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VAT AND EXCISES: EXECUTIVE SUMMARY

The thirty years since the Meade Report have seen a remarkable shift in the balance of taxation in the UK towards the Value Added Tax (VAT), which now accounts for around one sixth of all tax revenue. Reliance on alcohol and tobacco excises, in contrast, has fallen. This chapter considers the strategic design issues that we believe should shape the future course of UK policy on VAT and these excises. Given the strength of EU restrictions on indirect tax policy, this also means, to some degree, considering their future in Europe more widely.

The paper is in four parts. The first considers theoretical insights into the role and optimal structure of indirect taxes. The second focuses on the VAT, and the third on alcohol and tobacco excises. The fourth considers the increasingly important international issues bearing on the design and implementation of these taxes.

The appropriate balance between direct and indirect taxation - between income taxes and taxes on goods and services - is one of the oldest issues in public finance, but still imperfectly understood. It is clear, however, that the differences between the two types of tax are less sharp than once thought. In particular, the close equivalence between a uniform tax on consumption and a uniform tax on wage and profit income means that - as long as people take price levels properly into account - the two taxes should have broadly equivalent effects on the labour market. So shifting the balance of taxation towards VAT cannot be expected to have much impact on work incentives or levels of employment. Indeed, the appropriate mix of direct and indirect taxes may be primarily a matter of administration and compliance. Running a broad-based consumption tax in parallel with taxes on income reduces the risk of revenue losses by spreading it across a number of sources each of which is to some degree independently enforced.

Indirect taxes offer scope, not available with an income tax, for taxing different components of consumption at different rates. One group of reasons for taxing some goods more heavily is to deal with pollution (considered in another Chapter of this Review) and other external costs. The external costs of alcohol and tobacco consumption are frequently seen as the principal economic justification for continuing to levy high excise duties on them, so policy needs to be informed by a clear appreciation of the nature and scale of these external costs. Nevertheless, conventional externalities may not be the only grounds for high taxation of tobacco and alcohol. Recent economic literature argues that people's lack of consistency and self control may justify higher taxes than would be warranted if consumption choices were being made by wholly rational, well-informed consumers.

Whether the opportunity to charge different tax rates on different commodities should be exploited more generally depends on the range of other tax instruments available, and the characteristics of people's demands for those commodities. Lower tax rates on items such as childcare costs, travel costs to work and labour-saving food items (such as ready meals), and

higher tax rates on items like leisure-time consumption and DIY inputs, could help to offset the disincentives to work created by the tax system. But it is far from clear how much differentiation would be justified on these grounds, or which commodities should be taxed more and less heavily. There may also be plenty of practical obstacles to the complex pattern of tax rates that might be required, and these need to be weighed against any potential labour market gains.

One clear implication of this line of analysis, however, is that the case for using preferential rates of VAT to help the less well-off is weak: there are better redistributive instruments available to the UK government than fine-tuning rates of commodity taxation. The chapter shows that ending all current zero and reduced rates (except for housing and exports) while increasing all means-tested benefit and tax credit rates by 15% would leave the poorest 30 percent of the population better off, on average, and raise £11 billion that could be used to help them further or for some other purpose. The essence of this result is nothing new. Finding the political will to implement such a change needs to begin with a recognition of the fundamental unfairness – and wastefulness – of the existing rate structure.

New at the time of *Meade*, the VAT systems of EU countries are now starting to look outdated by comparison with more recently designed systems, both in terms of the rate structure and in aspects of basic design. Two issues stand out:

First are the widespread exemptions - for public agencies and health, education, medical services, and financial services, in particular - which break the chain of VAT paid on sales and reclaimed on purchases of inputs, creating inefficiencies of unknown magnitude. Recent international experience - including that of New Zealand - shows that many of these exemptions are unnecessary, and demonstrates the potential for a base-broadening reform of the VAT. The case for considering alternatives to exemption is especially clear in relation to financial services, though comprehensive solutions are difficult. One possibility meriting close attention is cash-flow treatment of financial services—treating all cash inflows to providers of such services (including deposits) as reflecting VAT-able sales to customers and treating all cash outflows (including loans made) as purchasing inputs—but zero-rating financial transactions with registered businesses. While there are many practical issues that require further attention, movement to such a system would not only remove distortions but likely entail a substantial net revenue gain.

The second key structural issue is the VAT treatment of trade between EU member states. We argue that while the goal of a systematic destination-based VAT treatment of internationally-traded goods and services remains desirable, the current mechanisms by which this is achieved need reconsideration. In particular, VAT zero-rating of exported goods exposes the VAT system to significant risks of fraud and evasion - exploited by recent high-profile instances of "carousel fraud", as well as by more mundane evasion. We argue that a reform of the VAT treatment of intra-EU trade, in which goods would be exported bearing

VAT, would reduce the vulnerability of the VAT system to frauds and evasion surrounding international transactions.

I. INTRODUCTION

The Meade report was confined to direct taxation: it was initially to intended to review the whole tax system, but time constraints led the committee to exclude indirect taxes.¹ One reason for this prioritization, perhaps, was that the UK had then only recently implemented a major indirect tax reform, introducing a value-added tax (VAT) to replace the ‘purchase tax’ (a single-stage sales tax) as a requirement of entry into the European Community. It may have seemed that there would be little appetite for further reforms to the UK’s indirect tax system for some time to come. As it turned out, however, developments in indirect taxation, and particularly the rise of the VAT, have been amongst the most marked changes in the U.K. tax system since the publication of *Meade*, and one of those most consistent with the central thrust of the *Meade* report—its advocacy of expenditure taxation.

Indirect taxes evidently merit closer attention than *Meade* was able to provide. Moreover, there have been significant developments in the area since, conceptually and practically:

- Theoretical developments since *Meade* have considerably altered our understanding of the contribution that can be made by indirect taxes—both VAT and excises—to raising revenue and pursuing distributional and other social objectives.
- Having been in place for some 35 years the UK VAT, like that of many EU members, is now beginning to show its age, and a fundamental review, in the light of experience with more modern VATs, is overdue.
- The elimination of internal frontiers in the EU has brought new and challenging issues of administration, enforcement, and tax competition in relation to the VAT and excises, undreamt of 30 years ago and as yet still unresolved.
- Indirect tax policy in the U.K. is more explicitly constrained by international agreements than is any other area of tax policy (with the sole exception of tariff design). To a large degree, assessing indirect tax policy in the U.K. requires assessing it in the EU more widely, a key question being whether EU constraints have been a help or a hindrance.
- Recent developments—notably the growth of trade in international services and e-commerce, and high profile VAT fraud—have raised challenges that question basic design features of the VAT, to a degree that causes some to doubt its future.

¹ The only substantive discussion of indirect taxes is in the context of one of the more radical reform options, the ITVAT, under which existing income taxes would be transformed into a tax on expenditure using a VAT-type mechanism.

The focus of this chapter, for the most part, is on the strategic design issues that we expect and/or hope will shape the development of indirect tax policy in the U.K., and the EU, in the coming years.

The paper is in four main parts. The first considers economic theory and empirical evidence on the optimal structure of commodity taxes.² What, in particular, do taxes on goods and services contribute to an efficient tax structure that cannot be achieved equally or more efficiently by other available tax instruments? We then consider in turn the two principal categories of indirect tax in the UK: the VAT, applied to a considerable proportion of spending, and the excise duties levied at high rates on a limited number of goods. We compare the strengths and weaknesses of the VAT with alternative broad-based taxes on goods and services, in particular the single-stage retail sales taxes common in the US, and discuss issues concerning VAT rates, base, the treatment of small firms, financial services and compliance. Turning to the excises we discuss externality arguments for levying high excise duties on alcohol and tobacco (those on fuel being considered in a separate chapter), and issues concerning the choice of tax base. The fourth main part outlines and assesses international issues in indirect taxation. Conclusions are drawn in Section VI.

II. THE ROLE AND DESIGN OF INDIRECT TAXES

The years since *Meade* have seen a significant change in the pattern of indirect taxation in the UK. Over the period as a whole, reliance on indirect taxes has increased only moderately, from around 23 percent of total tax revenue (including national insurance) in 1978-9 to about 25 percent in 2007-8.³ There has, however, been a marked change in the way in which this revenue is raised, with a substantial increase in reliance on the VAT (from about 9 to 16 percent of total tax revenue⁴) and a reduction in that on the excises on alcohol and tobacco (each falling from around 4 percent of the total to about 1.5 percent).⁵ These developments

² One key issue not addressed here is the incidence of these taxes. This is only partly for brevity, there also being little hard evidence to draw on (especially for broad-based commodity taxes). It is simply assumed that the incidence is fully on consumers, which such evidence as there is suggests is not unreasonable, at least for the longer-run. (See for example Carbonnier (2007) and the references therein).

³ Revenue statistics in this paragraph come from HM Treasury: see http://www.ifs.org.uk/ff/revenue_composition.xls.

⁴ HMRC reports VAT revenues net of refunds paid to various public bodies but includes those amounts refunded in total tax revenue, so that the implied VAT shares need to be interpreted with caution.

⁵ For the period as a whole, revenue from fuel excises and other indirect taxes (such as the former car tax and more recent climate change levy) have both been broadly unchanged, at something under 5 and 2 percent respectively.

have not occurred evenly or even monotonically over this period. The rise of the VAT began with the dramatic first budget of the Thatcher government in 1979, which raised the standard rate of VAT from 8 to 15 percent (while reducing income tax rates sharply), and continued with the increase in the standard rate to 17.5 percent, its present level, in 1991.⁶ Since the early 1990s, when it reached more than 18 percent, the share of the VAT in total tax revenue has actually decreased. Most of the reduced reliance on excises also dates from around then (though receipts from those on alcohol and tobacco have declined throughout the period), so that the overall share of indirect taxes has also fallen since the early 1990s by about 5 percentage points. The shift towards indirect taxation has thus, to a large extent, come and gone, leaving the compositional change—the shift from excises to VAT—as the most striking structural development.⁷

These developments highlight two key questions for tax policy: What is the appropriate balance between direct and indirect taxation, and what is the best structure of indirect taxes?

A. Equivalences and the balance between direct and indirect taxation

The appropriate mix between direct and indirect taxes is one of the oldest issues in public finance: it was a key issue, for example in mid-Victorian politics, when the future—indeed survival—of the income tax remained in doubt.⁸ More recent and formal theory has brought relatively few additional insights. The most important, perhaps, is a recognition that, in principle at least, the balance is to some degree arbitrary, there being a close similarity in terms of their impact on individuals' budget constraints—and hence, in the absence of some form of fiscal illusion, on their behaviour—between a uniform tax on consumption and a uniform tax on wage and profit income. This is immediately clear for a consumer who lives only one period and receives income only from these sources: for them, a tax of 20 percent on all the income they receive is equivalent to a 25 percent tax on everything they spend.⁹ In such a world, the balance between commodity and wage taxation would be immaterial.

⁶ A reduced rate of 8 percent, mainly for domestic energy use but subsequently extended to other items, was introduced in 1994, and reduced to 5 percent in 1997.

⁷ The OECD *Revenue Statistics*, which include in VAT revenue amounts refunded to public bodies, do not show the same peak in VAT revenues as do the HMRC figures used here. They do however also show a peak in reliance on indirect taxes in the early 1990s.

⁸ See for example Matthew (1979), who notes that in his famous comparison of direct and indirect taxes to “two attractive sisters” to both of whom he felt it allowable to pay his addresses, Gladstone carefully did not say he felt obliged to pay them equal attention.

⁹ The only reason these numbers differ is that income tax rates are conventionally described in tax-inclusive form (including the tax itself in the base) and VAT rates in tax-exclusive form (excluding it).

For a consumer who lives for several periods, consumption over the lifetime (and any bequest given at the end of it) has to be financed from the initial stock of savings, wage earnings, and receipts of profit and transfer income. The equivalence is then somewhat more subtle: a uniform consumption tax, levied at an unchanging rate over time,¹⁰ is equivalent to a proportional tax on wage, transfer and profit income, also at an unchanging rate, combined with a tax on initial assets and subsidy to bequests at the same rate.

Such equivalences point to the potential fallacy, for example, in arguing that relatively heavy reliance on commodity rather than wage taxation (whether through the personal income tax or social security contributions) is ‘good for employment’: absent other sources and uses of funds, such a shift has no real impact on labour supply. Other distortions may mean that there is some effect on labor market equilibrium: with a binding minimum for the wage before tax and employee’s social contributions, for example, a reduction in the employer’s social contribution may reduce gross wage costs and so increase employment. But dealing with such distortions is a matter more for labor market rather than tax policy. Absent such considerations, such a shift has effects only through its impacts on the real value of other sources and uses of funds. Labor market outcomes may be affected, for instance, if such a shift somehow moves the real burden of taxation to those out of the labor market, for example by reducing the real value of unemployment benefit. In practice, however, this can be hard to do: pressures to raise benefit levels in the face of commodity tax increases, for example, can be hard to resist. Most simulations find that the likely employment effects of such tax shifts are relatively minor: see, for example, the recent analysis of such proposals for France in Besson (2007). There is some evidence, however, that relatively heavy reliance on commodity rather than income taxation has been associated with faster growth (Kneller, Bleaney and Gemmell, 1999).

These equivalences also imply that the choice across alternative tax mixes can be driven largely by considerations of administration and compliance. And these can plausibly point towards the simultaneous deployment of taxes that would be entirely equivalent if their enforcement were costless, as a means of diversifying enforcement risk. It may be optimal, for example, to deploy both a sales tax and a uniform wage tax levied by withholding: withholding is likely to be a good way of capturing a large part of taxpayers’ wage income before they receive it, but perhaps relatively ineffective in reaching the self-employed; sales taxation may be a good way to capture a large part of taxpayers’ incomes, including that of the hard-to-reach self-employed, when they spend it. This point is stressed by Boadway, Marchand and Pestieau (1994), who show that when some income escapes tax it may be helpful to deploy a uniform commodity tax even when there would be no other reason to do so. (Such practical considerations also have implications for the form in which indirect taxes

¹⁰ If its rate is expected to change over time (to increase, say), then a uniform consumption tax affects (reduces) the return on savings and so is in part equivalent to a (positive) tax on capital income.

should be levied, notably for the relative merits of the VAT and retail sales taxes, to which we return later).

Beyond these fairly general observations, the appropriate balance between direct and indirect taxation has received relatively little formal attention. Slemrod and Yitzhaki (1996) provide a conceptual framework for determining the appropriate tax mix when enforcement is imperfect, requiring that the marginal social cost incurred by raising an additional £1 by some tax instrument, defined to include both administration and compliance costs as well as those from the implied distortion of economic activity, be the same for all such instruments. But it remains unclear, in practice, whether the balance currently struck in the U.K. is in any sense broadly appropriate.

B. The structure of indirect taxes

There are broadly two aspects of this issue: the way in which commodities (by which we mean both good and services) should be taxed, and the rates at which they should be taxed.

How should commodities be taxed?

The starting point is the Diamond-Mirrlees (1971) production efficiency theorem: in the absence of externalities and non-competitive behavior, and in the absence of restrictions on distorting tax instruments or the ability to levy firm-specific taxes on pure profits,¹¹ a necessary feature of an optimal tax system—in the strong (Pareto) sense that if this were not the case then one could find a tax reform from which everyone would benefit—is that production decisions are left undistorted. Put simply, business transactions should not be taxed. The intuition is simply that any distortion of production decisions reduces aggregate output, which cannot be wise so long as there is some useful purpose to which that output could be put.

Strictly, these conditions are unlikely to be met in practice. Externalities are the most obvious (and conceptually easiest) source of failure: commodities generating external effects should on this account be taxed at the same rate whether used as intermediate goods or as final consumption (the damage done by CO₂ emissions being the same, for instance, whether fueling industry or private travel). The other requirements of the Diamond-Mirrlees theorem are also inherently implausible as descriptions of reality, but—with one exception—the precise consequences of their failure appear to be sufficiently circumstance-specific, and the

¹¹ Pareto efficiency from a worldwide perspective may also involve production inefficiency in the allocation of resources across countries if there are constraints on the effective ability to make international lump sum transfers (Keen and Wildasin, 2004). But this generally calls for the use of trade taxes and so does not bear directly on the domestic indirect tax design on which we focus here.

political risks from allowing special treatment sufficiently troubling, for production efficiency to remain the best guiding principle for practical tax design.

The requirement of production efficiency proves to be a powerful one. As will be seen, it is both a key reason for the use of the VAT (or, equivalently --in principle-- a retail sales tax) in preference to taxes that burden intermediate goods transactions, and also has strong implications for the improvement of the VAT both in the U.K. and in the EU more generally.

What structure for commodity tax rates?

Turning to the second aspect, the key theoretical question—given the equivalences noted above between a uniform proportionate tax on all elements on final consumption and the combination of a proportionate tax on wage income and other items—is that of whether it is desirable to tax some goods or services more heavily than others.¹²

The optimal design of such commodity tax structures has received substantial attention, from Ramsey (1927) onwards. One key insight—from results of Besley and Jewitt (1990), Deaton and Stern (1986) and Atkinson and Stiglitz (1976)—is that the case for such rate differentiation is weaker the greater is the government’s ability to pursue its distributional objectives by other means, including, but not only, by taxing (or subsidizing) income.¹³ The central point here is that differential commodity taxation is a very blunt instrument for the pursuit of equity objectives, with the zero-rating of food and children’s clothing in the U.K. being a classic example.

Take food, for example. It is indeed the case that the less well-off spend a higher *proportion* of their income on food than do the better off. But this is not in itself a good reason—even on distributional grounds, leaving the need to raise revenue aside—for subjecting it to a differentially low rate of tax. This is for two reasons.

¹²Here we confine our discussion to linear commodity taxes of the type that characterize the U.K. VAT and excises: charges that are simply proportional to purchases. It is possible to envisage more complex non-linear tax structures. Commodity taxes might, for example, vary more or less than proportionately with the quantity consumed. While feasible in some cases—some countries levy non-linear charges on domestic electricity use, for instance—the possibilities of resale or splitting purchases commonly rule this out. Alternatively the tax paid might in principle depend on the history of consumption, or such characteristics as age: this could in principle be helpful in dealing with addiction problems that can arise with alcohol and tobacco (indeed regulatory restrictions on under-age drinking, for example, effectively implement an infinite tax rate).

¹³ More precisely, these results imply that the preference restrictions under which commodity taxation is unnecessary become weaker the more flexible is the instrument by which wage income can be taxed.

First, looking only at a snapshot of spending and income patterns in the population at any moment may be misleading given the variability of income over a lifetime: those with low incomes now may be the young or elderly who will be, or have been, amongst the high income groups at other times. Put differently, a commodity tax looks regressive when assessed relative to current incomes in part because those with high incomes tend to have high savings, and so appear to escape the tax—but they will face it when they come to spend those savings. One way to address these issues is to relate food spending not to income in any period but to total spending, since the latter may be a better reflection of household's perceptions of their own long-run spending ability. Doing so, as Kay and Davis (1985) show for items zero-rated in the U.K.—and as subsequent studies have shown for a range of taxes on particular commodities¹⁴—tends to greatly dampen the apparent distributional case for tailoring commodity taxation to consumption patterns.

The second reason—perhaps potentially more persuasive to non-economists—is that even if the better off spend a smaller *proportion* of their current income on such items as food than do the less well-off, they are likely to spend a smaller *absolute* amount on them. If there were no other way of transferring resources to the poorest, setting a low tax rate on these items might be sensible policy. But it is unlikely to be so when, as in the U.K., there are a range of other instruments—not only the income tax, but tax credits and benefits—that could be targeted more directly upon them: it seems likely that, by such means, more than £11.50 of each £100 raised by eliminating the zero-rating could be channeled to the poorest, making that a better way of pursuing equity goals. Kay and Davis (1985) and Hemming and Kay (1981) provided early illustrations of this point for the U.K., the latter showing for example that the distributional impact of eliminating zero-rating could be very largely offset by cutting the standard rate of income tax and increasing the tax threshold. We revisit this simple but crucial insight, using more recent data, in Section III.B—and show that it has lost no force over the years.

With sufficiently rich possibilities for income-related payments, the potential case for differential commodity taxation thus rests primarily on efficiency considerations. This is often taken to mean that tax rates should be especially high on commodities with especially low own-price elasticities of demand (meaning that demand for them is relatively insensitive to their price), the intuition behind this 'inverse elasticity rule' being that in such cases a relatively high tax rate does little to reduce demand, and so causes little distortion of behavior, while providing a robust revenue source. This prescription can prove dangerously misleading, however. One evident limitation is that it ignores the effect that increasing the tax on one commodity may have on the demands for—and hence distortions associated with, and revenue collected from—other commodities. Unless all cross-price elasticities are zero

¹⁴ See Poterba (1989) on alcohol and tobacco, and Hassett, Mathur and Metcalf (2007) for a recent analysis of petrol / fuel taxes.

