -1.275$ percentage points:

$$(4) \quad \Delta r = \frac{1+r}{1+t} \Delta t = \frac{1+r}{1.089} (-1.275).$$

A reasonable approximation is that $(1+r)/1.089 \approx 1$, implying that the recently enacted temporary cut in VAT changes the relative price of current consumption by as much as (or perhaps a bit more than) a full percentage point (100 basis point) cut in interest rates. Such a cut in interest rates would normally be considered a large cut in the intertemporal price.

A temporary VAT cut differs from an interest rate cut in several important ways. First, a temporary VAT cut flows to households via a different channel from an interest rate cut. An interest rate cut by the Bank of England lowers the cost of current consumption only if that cut is passed on by financial institutions to households. We would normally expect this to be the case, but in the current environment there is considerable evidence that lending is severely rationed and that lenders are not passing on Bank of England interest rate cuts in full to firms and households. Interest rate cuts by the Bank of England may be ineffective for this reason. For the VAT cut to have an impact, retailers must reduce their prices – the pass-through referred to in Section II – but in the prevailing environment, this may be a more effective way of lowering the cost of current consumption than lowering interest rates.

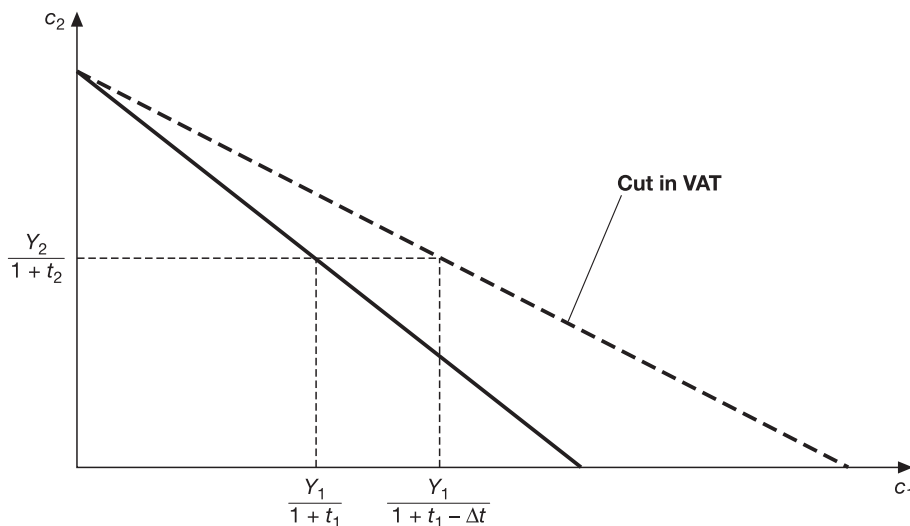
Second, a temporary VAT cut and an interest rate cut have different implications for the public accounts. We return to revenue implications in Section VI(1).

Third, a VAT cut is focused on household consumption. It will not have the same effect on investment by firms or on the exchange rate (and hence exports) that an interest rate cut might have.

Finally, a VAT cut and an interest rate cut may have different income effects. We will discuss the magnitude of the income effect of a temporary VAT cut in Section V, but the sign of the income effect of an unfunded VAT cut is unambiguously positive for all consumers: all consumers have increased purchasing power. Figure 1 shows how the budget constraint rotates outwards following a VAT cut. By contrast, the income effect of an interest rate cut is positive only for borrowers, while it is negative for savers. Figure 2 shows that the rotation of the budget constraint following an interest rate cut is through the endowment point, meaning that those who save have a negative income effect while those who borrow have a positive income effect.