(so that the demand for each commodity is unaffected by the price of any other), it is quite possible that increasing the tax on some good with a low price elasticity, while increasing revenue from that item, may actually reduce total tax revenue and/or lead to more distortion rather than less. And tempting though it may be to ignore cross-price elasticities, doing so evidently becomes inherently less plausible at degrees of disaggregation over commodities sufficiently fine to make tax differentiation meaningful. A tax on beer, for instance, may have little effect on the generality of spending on other commodities but quite powerful effects on the demand for spirits, wine or tobacco.

There is an even deeper sense, however, in which the inverse elasticity rule is misleading. For the fundamental determinant of the case for a differentially high tax on some commodity is the way in which taxing it affects market labor supply. As a general principle, commodity taxes should be heaviest—all else equal—on those items that are most complementary with (or least substitutable for) leisure (by which is meant time not spent in the formal labor markets).¹⁵ Thus season tickets to watch football games should be taxed more heavily, for example, than season tickets to commute to work. Intuitively, taxing either particular commodities or income in general unavoidably discourages labor supply—recall the similarity between a uniform commodity tax and a tax on wage income noted earlier—and the only useful purpose that taxing different commodities can serve is in mitigating this distortion by making leisure less attractive than it otherwise would be: which means taxing most heavily those goods whose consumption tends to be associated with that of leisure. Conversely, if all commodities are equally complementary with leisure—a condition referred to as ‘weak separability’—then all should be taxed at the same (proportionate) rate. This result, due to Atkinson and Stiglitz (1976), is a central insight from the modern theory of indirect taxation. The inverse-elasticity rule is simply a special case of these more general observations, applicable in the further special case in which wage income is in itself untaxed: if, for example, an increase in the price of some good had little effect on the demand for it, and none on demand for other commodities, then taxing it more heavily would mean an increase in total expenditure that could only be paid for by working harder—and so that good must in that broad sense be a complement with leisure. But it is the link with labor supply, not the own price elasticity, that is the fundamental concern.

Further perspectives on the structure of optimal commodity tax structures are provided by recent contributions which have stressed that what is regarded simply as ‘leisure’ in the standard optimal tax framework described above—which simply means time not spent in paid work—may also be put to productive use in household production. In such settings, Kleven, Richter and Sorensen (2000) and Piggott and Whalley (2001) show, a case emerges

¹⁵ The relevant sense of ‘complementarity’ differs according to the capacity of the government to tax wage income: see for instance Atkinson and Stiglitz (1980). The situation in mind here, as seems most relevant in the U.K., is that in which there are no restrictions on the shape of the tax schedule applied to such income.

for relatively low taxation of commodities that are close substitutes for such self-supply—which generally means such services as home improvement and repair—as a means of mitigating the unavoidable discouragement of market labor. If hiring a gardener is cheap, people might work overtime instead of mowing the lawn themselves. Thus Piggott and Whalley (2001) for example, report calculations suggesting that extension of the Canadian VAT to include such services may have been welfare-reducing. In somewhat similar spirit, a series of papers¹⁶ consider tax design when consuming commodities takes time (such as doing the laundry, or watching a DVD). Boadway and Gavhari (2006) show that it may then be optimal to tax less heavily those commodities for which time spent in consumption is pleasurable (being more like leisure in the everyday sense of relaxing) and tax more heavily those for which it is not (being more like work); and amongst the latter, those that require a lot of time to consume should be taxed more heavily than those that do not (again pointing to relatively light taxation of services that can readily be replicated at home). Thus DVDs should be taxed less heavily than ironing boards, which (since ironing is not only dull but time consuming) should be taxed more heavily than dishwashers (dull to fill, but quick to use). Intuitively, such a structure serves the same broad purpose of counteracting tax-induced disincentives to undertaking paid work, while also recognizing that it is better that any given amount of time not spent in paid work be passed doing pleasant rather than unpleasant things (it making no direct difference for tax revenue, in particular, how that time is spent).

These models, it should be noted, are perfectly consistent with the standard framework described above, which simply takes the enjoyment of time not in paid work and the consumption of marketed commodities to be the objects of choice: one can conceive of individuals as having already decided how to use their time not in paid work before applying that framework. What these models do is add detail—relating for instance to the time intensity of consumption—on the relationship between time spent outside paid work and the household's final well-being, and show how that detail is reflected in the structure of commodity demands and labour supply, and hence in optimal tax rates. Quite how informative for policy design a focus on this additional structure will prove remains to be seen: we know relatively little, for instance, on whether time spent consuming particular goods is enjoyable or not (shopping is a pleasure for some, a chore for others), and, as stressed by Gavhari (2007), these approaches do not obviate the need to know price elasticities in order to calculate optimal tax rates. The important point for present purposes, however, is that the principles of optimal tax design set out above continue to apply. In particular, weak separability between market consumption goods and time in paid work remains sufficient—given the atemporal context and other ancillary assumptions—for uniform commodity taxation to be optimal.

¹⁶ Christiansen (1984) considers the issue briefly, Gavhari and Yang (1993) and Kleven (2004) do so in detail,

Is it then the case that preferences do, in practice, appear to be weakly separable? The only detailed study of this key issue of which we are aware is that of Browning and Meghir (1991), who are able to reject weak separability with great confidence. Revisiting this issue with more recent U.K. data (Crawford, Keen and Smith, 2008), we have arrived at the same conclusion: a firm rejection of weak separability. This finding needs to be interpreted with caution. It is possible, for instance, that commodity demands be linked with hours worked in the data not because of properties of tastes but as reflections of intertemporal considerations that are not modeled within the estimation framework used. Nevertheless, there emerges no clear presumption that one can simply tax all commodities at the same rate—and, by the same token, some presumption that well-designed commodity taxes have some role to play.

The question then arises as to precisely what form such rate differentiation should take. Table 1 reports estimates from Crawford, Keen and Smith (2008) of the complementarity of commodity demands with leisure for 20 broad groups of spending by UK households. Commodities found to be complements with leisure (in the sense of time not in paid work)—and so candidates for relatively heavy taxation or, more precisely, whose consumption should be most strongly discouraged by the indirect tax system—include most foodstuffs, domestic fuels, tobacco, children's clothing and, perhaps surprisingly, public transport. This list includes some commodities which we might also wish to tax more heavily on externality grounds, but here we are considering only the implications of non-separability with labour supply. Complements with work, on the other hand—commodities whose consumption should be less discouraged less by taxation—include alcoholic drink, food eaten out of the home, motor fuels, and leisure items (the last of these perhaps reflecting the use of such goods as substitutes for time in producing relaxation, in line with household production considerations discussed above). Again, the list of commodities includes some associated with pollution and other externalities, which might have implications for tax rates tempering those arising from the issues of preference structure addressed here.

Table 1: Estimates of commodity demand complementarities with leisure (Crawford, Keen and Smith, 2008)

	Impact on budget percentage share of an additional hour worked (t statistics in brackets)
Bread and Cereals	-0.024 (64.3)
Meat and Fish	-0.060 (-49.2)
Dairy products	-0.045 (-66.6)
Tea and coffee	-0.008 (-29.5)
Fruit and vegetables	-0.037 (-52.8)
Other zero-rated foods	-0.020 (-28.1)
Standard-rated foods	-0.027 (-40.0)
Food eaten out	0.054 (38.5)
Beer	0.020 (13.3)
Wine and spirits	0.020 (21.2)
Tobacco	-0.026 (-16.6)
Domestic fuels	-0.049 (-30.6)
Household goods and services	0.064 (24.2)
Adult clothing	0.000 (-0.0)
Childrens' clothing	-0.006 (-8.7)
Petrol and diesel	0.046 (35.9)
Public transport	-0.006 (-6.2)
Leisure goods	0.019 (9.4)
Books and newspapers	-0.001 (-2.0)
Leisure services	0.086 (28.1)

Note: Results from demand system estimates reported by Crawford, Keen and Smith (2008), based on household micro-data from 22 years of the UK Family Expenditure Survey (1978-1999). The table shows the impact of an additional hour worked on the budget (percentage) share of each commodity group in household spending. Thus, for example, an additional hour worked reduces the (average) percentage of households' spending devoted to bread and cereals by 0.024 points. Commodities for which the coefficient is negative are leisure complements, and those for which the coefficient is positive are leisure substitutes. All coefficients except that on adult clothing are significantly different from zero, implying that weak separability is firmly rejected.

What this implies for the level and even sign of the various tax rates themselves is less clear-cut, however, since that depends not only on the sign but also on the magnitude of demand responses, and, moreover, also depends on patterns of cross-price effects. In Crawford, Keen and Smith (2008) we demonstrate the significance of this observation; the pattern of relative tax rates that should be applied to different groups of goods differs quite markedly from the pattern of complementarity and substitutability shown by the estimated coefficients on hours worked in the commodity demand equations. For example, while domestic energy appears as a leisure complement - according perhaps with the intuition that those working less will spend more time at home and incur higher costs of heating and lighting - it appears to be a commodity that, on efficiency grounds, should actually be taxed less than others, once the cross-price effects are taken into account. Likewise, the estimated coefficients on the broad categories of "leisure goods" and "household goods and services" are both positive, indicating that both are leisure substitutes, but taking account of cross price effects suggests that we would want to tax the former more heavily than other goods and services, and the latter at lower rates. This work may still be some way from being able to provide a definitive answer to the question of the pattern of optimal commodity tax rates for the U.K. Nevertheless, the significant role played by the pattern of cross-price effects does serve to stress that conventional wisdom and crude intuition can be unreliable guides in thinking about indirect tax design.

It is unclear, however, whether the social gain from moving to an optimally differentiated rate structure would be large. Since the effects on commodity demands of hours worked reported by Crawford, Keen and Smith (2008) are small, there is reason to suppose that—even assuming we knew the optimal structure—it would not be. And that is important because against any such benefits must be set the evident practical costs of implementing differential rate structures. Applying the very large number of distinct rates to which theory might point would require ensuring, for instance, that commodities are not to an unacceptable degree misrepresented as liable to a lower rate than intended. Issues thus arise concerning the number of distinct rates to apply, and which commodities to combine for identical tax treatment.¹⁷ Further and distinct practical difficulties arise under the VAT, since multiple rates increase the reporting burden on traders (there being evidence that this effect is substantial)¹⁸ and, even if honestly applied in themselves, exacerbate control problems by increasing the likelihood that some traders (producing lightly taxed outputs from highly taxed inputs) will be entitled to refunds, an aspect of VAT implementation that all tax administrations have difficulty with (see for instance Harrison and Krelove (2005)). This is

¹⁷ The optimal partitioning of commodities into a fixed number of rate categories is analyzed by Gordon (1989).

¹⁸ Cnossen (2003) reports that firms in the U.K. subject to more than one output VAT rate have more than twice the compliance costs of those subject only to one.

especially likely to be the case when—as with domestic zero-rating in the U.K.—the reduced rate is applied largely to final products. And in a wider context the potential effectiveness, in terms of both targeting and ease of implementation, of alternative spending measures would need to be weighed against any case for rate differentiation: if child care is a strong substitute for leisure, for instance, application of a reduced VAT rate may be inferior to public support for provision.

III. THE VALUE ADDED TAX

The rise of the VAT has been one of the central developments in UK tax policy since *Meade*. This chapter reviews key aspects of the design of the VAT and associated implementation issues. As background, Box 1 provides a quick primer on the main features of the VAT, and distinctive terminology.

Box 1. A VAT Primer

Value added tax (VAT) is levied on the sale of goods and services by registered businesses (those with annual turnover above some threshold level—the choice of which is discussed in Section III.B—or who choose to register voluntarily). It applies to all sales, whether to private consumers or other businesses (in contrast to the retail sales taxes levied in the US, for example, aim to tax sales to final consumers only).

Under the ‘invoice-credit’ form of the VAT—and all national level VATs are of this form, except that in Japan¹⁹—registered businesses offset the VAT they have been charged on their purchases (‘input VAT’) against the liability (‘output VAT’) on their sales, remitting only the net amount due. The result, if this chain of output tax and input credit remains unbroken, is that no net revenue is collected from the taxation of intermediate goods sales (business-to-business or ‘B2B’ sales), so that the ultimate base of the tax is final consumption (in the sense, more precisely, of sales other than to registered businesses).

For example, consider a simple chain of production consisting of two firms. Firm F makes sales of £30,000 to final consumers and no B2B sales. In the course of production, it uses inputs purchased from Firm Y at a cost of £10,000 plus VAT. Firm Y makes no sales to consumers and uses no taxed inputs; its entire £10,000 output is sold to firm F.

If the sales of both firms are subject to VAT at the (tax-exclusive) rate of 17.5% (which happens to be the current standard rate in the UK) Firm Y will be liable for £1,750 (=17.5% of £10,000) in VAT on its sales to X. Firm F will be liable for output VAT of £5,250 (=17.5% of £30,000) on its sales of £30,000, but can offset against this the £1,750 tax paid on its own purchases, giving a net VAT liability

¹⁹ The VAT in Japan is levied on a ‘subtraction basis’: that is, on the book difference between total sales inputs. There also exist a number of subnational VATs levied on other than an invoice-credit basis. The Italian IRAP (*imposta regionale sulle attività produttive*), for instance, is an origin-based (no remission for exports, or taxation of imports) subtraction method VAT, while both Michigan and New Jersey have implemented what are essentially VATs levied on origin additions basis (that is, applied to the sum of wages and profits). Bird (2000) makes a general case for such taxes as a suitable source of subnational revenue, an issues not considered here.

of £3,500. The VAT collected from Firm Y is thus, in effect, refunded to Firm F. Total VAT remitted by two firms taken together is £1,750 + £3,500 = £5,250, which is equivalent to 17.5% of the (tax-exclusive) value of the sales made to final consumers.

‘Zero-rating’ means that the seller charges a VAT rate of zero on its sales but is still entitled to credit for the input VAT paid, so that no VAT remains: the Australian term ‘VAT-free’ is perhaps more descriptive. So long as some input VAT has been paid, the business will on this account be due a refund.

For example, if the sales of Firm F in the above example are zero-rated while Firm Y’s remain standard rated, Firm F would charge no VAT on its sales and would be due a refund of the £1,750 VAT paid on its purchased inputs. Total VAT collected is zero.

The universal practice is to zero-rate exports and fully subject all imports to the VAT. This is as a way—though, as discussed later, not the only one—of ensuring that the VAT applies only to domestic consumption, consistent with the ‘destination principle’ discussed, and contrasted with the origin principle (of taxation by place of production), in Section V.A), Quite where the place of consumption is, however,—and so what ‘export’ and ‘import’ mean—is generally fairly clear-cut for goods. But it is much less so for services, so that ‘place of supply’ rules, determining where tax should be charged, are especially problematic in that context: this issue is discussed in Section V.C.

‘Exemption’ means that sales are not subject to VAT but, in contrast to zero-rating, the firm does not have the right to reclaim the VAT paid on its inputs: the Australian term ‘input-taxed’ is perhaps more telling. The input VAT thus ‘sticks,’ and the VAT acquires elements of a tax on production rather than consumption.

If Firm F in the example is selling VAT-exempt goods, it would charge no VAT on its sales but would not be able to reclaim the £1,750 VAT paid on the inputs purchased from Firm Y. Firm F’s sales would thus indirectly bear some VAT, in the form of the VAT charged earlier on the inputs purchased from Firm Y. Revenue is lower than it would be if F were taxed, by the amount of the tax due on its own value added.

If instead it is Firm Y, selling the intermediate good, that is exempt, there is no effect on total revenue: Firm Y itself then charges no output VAT (and by assumption, pays no input VAT either) so that F simply has no input VAT to credit against its output VAT of £5,250. This is the self-correcting feature of the VAT noted in the text. Revenue would be affected, however, if Firm Y had paid some tax on its inputs: exemption means it would not be able to recover that VAT, and since the output VAT charged by Firm F would be unchanged—or, if anything, increased, as Y increases the price it charges F in order to meet its increased input costs—the total revenue collected would actually increase.

A. The nature and strengths of the VAT

The VAT has now been adopted by more than 130 countries, including all members of the OECD other than the United States. While each country will have had its own reason for adoption, the main reason in the U.K. was simple: it was (and is) required as a precondition for entry into the EU. And the central reason for the EU’s insistence on the VAT is to provide a transparent means of ensuring that exports are relieved of indirect taxation (or

subsidy) and imports brought into tax on an even footing.²⁰ A well-functioning VAT—with unbroken chain of crediting and refund—is also consistent with the theoretical preference, described above, for taxing commodities (other than those generating production externalities) only on their final sale to consumers, so as to preserve production efficiency. But, as we see shortly, there are other ways of achieving the same effect. What then is the particular merit of the VAT?

This question is of more than historical interest. Somewhat ironically, the zero-rating of exports under the VAT that has proved so effective in facilitating trade between member states by removing indirect tax as commodities pass between them has also proved highly problematic when the later stage of economic integration—the removal of fiscal frontiers—was reached. And these difficulties have called into question fundamental design features of (and even the wisdom of retaining) the VAT, as discussed in Sections III.C and V.B below.

One way of pursuing production efficiency and the taxation only of domestic consumption is by exploiting the equivalence between the VAT and other combinations of instruments. For instance, a destination-based VAT, levied on the difference between the domestic sales S of every firm and its purchases of material inputs (the latter comprising investment spending I and other material purchases P) is equivalent to a tax on the firm's wage bill W and combined with another on cash flow earnings $S-W-I-P$. (More precisely, the equivalence is with a destination-based, R-form cash flow tax: see Auerbach, Devereux and Simpson (2008)).²¹ Thus a VAT would be unnecessary if there were no constraints on the ability to tax labor income or destination-based cash flow profit. Conversely, such a cash flow tax might not be needed if a reasonably functioning VAT and wage taxation were available. It may nevertheless be optimal to deploy all instruments, including both a VAT and a cash flow profit tax, if—in similar spirit to the analysis of Boadway, Marchand and Pestieau (1994) mentioned above—evasion possibilities differ between them (Gordon and Nielsen, 1997).

The second way of pursuing these same two objectives would be deploying a retail sales tax (RST), which levies tax only at the point of final sale. (In the example of Box 1, for instance, the same final effect could be achieved by taxing, at the same rate of 17.5 percent, only the sales of Firm Y).

²⁰ Södersten (1999) provides an interesting historical account of the adoption of the VAT in Europe.

²¹ Or to an origin-based cash flow—in turn equivalent in present value, if the tax rate is unchanging, to a tax on pure profits combined with a levy on the initial capital stock (hence the notion of consumption taxation as bearing on 'old' capital)—and a subsidy to inflows from abroad. The flat tax of Hall and Rabushka (1983) is equivalent to an origin-based VAT, collected by the subtraction method, supplemented by the application of a single marginal rate to labor income (with a nonrefundable tax credit).

Since a VAT and RST are economically equivalent when both function perfectly, the choice between them must rest on the differential challenges for administration and compliance that they imply, and in the opportunities and incentives for evasion that they create. And here the key difference²² lies in the ‘fractional’ nature of the VAT, with tax in principle collected at each stage of production, compared with the single-stage nature of the RST.²³ Put simply, if the final sale of some commodity escapes tax, no revenue is collected under an RST; under the VAT, on the other hand, all that is lost is the tax on value added at that final stage, since tax (in principle) will have been collected on the final seller’s purchases. This means, of course, that in such circumstances the VAT does indeed tax intermediate transactions, which runs foul of the presumption for production efficiency created by the Diamond-Mirrlees theorem discussed above. Recall, however, that this result presumes that all final sales can be taxed. When they cannot, then, as noted by Newbery (1986), it is generally desirable to tax inputs as a surrogate for the missing output tax. And it is here that the VAT may do a particularly good job, since the unrelieved input tax is likely to arise precisely where, for some reason output tax is not charged.

This distinctive fractional nature of the VAT is a feature stressed by its practical advocates, and a prime consideration in arguing, along the pragmatic lines above, for substantial reliance on the VAT within the tax mix. But while influential in practice, the strength of this case for the VAT has received little analytical or empirical attention. Nor has the possibility of exploiting it still further. Keen (2006) notes, for example, that a uniform VAT taxes informal sector inputs at the same rate as formal sector sales, when one might in principle want to tax the former more heavily—which could be done by the use of some creditable withholding tax or other supplement on sales likely to be to informal sector operators. Such taxes are indeed quite common in emerging market and developing countries, but less so in developed. That is surprising, in that they are more likely to be able to implement the crediting needed to prevent such taxes becoming an additional burden on legitimate traders, but presumably reflects a lesser concern with informality issues. Indeed the trend in the EU (though not in the U.K., as noted later) has been to set low output tax rates on items potentially subject to informality, not high input rates. This aspect of indirect tax policy, in any event, is pursued no further here.

²² There are also likely to be differences in the number of firms that need to be subject to the tax, but it is not clear a priori whether this will be greater or less under the VAT: it will be greater in that all types of businesses, not just retailers, are brought into the tax, but less to the extent that the fractional nature of the VAT means that many small firms can be excluded from the system, by means of a registration threshold, without major revenue losses (a point explored further).

²³ This does not mean that revenue accrues to the government sooner under the VAT, since the same tax that is collected from the seller of some item used as an intermediate input is also (and quite possibly simultaneously) credited to the buyer.

Building on the fractional nature of the VAT, some suggest that—in its invoice-credit form—the VAT is ‘self-enforcing’ in the sense that each trader has an incentive to ensure that their suppliers have themselves properly paid output VAT, in order that they themselves can then claim an appropriate credit.²⁴ There is an element of truth in this. Certainly businesses registered for VAT can gain nothing (beyond perhaps some cash flow advantage) by purchasing inputs on an untaxed basis, since they are in any event able to claim credit or refund for any tax so paid. Indeed there is a strict advantage in purchasing from VAT-registered businesses, since unregistered businesses will be unable to reclaim the VAT they themselves have been charged on their inputs. Thus traders selling to other businesses may indeed wish to register to charge the VAT even if their annual turnover is below the threshold at which VAT registration is mandatory, and arrangements for such voluntary registration are a key part of any well-designed VAT. There is also a sense in which the VAT is self-correcting: if for some reason output VAT is not charged at some intermediate stage of production, proper payment by a trader later in the chain will replace that missed tax (since they then charge the proper output tax themselves, with their input tax credit reduced by precisely the amount of the output VAT that their suppliers should have charged but did not).

But the strength of these intrinsic features of the VAT should not be over-stated. It remains the case that those selling to private individuals and businesses not registered for VAT have similar incentives to sell without tax as under an RST, although muted to the extent that they have paid VAT on their own purchases. That is, while the VAT contains incentives for the formation of ‘good’ chains of compliant traders, it also contains incentives for ‘bad’ chains of non-compliance: de Paula and Scheinkman (2006) argue that the latter has been an important feature in Brazil, for example. Moreover, while registered traders have an incentive to ensure that their suppliers provide them with an invoice that the authorities will accept as establishing their right to refund or credit of input VAT, they have no incentive—unless specific requirements are imposed—to ensure that this tax has actually been remitted to the tax authorities. Furthermore, the credit and refund mechanism of the VAT creates its own opportunities for fraud, as we also discuss later.

Whether the VAT has proved to be a particularly effective form of taxation is, or should be, ultimately to some degree an empirical matter. But the question has received little attention. Such evidence as there is on the performance of the VAT (in Keen and Lockwood (2006a, b) suggests that it has indeed proved an effective form of tax: countries with a VAT, especially higher income countries, tend to have higher tax ratios—modestly, but significantly so—than

²⁴ At the opposite extreme, it is also sometimes claimed that the ability to cross-check invoices—verifying that every credit claim is matched by some payment of output tax—can make the VAT especially abuse-proof. While there is again an element of truth in this—invoices do indeed provide a useful trail for VAT auditors—this too can be overstated. Even with the developments in information technology in recent years, systematic massive cross-checking of invoices remains, at least for the present, effectively impossible.

those without, which is as one would expect if the VAT has had the effect of reducing the marginal distortionary and other costs of mobilizing tax revenue.

B. Key design features of the UK VAT

The design of a VAT requires a wide range of decisions as to its rates and coverage. This section reviews the central choices made in the UK. Those choices are constrained by a variety of EU rules on the common VAT: some key features of these, mostly as they relate to rate structure, are summarized in Box 2, and others will be set out and discussed below.

Box 2. EU rules on the value added tax

The common VAT rules, with the 1977 Sixth VAT Directive at their core and recently consolidated in directive 2006/112/EC, establish broad commonality in definitions on such core matters as taxable person, taxable event, and place of supply. Beyond this, particular rules apply to permissible rates and exemptions

Rates

With the adoption of the internal market in 1992, and fear that the removal of internal fiscal controls would out downward pressure on VAT rates, member states agreed not to set their standard VAT rate lower than 15 percent (a provision recently extended to 2010). Member states may set no more than two reduced rates: at no less than 5 percent on a positive listing of ('annex III') items and, on condition that competition is not distorted—in effect restricting the application to final sales—on use of electricity, natural gas and district heating.

As transitional provisions—until the adoption of a 'definitive' regime for the taxation of intra-Community trade, for which no date is set—member states are allowed to retain a variety of otherwise prohibited measures that were in place at the start of 1991: 'super-reduced' (including zero) rates applied for social reasons—by which means the domestic zero-rating in the U.K. survives—rates of less than 5 percent on Annex III items, and a reduced rate of no less than 12 percent (the 'parking rate') on non-annex III items. Many of the new EU members, of course, did not have a VAT in place at this date, and so are unable to benefit from this provision: they are required to be fully compliant by 2100 at the latest: Malta, for example, must by then remove its zero-rating of foodstuffs and pharmaceuticals, though there is no similarly unconditional obligation on the U.K.

Member states may also apply (until the end of 2010) a reduced to no more than three specified labour-intensive services (such as hairdressing, domestic service and the renovation and repair of private dwellings).

Exemptions

EU rules mandate several exemptions, including for: medical care, education, social welfare and cultural activities, financial services, and the letting of immovable property (with member states allowed, in the last two cases to provide taxpayers an option to be taxed—which the UK currently does for letting but not for financial services). Supplies by public bodies are also exempt (strictly, are outside the scope of the VAT) so long as this does not distort competition; a few member states provide for the refund of input VAT to such bodies in some cases, as the UK does automatically for local authorities, the government of Northern Ireland, and some other named bodies, and on a discretionary basis for others,

By way of background, Table 2 provides comparative information on key design characteristics for all OECD countries (other than the U.S., which of course does not have a VAT).

Rate structure

At 17.5 percent, the standard rate is around the OECD average and comfortably above the EU minimum of 15 percent. Indeed that minimum is currently binding for only one member state, Luxembourg. It is theoretically conceivable that a lower rate in Luxembourg would have induced the UK to set a lower rate (perhaps because other and larger countries might have been induced to do so), but this seems unlikely: certainly the most direct form of interaction between national indirect tax systems—smuggling and cross-border shopping—seems to be fairly limited in relation to the VAT.²⁵ Nor, by the same token, is there any evidence that the UK is constrained from further increasing the standard rate in a way that further increasing the EU minimum would ease.

²⁵ The main exception to this appears to be that between Germany and Denmark, with a differential in the standard rate that was 9 percentage points until the 2007 increase in Germany. Gordon and Neilsen (1997) estimate that this caused the former to lose only around 0.8 percent of its VAT revenue from cross-border shopping, though this was before the removal of fiscal frontiers and may have increased since.

Table 2. VAT Rates, Revenues and C-Efficiency in the OECD/1

	Standard Rate (percent)	Reduced Rates /2 (percent)	Threshold /3 (in USD)	C-Efficiency /4 (percent, 2005)
Australia	10	Zero	35,500	57
Austria	20	10, 12	34,40	60
Belgium	21	Zero, 6, 12	6,400	50
Canada	6	Zero	25,000	52
Czech Republic	19	Zero, 5	70,000	59
Denmark	25	Zero	5,800	62
Finland	22	Zero, 8, 17	9,700	61
France	19.6	2.1, 5.5	87,500	51
Germany	19	7	20,000	54
Greece	19	4.5, 9.0	11,500	46
Hungary	20	5	30,800	49
Iceland	24.5	Zero, 7	4,800	62
Ireland	21	Zero, 4.8, 13.5	63,000	68
Italy	20	Zero, 4, 10	8,000	41
Japan	5	-	80,600	72
Korea	10	Zero	None	71
Luxembourg	15	3, 6, 12	11,500	81
Mexico	15	Zero	None	33
Netherlands	19	6	2,200	61
New Zealand	12	Zero	26,300	105
Norway	25	Zero, 8, 14	5,600	58
Poland	22	Zero, 7	20,900	48
Portugal	21	5, 12	11,500	48
Slovak Republic	19	-	86,700	53
Spain	16	4, 7	None	56
Sweden	25	Zero, 6, 12	None	55
Switzerland	7.6	Zero, 2.4, 3.6	44,100	76
Turkey	18	1,8	None 4/	53
United Kingdom	17.5	Zero, 5	93,600	49
Unweighted average	17.7			58

Source: OECD (2008). Rates applying only in particular regions—such as the reduced rate applied in border regions by Mexico, and to overseas departments by France—are excluded.

1/ As at 1 January 2007 except for C-efficiency.

2/ 'Zero' indicates zero-rating of some domestic sales.

3/ This is the general threshold. Some countries apply a lower threshold to services.

4/ VAT revenue divided by the product of the standard rate and final consumption expenditure less VAT revenue.

4/ Small retailers and taxpayers taxed on a lump sum basis or exempt from personal income tax, and farmers, are not required to register. Personal income tax thresholds and conditions apply to VAT.

More striking than the level of the standard rate is that the U.K. VAT is marked by very substantial rate differentiation: domestic zero-rating is extensive (including notably most foodstuffs, children's clothing and residential construction), and a reduced rate of 5 percent is also applied to domestic power and energy, and a range of other items (such as contraceptives, certain energy-saving products, and children's car seats). HMRC put the revenue cost in 2007-8—the additional VAT that would be raised if tax were instead charged at the standard rate (ignoring any behavioural response)—at around £29 billion for domestic zero-rating (around 40 percent of this being from food, and around 30 percent from new dwellings) and £3 billion for the reduced rate (almost all of this being for domestic fuel and power). Exemptions are reckoned to cost another £12 billion (the largest item, accounting for over one-third of this, being financial services).²⁶ This compares to total VAT revenue of around £80 billion. It means that C-efficiency in the U.K.—the ratio of VAT revenues to the product of the standard rate and private consumption, which would be 100 percent for a textbook VAT levied at a uniform rate on all consumption (and comes close to that in New Zealand)²⁷—is very low by OECD standards.²⁸

It has been recognized for more than twenty years that the policy rationale for the zero-rating of food and children's clothing is extremely weak. Theoretical and empirical developments over the last twenty years, as reviewed above, have only confirmed these doubts. Our own empirical results, discussed above, do not provide any suggestion that differentially low rates on these items—or indeed any others—is warranted, given the availability of fairly flexible earnings-related instruments: most foodstuffs appear to be complements with leisure, by differentially low complementarity with leisure. The survival of zero-rating of food and children's clothing appears simply to reflect politicians' doubts of their ability to explain why a package involving its removal need not have a regressive impact: as discussed in Alt, Preston and Sibieta (2007), the commitment to this zero-rating appears to have become a signal of commitment to at least a moderately pro-poor policy.

²⁶ Table 1.5 at http://www.hmrc.gov.uk/stats/tax_expenditures/menu.htm

²⁷ The use and limitations of C-efficiency measures are discussed in Ebrill et al (2001) and OECD (2008), which relabels it the 'VAT revenue ratio.'

²⁸ The OECD calculations reflect a figure for VAT revenue substantially above that reported by HMRC: £83 billion for 2005 compared to £73 billion, the difference largely reflecting the treatment of refunding of VAT to public bodies.

The rationale for the reduced rate is also far from clear: to the extent that its original purpose is to mitigate ‘fuel poverty,’ such measures as the additional winter allowance or pensions provide reasonably well-targeted relief (though a strong case could be made for an element of income-relation). Indeed, there is some perversity in applying the reduced rate to both energy use and purchases of some energy-saving materials. The deeper issue here is the proper design of energy taxes, and similar mechanisms, such as cap-and trade systems along the lines of the EU Emissions Trading Scheme, to address environmental and other non-revenue concerns such as supply security (see Fullerton, Leicester and Smith, 2008). With these in place, there would be little case for differential treatment of final energy use; and without them, as at present, it is hard to make a case for rates on final use that are actually lower. Experience with this lower rate, into which an increasing and diverse number of items have been moved, also illustrates the further general experience that preferential treatment, once granted, tends to spread, and that in doing so the wider coherence of the tax system suffers. Quite why parents should pay no VAT when they buy clothes for their children but 5 percent when they buy them a car seat is by no means clear.

Indeed in a broader sense the extensive rate differentiation still found in the VATs of EU members is coming to look increasingly quaint. Most new VATs adopted in recent years have a single rate: not only in Australia and New Zealand, but also in developing countries, where the case for a single rate is actually weaker (because of a lesser ability to deal with the distributional implications through other instruments). Others, it seems, have learnt lessons from the EU experience that EU members themselves have not.

Experience also shows, however, that moving towards a uniform VAT rate structure is not easy once differentiation has been admitted (though there are some success stories: the Slovak Republic, for instance, unified its two distinct VAT rates in 2004²⁹). What will evidently be needed, to overcome distributional concerns, is the packaging of movement to uniformity with other reforms intended to neutralize the equity impact (just as in the Slovak Republic the VAT reform was part of a much wider package, including increased generosity of in-work support).

What might such a reform package for the U.K. look like? By way of illustration, consider applying the current standard rate of 17.5 percent to all commodities except housing and items currently exempt from VAT³⁰—eliminating, that is, the current reduced and zero-rate—and combining this with a 15 percent increase in all income support, income-based

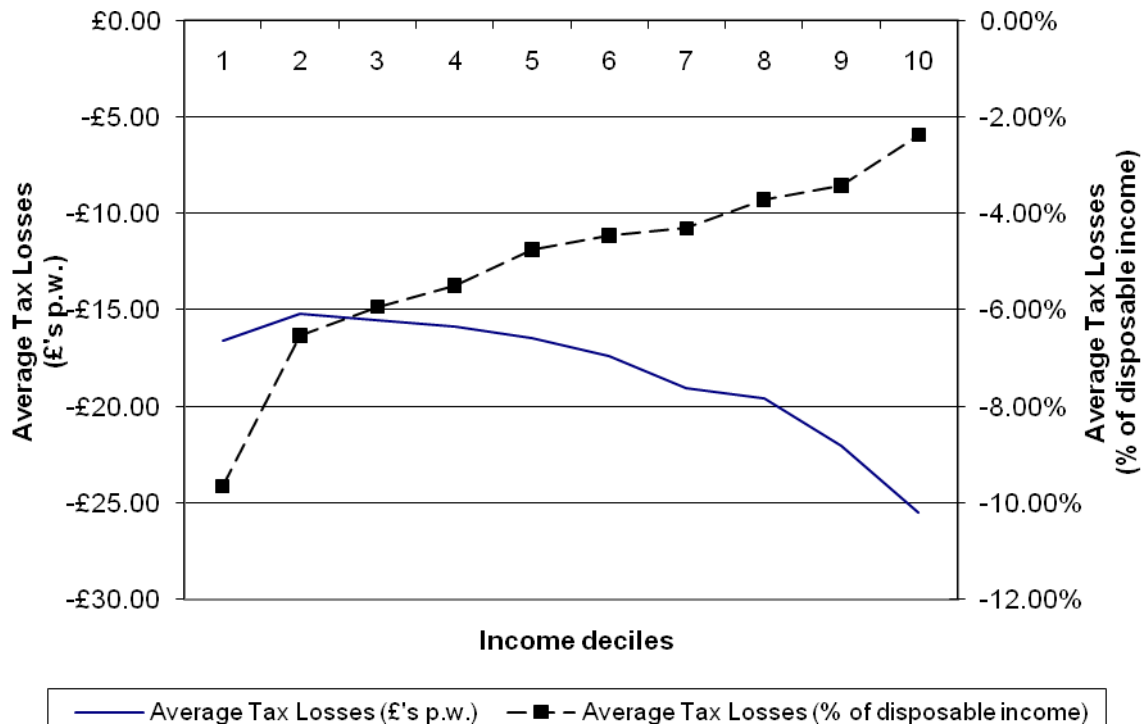
²⁹ But also reintroduced a reduced rate in 2007.

³⁰ This is in order to respect exemptions currently required under EU rules (though simulations not reported here show that these too could be removed as part of a rate-unifying reform with the same features as that in the text, protecting the poorest and increasing total revenue). The Insurance Premium Tax is kept at its current rate of 5 percent.

jobseeker's allowance and tax credit rates and in the associated housing benefit and council tax benefit thresholds.³¹

Figure 1 shows the implied change in VAT payments across the income distribution. As one would expect, the largest absolute financial losses (broken line, left scale) are found amongst richer households simply because they spend more on average on reduced- and zero-rated goods than do less well-off households. However, the increased VAT payments are a larger proportion of disposable income (right hand scale) at lower income levels, since the less well-off spend a greater proportion of their incomes on food and other items currently taxed preferentially.

Figure 1: Tax losses from unifying VAT rates at 17.5 percent



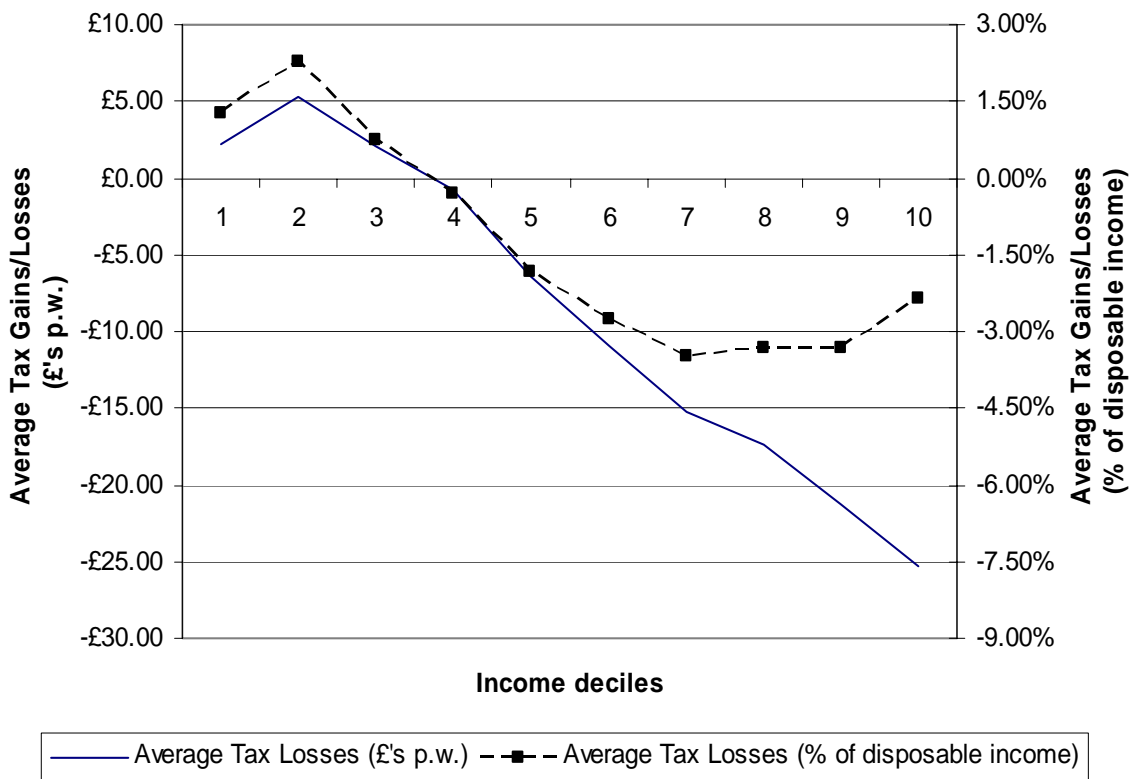
Note: Income decile groups (1=poorest, 10=richest) are derived by dividing all households into 10 equal-sized groups according to disposable income adjusted for household size and composition using the McClements equivalence scale.

Source: IFS calculations using the IFS tax and benefit microsimulation model, TAXBEN, run on uprated data from the 2005–06 Expenditure and Food Survey.

³¹ It is assumed that the incidence of the VAT reform is fully on retail prices and that of the compensating measures fully on net incomes.

When the compensating measures are combined with the VAT reform, however, the net impact across the income distribution is quite different, as shown in Figure 2. Households in the lowest income decile group, for example, gain on average about £2.50 per week whereas those at the top lose around £25 per week. It is not quite the case that those on lower incomes always gain more than those on higher—those in the second decile group gain more than those in the first—but the broad distributional impact is clear-cut: the poorest three-tenths gain on average while those on higher incomes tend to lose.

Figure 2: Distributional impact of the reform package



Source: IFS calculations using the IFS tax and benefit microsimulation model, TAXBEN, run on updated data from the 2005–06 Expenditure and Food Survey.

Note: Income decile groups (1=poorest, 10=richest) are derived by dividing all households into 10 equal-sized groups according to disposable income adjusted for household size and composition using the McClements equivalence scale. Uniform VAT rate excludes housing and non-insurance financial services: see text for details of the reform.

Importantly, the package implies a net increase in tax revenue: the VAT reform raises around £23 billion while the compensating package costs about £12 billion. If so desired, this £11 billion saving could be used to finance further pro-poor measures.

This package is intended to be essentially illustrative. Behind the aggregate effects shown in the figures are effects that vary across household type. The component of the package relating to child tax credit, for example, means that those with children tend to gain more than those without. There are also potential impacts on labour supply that are not included in the modeling here but would need to be considered in developing a fully formulated proposal. The key point, however, is that it is not difficult to find ways of compensating the losers from VAT rate unification, arriving at a package of reforms that improves both the progressivity and efficiency (including in terms of administration and compliance) of the overall tax system—and in the process provide revenue that could finance further desirable tax reductions.³²

Two other aspects of the VAT rate structure merit comment. First, the U.K. has notably not taken up the option under current EU rules (until 2010) to apply reduced rates to specified labour-intensive activities. Such rate reductions can be defended in principle on optimal tax grounds in terms of the arguments cited above for relatively low taxation of services readily self-supplied by consumers. Against this, of course, they carry the administration and compliance burden associated with increasing the extent of rate differentiation. And a recent assessment by the European Commission (2003) is skeptical as to the effectiveness of such provisions in increasing formal sector employment. It is difficult to make a compelling case that the U.K. has made a mistake in not taking up this option.