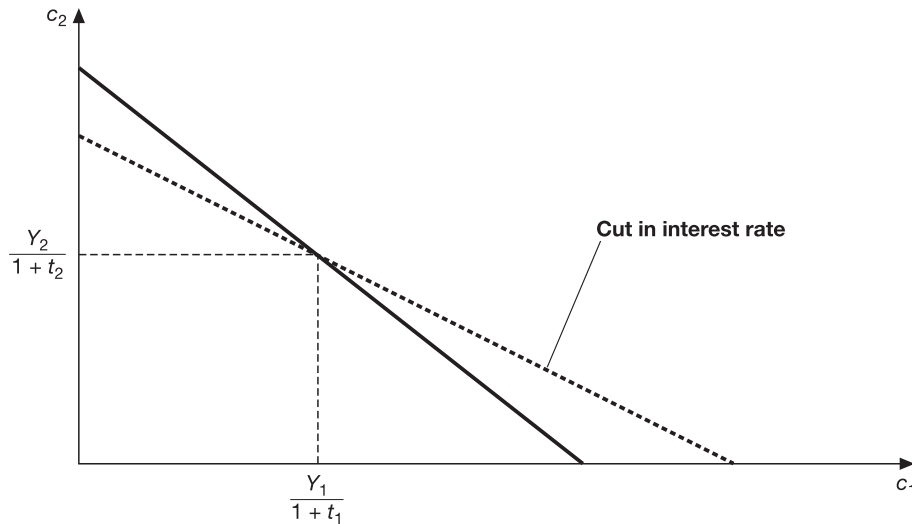
If the VAT cut were funded, the net income effect would depend on how the burden of the tax used to fund the cut was distributed. For example, if the cut were funded by a lump-sum tax,² then that tax would move the budget constraint in Figure 1 inwards. In this case, the net effect of the VAT cut on the budget constraint would look more like an interest rate cut.

FIGURE 1
The effect of cutting VAT



²Or any tax that did not distort the intertemporal price of consumption.

FIGURE 2
The effect of cutting the interest rate



IV. Intertemporal substitution effects

The relevant behavioural parameter is the elasticity of intertemporal substitution (EIS); see Box 1. Attanasio and Wakefield (2008) survey micro-data-based estimates of this parameter and suggest that a 'plausible range of values for the EIS is between 0.5 and 1' (page 38). The top of this range suggests a proportional consumption increase that is exactly equal to the proportional change in the price, so a 1.2 per cent cut in the price of current consumption increases the level of consumption by 1.2 per cent. The intermediate case of an EIS of 0.75 would equate to a 0.9 per cent increase in current consumption.

There are at least two reasons to think that, for the current application, the relevant EIS will be at the higher end of the range suggested by previous estimates. Both have to do with the fact that the VAT cut will fall on a different set of goods from the set of goods that economists have typically studied when estimating the EIS. Micro-data estimates of the EIS are based on total non-durable consumption – including VAT-free goods such as food, but excluding durables.

The first point to note is that the goods that do not face the full VAT rate are (mostly) necessities. As Browning and Crossley (2000) point out, 'luxuries are easier to postpone'. The basic intuition is that necessities tomorrow are often not a good substitute for necessities today. For example,

BOX 1

The approximate Euler equation

It is often assumed that utility is additive over time and that utility in any period is a power function of the level of consumption in a period, c_t :

$$u(c_t) = \frac{c_t^{1-(1/\theta)}}{1-(1/\theta)}.$$

This common variant of the life-cycle–permanent-income hypothesis (LC/PIH) has households maximise

$$E \left[\sum_{t=1}^T \beta^t u(c_t) \right] = E \left[\sum_{t=1}^T \beta^t \frac{c_t^{1-(1/\theta)}}{1-(1/\theta)} \right].$$

With this set-up, one can show the following approximate relationship:

$$\Delta \ln c_{t+1} = \alpha + \theta \ln(1 + r_{t+1}) + u_{t+1}.$$

Here, $\theta > 0$ is the elasticity of intertemporal substitution. It measures the effect of the rate of return, r_{t+1} , on the rate of consumption growth, $\Delta \ln c_{t+1}$. For a given θ , when r_{t+1} is larger, consumption growth is larger, meaning more saving today and more spending in the future. For a given increase in r_{t+1} (through, for example, reducing taxes on interest income), a larger θ means a larger increase in consumption growth, meaning more saving today and more spending in the future.

eating next month is not really a good substitute for eating this month; it is important to eat in both months. On the other hand, the purchase of luxuries can probably be brought forward, or pushed back, in time, to take advantage of interest rates or of changes in the VAT rate. For example, a trip to Hawaii next month (or even next year) is probably a pretty good substitute for a trip to Hawaii this month. Thus it is reasonable to think that a household might postpone a trip to Hawaii when interest rates are very high (borrowing is costly and saving advantageous – the cost of current consumption is high) or bring a trip forward when interest rates are low (it is cheap to borrow and saving offers little reward – the cost of current consumption is low). We would expect households to respond to a temporary VAT reduction in the same way.