The second striking feature is that the U.K. is alone among OECD countries in zero-rating construction and sale of residential properties (residential letting is exempt). This creates a potentially significant distortion towards the consumption of housing services, and especially owner-occupation, of a kind that the U.K., to its credit, has carefully counteracted by eliminating mortgage interest deductibility. The underlying difficulty, of course, is that the consumption of housing services is not directly observable. The same problem arises to some degree with all durable goods, of course, and the standard if imperfect approach is to simply charge VAT at the first sale: since the price of a durable reflects the present value of the stream of services it is expected to yield, this amounts to prepayment of VAT on those services. The same approach can be adopted for housing, fully taxing the first sale of residential properties (as is already done in the U.K. for commercial properties).³³ Doing so in the U.K. would be permissible under EU rules, and is already done in Belgium and France, for example. The increase in (VAT-inclusive) house prices this would imply would create difficulties: first-time buyers would suffer, while owners of existing properties would enjoy a windfall gain. The former could be addressed by providing a (perhaps temporary) subsidy to

³² The overall impact of this reform on the non-housing RPI is modest, at around 0.35 percentage points

³³ Commercial letting is exempt, but with an option to tax. Thus arrangements for commercial property properly allow for the full operation of the VAT chain.

new buyers, as Australia did when introducing its VAT in 2000. The latter would be eliminated (and tax receipts increased) if the tax were instead levied on all house sales after some implementation date (since the same prepayment logic applies to the sale of old but previously untaxed houses).

The political resistance to moving away from the present extensive domestic zero-rating has proved formidable, to such an extent that it is hardly on the policy agenda. Moving instead to exemption might seem a tempting compromise. This is not only untransparent, however, but may not even reduce implementation costs (given the difficulties of dealing with partially exempt traders). Moreover, as argued next, strengthening the U.K. VAT requires less exempting, not more. More appealing would be to tax these items at (for some period) below the standard rate, perhaps moving them to the present reduced rate. Consideration could also be given to earmarking the proceeds, to pay not only for the compensation but some other popular items (including tax or social security reductions). Presenting VAT increases in this way has been considered in France and Japan, for instance, and recently done with success in Ghana (where resistance to the VAT has historically been particularly high). Against any political advantage of doing so must be weighed, however, the implied inflexibility in the use of funds—the absence of earmarking is one of the wider (if often unremarked) merits of the current U.K. tax system that should not be taken lightly.

Exemptions

Exemptions under the U.K. VAT are extensive, reflecting the EU law summarized in Box above and including most of what the OECD (2004) calls ‘standard’ exemptions.³⁴

Any exemption is anathema to the logic of the VAT, since it inherently breaks the chain of credit and refund, leading to an element of production taxation. The consequent distortions can take a number of forms. These include an incentive to self-supply (banks providing security services in-house, for example, so as to avoid unrecovered VAT if hiring the services from others), distortions of competition (as financial institutions across the EU face different input costs as a consequence of being charged different rates on their inputs, this effect also cascading into the costs of business using those services; and as exempt public services compete with taxable ones provided by the private sector), and a bias towards imports (since these will have been freed of VAT in the country of export). They also create additional administration and compliance burdens (and opportunities for tax planning) through the need to allocate input VAT between taxable and exempt outputs (credit being available for the former but not the latter) for producers selling both. As Bird and Gendron

³⁴ These include: postal services; hospital and medical care; dental care; charitable work; education; non-commercial activities of non-profit making organisations; sporting services; cultural services (except radio and television broadcasting); insurance and reinsurance; letting of immovable property; financial services; betting, lotteries and gambling; supply of land and buildings; and certain fund-raising events.

(2007) note, there is little firm evidence on the quantitative importance of these distortions. The rebating of input VAT to local authorities and similar bodies in the U.K. may limit those from the exemption of public bodies (the revenue impact of which may also be fairly modest, since full taxation means one part of government paying taxes to another). There is though every sign that these are serious concern in the financial sector, and certainly its sheer (and increasing) size—Zee (2006) reports that it accounts for 30 percent of GDP—suggests that the risk of distortion deserves serious attention.

These standard exemptions are to a large degree the hallmark of ‘old’ VATs—such as that laid down for the EU has become. They reflect outdated presumptions on the arrangement of economic activity—a vision of a large public sector largely insulated from competition with private operators—and, to a large, degree, a failure to recognize that the logic of the VAT can be applied to these items. Aujean, Jenkins and Poddar (1999), for instance, explain how the public sector can be brought fully into the VAT system, and New Zealand in particular now largely does this (even charging VAT on public subsidies used to provide goods and services without charge). There is a very strong case, as argued by Cnossen (2003, 2008) for eliminating many of these exemptions. These are not matters, however, on which the U.K. can act unilaterally (or on which we have much to add), so we simply refer the reader to the cited sources, and the general treatments in Ebrill et al (2001) and Bird and Gendron (2007), for discussion of how the common rules might usefully be restructured.

There is though one aspect of such importance, for reasons noted above, and so central to this wider review of the tax system, as to require some comment, This is the VAT treatment of financial services.³⁵ Those charged for in the form of a fee raise no conceptual difficulty—they can and should be fully taxed, though in practice it seems few do so as a general principle (South Africa being an exception).³⁶ The difficulty arises for those charged for as a margin, between bank’s borrowing and lending rates, for example. The choice of exemption in the EU³⁷ to a large degree reflected an inability to see how (continuing with that example)

³⁵ Some have argued that financial services should not be taxed on the grounds that they do not represent consumption since they do not enter the direct utility function. This now seems largely discredited: we have no idea what the arguments of final utility are. Boadway and Keen (2003) review the theoretical arguments in this area.

³⁶ One reason for this, as noted by Zee (2006), may be concern that different approaches to the taxation of financial services paid for by fee and those paid for implicitly in a spread is the risk of financial institutions arbitraging between the two. McCann and Edgar (2003) argue that the scope for this is likely to be limited in practice, though the issue remains open.

³⁷ Many other approaches have been adopted: see for instance Bird and Gendron (2007) and Zee (2006). Some—notably using fixed coefficients to simplify the allocation of inputs to taxed and exempt activities (as, in somewhat different ways, do Australia and Singapore)—seem likely to be superior to exemption. Other than outright zero-rating, however (which to large degree gives up on the basic objective of taxing financial services entering final consumption), only the cash flow method about to be described fits within an invoice-credit VAT.

that margin could be broken down into value provided to depositor and borrower, as appeared to be necessary if only that part accruing to any households involved in the transaction is to be taxed. Following Poddar and English (1997), however, it is now understood that such transactions can be properly brought into an invoice-credit VAT by treating all cash inflows to those providing financial services (including principal amounts) as reflecting VAT-able sales to customers, and treating all cash outflows (including loans made) as the purchase of inputs carrying creditable VAT. Intuitively, this ensures that all flows involving registered traders are subject to a tax that is fully credited; the revenue that remains thus derives from transactions involving households.

This approach offers straightforwardly for some financial transactions, not only those charged for as an explicit fee but also term insurance (see for instance Box 8.1 in Ebrill et al (2001)), and is in such cases already applied in some of the more modern VATs, such as those of Australia, New Zealand and Singapore. The literature has struggled, however, to find simple ways of administering such a system for other intermediation services. One possibility, suggested by Huizinga (2002) and Poddar (2003), is to zero rate all transactions with registered businesses—as is now done in New Zealand—while providing cash flow treatment of transactions with households, so that responsibility for remittance falls on the financial institution). While this would require financial institutions to be able to distinguish between registered and non-registered customers, that is a distinction which is not only already made in many cases but is also inherent in a wider approach to VAT redesign, the ‘VIVAT,’ that we shall argue later has appeal on quite different grounds. The essence of the VIVAT is that all sales to registered traders be taxed at a common EU rate, while other sales are taxed at the final rate specified by each member. The arrangement just described fits well into such a system: all that is needed is apply a common intermediate rate of zero on financial services transactions involving unregistered traders and tax provision to non-registered traders, at the final rate specified by each country, and on a cash-flow basis. Box 3 illustrates how this would work.

Box 3. Cash Flow Treatment of Banking with Zero-Rating of Transactions with Businesses

Consider first the case of a bank that deals only with households. In period 1, one household deposits £1,000 and another borrows the same amount. In period 2, the latter repays the loan with interest at 15 percent and the former withdraws the principal with interest at 5 percent. The VAT rate is 10 percent.

The VAT consequences in period 1 are that the bank remits £100 in respect of the deposit (10 percent of £1,000), this being treated as a taxable sale, but receives a credit of £100 in respect of the funds it loans out, treated as a taxed purchase. In period 2, repayment of the loan creates a VAT liability of £115 (10 percent of principal and interest of £1,150) while withdrawal of the interest-augmented deposit gives a credit of £105 (ten percent of £1,050). The only net VAT collected, all in period 2, is thus £10. This is equal to the product of the VAT rate and the entire value of the bank’s spread (£100)—which is as should be, since in this case the entire value of the intermediation service provided by the bank in this case accrues to final households.

Now suppose that the borrower is a registered trader. With transactions involving the borrower then zero-rated,

and so triggering no tax payment, all that remains is the payment of £100 in period 1 and credit of £105 in period 2.³⁸ Denoting by R the interest rate available to the government, the net revenue effectively collected, in period 2 equivalent, is ten percent of $(R-0.05) \times £1,000$. In effect, the intermediation services enjoyed by the depositor are valued, and taxed, at the excess of the government's discount rate over the deposit rate.

In terms of equivalences of the kind discussed in Section II.A, such a VIVAT form of cash flow tax would be closely related to the R+F destination based cash flow tax discussed in Auerbach, Devereux and Simpson (2008). It would not quite be equivalent, at firm level, to such a tax (combined with a wage tax), since it would exclude cash flows related to financial services purchased by registered businesses. Summed across firms, however, these flows net to zero, so that such an equivalence would apply at an aggregate level.

There are evidently many challenging practical issues to address before a scheme of this kind could be firmly recommended. But the potential benefits appear significant, not only in terms of easing distortions but also in simple revenue terms. A priori, it is not clear whether such a system (or any form of cash flow treatment) would lead to an increase in VAT revenue (since the unrecovered tax on financial sector inputs under the present exemption system, amplified by further cascading into the taxable value of other commodities, could exceed that due on the value enjoyed by final consumers). In practice, however, it seems likely that it would. For the EU as a whole, Huizinga (2002) estimates, such a scheme would raise an additional €12 billion, while for Germany alone Genser and Winker (1997) estimate a net increase of DM 10 billion (€5 billion).

The threshold

One particular form of exemption is that, de facto, of businesses falling below the VAT threshold (unless, as discussed above, they choose to register voluntarily). At £61,000, the threshold in the U.K. is the highest in the OECD (Table 2). But there is also evidently massive variation in VAT thresholds, some countries having none at all. The natural question is whether the U.K. has set it too high.

³⁸ This simplifies, in that payment of the tax on deposit leaves only £900 available for loan. But this is inessential: taking account of the absence in this case on any tax on the repayment of the loan, it is readily verified that, given the credit on the depositors' withdrawal of £1,050, the bank earns £1,150. Alternatively, arrangements might be put in place (along the lines of the Tax Calculation Account (TCA) of Poddar and English (1997)) to defer (with interest payable) remittance of tax on inflows from households until the credit in respect of withdrawal becomes available. Note too that zero-rating transactions with registrants eliminates any need for TCAs by or on behalf of registered businesses, which has been seen as a major compliance obstacle to cash flow taxation.

Since any threshold distorts competition between those above and below it, the only rationale for excluding smaller businesses from the tax is to save administration costs to the authorities and compliance costs to the taxpayer. Against this, of course, must be weighted the revenue foregone³⁹ by excluding those businesses from tax. Box 4 sets out a simple framework for thinking systematically about these trade-offs. It shows too that inserting plausible parameter values (for implementation costs and the social value of tax revenue), a threshold at the U.K. level is not hard to rationalize.

Box 4: Setting the VAT threshold

For a benchmark case in which these costs, A and C respectively, are independent of firm size, Keen and Mintz (2004) show that trading off the implementation costs saved and the revenue foregone by excluding some from the VAT implies an optimal VAT threshold of:⁴⁰

$$z^* = \frac{\delta A + C}{(\delta - 1)\tau\nu} \quad (1)$$

where δ denotes the marginal cost of public funds, τ the rate of VAT and ν the ratio of value added to turnover. None of these parameters is known with great certainty. But supposing, for illustrative purposes, that the marginal cost of public funds is 1.2, administration and compliance costs £120 and £600 respectively,⁴¹ then with a VAT rate of 17.5 percent and a ratio of value added to sales of 30 percent, the implied VAT threshold is about £57,000—less than at present, but a similar order of magnitude. Lower values of the marginal cost of public funds, of implementation costs, or of the ratio of value added to sales, would give figures closer to the actual. While this suggests that the U.K. value is well within the bounds of the plausibly optimal, it should be noted that the value implied by (1) is quite sensitive to parameter values: changing the marginal cost of public funds to 2.0, for example, the optimal threshold falls to around £16,000.

³⁹ Although exemptions may in general increase rather than reduce revenue, small traders in the middle of the chain will generally find it advantageous to register voluntarily. The expectation is thus that a threshold will lose revenue.

⁴⁰ The underlying intuition is simple. The social benefit from slightly increasing the threshold from some initial level of Z is the saving in compliance costs C and the administration costs A , with the latter, since it is financed from distorting tax revenue, being weighted by the marginal cost of public funds, all multiplied by the number of taxpayers $f(Z)$ taken out of the VAT. The social cost is the revenue foregone, $\tau\nu z$, multiplied by the excess of the marginal cost of public funds over unity (the reduction in revenue being a private gain) and, once more, that number of affected taxpayers. Equating these marginal social cost and benefit to characterize an optimal threshold z^* , the result in (1) follows.

⁴¹ A recent study of tax compliance costs in the UK by KPMG (2006) implies an average VAT compliance burden per registrant of £562 (combining figures in tables 3 and in section 3.3.4). Another for New Zealand (Colmar Brunton, 2005) implies a cost in terms of internal time alone (so neglecting bought-in advice and equipment) of around £660 (though varying fairly substantially, if not entirely systematically, with firm size). It seems unlikely that it is cheaper to comply with the relatively complex U.K. than with the simpler one in New Zealand, so that £600 seems a reasonable order of magnitude. Earlier estimates by Cnossen (1994) suggest administrative costs of around 20 percent of compliance costs: hence the £120 figure.

The simple rule set out in the Box ignores many potentially important considerations. Implementation costs are likely to vary with firm size, for example, and account must also be taken of the inefficiencies created by distorting competition between firms of different size and potentially inducing artificial splitting to remain below, or simply discouraging expanding firm size above, the threshold.⁴² This raises important questions, as Bird (2008), points out, as to whether some simple ‘replacement’ for the VAT should apply to those below the threshold (which may itself affect where that threshold should be).⁴³ These considerations significantly complicate the analysis, with the distribution of firm size, for example, playing an important (and theoretically ambiguous) role. Simulations by Keen and Mintz (2004), however, tend to point to thresholds optimally higher than that implied by (1); the somewhat different model of the determinants of firm size in Zee (2005), on the other hand, points in the opposite direction.⁴⁴ Further considerations, awaiting closer analysis—such as the propagation of beneficial VAT chains of the kind described above—may point to lower thresholds. But others, such as the need to control registration as a defence against carousel and other fraud (as discussed below) point to higher. There is good reason to suppose that the relatively high threshold should be counted as a strength of the U.K. VAT.

C. VAT enforcement and compliance issues

Like all taxes, the VAT is subject to evasion. For example, traders large enough to be liable to register may fail to do so, they may under-report sales, or, where different goods are subject to tax at different rates, they may misclassify sales into the category subject to a lower rate of tax. As discussed above, the fractional nature of the VAT in some respects reduces its exposure compared with other systems of sales taxation.

In other respects, however, VAT offers distinctive opportunities for evasion and fraud, especially through abuse of the credit and refund mechanism. Revenue may be lost through exaggerated claims for credit for VAT paid on inputs. Moreover, the opportunity exists for outright fraud through the construction of business activities with the sole purpose of

⁴² KPMG (2006, Annex C p.4) report that some firms interviewed indicated a deliberate decision to keep their size below the VAT threshold.

⁴³ For discussion of this, and more generally of the potential importance of the VAT threshold in anchoring the tax treatment of SMEs, see International Tax Dialogue (2007).

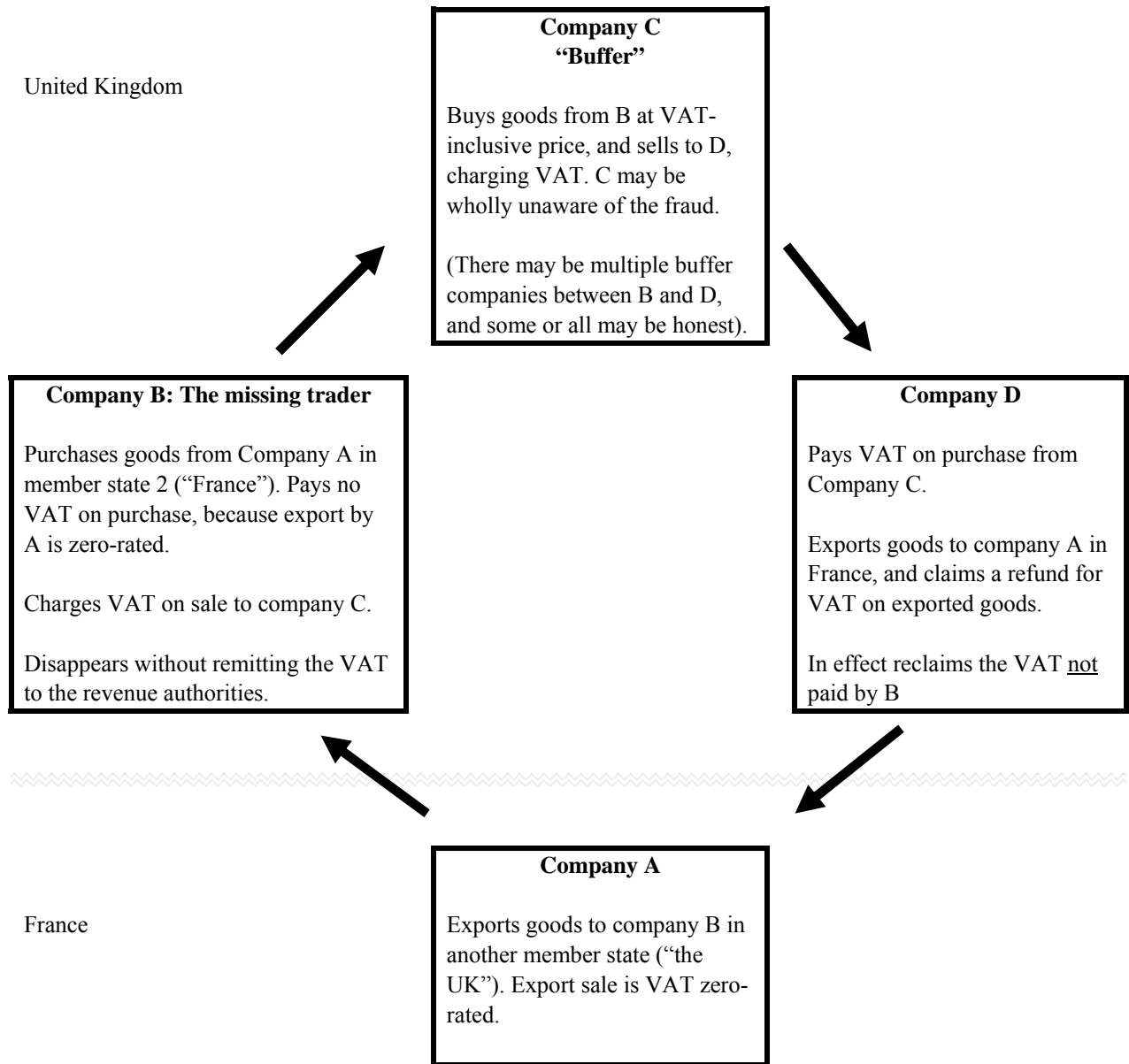
⁴⁴ Both Keen and Mintz (2004) and Zee (2005) have firms differing in underlying productivity, the former have them producing a homogeneous product whereas the latter has them producing Dixit-Stiglitz substitutes. Dharmapala, Slemrod and Wilson (2007) explore the same issue in a model with endogenous entry and exit; the likely quantitative implications for the optimal threshold, however, remain to be analysed.

defrauding the exchequer, because some categories of business can be entitled to net refunds of VAT from the revenue authorities. These include firms selling predominantly zero-rated goods that are due refunds of input VAT. The extensive domestic zero-rating means that refunds are particularly extensive in the U.K., at around 40 percent of gross VAT receipts (Harrison and Krellove, 2005). Little is known about the extent to which domestic zero-rating gives rise to fraud problems. The zero-rating of exports, however, has clearly become a significant source of difficulty.

Particular attention has come to be paid to ‘Missing trader intra-community’ (MTIC) frauds, which abuse the refunding of VAT to exporters by means of a series of contrived transactions. Figure 3 provides a simple example of a ‘carousel fraud,’ the best known example. The two key features of the VAT that this exploits are the zero-rating of exports and the system of ‘deferred payment’ for VAT on imports from other EU member states, adopted in the EU since the removal of fiscal frontiers in 1992.⁴⁵ Under deferred payment, VAT on imports from one member state into another is levied not at the border but at the time of the importer’s next periodic VAT return. As a result, there may be a considerable time lag between the date at which the importing firm (Company B in the example) brings the goods into the U.K. and the time at which the VAT authorities seek payment of the VAT due. In the meantime, the goods are sold on, via complicit—or perhaps unwitting—‘buffer’ companies in the UK, to Company D, which exports the goods, claiming a refund of the

⁴⁵ There are indications that the general level of VAT revenue losses rose by about one-third by the mid-1990s compared with pre-1992 levels (see Table 2.1 of HM Customs and Excise, *Measuring Indirect Tax Losses*, 2002, <http://www.hm-treasury.gov.uk/media/389/E5/admeas02-297kb.pdf>). It is unclear what has sparked the recent sharp growth in organised, large-scale fraud.

Figure 3. Carousel Fraud: A Simple Example



VAT paid when it purchased the goods from Company C. In the basic carousel illustrated, the exported goods are then re-imported by Company B—or more likely a new firm, B having gone missing—and so on, following a cycle in which VAT refunds are claimed repeatedly whenever the goods are exported, while the corresponding import VAT liability accumulates but is never paid. This example is extremely simple. In practice, the basic structure of the fraud may be obscured by the use of buffer companies that may or may not

be complicit. Moreover, innovation has been a constant feature of these forms of fraud, as those perpetrating them seek to stay one step ahead of the authorities' ability to detect fraudulent transactions.

Key design features of the VAT system influence the extent to which it is exposed to systematic missing trader frauds. These include the extent to which the system allows intending missing traders (such as Company B in Figure 3) to register for VAT, and the relative timing of VAT payments and receipts. These design features play a critical role in allowing or preventing revenue loss through carousel fraud. *Ex post* audit and investigation, while important, is unlikely to forestall considerable loss of revenue, because the essence of the fraud is that money is made quickly, in the time gap before the missing trader is required to remit the VAT it has supposedly charged on its sales. Once the money has disappeared into the complex web of transactions, tracing and recovering unjustified VAT refunds becomes time-consuming and costly.

Other than more vigorous investigation, two broad approaches may be taken to designing-out the opportunities for fraud based on current treatment of trade between EU member states. One is essentially administrative, in the sense that it retains the zero-rating of intra-community supplies. The other, more fundamental to the structure of the tax itself, removes export zero-rating altogether.

Administrative measures that could be taken while maintaining the current VAT design include, for example: tighter checks on firms seeking to register for VAT (for example, with an on-site visit) and requiring guarantees in dubious cases; slowing down the payment of VAT refunds relative to the collection of VAT due (although this can impose severe cash-flow burdens on legitimate businesses); adopting or strengthening joint and several liability rules by which traders can be held responsible for fraud elsewhere in the chain that they might reasonably have been expected to be aware of; and establishing better and quicker information exchange between national tax authorities (so that the country of import can become promptly aware that exports to it that have been reported in another member state have not shown up in its own VAT system). However, while measures of this sort may reduce the risk of VAT fraud, they clearly have undesirable side-effects. More bureaucratic VAT registration procedures and slower payment of VAT refunds might harm legitimate businesses as well as discouraging fraud, for example, and these effects may outweigh the enforcement gains. The authorities have a difficult balance to strike, between ensuring that VAT administration does not impose excessive burdens on business in general and ensuring that it is not unduly exposed to fraud. Some level of VAT evasion has to be tolerated in the wider business interest.

More radical measures within the context of a system that preserves zero-rating of intra-community exports include:⁴⁶

- The use of ‘reverse charging’, by which liability in a business-to-business (B2B) transaction is placed on the buyer rather than the seller. This would close the carousel fraud in Figure 3.2 by making the VAT due on the sale by B (the missing trader) the responsibility of the buyer, C. In turn, the tax due on the sale from C to D would be the responsibility of D. The zero-rating of the subsequent export sale would then offset D’s tax liability on its purchases from C, reducing the tax payment by D but not requiring outright refunds. The opportunity to make fraudulent gains by claiming refunds of tax that have not in fact been paid would thereby be eliminated. The UK recently received EU approval to apply reverse charging for mobile phones and computer chips, both having proved popular instruments for carousel fraud, but member states have yet to agree on whether this should be permitted. More radically still, Austria and Germany have proposed allowing reverse charging for all B2B transactions above a certain size (€10,000 in the case of the Austrian proposal and €5,000 in the German proposal). The proposals differ in terms of the scale of the reporting obligations placed on firms and their customers: the German proposal would require both parties to a B2B transaction to report it to the tax authorities, and electronic cross-checking of this information, while the Austrian proposal would place fewer reporting burdens on firms.

The difficulty of reverse charging limited to certain products—as proposed by the UK—is that MTIC frauds may simply move on to other goods, not covered by reverse charging. There would also be new enforcement issues, at the ‘boundary’ between commodities subject to reverse charging and those subject to ‘normal’ VAT. Universal reverse charging, as proposed by Austria and Germany, avoids these difficulties. But it also, in effect, turns the VAT into something closely akin to a single-stage retail sales tax, with tax payments suspended until goods are sold to final consumers (albeit with the possibility of cumbersome reporting procedures for B2B transactions). The danger of this is obvious: it undermines the fractional nature of the VAT and instead collects all VAT revenue at the final sale, so exposing the system to substantially greater risks of revenue loss through unreported sales to final consumers. In effect, the VAT would be converted into an RST. Extensive reverse charging might help to stem losses from MTIC frauds, but would also expose the VAT to other risks of revenue loss through more mundane forms of evasion.

⁴⁶ There are others not discussed here, such as the ‘prepayment VAT’ (PVAT) of Poddar and Hutton (2001), under which goods would not be shipped without adequate guarantee of payment of import VAT. Ainsworth (2007) attempts an exhaustive listing.

- ‘Reverse withholding’ schemes would tackle VAT frauds in a broadly similar way to reverse charging, by requiring the purchaser in a B2B transaction to make a direct payment to the authorities of part or all of the VAT due on its purchase. The difference is that the seller would remain liable for output VAT, receiving a credit for the amount withheld by the purchaser. Depending on the proportion of the VAT that the purchaser is required to withhold, this would diminish or even eliminate the scope to generate revenues through fraudulent refund claims, since exporting firms will themselves have paid part or all of the VAT on their purchases that they subsequently reclaim on export. The principal drawback of reverse withholding (which is quite common in Latin America but untried in Europe) would be its administrative complexity (which arises because of the need to ensure that the seller is given credit for withholding only when this has actually taken place) and the increased likelihood that traders will be due a refund (because of the reduced output tax they pay).
- Adoption of a system of ‘VAT accounts’, under which traders would be required to open a distinct bank account into which they would transfer the amount of VAT charged to their customers. VAT refunds would only be paid if the authorities were able to verify that the corresponding VAT payment had been made. This has been proposed by Sinn, Gebauer and Parsche (2004) as a solution to the problem of VAT fraud, and a system of this sort has been tried in Bulgaria. The key feature is that it requires the VAT payment to be made *earlier* than in the present system, so that when refunds are paid, they can be checked against past payments made. Apart from this matter of timing, however, it does not fundamentally alter the situation. It is not clear that cross-checking refund claims against past payments to a bank account would be any easier, or more reliable, than checking that past payments have been remitted to the revenue authorities themselves. The scheme also eliminates the cash flow benefit that firms’ enjoy (providing some offset to their compliance costs) by retaining VAT collected until the next periodic payment becomes due. Reflecting these difficulties, Bulgaria has decided to remove its VAT account system.
- The compulsory use of a third party to guarantee VAT payments, either in general or for particular sectors, as set out by Ainsworth (2006). In the example set out in Figure 3, Company B, the future missing trader, would be required to obtain a guarantee that its VAT payments would be made. The principal difficulty with this is the cost involved; it is far from clear that banks or other potential guarantors would be any better placed than the revenue authorities to prevent firms disappearing with outstanding VAT liabilities, and the premium required to cover this risk would place substantial burdens on honest firms operating in the sectors most subject to VAT fraud.

These various administrative solutions all have weaknesses, either in creating other opportunities for fraud and/or in increasing taxpayers’ compliance costs. A more durable

solution to the problem of missing trader fraud requires a fundamental redesign of the VAT treatment of international transactions. The opportunity to claim fraudulent VAT refunds arises principally because of the break in the VAT chain that occurs as a result of the zero-rating of exports; and the break occurs at an especially vulnerable point in the chain, where control passes from one national tax administration to another. Export zero-rating requires substantial amounts of VAT receipts to be paid back as refunds, and a system that requires refunds on such a large scale creates opportunities for correspondingly large-scale revenue fraud. Ending VAT zero-rating for trade between EU member states would sharply reduce the scale of refunds and eliminate some of the most tempting opportunities for missing trader frauds. We discuss ways in which this could be done in Section IV.2 below.

IV. EXCISE TAXES ON ALCOHOL AND TOBACCO

The UK, in common with all EU countries, applies excise taxes,⁴⁷ as well as VAT,⁴⁸ to three principal groups of goods: motor fuels, tobacco products and alcoholic drinks. The scale of these taxes varies widely across the EU (Table 3). In the case of all three, UK excise rates are at the top end of the range, and their revenue contribution is significant: some £40 billion in 2006-07 (8.2 percent of total revenues), of which more than half (some £24 billion) was from motor fuel taxes, with £8 billion each from tobacco and alcoholic drinks. As noted earlier, however, the period since *Meade* has seen a substantial reduction in the importance of the excises as a source of revenue. Intellectually too, they have—until recent years—been out of fashion. What role, if any, remains for excises within the modern tax system, and on what basis should they be levied?

This section focuses on alcoholic drinks and cigarettes: The taxation of motor fuels is discussed in the separate chapter on environmental taxation (Fullerton, Leicester and Smith, 2008).

⁴⁷ By an ‘excise’ we mean a single-stage sales tax applied to a limited group of commodities. The UK excises on alcoholic drinks and tobacco products discussed here are levied at the wholesale stage, with production and movements of these goods before the excise is levied subject to close monitoring and control by the revenue authorities. The UK also levies single-stage sales taxes on a number of other goods and services, including gambling, insurance premiums and airline tickets, which for practical or historical reasons are not covered by VAT, and also levies some environmental taxes which are basically single-stage excises on certain goods and services including landfill use and quarried aggregates such as gravel. EU rules govern the structure and, to some extent, the rates of the three principal excises—on alcohol, tobacco and mineral oils—and also discourage proliferation of additional new excises. Nevertheless, some EU members, notably Denmark, have historically levied excises on a much wider range of goods and services, and continue to do so.

⁴⁸ VAT is levied on the price of the product, including the excise. This sequencing make no difference when excises are ad valorem, but when they are specific preserves the (potential) role of the VAT as a generalized tax on consumption in the sense that a uniform change in the VAT rate applied to all commodities then leaves their relative consumer prices unchanged.

Table 3. Excise Duty Rates in the UK and the EU, July 2007 (in euros)

Member state	Cigarette excise per pack of 20	Specific excise as % of total tax	Beer per litre, at 12.5 degrees Plato	Still wine per 75 cl bottle	Spirits per 70cl, 40%
Belgium	2.29	11	0.21	0.47	4.91
Bulgaria	0.70	7	0.10	0	1.57
Czech Rep.	1.16	42	0.11	0	2.62
Denmark	2.29	54	0.34	0.82	5.63
Germany	2.81	46	0.10	0	3.65
Estonia	0.70	39	0.19	0.66	2.72
Greece	1.61	5	0.14	0	3.05
Spain	1.53	9	0.11	0	2.32
France	3.20	8	0.13	0.03	4.06
Ireland	4.28	55	0.99	2.73	10.99
Italy	1.99	5	0.29	0	2.24
Cyprus	1.69	20	0.24	0	1.70
Latvia	0.52	43	0.09	0.43	2.53
Lithuania	0.55	54	0.10	0.43	2.60
Luxemburg	1.76	15	0.10	0	2.91
Hungary	1.00	45	0.25	0	2.40
Malta	2.20	12	0.09	0	6.52
Netherlands	2.28	50	0.25	0.59	4.21
Austria	2.00	21	0.25	0	2.80
Poland	0.91	35	0.22	0.34	3.21
Portugal	1.86	49	0.17	0	2.68
Romania	0.83	39	0.09	0	2.10
Slovenia	1.28	20	0.34	0	1.95
Slovakia	0.91	52	0.17	0	2.12
Finland	2.40	10	0.97	2.12	7.91
Sweden	2.45	18	0.79	2.37	15.04
UK	4.97	52	1.01	2.63	8.08

Source: Authors' calculations from data in *European Commission Excise Duty Tables* ref 1.025 (July 2007), downloaded from http://ec.europa.eu/taxation_customs/index_en.htm#.

The case for higher taxation of alcohol and tobacco does not immediately entail the use of completely separate additional taxes for these commodities. Why not, instead, implement such differential taxes by differential VAT rates? There are three main reasons. First, excises are a natural way of correcting for damages that arise from the use of the commodity in production as well as in final consumption; by contrast, higher VAT on production inputs would do little to alter the behaviour of VAT-registered producers. Second, in so far as there is a strong case for taxing some commodity on a specific rather than ad valorem basis, this can be implemented more easily with a separate excise. Third, very high tax rates create

particular enforcement risks that call for physical controls beyond the book-based enforcement on which the VAT is based.

A. Revenue-raising efficiency in the taxation of tobacco and alcohol

Leaving externality arguments aside for the moment, are the characteristics of demand for these commodities such as to call for above-average taxation on standard optimal tax grounds? The question is often posed in terms of the presumption that commodities with low own price-elasticities of demand provide a relatively efficient revenue source. But, as discussed in Section II.B, this simple inverse-elasticity rule applies only as a very special case of the optimal tax problem in which all individuals are identical (and, for some reason, lump sum taxes cannot be applied). When individuals differ only in their earnings ability and a nonlinear income tax is available in addition to potentially differentiated commodity taxes, the key demand characteristic relevant to revenue-raising efficiency is the degree of complementarity/substitutability with leisure. Is there any reason to believe that cigarettes and/or alcoholic drinks are particularly (relatively) complementary with the leisure (in the sense, more precisely, that, conditional on a given level of total expenditure, those who supply more market labor will smoke or drink less)?

It is unclear, a priori, whether cigarette consumption is likely to be a complement with leisure or a substitute. For some people smoking be a leisure-time pursuit; for others, it may help with the stresses and social interactions involved in working; for some it may be both. The overall relationship between cigarette consumption and labour supply cannot be resolved on the basis of a priori reasoning. Systematic empirical evidence is sparse. Parry (2003) notes that, while some studies have suggested a slightly negative income elasticity of demand for cigarettes, it is difficult to infer much about complementarity or substitutability with labour supply from this; he suggests that workplace smoking restrictions might be a reason to believe that smoking and working may not be complementary. A similar conclusion emerges from the results from Crawford, Keen and Smith (2008) reported earlier in this paper, which suggest that labour supply and tobacco spending are modest substitutes, with an effect that is statistically-significant, but relatively small.

Overall, the evidence is far from overwhelming, and its reliability is greatly compromised by the sharp socio-economic differences in smoking patterns which have emerged in most countries in recent years. In the current state of knowledge it is unlikely that cigarette consumption is sufficiently-complementary with leisure to warrant high taxation on these grounds alone, though as Parry (2003) finds, different values for the relative substitution between cigarettes and leisure, within a relatively moderate range, can make a considerable difference to the estimated optimal tax on cigarettes.

The relationship between alcohol and the labour/leisure choice is also likely to be complex. More leisure means more time to consume alcohol and also reduces the risk that the

consequences of over-consumption (hangovers and so on) will negatively affect work performance. On the other hand, some level of alcohol consumption may be complementary with time spent working (and hence a leisure substitute), either because drinking helps workers unwind after a stressful day or because of social drinking and networking with colleagues. The balance between these two effects may vary with individual alcohol consumption. At low consumption levels, alcohol may be complementary with work, but at higher levels it may be complementary with leisure. The results from Crawford, Keen and Smith (2008) reported earlier for two categories of alcoholic drinks, ‘beer’ and ‘wines and spirits,’ show a positive and significant relationship between their budget shares and hours worked, suggesting that both are, on average, leisure substitutes rather than complements. This result should, however, be viewed with some caution, as it is well-known that alcohol expenditure is under-reported in UK household budget surveys, particularly because of under-representation of high consumers. If the relationship between alcohol consumption and labour supply is very different among heavier drinkers than the rest of the population, then the estimates will be biased by the omission of high consumers. Nevertheless, and as with cigarettes, the evidence does not create a compelling case for taxing alcohol more heavily than other goods on grounds of revenue-raising efficiency alone.

B. Consumption externalities and commodity taxation

The excises on alcohol and tobacco might alternatively be justified in terms of their role in discouraging consumption that has consequences beyond the immediate pleasure of the consumer themselves.

Even if we put aside any paternalist inclinations and regard individual consumers as best placed to judge the costs and benefits of consumption to themselves, externality-correcting taxes may be needed if to ensure that costs imposed on others are properly considered. The case for using taxes to discourage *socially* harmful activities was set out by Pigou (1920) and has been developed subsequently in the context, primarily, of environmental policy. In an otherwise first-best context—with prices undistorted by taxation, imperfections of competition or other factors—the tax should be set equal to the marginal external cost of each unit consumed. In more realistic contexts, this conceptually simple policy prescription becomes nuanced. When taxes also serve a revenue-raising purpose, for instance, Sandmo (1976) and Pirtillä and Tuomala (1997)—dealing with the cases in which direct taxes may and may not be imposed—show that optimal commodity tax rules take an additive form in which a Ramsey-type component is supplemented by one related to the marginal external damage, but potentially somewhat lower to reflect the potential intensification of the distortions from pre-existing taxes. Understanding the nature and extent of external damage is thus key to proper tax design,

The external costs of tobacco and alcohol consumption include direct externalities experienced by other individuals, such as the harm that drunken drivers cause to others, and

collectively-borne resource costs such as the cost of publicly funded medical treatment for smoking- and alcohol-related conditions. In both cases, individual consumption decisions will not reflect the full social costs of consumption, because the individual consumer does not bear the marginal costs of medical treatment or of direct externalities that follow from their smoking or alcohol consumption decisions. Excise taxes may provide a way of confronting the consumer with these costs.

Frequently, the discussion of whether alcohol consumption and smoking are socially harmful also includes discussion of the consequences for the individual consumer's own health, employment prospects, accident risks, and so on. Such costs to the individual consumer are not, however, externalities. Arguments that they might warrant higher taxation to discourage consumption involve an element of paternalism, perhaps reflecting a concern that individuals may be poorly informed about some of the consequences for themselves of consumption. Viscusi (1995), for example, discusses whether individuals accurately perceive the health risks of cigarette smoking. However, unless there are grounds to believe that consumers are poorly informed about some of the consequences of consumption paternalist arguments tend to meet with scepticism among economists.

Nevertheless, with tobacco and alcohol, the case for discouraging consumption, in the individual's own interest, should not be dismissed too lightly. Some of the individual costs of smoking and drinking arise as a result of the addictive nature of consumption, and this adds a further dimension to the problem. Current consumption may increase the risk of future addiction. A well-informed and rational consumer would presumably be less willing to start smoking than if there were no risk of future addiction (Becker and Murphy, 1988; Chaloupka 1991). However, it is unrealistic to assume that all individual users of tobacco and alcohol fully grasp the addictive risks associated with each unit of consumption (Orphanides and Zervos, 1995). In addition (except in an empty and tautological sense), it is unrealistic to assume that all consumption decisions—particularly of alcohol—are based on a rational calculus of the costs and benefits of each unit consumed.