A corollary of this point is that the rich, who consume many luxuries, will have a larger EIS than the poor, who consume mostly necessities. This idea is developed further in Crossley and Low (2009) and in Box 2. It has implications for the distributional aspects of a VAT cut, to which we return in Section VI(2).

The second issue is durables. We expect durables to have a high EIS for two reasons. First, many durables are also luxuries. Second, the durability of durables – or, more precisely, the fact that they are non-perishable – breaks the link between expenditure and consumption. To a certain extent, the

BOX 2

The approximate Euler equation with subsistence consumption

One way to think about the intuition for why the EIS is higher for the rich is to modify the model in Box 1 slightly and make the (not unreasonable) assumption that utility depends on the excess of consumption over a subsistence amount \underline{c} :

$$u(c_t) = \frac{(c_t - \underline{c})^{1-(1/\theta)}}{1-(1/\theta)}.$$

A subsistence level of consumption captures the idea that some components of consumption are very difficult to postpone or bring forward (the subsistence amount must be consumed in every period) as well as the suggestion that those components of consumption are more important for poorer households. With this modified model, one can show that the approximate relationship between rates of return and consumption growth becomes

$$\Delta \ln c_{t+1} = \alpha + \left(\frac{c_t - \underline{c}}{c_t} \right) \theta \ln(1 + r_{t+1}) + u_{t+1}.$$

The elasticity of intertemporal substitution is now $\left(\frac{c_t - \underline{c}}{c_t} \right) \theta$, which differs between

rich and poor and, in particular, is larger for the rich. In this set-up, the interest rate responses of rich or middle-income families are different from the interest rate responses of poor families, and, in particular, as c gets close to \underline{c} (i.e. for households close to the minimum subsistence level that they need to survive and function in society), households cease to substitute, irrespective of whether the change in the relative price of current consumption comes from an interest rate change or a temporary VAT cut.

timing of expenditures on non-perishable goods can be adjusted without altering the timing of the consumption. This in turn means that expenditure should be highly responsive to intertemporal price differences. This is the 'arbitrage' effect referred to by Barrell and Weale (this issue).

To summarise, the basket of goods affected by a temporary VAT reduction has a higher EIS than the basket of goods that is normally used to estimate the EIS. The latter suggests an EIS of perhaps 0.75; for the basket of goods affected by a temporary VAT cut, an elasticity of 1 does not seem unreasonable. Thus, as an assessment of the *substitution* effect of a 1.2 per cent fall in the current price of goods and services, an expenditure response of at least 1 per cent seems a reasonable lower bound, and 1.2 per cent is our preferred estimate.

Note that with an EIS of 1, the increase in (real) consumption exactly offsets the fall in the price of current consumption, so that there is no change in current spending. This in turn implies no change in current saving, and hence no change in the resources available for future consumption.

Finally, if the government had announced that the revenue lost due to the temporary VAT reduction would be recouped through a higher future VAT, this would have increased the magnitude of the substitution effects discussed in this section. This is because the change in the tax rate in the future increases the size of the relative price change between the present and the future: in terms of equation (2), an increase in the denominator reinforces the reduction in the numerator. However, while the government apparently did consider increasing VAT to 18.5 per cent in 2011, it ultimately chose instead to raise future revenues through different means (BBC News Online, 2008), as well as to cut spending.

V. Income effects and credit constraints

There are two reasons to think that the income effect of a temporary VAT reduction will be small. First, consumers have a longer planning horizon than two periods, and in this respect Figures 1 and 2 are misleading. A price cut for a good (current consumption) that is a small part of a consumer's basket (lifetime consumption) has a small income effect.