Departments from standard norms of rational behaviour have been emphasised by some authors—notably Gruber (2001) and Gruber and Köszegi (2001, 2004)—as constituting distinct. What is central to these arguments, which are reviewed at greater length in Gruber (2008), is not simply the addictive properties of cigarettes and alcohol, but rather that individuals may show a basic time inconsistency in their behaviour: wanting to quit in the future, for example, but when the time comes preferring not to. They may then welcome devices that help to commit their future behaviour, with high current prices for example inducing a reduction in present consumption that will make it easier to amend their future behavior (Gruber and Mullainathan, 2005). Various different ways have been suggested of thinking about this kind of behaviour: Gruber refers to this as an 'internality,' while Viscusi (1995) discusses the concept of an 'externality to one's future self.' This can lead, as Gruber (2008) points out, to fairly high levels of cigarette taxes—though not ones far out of line with

those currently levied in the U.K. Quite how persuasive these ideas are remains as yet unclear. One implication pointed out, for example, is that smokers would vote for a cigarette tax increase.

To the extent that such behaviour may undermine the case for setting tobacco and alcohol taxes based on the level of traditional externalities, the key consideration in public decision-making becomes the effectiveness of taxes in modifying the behaviour of those most likely to make ill-informed choices and face commitment difficulties. For this reason, the impact of taxes on the smoking and drinking behaviour of children and young adults becomes a major focus. The balance of evidence suggests that higher taxes are more effective in restraining consumption by this group than for the population in general (Lewin et al 1981, Lewin and Coate, 1982, Chalopuka and Wechsler, 1997).

External costs and tobacco taxes

What level of cigarette taxation would be required to reflect the marginal external costs (as traditionally defined) of smoking? These costs fall into three broad categories. The first consists of direct externalities experienced by other individuals, including the annoyance and adverse health effects from passive smoking. These people may include work colleagues and wholly-unrelated individuals (other patrons of a bar or restaurant, for instance), but a high proportion will be friends and family members. The second comprises collectively borne costs, such as those of publicly funded medical treatment for smoking-related conditions. The third category of externalities arise through the tax system. Smoking may have consequences for the individual consumer's income and expenditure, especially through a higher rate of sickness absence. While these effects would be wholly internal in a 'first-best' world without distortionary taxes, the presence of income taxes and spending taxes gives rise to what is, in effect, a tax revenue externality. Given the efficiency cost of raising public revenues through distortionary taxation, induced changes in revenues have a clear social significance.

There is an extensive literature on the social costs of smoking. Much of this is not directly relevant to the estimation of corrective taxes, however, because an insufficiently clear distinction is drawn between costs experienced and internalized by the individual consumer and external costs experienced by others.

The most widely quoted US estimates of tobacco consumption externalities, appropriately defined, are those of Manning et al. (1989). These distinguish between the gross costs of smoking (higher costs of medical treatment, and so on, as a result of conditions caused by smoking), and the net costs, which offset against the gross costs a range of cost savings (mainly public expenditure effects) arising from the premature death of smokers. Gross costs were estimated at 42 cents per pack, discounting future costs at 5 percent, while net costs were 15 cents per pack, on the same basis. Adding amounts to reflect the costs of passive

smoking and smoking-related fires raises the net costs to 38 cents per pack—very close to the 37 cents per pack average tax on cigarettes in the US at the time.

These estimates were subsequently updated by Viscusi (1995), with adjustments to reflect the lower tar levels of cigarettes smoked by more recent generations of smokers, and to reflect the lag profile with which this change in tar content feeds through into health effects after consumption. Table 4 summarises some of the key components in the estimates presented by Viscusi, again with total external costs expressed in terms of the externality per pack. The effects of Viscusi's tar and lag adjustments in the example shown are relatively modest, but such adjustments have been controversial in the light of some evidence suggesting that smokers may smoke lower-tar cigarettes more intensively (Evans and Farrelly, 1988).

The picture in Table 4 may be partial. No estimates are included for the direct externalities of passive smoking, either in terms of annoyance, or the substantial items that could arise from the health effects of passive smoking, especially on children and other family members. Evidence on these effects has been accumulating rapidly in recent years, and is reviewed in Adams et al (1999). Viscusi (1995) argues that passive smoking effects are insufficiently precisely determined to permit point estimates, but shows a range of possible values, leading to a bottom line which varies from a net saving to a larger net cost, among which he suggests the median estimate of zero net external costs may be regarded as a plausible upper bound.

Taking account of public expenditure offsets arising from the premature death of smokers has been controversial in the public debate. It nevertheless seems wholly correct. If these items were private costs (for example, if individuals were responsible for paying actuarially-differentiated private insurance premiums to cover future costs arising from their consumption decisions), then a rational consumer would experience the additional health costs and reduced future social care costs in the same way, and there is no reason to believe that they would treat the two insurance premiums differently. Since the purpose of externality taxation is to confront the individual decision-maker with the external costs of their decision, on the same basis as if they were private costs, consistency would require that both additional costs and cost reductions be treated in the same way.

Table 4: Expected external costs of cigarettes for the United States, in cents per pack

	External cost, raw data	External cost, tar adjustment based on 20-year moving average
Medical care before 65	0.326	0.302
Medical care after 65	0.172	0.153
Total medical care	0.498	0.455
Sick leave	0.012	0.011
Group life insurance	0.126	0.114
Nursing home care	-0.221	-0.197
Retirement pension	-1.099	-1.000
Fires	0.016	0.016

Taxes on earnings	0.351	0.326
Total net external costs	-0.317	-0.274

Source: Viscusi (1995); based on 3 percent discount rate.

One reason that public expenditure offsets arising from premature mortality have been controversial is their size. On Viscusi's unadjusted figures, additional medical care costs for smokers are approximately 50 cents per pack, while savings on nursing home care and retirement pensions are equivalent to about \$1.30 per pack. But there is even controversy about the sign of the health care cost component. In a study for the Netherlands, Barendregt et al (1997) found that the long-term effect of smoking cessation was to increase health care costs. In the short-term, they estimated health care costs would fall, as ex-smokers cease to suffer the illnesses caused by smoking, but this 'conventional' effect on the costs of treating smoking-related diseases would then be offset by longer-term costs, as ex-smokers survive long enough to suffer the very costly medical conditions of old age. By contrast, Rasmussen et al (2004) use a similar approach, but find that the overall lifetime effects of smoking cessation on health care costs are beneficial.

The externality case for cigarette taxes requires clear identification and measurement of the external costs of smoking. Nevertheless, attempts to draw a clear boundary between internalized and external costs are not straightforward, and a number of areas of conceptual and practical difficulty can be identified.

- *Effects on family members.* One controversial area is the treatment of costs borne by family members. Family members of a smoker may experience considerable costs, including ill-health, and pain and distress as a result of the illness and premature death of the smoker. Many of the consequences of smoking during pregnancy, including severe damage to the lifetime health of the child, also come under this heading. There are, in addition, further important costs for the healthcare system in treating these conditions. Whether, and to what extent, costs experienced by other family members should count as externalities has been controversial. As Viscusi (1995) notes, it turns, in principle, on whether the welfare of other members enters into the utility function of the smoker, and, in other areas of policy, it is often assumed that family members are assumed to care for each other's welfare to the extent that the welfare of the household can be considered as a single entity. In the case of smoking, however, this seems an extreme position, and at least some of the harm inflicted on family members and unborn children would seem best treated as externalities.
- *Healthcare Finance and External Costs.* How far are the costs of medical treatment and healthcare internalized when tobacco consumption decisions are made, and how far should they be counted as an externality? In the case of publicly funded, tax-financed systems such as the UK National Health Service, the answer is

straightforward: the treatment costs of illnesses resulting from individual consumption decisions are collectively financed. The same may largely be true of other collectively financed systems, such as employer-financed healthcare. By contrast, a system of private insurance capable of appropriate differentiation of insurance premiums might be able to internalize a large part of the healthcare costs associated with smoking.

- *Effects on wages and productivity.* A large part of the total social cost of smoking estimated by Manning et al (1989) and Viscusi (1995) consists of foregone tax revenues on earnings, due to the shorter and less-productive working lives of smokers. This seems fairly uncontroversial. Whether more of the income or output loss from sickness absence and other smoking-related productivity effects should be counted as an externality depends primarily on how far the effects of smoking on worker productivity are reflected in wages. If workers are paid their actual marginal product, then there is no externality: smokers who are less productive receive correspondingly lower wages. However, employers may not always be able to differentiate the wages paid to smokers and non-smokers: Employment protection and sick pay legislation may, for example, compel an employer to continue making payments to a worker who has fallen sick as a result of smoking. In this case, the lower productivity of smokers generates externalities of two forms. First, the employer paying a smoker wages that exceed the worker's marginal product will experience a real income externality. Secondly, since the overall marginal product has fallen and the employer is unable to differentiate the wages paid to different workers, both smokers and non-smokers will receive lower wages as a result of the lower productivity of smokers.

External costs and alcohol taxes

The external costs of alcohol consumption, like those of smoking, include (i) direct externalities experienced by other individuals, including the victims of accidents, property damage, and violence caused by other people's drinking, (ii) collectively borne costs, such as the cost of public order policing and publicly funded medical treatment for alcohol-related conditions, and (iii) tax revenue externalities. The most widely quoted US estimates of alcohol consumption externalities, appropriately defined, are those of Manning et al. (1989), who estimate that net external costs are equivalent in value to about 35 per cent of the producer price of alcohol. A very large proportion of these are from alcohol-related traffic fatalities. Parry (2003) notes that there are fewer such accidents in the UK, so that marginal external costs are consequently also likely to be lower.

Estimates of external costs of alcohol consumption for the UK by Maynard, Godfrey, and Hardman (1994) included various categories of direct externality (such as the damage caused in road traffic accidents) and also the cost of defensive measures (such as policing costs and

the costs of research on alcohol problems). The costs of collectively funded medical treatment in the UK National Health Service of alcohol-related illnesses are also included. But the largest items are under the heading 'costs to industry', including the substantial costs of sickness absence and unemployment. Quite how far these should count as external costs depends on what is assumed about the effects of alcohol-induced productivity effects on individual wages, an issue discussed above for smoking. Overall, Maynard et al. calculate the total externalities associated with alcohol consumption in the UK to be around £2.7 billion, equivalent to some 17 per cent of pre-tax alcohol expenditure.

Translating such estimates into appropriate rates of Pigouvian taxation on alcoholic drinks is complicated by the fact that most are of total costs, not marginal. Unlike cigarette externalities, which may well be almost constant across each unit consumed, the externalities from alcohol consumption largely relate to abusive consumption, and the marginal external cost of consumption may well differ sharply from the average. Excessive consumption, leading to serious drunkenness in individual episodes or alcoholism over time, is the prime source of the externalities, and the external costs associated with moderate consumption may be close to zero. While the results of Maynard et al (1994) suggest that the average external cost from alcohol consumption in the UK might be of the order of 17 per cent of the pre-tax price of alcohol, the marginal external cost may be quite different—and higher

Diamond (1973) considers the design of corrective taxation when all individuals causing externalities must be taxed at the same rate, but where the externalities from some are more damaging than those from others. Where there is separability between the externality and consumption, the optimal tax is simply the weighted average of the marginal contributions to the externality, across different individuals, where the weights are given by the sensitivities of demand for the externality-generating good. If the primary reason for differences in the external costs of alcohol arises from differences between individuals, rather than between units of drink consumed by a particular individual, then this result may provide some support for regarding the average external costs as a rough-and-ready indicator of the optimal externality tax. But if the external damage caused by alcohol consumption varies across units consumed by each individual (for example, if the 'last drink' causes all the problems), then the appropriate externality tax would be considerably higher.

Pogue and Sgontz (1989) investigate further the implications for optimal alcohol taxation of the requirement that the alcohol sold to abusive and non-abusive drinkers be taxed at the same rate. Their analysis is directed at quantifying the trade-off between the reduction in welfare of non-abusive drinkers and the social benefits from the reduction in consumption by abusive drinkers. The balance will depend on the size of marginal social costs from abusive consumption, the size of the welfare loss from distorted non-abusive consumption, the relative numbers of abusive and non-abusive consumers, and the price elasticities of the two groups. (There is also the difficult issue of principle of whether alcohol-dependent consumers of alcohol should be treated as deriving utility from their abusive consumption, or not.)

C. Distributional aspects of alcohol and tobacco excises

As argued earlier, the availability of a sophisticated income tax and direct transfer system effectively undercuts any distributional rationale for differential commodity taxation, and any reason to have particular concern about the distributional characteristics of taxes on most commodities. As a general rule, the distributional incidence of individual components of the tax system is of less concern than the overall distributional incidence of all taxes (or, indeed, all government fiscal interventions) taken together. The fact that a particular regressively distributed component of the tax system may bear disproportionately heavily on poorer households may be unimportant if it is counterbalanced by distributional progressivity in other taxes.

Nevertheless, where, as with tobacco taxes, taxes are distributed extremely unevenly across households at similar income levels, there may be reason to look at the separate distributional incidence of the tax, since any adjustment to other taxes can only offset on average the distributional impact of the excise tax on tobacco. The distributional incidence of taxation on heavy smokers will be more heavily influenced by the distributional characteristics of the tobacco tax; and for non-smokers, the incidence of the tobacco tax will be an irrelevance.

Studies for the USA have found that alcohol and tobacco taxes appear substantially less regressive when a longer time frame is used for analysis than when analysed on the basis of current income. Poterba (1989) shows that the regressivity in relation to current (annual) income of alcohol and tobacco excises in the US is diminished sharply if distributional incidence is assessed in relation to household expenditures, a measure arguably more consistent with life-cycle analysis. Lyon and Schwab (1995) use data from the US Panel Survey of Income Dynamics (PSID) to compare the effects of analysing distribution based on incomes over different periods. Both alcohol and tobacco taxes appear more regressive when analysed using income data for a single year than five-year data, and a further reduction in regressivity is found if the analysis is based on lifetime, rather than five-year, income.

Table 5 shows a similar analysis, using more recent data for the UK. Analysed on the basis of current income, tobacco taxes look massively regressive, because household tobacco spending as a percentage of income for the poorest income quintile is some four times that for the richest quintile. On the other hand, analysed on the basis of household spending quintiles, tobacco taxes still look significantly regressive, but much less so than based on current income. The average tobacco budget share for the lowest-spending quintile is less than double that for the highest-spending quintile. Likewise with spending on alcoholic drinks, a distributional analysis based on current income would suggest that alcohol taxes would be significantly regressive, with spending as a percentage of income by the poorest income quintile twice that of the richest. Analysed on the basis of household spending

quintiles, however, alcohol taxes do not look regressive, and indeed appear somewhat progressive across the first four quintiles.

Table 5

Income and expenditure shares of tobacco and alcohol, United Kingdom, 200x

Quintile group	Current income quintiles, and tobacco spending as % of total current income	Expenditure quintiles, and tobacco spending as % of total current expenditures
1 = poorest	2.37%	1.60%
2	2.04%	1.95%
3	1.53%	1.69%
4	0.99%	1.32%
5 = richest	0.56%	0.92%
Quintile group	Current income quintiles, and spending on alcoholic drinks as % of total current income	Expenditure quintiles, and spending on alcoholic drinks as % of total current expenditures
1 = poorest	6.09%	2.53%
2	4.28%	4.16%
3	3.84%	4.86%
4	3.88%	4.94%
5 = richest	3.10%	4.72%

D. Specific versus ad valorem taxes

Unlike VAT, which simply taxes commodities in proportion to their selling price at one of a limited number of percentage tax rates, the separate excises for alcohol and tobacco offer—in principle at least—a wider menu of possibilities for the precise specification of the tax base. These are constrained by EU rules. For cigarettes, member states must levy an excise comprising both ad valorem (price-related) and specific (per 1000 cigarettes) components, and the specific element should be between 5 and 55 percent of the total tax (including VAT) levied on the ‘Most Popular Price Category’ of cigarette in the member state concerned. Currently, the UK tobacco excise (in conformity with EU rules) includes both ad valorem and specific components: cigarettes bear a specific excise of £105.10 per 1000 cigarettes, and an ad valorem excise of 22 percent of the retail selling price. The UK alcohol excises, by contrast, are wholly specific taxes, based—as in all EU member states—on product volume and/or alcohol content.

Issues arising in the choice between specific and ad valorem taxes are surveyed in Keen (1998). The latter have a distinctive ‘multiplier effect,’ in the sense that actions which increase, or reduce, the producer price by a given amount will have a larger effect on the price charged to the consumer. As a result, ad valorem taxes will tend to discourage costly improvements in product quality and to promote more vigorous price competition between producers. Specific taxes, on the other hand, will tend to have an upgrading effect on product quality. The overall implications for consumer welfare and tax revenue of the choice between specific and ad valorem taxation will vary, depending on the structure of preferences and on market structure.⁴⁹ Ad valorem taxation of goods will also tend to be more attractive where producers exert a degree of monopoly power and where there is little product differentiation. Specific taxes would be preferred where there are reasons to want to maintain product quality or where taxation is partly intended to affect an externality that is broadly related to the quantity of the product rather than to its value. Other considerations include the potential distributional advantage of ad valorem taxation in retaining relatively low price variants (though again this is unlikely to be a powerful concern, given the range of distribution-sensitive instruments available in the U.K.), perhaps greater ease of administering specific taxes (which require physical checks rather than valuation) and the differing responsiveness of revenues to variations in the underlying producer price (being more stable under specific taxation, for example, when the demand elasticity is low—but not a concern if tax rates can be adjusted frequently relative to these underlying price movements).

For tobacco products, the importance of potential differences in product quality—the wide variation in prices across bands suggests that product differentiation in this market is not simply horizontal—point to substantial reliance on specific taxation. The most plausible argument for ad valorem taxation is likely to lie in market dominance concerns, but the objective of maintaining a low price for the final product does not sit easily with the corrective arguments for tobacco taxation. As for the form of the specific element of the tax base, EU rules require this to be based on the number of cigarettes, in contrast to earlier UK excises based on weight of tobacco (a shift which led to considerable changes in the pattern of competition within the industry). It is sometimes suggested that there might be merit in targeting more precisely the active or harmful content within cigarettes (taxing in proportion to nicotine or tar content), but the case for this is somewhat undermined by evidence that smokers can compensate for changes in strength by smoking weaker cigarettes more intensively (Evans and Farrelly, 1988).

⁴⁹ Delipalla and Keen (2006) show that, in competitive circumstances, the mix should be such as to have minimal effects on product quality, in the sense that, at an optimum, uniform intensification of both taxes would leave quality unchanged. Recognition that ad valorem taxation leads to a lower consumer price than does ad valorem, for a given level of revenue, in circumstances of imperfect competition, dates back to Musgrave and Suits (1953), and is explored further in Delipalla and Keen (1992).

In the case of the alcohol excises, one particular issue frequently raised (and where there is scope for UK reform despite the current EU constraints on the definition of the excise tax base) is the role of alcohol content in defining the tax payable, both within a single category of drink (beer, wine, or spirits) and across the three principal categories of drink.

Spirits are currently taxed much more heavily per unit of alcohol than beer and wine. More uniform taxation of alcohol content across the three principal categories of drink has been advocated persuasively by Crooks (1989) among others. It would avoid distortion between competing drinks. It would also seem a natural way to structure the Pigovian taxation of alcohol, in that it would appear to target the externality tax precisely to the underlying source of the externalities. Nevertheless, the issue is not straightforward, because different drinks may differ in their propensity to generate external costs per unit of alcohol content. Arguably, spirits offer the greatest potential to get very drunk very quickly, which may exacerbate some of the externality problems. If uniform taxation of alcohol content would make low-cost industrially produced spirits the cheapest form of alcohol, the shift of abusers to spirits consumption might then not be a matter of social indifference.

V. INTERNATIONAL ISSUES

International considerations in the setting of indirect taxes have come to be far more pressing than they were at the time of *Meade* (as in other areas of tax policy too), with the increased cross-border mobility of commodities, fostered within the EU by the elimination of internal fiscal frontiers, posing new and potentially profound challenges for both the VAT and excises. These concern the fundamental basis on which commodities are taxed, the difficulties created by zero-rating exports under the VAT, the treatment of border-crossing services—an issue that has required little attention until recent years—and interactions in tax-setting.

A. Origin or destination taxation?

The international norm is for commodities to be taxed where they are consumed: the destination principle. As seen above, however, implementing this—particularly with the zero-rating of exports under the VAT—has become problematic. One broad solution that might suggest itself, and is also consistent with a long-standing EU objective of allowing traders to treat sales anywhere within the union in the same way, is to shift to taxation in the place of production: an origin principle. This has brought back to the fore a long-running debate on the comparison between destination and origin taxation.

It is important first to be clearer on terminology than much of the policy discussion has been. With consumption and production occurring in different jurisdictions, there are a wide variety of ways in which commodities entering international trade might be taxed, differing in which jurisdiction (including, potentially, a supranational one) sets the applicable tax base

and rate(s), which collects the revenue, and which ultimately benefits from the revenue (Messere, 1994). The current international rule, WTO-approved, is that the country in which consumption occurs does all three of these things. But such a dichotomy cannot do full justice to the range of possibilities. The point is of some importance, since, as will be seen, some of the schemes proposed to overcome present difficulties disassociate the three aspects, having, for instance, one country collecting tax but transferring the proceeds to another. For definiteness, we here take destination (respectively, origin) taxation to refer to a situation in which the applicable tax rate is set by the country of consumption (production), though as will be seen even this needs further elaboration for the VAT.

Implementing destination taxation requires some mechanism for border tax adjustment, taking commodities out of tax in the exporting country and bringing them into tax in the importing country. Conceptually straightforward for the excises, this is achieved under the VAT by zero-rating exports and bringing imports fully into tax.⁵⁰ This means that purchasers, whether final consumers or registered businesses, have no tax reason to prefer domestic products over imports or vice versa. This procedure typically uses border controls to monitor exports and imports, but as noted in Section III.C this is implemented in the EU in the course of traders' normal periodic returns.⁵¹ These arrangements are explicitly regarded as transitional, the ultimate objective being movement to 'origin taxation' which (an example of the potential for linguistic confusion in this area) in this context simply seems to refer to the collection of tax by the country of export.

Under origin taxation, no border tax adjustment is needed for excises. Matters are not so straightforward, however, for the VAT. While an origin-based VAT (in the general sense above) could take a number of forms, the most natural is that in which the value added in the production of any commodity is taxed at the rate of the country in which it is added. This requires that VAT be charged on exports at the rate of the exporting country, but credit then given in the importing country not for the export VAT actually paid but the hypothetical amount that would have been paid had VAT been charged at the rate of the country of import.⁵² This is referred to as the 'stage of processing method' by Grossman (1980) and the 'notional credit method' by Genser et al (1995).

⁵⁰ Unregistered businesses and cross-border shopping final consumers are currently taxed on an origin basis in that sense (for the former, within limits of reasonable personal use). Mail order firms and other distance sellers are required to register for VAT in countries to which they sell once their sales exceed threshold levels.

⁵¹ A second-order distortion this creates is the possible cash flow advantage which may arise as a result of the tax treatment of intra-Community transactions. In the present system this favours importing goods from a supplier in another member state over purchases from a domestic supplier, although the effect is small, and depends on the timing of VAT payments and recovery. Vanistendael (1995) gives greater weight to this issue.

⁵² Suppose for example that a good with producer price €100 is exported from a country with a VAT rate of 10 percent to another where the VAT rate is 25 percent: the tax-inclusive price to the importer will then be and the

(continued)

These then are quite different methods of taxing commodities entering international trade. Destination taxation is well-established as the international norm. Nevertheless, the transitional nature of current arrangements within the EU, and more generally the difficulties that federal countries experience in operating destination-based invoice-credit VATs levied by lower-level governments (which in turn arise from the same problems of zero rating exports in the absence of border controls as now faced in the EU), suggest that, as international integration deepens, so the case for applying VAT on a destination basis—or at least the way it is currently implemented—requires reconsideration.

Conditions for equivalence

At first sight, origin taxation seems to run counter to the whole thrust of EU policy to eliminate impediments and distortions to intra-EU trade: it would mean that a British firm purchasing goods from other member states would no longer treat the VAT rates of other member states as a matter of indifference. In comparing possible suppliers in Denmark and Germany, for example, it would need to take into account the respective VAT rates there (currently 25 per cent and 17.5 per cent respectively), since these would affect the input tax credit available. It might seem that such a system would involve massive, and costly, tax-induced distortions of business purchasing decisions, unless severe restrictions were placed on member states' powers to determine their own VAT rates.

It is certainly likely that the system would be *perceived* as one in which tax differences between member states are much more likely to distort business purchases than under the 'level playing field' provided by the destination principle. Cnossen and Shoup (1987), in reviewing the relative merits of origin and destination principles for VAT, see this as a key obstacle to adoption of an origin-basis VAT and it is hard to disagree. Nevertheless, they and many others have noted that there are circumstances in which an origin and destination principles are equivalent in the sense that they lead to exactly the same patterns of trade and economic welfare. Despite appearances, the playing field is then no more level under one principle than under the other.

The most general statement of such results is in Lockwood, de Meza and Myles (1994a), but the gist is easily stated. Start with the simple case of a world lasting for a single period and comprising two countries, each of which taxes all commodities at a uniform proportionate rate (which may differ between the two countries). It is then easily seen that the shift from destination to origin principles need have no effect on the real allocation of resources, with no need even for compensating international transfers. All that is required to restore the

available credit $(€110/1.25)0.2 = €22$. This ensures that the part of the value that is added in the country of export is taxed at 10 percent and sets the stage for taxing further value added beyond that at 25 percent.

initial allocation of resources is either a devaluation by, or a reduction in the general price level of, the country with the higher tax rate: this will ensure, for instance, that the change of basis has no effect on the foreign currency of its imports. There are then neither substitution effects through changes in relative prices nor income effects through tax revenues. The intuition is straightforward. A uniform tax levied on a destination basis is a tax on the value of aggregate consumption, while a uniform tax levied on an origin basis is a tax on the value of aggregate production; and with balanced trade, these are the same thing.

Recent work has shown the equivalence between destination and origin taxation to hold in rather more general circumstances too. It continues to hold, for example, under imperfect competition, and in intertemporal trade models which have the feature that trade must be balanced in present value).⁵³ Striking as these equivalence results are, however, their practical is likely to be limited:

- *Problems with partial application.* A ‘restricted origin’ regime—in which the origin principle applies to trade between some subset of countries (such as the EU member states—while trade with the rest of the world remains subject to the destination principle, raises two sets of difficulties (Shibata, 1967). First, it opens up the possibility of trade deflection: traders operating in a high tax member state, for example, would have an incentive to export to a low tax member via the rest of the world (so incurring the lower tax rate of the country of final consumption)⁵⁴ rather than directly (incurring the high rate of their own jurisdiction). Second, since trade flows between the countries adopting the origin system need not be balanced, a change in tax basis generally redistributes revenue between them (with net exporters on trade within the group being the winners); this latter is less of a concern in pure efficiency terms, since it could in principle be undone by a simple lump sum transfer between countries. As Lockwood, de Meza and Myles (1994b) observe, both problems can be avoided if member states adopt the origin principle not only with regard to each other but also with regard to the rest of the world: a ‘non-reciprocal restricted origin system.’ This provides a clear analytical solution, but it is equally clear that it would be hard to persuade practitioners and policy-makers of the neutrality of a scheme in which exports from the EU are taxed twice (once in the EU, once in the country of destination) while imports into it are not taxed at all.
- *Intergenerational redistribution.* A change of tax basis can have complex and potentially powerful intergenerational effects (Bovenberg, 1994). A shift from destination to origin taxation, for example—somewhat akin to a shift from taxing

⁵³ Genser, Haufler and Sorensen (1995).

⁵⁴ The story is complicated, but, not fundamentally overturned, by the possible existence of tariffs.

consumption to taxing wages, as discussed in Section II—would tend to benefit the relatively wealthy and old (financing high consumption levels from past earnings) at the expense of the relatively young and poor (saving a high proportion of their factor incomes), with potentially adverse effects on capital accumulation.

- *Non-uniform taxation.* Unless all commodities are taxed at the same proportionate rate in each country—or a somewhat weaker similarity of tax structures holds⁵⁵—adjustment of the exchange rate or general level of internal prices alone cannot offset the effects of a change in tax basis. In practice, of course, indirect tax systems are far from uniform, reflecting not only multiple rates of VAT but also the excises. There appears to be little evidence, however, on whether the non-equivalence that this implies is in practice likely to be quantitatively substantial.
- *Altered incentives in tax-setting.* Still more fundamentally, the equivalence results presume that tax rates remain unchanged with a shift from one basis to another. National incentives in setting those tax rates, however, are likely to be quite different in the two cases, a point returned to shortly.

When equivalence fails, which is better?

Since origin and destination bases are thus not in general equivalent, the question arises: which is to be preferred? Three groups of issues are relevant.

A first set concerns that comparison if taxes are set cooperatively. Attention then focuses on the quite different arbitrage conditions they imply. Under the destination principle, residents in any country pay the same tax on both imports and domestically-produced items, and are thus led to equate producer prices across countries. With perfect competition, this in turn implies that relative marginal costs prices are equated across countries: which means an efficient pattern of production. Under the origin principle in contrast, consumer prices will tend to be equalised across countries, leading to exchange efficiency (that is, an efficient allocation of consumption across countries). The choice thus resolves to one between production and exchange efficiency. It might then seem that, under conditions outlined there, the Diamond-Mirrlees (1971) theorem discussed in Section II applies, so that production efficiency have priority (although this is less clear-cut than it may seem). As Keen and Wildasin (2004) point out, however, the Diamond-Mirrlees theorem is not directly applicable in international settings when distinct governments face distinct revenue constraints. In the

⁵⁵ When tax rates vary across commodities, devaluation or general price movements can neutralize the real effects of a change in basis if for every commodity the tax factors (unity plus the ad valorem tax rate) in one country is the same multiple of the tax factor in the other. Uniform taxation within each country is sufficient for this, but not necessary.

absence of international transfers, Pareto-efficient tax design may then require deploying taxes on trade or other instruments that drive a wedge between producer prices in different countries. Given the ability to transfer resources across members of the EU, however—effectively consolidating, to some degree, their governments’ budget constraints—their results suggest a presumption for production efficiency within the union.

Even with cooperative taxation, however, any presumption for destination taxation becomes less clear-cut under conditions of imperfect competition. The destination principle no longer implies production efficiency, because equalising after-tax prices across producers does not necessarily equalise marginal costs (Keen and Lahiri, 1998); in addition, taxing intermediate transactions could in principle be desirable (in the absence of more directly targeted measures) to offset monopolistic output distortions.

Second, important distinctions arise if taxes are set non-cooperatively. The incentives for strategic tax-setting are fundamentally dissimilar between the two: towards base-stealing and (pushing in the opposite direction) tax exportation under the origin principle; towards taxation of importables (to induce favorable movements in the terms of trade and to some degree capturing products otherwise accruing to foreign producers) under the destination principle. Not surprising, the two regimes cannot in general be unambiguously ranked (Lockwood, 1993; Keen and Lahiri, 1998).

Third, there is major practical difference between the two: under an origin-based VAT, producers would have an incentive—not present under destination taxation—to transfer price value-added into jurisdictions characterised by relatively low effective rates on value added (Genser and Schulze, 1997). Given the considerable difficulties faced in monitoring transfer pricing devices driven by corporate taxation, this is a potentially major drawback.

Implications

Is there then a case for shifting from destination to origin taxation? One advantage is that it would resolve the present asymmetry between the tax treatment of cross-frontier purchases of goods by individuals and by businesses. Under the current VAT system, differences in tax rates between countries are sustainable only to the extent that there are significant transport costs or other impediments to individual purchasing. If the pressure on the current system from individual cross-border shopping intensifies greatly, movement to origin taxation could be the best (or only) option available. It is also the case that recent results have placed origin taxation in a less-unfavourable light than before. But it remains hard to make a strong case for clear gains from moving to origin taxation, at least for the foreseeable future. Doing so would throw away the potentially useful ability to tailor national tax systems to national preferences, and risks inducing unwelcome production inefficiencies. It would fundamentally change strategic incentives in tax-setting, with unclear consequences. And it would open up potentially powerful possibilities for transfer pricing. Abandoning the destination principle in

favour of a full-blown origin system seems unlikely to offer sufficient gains to offset these various costs and risks.

B. Alternative VAT mechanisms for intra-EU trade

There are therefore good reasons to retain the destination principle as the underlying basis for the treatment of international trade. In relation to the VAT, however, there remain a range of important issues about the practical mechanism, export zero-rating, which currently achieves this condition. For it is important to recognize that although both the zero-rating of exports and the adherence to the destination principle are effectively universal, the former is not a necessary condition for the latter. Indeed export zero-rating has two significant drawbacks.

One, discussed in Section III.3 above, is that it creates problems for VAT enforcement. It breaks the chain of VAT revenue cumulation whenever the chain of production and distribution crosses national boundaries, a point of particular enforcement vulnerability. Goods supposedly exported, and therefore zero-rated, may be diverted to the domestic market bearing no tax. And the refund of VAT to exporters coupled with the deferred payment of VAT on imports gives scope for profitable criminal exploitation through large-scale ‘carousel frauds’ and similar schemes.

The second drawback, highlighted in the European Commission’s 1987 proposals for an alternative VAT mechanism to accompany the elimination of intra-EU border formalities at the end of 1992, is the sharp difference in VAT procedures applied to domestic sales and exports when exports are zero-rated. As a consequence, businesses’ VAT compliance costs are increased by the need to treat differently domestic sales and exports to other EU members states. Views differ on the importance of removing such differential treatment, and achieving what Keen and Smith (1996) call ‘compliance symmetry’: it is not achieved, for example, within the U.S., given different treatment of inter- and intra-state sales. Nevertheless, it has played a significant role in the EU debate, where removing impediments to intra-union trade, not least by smaller and medium-sized enterprises (most of them likely to be within the VAT system, even with a threshold as high as in the U.K.).

Much of the ‘1992’ programme of measures to complete the internal market of the Community was motivated by a concern that border formalities could increase the costs to a firm of doing business in other member states. Indeed, there was a concern that on occasion member states may have employed frontier bureaucracy as a form of trade protection against products from other member states. In order to remove the opportunities for such non-tariff barriers to arise, the 1992 programme abolished internal fiscal frontier formalities. In addition, in its original proposals, the Commission sought (but failed) to put in place after 1992 a VAT mechanism for cross-frontier transactions which enabled registered traders to treat sales to all member states, including their own, identically so as to ease closer integration within the internal market. In practice, however, the measures adopted, which

continue to apply, treat trade within and between member states very differently; and the new procedures then introduced to prevent VAT evasion on international transactions in the absence of frontier controls may well have magnified tax compliance costs on export transactions (Verwaal and Cnossen, 2002).

Several VAT mechanisms have been proposed that would achieve economic outcomes conforming to the destination principle but without zero-rating exports:

Exporter rating. This, advocated by Cnossen (1983) and adopted as the initial proposal of the Commission (1987) for the post-1992 world, means taxing intra-EU exports at the rate of the country from which the goods were exported, with credit then being available in the country of import and some clearing house mechanism put in place to ensure that revenue ultimately accrues, as at present, to the country in which consumption takes place. Exports and domestic sales would thus be taxed identically, which may be an advantage, since it reduces the danger that firms may be deterred from exporting by the need to deal with an unfamiliar export tax regime.

The central problems with this scheme relate to the operation of clearing. Under the initial proposal this have been done on the basis of individual transactions, necessitating complicated (and permanent) arrangements for measuring the required clearing flows. This would suffer, moreover, from the fundamental flaw that of undermining the incentive for member states to check the validity of claims for VAT credit on imported goods: the cost of giving this credit would be underwritten by the Clearing House, and there would be little incentive for member states to spend resources in reducing fraudulent claims (Lee, Pearson and Smith, 1988). An alternative would be a one-off compensation settlement (perhaps involving agreed annual revenue flows), reflecting the scale of the anticipated revenue changes. But while this would restore the incentive for member states to detect fraudulent claims for VAT credit on imports, it would introduce a new problem, giving rise to undesirable incentives for member states to raise their VAT rates so as to increase revenues from the taxation of exports. Since the importing member states would be required to give credit for whatever rate of tax was applied to exports, there would be no competitive restraint on this; the only limit would be the willingness of domestic customers to accept the higher VAT rates that would also apply to domestic sales.⁵⁶

Uniform rating. Under this scheme, intra-EU exports would continue to be zero-rated for the national VAT in the country of exports but would then be subject to a uniform VAT rate,

⁵⁶ While Article 90 of the Treaty of Rome proscribes the use of domestic taxes to provide indirect protection, it is not clear that the use of domestic taxation as a tax exporting device is similarly prohibited (just as WTO rules do not prohibit export taxes). Experience with Article 90 suggests, in any event, that it is effective only against the most egregious uses of domestic taxes to such trade-related ends.

determined by the Community. This fixes, to the extent of that uniform VAT rate, the break in the VAT chain on intra-Union exports, though compliance symmetry is not achieved, since exports and domestic sales are subject to different tax treatments. Such uniform rating can in turn be achieved in a number of ways.

In the *CVAT* regime advocated by Varsano (2000) for Brazil (which faces similar problems subnationally) and McLure (1999, 2000) more generally, this special tax rate for exports is operated as a separate tax, by a single tax authority operating across all the jurisdictions concerned. Since the additional tax on intra-EU exports (the ‘compensating VAT’) would be collected by the same authority that then gives credit for the input tax paid on imported goods, and since these amounts in principle cancel out—except that revenue would be raised to the extent of imports by other than registered traders—this system avoids any revenue redistribution between member states without any need for clearing between them. But it does so by establishing a parallel VAT operation and bureaucracy (for the taxation of intra-EU trade) that generates little net revenue—which seems likely to be a hard political sell. Quite how large the administrative and compliance costs would be in this parallel VAT administration is unclear, and it may be able to draw heavily on VAT information already gathered in national systems. But unlike exporter rating there is a clear danger of asymmetry in VAT compliance costs between exports and domestic sales.

One of the two options recently proposed by the Commission for dealing with VAT fraud—the other (with many hesitations) being reverse charging, as discussed in Section III.C—applies essentially the CVAT logic, in applying a uniform common VAT, at 15 percent, on trade between members states (Commission, 2008). Implementation however would remain wholly with national tax agencies, with proceeds from export VAT being reallocated to the country of import. This has substantial appeal (in contrast to reverse charging) of strengthening the VAT chain. But by opting against separate administration of the CVAT—no doubt for understandable political reasons—it effectively dissipates the key advantage of the CVAT in avoiding any need for revenue reallocation. And it does nothing to simplify VAT compliance or render it more symmetric.

Some similar properties are exhibited by the *Dual VAT* regime proposed by Bird and Gendron (1998), who draw on the Canadian experience from the combination of a federal VAT and the provincial VAT levied in Quebec. This envisages the continuation of national VAT systems, including the zero-rating of intra-union exports, but run in parallel with a new Community VAT, set at a uniform rate EU-wide, and operated without regard to national boundaries. This Community VAT generates revenues for the Community, and at the same time ensures that intra-EU exports, although zero-rated by the member state VATs, do move between member states bearing at least some burden of tax. An EU-wide VAT has some appeal as a source of own resources for the union (being more transparent, for instance, than the current use of a notional VAT base to determine, in part, national contributions). The political prospects do not currently appear bright, however, and the revenue need would

readily be met by a VAT rate so low—in the order of 2-3 percent would suffice to finance all the Unions’ activities—that the impact on fraud is likely to be limited. Compliance symmetry would also not be achieved.

The main feature of the **VIVAT**, proposed by Keen and Smith (1996, 2000), is that a uniform Community-wide rate of VAT would be applied to transactions between all VAT-registered traders in the EU (perhaps with a rate of zero applied to financial services as part of the cash flow approach described in Section III.B), while member states would retain the power to determine the rate of VAT on sales by traders to final consumers. This would achieve compliance symmetry, fix the break in the VAT chain between member states (with a firmness that depends, of course, on the level of the intermediate rate), and avoid some of the ‘incentive’ defects of the other main schemes, in terms of both enforcement and rate-setting incentives, noted above. And it does so without altering in any way the current ability of member states to choose the rate applied to final sales, or hence—since it is that, not the rate applied to intermediate transactions, that determines the total revenue finally raised (at least in so far as the crediting mechanism works properly). There is thus, in that sense, no real loss of national sovereignty. While some form of clearing would be needed to ensure that all revenue continues to accrue to countries of final consumption, the VIVAT lends itself more readily than does exporter-rating to some form of macro-related settlement—so ensuring adequate incentive, for instance, to control claims for credit of intermediate tax on imports—since the commonality of the intermediate rate removes scope for game-playing

A further attraction of VIVAT is that it could ease some of the difficulties created by the current VAT exemptions, discussed in Section III.B above. The application of different national rates currently distorts competition (reflecting the cascading effects of differing degrees of unrecovered VAT implicit in prices paid for financial services, for instance) and requires complex (almost unworkable) rules for hospitals, universities, local governments and others to declare their purchases in other member states so as to negate the incentive to buy abroad purely for tax reasons by ensuring that the appropriate VAT adjustments are made (by the revenue authorities of the importing country). A VIVAT would enable these distortions to be removed simply by enabling those producing exempt items to purchase at the intermediate rate, removing both the competitive distortion and the need to adjust tax on purchases from other member states. This would not remove the distortions that the widespread exemptions in the EU create, so that the case for reforming them out of the system, stressed in Section III.B above, would remain. But it would ease them.

The principal disadvantage of VIVAT, beyond the need to arrange revenue transfers between member states, is that it requires an ‘end user’ distinction to be made—and enforced—between the sales which a business makes to other VAT-registered businesses and those sales it makes to final consumers: between, that is, B2B and B2C transactions. These would be taxed differently under VIVAT, and there would be additional compliance costs to businesses and extra administration costs for the tax authorities in accounting separately for

the two categories and in handling difficult borderline cases. Assuming that the VAT rate on intermediate sales was never higher than the rate on final sales (the uniform Community-wide rate on intermediate sales might be 15 per cent, say, with rates on final sales ranging as at present from 15 per cent to 25 per cent), the central risk is of sales to final consumers being disguised as sales to registered traders. This would of course rely heavily on the use of VAT registration numbers, as at present, to identify VAT status. But it would be possible to apply the rules rather more stringently than at present, without serious damage to the firms concerned. If a firm failed to substantiate a claim to be allowed to apply the intermediate rate, it would have to apply the final goods rate, which in some countries would be very little higher. (It might also be possible to credit input VAT claims at that rate where it could be shown that the final consumer rate had been wrongly applied to an intermediate goods transaction). And it may even be that the opportunity to charge an inappropriately low rate would in some case reduce VAT evasion on final sales: instead of entirely concealing transactions and remitting no VAT, the better bet for those so inclined could be to offer to charge and remit the intermediate rate.