Second, if consumers anticipate that a temporary VAT cut will need to be paid for with higher taxes in the future, then the present value of their wealth is unchanged by the temporary VAT cut. This is the issue of Ricardian equivalence. If consumers understand that the government has an intertemporal budget constraint, then the temporary VAT cut has no income effect.

These two considerations suggest that for unconstrained households, the income effect must be small and the substitution effect is the key behavioural response to the policy. However, for those currently experiencing binding credit constraints, this analysis does not hold. This group would like to bring forward resources from the future in order to consume more in the current period. For this group, the substitution effect is unimportant and the temporary VAT cut has only an income effect. This income effect is easy to assess. As these consumers would like to consume more in the current period, they will increase consumption to offset completely the fall in prices, continuing to spend as much as they can. Thus a 1.2 per cent fall in the price of current consumption induces a 1.2 per cent increase in consumption.

In normal times, we would expect only a small fraction of UK consumers to be so credit-constrained. However, in the current economic environment, the number of credit-constrained consumers may be significantly greater. Conveniently, however, in this circumstance, the expected responses of constrained and unconstrained consumers are of similar magnitudes, making the incidence of credit constraints largely immaterial for the macroeconomic question at hand.

VI. Further issues

1. Revenue implications

Revenue from VAT, R , is $t \times c$, where c is consumption (measured in pre-tax pounds) and t is the average tax rate, so $\ln R = \ln c + \ln t$. From this, we can work out the proportional change in revenue for a given proportional change in the price of current consumption:

$$\begin{aligned} \ln R &= \ln c + \ln t; \\ \frac{\partial \ln R}{\partial \ln(1+t)} &= \frac{\partial \ln c}{\partial \ln(1+t)} + \frac{\partial \ln t}{\partial \ln(1+t)} \\ &= -EIS + \frac{t+1}{t} \\ &= -1 + \frac{1.089}{0.089} = 11.2. \end{aligned}$$

Multiplying this by the 1.2 per cent fall in the price of current consumption gives a short-run change in VAT revenue of -13.4 per cent. The proportional change in revenue is less than the proportional change in the average tax rate (which, as noted in Section II, is -14.3 per cent) because of the offsetting increase in current consumption. However, consumption is responding to the proportional change in its price, $\Delta \ln(1+t)$, which is much smaller than the proportional change in the tax rate, $\Delta \ln(t)$. For this reason, even with an EIS of 1, the consumption response to the tax cut provides only very modest mitigation of the revenue loss. Since we expect no change in current saving, and hence in future consumption, future VAT revenues are unaffected by the temporary VAT cut. Future VAT revenues would be reduced if the consumption response to the temporary VAT cut were greater than one-for-one (that is, if the EIS were greater than 1), so that households needed to finance some of the increase in current consumption through reductions in future consumption. Prior to the VAT cut, VAT was projected to raise £84.5 billion in 2008–09,³ or £91.5 billion in 13 months. The Treasury costed the temporary VAT cut at £12.4 billion,⁴ or 13.5 per cent of revenue. Because we expect a slightly stronger expenditure response than the Treasury, we anticipate a revenue cost for the stimulus that is lower by 0.1 per cent.

³Source: HM Treasury, 2008, tables B12 and B13 and paragraph B.59.

⁴Source: HM Treasury, 2008, table B5.

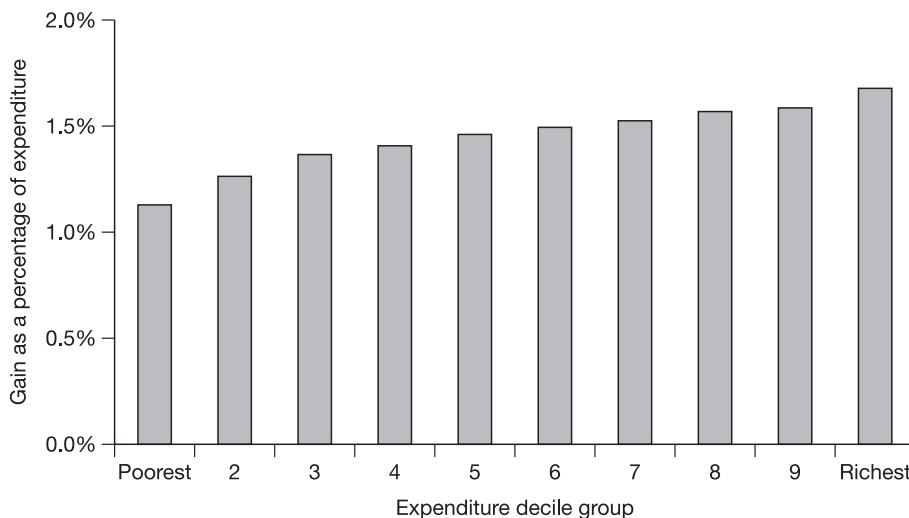
2. Distributional consequences

The goods that are VAT-exempt or face a reduced VAT rate (and hence are unaffected by the temporary VAT cut) are largely necessities. Thus VAT is actually a slightly progressive tax and the temporary VAT cut is slightly regressive: the cut confers greater (proportional) benefits on the rich (who consume more luxuries) than the poor. This is illustrated in Figure 3, which shows that households with higher total expenditures (that is, richer households) derive a higher *proportional* benefit from the VAT cut.⁵

The calculations presented in Figure 3 assume no behavioural response, but we have argued above that the temporary VAT cut should induce a substitution effect. Allowing for this substitution effect reinforces the mildly regressive nature of the VAT cut. Because luxuries have a larger EIS, the rich not only face a larger average price cut on their basket of goods but also are more inclined to take advantage of the temporary price cut by bringing forward consumption. These considerations both imply that the temporary VAT cut benefits the rich more than the poor.

FIGURE 3

Gain from temporary VAT cut by expenditure decile group



Source: Thanks to James Browne at the Institute for Fiscal Studies for computing the numbers underlying this graph.

⁵For further discussion of the distributional consequences of VAT, see Crossley, Phillips and Wakefield (2009).

3. Importance of the counterfactual

It is important to emphasise that the predictions outlined in the preceding sections are *relative to the counterfactual of no policy change*. An increase of 1.2 per cent against a counterfactual of falling consumption may translate into a reduced fall, rather than an actual rise. In the current environment, there may be a number of coincident effects that will mask the effect of the policy. If deflationary expectations are taking hold, these will reduce the expected relative price of *future* consumption, thus inducing a substitution effect in the opposite direction to the policy. Further, significant increases in uncertainty may make households feel less affluent, inducing a negative income effect, which is, again, in the opposite direction to the policy. The increase in uncertainty may be particularly relevant to expenditure on durables. To the extent that expenditure on durables is irreversible, there is an option value associated with waiting, which may suppress expenditure on durables until some of the current uncertainty resolves.

VII. Bottom line

For forward-looking and unconstrained consumers, we would expect the income effect of a temporary cut in VAT to be small and the substitution effect to be relatively important. We believe that the EIS for affected goods is around 1, so that, for unconstrained households, a response to the 1.2 per cent price fall of an increase of around 1.2 per cent in current (real) consumption seems reasonable. For constrained households, the mechanism is quite different, but the outcome is the same – a response of about 1.2 per cent in current (real) consumption. Thus the overall response does not depend significantly on the incidence of credit constraints in the economy and we should expect a response of about 1.2 per cent in current (real) consumption. This is significantly larger than the Treasury's prediction (summarised in Section I). Further, given that prices are falling by a similar amount to the increase in consumption, we should expect little change in nominal expenditures, which in turn means no increase in saving (in contrast to what the Treasury suggests). This analysis suggests a short-run fall in VAT revenue of about 13 per cent. Finally, the rich will benefit somewhat more from this rate cut than the poor.

As the preceding discussion indicated, there are two important areas where we lack evidence to inform our analysis of the economic effects of a temporary VAT cut. The first has to do with the extent of pass-through. Some commentators (for example, Spilimbergo et al. (2008)) have suggested that pass-through may be limited, so that retail prices will be little affected by the VAT cut. The argument that is usually advanced has to do with 'menu

FIGURE 4

Tesco promotes the government's fiscal stimulus

Source: www.tesco.com, 3 December 2008.

costs⁷: it is argued that there is a cost associated with changing retail prices, that this cost is borne by firms and that the tax cut is too small for retailers to bother with changing prices. We think that this argument is probably mistaken. Technological innovations have reduced the menu costs associated with price changes dramatically in recent years. For online retailers, as well as for large retailers employing the latest technology for pricing and inventory management, menu costs are essentially zero; such retailers account for a very large fraction of retail sales. Moreover, in the current environment, retailers are very anxious to generate sales, and anecdotal evidence suggests that retailers are not only passing through the VAT cut but also actively promoting consumer awareness of the fall in the price of current consumption. For example, Tesco advertised explicitly the cut in VAT online (see Figure 4). Nevertheless, there is limited formal evidence to guide our expectations about pass-through (see Blundell in this issue), and this would be a useful question for future research to address.

The second area in which evidence is lacking is the responsiveness of spending on durables to changes in the price of durables today (relative to the price of the durables in the future). As we noted above, most estimates of the EIS are based on non-durable consumption, but durables may be an important component of the response of current spending to a change in relative prices. There are two issues here. First, the fact that durables are non-perishable means that substitutability over time in expenditure may be greater for them than for goods that are perishable. Second, we normally think of the non-durable EIS as being a preference parameter (and so, roughly, invariant to the amount of uncertainty in the economic environment). However, because of the irreversible nature of many durable

purchases, they are, as indicated in Section VI(3), quite sensitive to economic uncertainty, and it may be that uncertainty not only suppresses the level of durables demand but also diminishes the responsiveness of durables demand to changes in relative prices (whether those relative price changes are brought about by a cut to the VAT rate or by a cut to the interest rate). This is another area in which more research is needed.

References

- Adam, S. (2008), 'Indirect and business taxes', IFS Briefing on the Pre-Budget Report 2008, 25 November (<http://www.ifs.org.uk/budgets/pbr2008/index.php>).
- and Browne, J. (2006), *A Survey of the UK Tax System*, IFS Briefing Note no. 9 (<http://www.ifs.org.uk/bns/bn09.pdf>).
- Attanasio, O. and Wakefield, M. (2008), 'The effects on consumption and saving of taxing asset returns', paper prepared for the Report of a Commission on Reforming the Tax System for the 21st Century, chaired by Sir James Mirrlees (<http://www.ifs.org.uk/mirrleesreview/reports/consumption.pdf>).
- Barrell, R. and Weale, M. (2009), 'The economics of a reduction in VAT', *Fiscal Studies*, vol. 30, pp. 17–30 (this issue).
- BBC News Online (2008), 'Treasury eyed VAT rise to 18.5%', 25 November, <http://news.bbc.co.uk/1/hi/business/7749074.stm>.
- Blundell, R. (2009), 'Assessing the temporary VAT cut policy in the UK', *Fiscal Studies*, vol. 30, pp. 31–38 (this issue).
- Browning, M. and Crossley, T. F. (2000), 'Luxuries are easier to postpone: a proof', *Journal of Political Economy*, vol. 108, pp. 1022–6.
- Crossley, T. F. and Low, H. (2009), 'Is the elasticity of inter-temporal substitution constant?', *Journal of the European Economic Association*, forthcoming.
- , Phillips, D. and Wakefield, M. (2009), 'Value added tax', in R. Chote, C. Emmerson, D. Miles and J. Shaw (eds), *The IFS Green Budget: January 2009*, Commentary no. 107, London: Institute for Fiscal Studies (<http://www.ifs.org.uk/publications/4417>).
- HM Treasury (2008), *Pre-Budget Report November 2008: Facing Global Challenges: Supporting People through Difficult Times*, Cm. 7484, London: The Stationery Office (http://www.hm-treasury.gov.uk/prebud_pbr08_repindex.htm).
- Spilimbergo, A., Symansky, S., Blanchard, O. and Cottarelli, C. (2008), 'Fiscal policy for the crisis', IMF Staff Position Note no. SPN/08/01, Washington, DC: International Monetary Fund (<http://www.imf.org/external/pubs/ft/spn/2008/spn0801.pdf>).