More fundamentally, however, the central distinction needed to operate a VIVAT, between B2B and B2C transactions, is one that is in any event likely to become increasingly important in the operation of the VAT, and is indeed at the core of recent initiatives in connection with the VAT treatment of international services.

C. VAT and internationally-traded services

International trade in services has grown much more rapidly than trade in goods in recent decades, placing increasing strain on some aspects of current consumption tax legislation and procedures, in the EU and elsewhere. The EU's VAT rules and procedures were primarily developed to handle goods trade, for which the notion of a trade transaction can be defined clearly in terms of the physical movement of the taxed commodities. For services, no such physical movement exists, making it much less straightforward to define transactions to which the tax provisions relating to international trade should apply. The main concern is that some transactions might end up untaxed or taxed twice, and that loopholes may be extensively exploited in the organisation of international services businesses. Similar anxieties arise about the continuing viability of consumption tax systems in the face of the rapid growth of e-commerce. This has undermined national regulation and taxation in certain areas (such as gambling services), and turned some readily-taxed goods (records and video-tapes, for instance) into hard-to-tax quasi-services (digital downloads).

Many of the problems in the VAT treatment of traded services can be traced to the "absence of internationally agreed principles to determine where taxation should take place" (OECD, 2004): in other words, to the lack of a systematic and uniformly-applied definition of the 'place of supply.' Current EU rules provide ad hoc treatment for particular categories of

service. Some are taxed on the basis of the place of the supplier, others on the basis of the place of consumption; further complexity arises through the use of proxies (such as the place of establishment, or the place of performance) to define the place of either production or consumption of certain services.

The consequences of alternative approaches to the taxation of international services vary considerably across different types of transaction:

B2B transactions between VAT-registered traders. Which side of the transaction applies VAT is in this case unimportant in terms of economic efficiency because the tax rate has no ultimate impact: any tax paid is recovered later through the natural mechanism of the VAT, and there is no advantage (apart from second-order cash-flow considerations) to purchasing from a lower-taxed source. Having the seller charge tax—by deeming the place of supply to be that in which they are located—has the merit of securing revenue by maintaining a chain of VAT payments, but requires some mechanism for reallocating revenue if it is accrued to the country in which final consumption occurs. Instead having the buyer reverse charge themselves tax on such purchases—deeming the place of supply to be where they are located—avoids any need for revenue reallocation, but at the cost of breaking the VAT chain.

Sales to exempt traders. Since VAT paid on inputs then ‘sticks,’ the VAT treatment (in particular, the tax rate at which supply is taxed) matters for efficiency. The problems here mirror similar problems in the taxation of domestic sales of services to exempt firms, and again point to the importance of scaling back exemptions as discussed in Section III.B. These difficulties are exacerbated to the extent that domestic and cross-border sales of services might be taxed differently: for example, if the former is subject to normal VAT, and the latter zero-rated.

B2C sales. Distortions arise if some final consumers face different tax rates for similar products. For goods, these problems arise primarily through cross-border shopping, because the country of purchase may differ from the country of consumption, or of residence of the final consumer. Distance selling (mail order) raises similar issues of distortion, mitigated by the special regime applied to such trades. For services, distortions would arise through the equivalent of cross-border shopping or distance selling: in other words, the possibility that a consumer might be able to obtain equivalent services from suppliers located in different member states, and these might, under some definitions of the place of supply, be taxed differently.

The key efficiency issues in defining the Place of Supply for services thus primarily concern cross-border sales of services to final consumers and entities not registered for VAT, and are broadly analogous to the issues of cross-border shopping or distance selling for goods.

As with cross-border shopping for goods, the practical significance of the problem, in terms of the risk of significant economic distortion, will vary considerably between products. At one extreme there are services which are effectively different if they are performed in different locations. Examples include passenger transport (a tram journey in Brussels is no use to the Manchester commuter trying to get to work), service performed on fixed property (by a plumber, for example), and various entertainment services (a cinema ticket in Stockholm is not a close substitute for a ticket for the identical film in Rome). At the other extreme there are services (including most e-services) where the location of the supplier is irrelevant to the performance of the service, and where a private customer could, in principle, purchase the service from a supplier in another member state without any penalty in terms of cost, inconvenience or quality as compared with the equivalent domestic supply.

For the first group of services, the location of the customer coincides with the location of the supplier when the service is performed, and defining the place of supply as either would have an equivalent effect on economic efficiency. Problems of distortion in purchasers' decisions only arise if the place of supply is defined in terms of the location of the supplier, and if this can differ from the place where the service is performed. For the second group of services the definition of the place of supply is an issue of much greater significance for economic efficiency. For these services, distortion in sales to final consumers and B2B sales to exempt traders can be avoided only by taxing where the customer is located.

There is no simple way, however, of implementing this outcome.

- If the supplier remains liable for the tax, a small-volume EU supplier with customers spread thinly across all member states would have to deal with 27 separate tax authorities. A potential solution to this would some form of 'one-stop shop,' allowing a supplier to deal with a single agency in respect of all EU-wide sales. There are various ways in which this could be organised, but the key idea is that the agency would charge VAT at the rate appropriate to each country, and remit the tax collected, and information about the transaction, to the VAT authorities in all member states to which sales were made.
- In some specific cases, such as digital downloads, the supplier may have no idea of the location of the customer, and so be unable to apply tax on the basis of the customer's location. This suggests that some EU-wide regime (a common rate of tax on all exports of digital services, or even on all sales of digital services within the EU) would be the most appropriate solution.
- If the supplier is located outside the EU, enforcement poses evident difficulties.

And while the alternative of making the customer might liable for the tax on purchases of services is in principle a complete solution to the problem of ensuring economic efficiency, there are considerable practical difficulties. For B2B transactions, such reverse charging

breaks the VAT chain. And for final consumers, it is evidently unworkable—the experience of the use tax in the US, which in principle requires taxpayers to declare out of state purchases but in practice is almost entirely ignored, illustrates the point.

The approach recently adopted by the EU (with effect from 2010), which follows OECD guidelines, is to tax B2B service purchases in the place where the customer is located, but B2C purchases where the supplier is located (at the rate applicable to the country of the consumer).⁵⁷ The former opts for avoiding revenue allocation. This is clearly a more coherent approach than at present, albeit one with risks: of ensuring that the break in the VAT chain for B2B trade is not exploited, and of identifying the proper rate at which to charge final consumers and implementing a transactions-based reallocation of revenues. Interestingly, it is built on precisely the distinction between sales to registered and to non-registered traders that is at the heart of the VIVAT, but without securing the full advantages that it offers in maintaining the VAT chain and ensuring compliance symmetry. A more thoroughgoing application of the VIVAT logic would not avoid all the difficulties in this area—such as, in some cases, identifying the location of final consumers—but could provide a more coherent framework for addressing these as other issues.

D. Excise tax competition and cross-border shopping

Tax-induced cross-border shopping and smuggling pose significant policy challenges for the EU. Not only do they cause a direct revenue loss—or perhaps gain to low tax countries—but they are likely to lead to tax rates being set lower than they otherwise would be.

The extent and impact of cross-border shopping

The problem of revenue losses from legal cross-border shopping by individuals has come into prominence as a result of the abolition of border controls between EU member states at the end of 1992. Before this, most member states applied restrictive travellers' allowances on personal imports of tax-paid goods from other EU countries, as well as from the rest of the world, and this kept legal cross-border shopping within tightly constrained bounds. As a result of the abolition of border controls, individuals can purchase goods in another member state and bring them home without restriction or fiscal adjustment, so long as the goods are for their personal use and not for resale.

The scale of revenue losses from both legal and illegal cross-border movements of alcohol is controversial. HM Customs and Excise estimated the UK revenue loss from *legitimate* cross-Channel shopping for alcohol in 1998 at £285 million, about 5 per cent of total UK alcohol

⁵⁷ Council Directive 2008/8/EC of February 12, 2008 amending Directive 2006/112/EC as regards place of supply of services. Application to telecoms is from 2015, and a range of special treatments apply.

duty revenues. Some part of this revenue loss would have arisen as a result of duty-free purchases, rather than tax-paid purchases in other member states, though it is a reasonable guess that a significant part of the alcohol purchased duty-free would have been purchased outside the UK in the absence of the opportunity to make duty-free purchases (Christiansen and Smith, 2004).⁵⁸ HM Customs and Excise estimated that *illegal* cross-Channel smuggling of alcohol in 1998 involved a revenue loss to the UK of some £230 million, around 4 per cent of total alcohol excise revenue.

For individual member states in this position, alcohol tax policy needs to take account of the potential revenue losses through legal and illegal cross-border activities. Crawford and Tanner (1995) and Crawford, Smith, and Tanner (1999) consider whether the revenue losses through cross-border shopping induced by duty differentials are sufficiently large that UK revenues could be increased by cutting the rates of UK excise duties. They observe that the post-1992 abolition of border controls acts so as to increase the price elasticity of demand for UK-bought alcohol: as the price is increased, some consumers reduce their consumption of alcohol altogether (the normal effect, in the absence of cross-border shopping opportunities), but in addition others may now switch to buying abroad. The higher elasticity for UK-bought alcohol might suggest that UK tax rates on alcohol should be reduced. Indeed if the increase in elasticity is sufficiently large, it is possible that the existing rates of duty might exceed the revenue-maximizing duty rates.

Using data from the UK Family Expenditure Survey for the years spanning completion of the Single Market, Crawford, Smith, and Tanner (1999) find, however, no evidence of a significant change in elasticities. Whether a reduction in duty rates on the various categories of alcoholic drink would increase or reduce UK tax revenues depends on the own- and cross-price elasticities of demand for the various categories of alcoholic drinks. Crawford et al. find that the UK tax rates on beer and wine are still lower than revenue-maximizing tax rates, meaning that a cut in duty on these drinks would reduce total revenues (even though it would repatriate a certain amount of cross-border shopping). On the other hand, they cannot reject the hypothesis that the current UK tax rate on spirits is at around the revenue-maximizing rate. This suggests that the duty on spirits may be closer to the level at which a cut might reduce cross-border shopping by enough to compensate for the revenue lost on each unit.

Policy problems and responses

⁵⁸ In 1999 the EU countries abolished duty-free sales on intra-EU travel. Christiansen and Smith (2004) note that the global welfare gains from abolition of duty-free may be asymmetrically distributed between countries, and that high-tax countries may have relatively less to gain from its abolition than lower-tax countries; in particular it may deny them an opportunity to appropriate rents from sales to foreign travellers that would not otherwise be made. Christiansen and Smith (2008) discuss the implications of duty-free sales for the optimal structure of commodity taxes.

The question for policy is what, if anything, should be done about the implications of such potential tax-induced cross-border purchases, legal and otherwise. In assessing this, it is important to remember, the extent of the problem cannot be inferred simply from the extent of observed cross-border shopping. Observing zero cross-border shopping could mean that there is simply no inclination to exploit tax differentials, as would be the case with literally non-tradable goods. But cross-border shopping would also be zero in equilibrium if intense tax competition drives all countries to charge the same excise tax rates, with all standing to benefit from setting a collectively higher rate.

In response to EU proposals to require member states to set VAT rates within specified bands, Lee, Pearson, and Smith (1988) argued that fiscal externalities arising from cross-border shopping between member states could warrant some level of EU tax coordination. However, since these negative fiscal externalities primarily arise where member states cut their rates below those of neighbours, this would indicate an EU-wide floor to excise duty (and VAT) levels, but no corresponding need to place an upper limit on member states' tax rates⁵⁹.

The subsequent formal literature on tax policy in the presence of cross-border shopping has explored in more detail the potential impact of cross-border shopping (including for this purpose smuggling of tax-paid goods) and the tax competition it can lead to, and the appropriate policy responses. Using a stylized two-country model in which governments set their tax rates non-cooperatively, each concerned only to maximize its own tax revenue, Kanbur and Keen (1993) show that ⁶⁰ imposing a minimum tax rate (a tax floor) leads both countries to gain relative to the non-cooperative outcome: even the low tax country benefits despite being forced to raise its tax rate, because this enhances the ability of the other country to increase its rate. Simply imposing a common rate, on the other hand, must cause the low tax country to lose, unless the common rate is set at a sufficiently high level.

Some argue, however, that unrestricted tax competition may be a useful mechanism to control the tendency of governments to excessive growth. The case for the EU imposing some form of duty coordination—and indeed potentially coordinating in other areas of tax policy too—thus to some degree turns on fundamental differences of philosophy about the

⁵⁹ A ceiling on tax rates could be justified where countries have a degree of monopoly power, which would permit tax exporting.

⁶⁰ In the Kanbur-Keen (1993) framework it is the smaller country that sets the lower tax rate in equilibrium (since in setting a lower rate than the other it has more to gain by attracting the large tax base from abroad than it has to lose from reducing revenue from its own domestic tax base). Location may also matter for tax-setting incentives: Ohsawa (1999) shows that with three otherwise identical countries ordered on a line, that in the middle tends to set the lower tax rate as it has more borders to attract tax base across. Keen (2002) reviews the literature on cross-border shopping.

nature and value of governments. Those who view governments as choosing tax and spending policies to maximize social welfare may regard tax coordination as a way to ease what would otherwise be an undesirable constraint on their choices, while those who believe that there is a natural tendency towards excessive growth in government spending may view tax coordination in a less positive light. Even in this latter case, however, some degree of coordination may be desirable if—as seems plausible—policy-makers are not simply Leviathans having no selfless concerns and facing no electoral constraints.⁶¹

These considerations suggest to us a strong case for the agreement of minimum excise tax rates. And this is indeed the strategy that the EU has followed since the advent of the single market. The key issue is not the wisdom of the approach, but the low level—zero, in some cases—at which these minima are set. Raising them to more appropriate rates has however proved difficult, and this is unlikely to change.

⁶¹ On this wider political economy issue, see Edwards and Keen (1996) and Besley and Smart (2007).

VI. CONCLUSIONS

One of the most remarkable developments in U.K. tax policy in the thirty years since *Meade* has been the shift towards indirect taxation, with the VAT—still new at the time of the report—coming to acquire a pivotal role in the overall tax system. Some aspects of this development, and of indirect tax design more generally, remain less than fully understood. In particular, the proper broad balance between direct and indirect taxes turns on relative efficiency and implementation costs about which little is known. And while much has been learnt about the theoretical case for some degree of differentiation in the rates of indirect taxation across commodities, limitations of empirical knowledge and understanding of implementation costs still leave some disconnect between these results and their practical application. What does seem clear, nevertheless, is the potential for building on the inherent strengths of the VAT to improve its effectiveness within the wider U.K. tax system, and the need for clearer thinking of the role of the traditional excises.

Rate Differentiation

Theory, much of it having come to prominence since *Meade*, suggests that when—as in the U.K.—government has at its disposal a fairly sophisticated range of instruments for redistribution, the contribution of commodity taxes to efficient revenue-raising could be limited. Certainly there are grounds to tax goods and services associated with external costs in either production or consumption, an issue explored at more length in the paper on environmental taxes (Fullerton, Leicester and Smith, 2008), and relevant also to the case for the high excises on alcoholic drinks and tobacco in the UK. But, except where externalities are involved, theory indicates that differential commodity taxation is unnecessary if patterns of commodity demand are independent of labor market status (the ‘weak separability’ condition). In this situation, patterns of spending convey no information that cannot be directly exploited by more directly targeted redistribution, and taxes which vary with patterns of spending—the additional sophistication in the tax structure which commodity taxes offer—achieve nothing that cannot be achieved by other tax instruments. Nevertheless, the available empirical evidence firmly rejects weak separability, implying that appropriate rate differentiation could reduce the overall distortionary costs of taxation.

Precisely what kind of differentiation would be helpful, however, is much harder to say. In principle, tax rates should be chosen so as to reduce most the demand for goods that are, in an appropriate sense, complements for leisure (meaning time not spent in market work). In this way, unavoidable distortions against market work can be mitigated. The empirical work reported in Crawford, Keen and Smith (2008) suggests that on these grounds we might think of taxing the broad category of "leisure goods" more heavily than other goods and services, and domestic fuels and "household goods and services" at lower rates. But the limitations and uncertainties of both the theory and the empirical work are such that, at least as yet, they

provide little firm basis for policy prescription. The finding that the departures from weak separability, while significant, are quantitatively small suggests too that the gains from differentiation may not be large, though this requires more thorough investigation. And the administrative and compliance costs of rate differentiation would certainly need to be weighed against any advantage to be had in exploiting features of commodity demands. There is some evidence, and much anecdotal wisdom, that implementing such rate differentiation through the VAT would be quite costly (in terms, for example, of the likely increased need for refunds—to those selling lightly taxed items using more heavily taxed inputs—and to monitor borderline issues). Experience suggests that implementation of multiple stand-alone excises is likely to be even more problematic. And, not least, departures from uniformity may make it harder to resist simple lobbying for preferential treatment.⁶² Externality issues aside, there is thus a strong case, albeit a largely pragmatic one, for uniformity in commodity taxation, and this is indeed the path that has been taken in most of the more modern VATs that have been introduced in recent years.

Since the VAT is at present marked by significant rate differentiation, the implications of this for the U.K. are substantial. The present domestic zero-rating and the reduced rate serve little purpose that could not be better achieved by other means. We have shown here that eliminating both would enable the standard VAT rate to be cut from 17.5 to 15 percent (the minimum allowed in the EU) while providing enough revenue to reconfigure tax credit and income support systems so as to ensure that most poorer households gain from the reform and still leave an additional £7 billion, all with little impact on the price level. Similar remarks apply to the present zero-rating of residential construction. Though not explicitly analyzed above, here too there is evident scope for eliminating distortions by following others in including new sales fully into the VAT while putting in place measures to compensate the losers.

The essence of this has been known for many years, at least in relation to the zero-rating of food and children's clothing. What has been lacking is political will, a first step towards forming which is likely to be better public understanding of the inherent unfairness of the current rate structure. There may even be a case for some appearance of earmarking the proceeds from such a VAT reform.

Exemptions, international trade and the VAT

New at the time of *Meade*, the VAT is now starting to look old, and imperfectly adapted to the changed international circumstances in which the U.K. finds itself. This is true not only in relation to the rate structure, but more deeply too of aspects of its fundamental structure. Two

⁶² As argued in the context of tariff formation by Panagariya and Rodrik (1993).

issues stand out, with the EU in each case playing a key role. The proper response, in each case, is not to compromise but rather to build on the underlying logic of the VAT.

First are the widespread exemptions that are enjoined by current EU rules, notably in relation to public agencies and health, education, medical services, and financial services. In breaking the chain of tax and credit, these violate the logic of the VAT in a way that rate differentiation does not. There is little quantitative evidence on the costliness of the inefficiencies this creates—including the incentive to self-supply and other distortions to production decisions, increased implementation costs for partially exempt traders, the bias towards imports—but good reason to suppose they are not trivial, and perhaps greater now (as a consequence of privatization and increased financial sophistication) than they were thirty years ago. And at a technical level it is now much better understood—and illustrated by experience in New Zealand, discussed in the comment by Dickson and White (2008)—that these exemptions are not inescapable.

The case for considering alternatives to exemption is especially clear in relation to financial services, though this is one area in which no country has implemented a full solution. One possibility discussed above is to apply a cash-flow treatment to financial services—treating all inflows as VAT-able purchases and outflows as sales—while zero-rating transactions with registered businesses. Movement to such a system would not only remove distortions but likely enable a substantial net revenue gain. And while much closer examination is clearly required, it could fit neatly within the VIVAT form of VAT that we believe has other attractions too.

Eliminating these exemptions would require, however, a change in EU rules, which in turn requires unanimity among the 27 member states. It is not hard to imagine change in the VAT treatment of the financial sector, in particular, being vetoed. This raises wider questions as to the appropriateness of EU provisions that may impede member states adopting measures that may improve the operation of their domestic VAT systems without having any obvious adverse spillover effects. The first step, in this as perhaps in other areas, may be allow some degree of experimentation by member states.

The second key structural issue is the VAT treatment of trade between EU member states. Ironically, while the VAT proved well-suited to the early stages of integration, as a means of limiting hidden protection and export subsidies, it has proved problematic at the later stage in which internal fiscal controls are removed. It is important not to over-react to much-publicized missing trader frauds exploiting current arrangements: they are but one part of an overall level of VAT abuse that may be broadly comparable to that under the personal income tax. Nevertheless, action is clearly needed to strengthen the integrity of the VAT.

Part of this response must of course be improved administrative cooperation, but the greatest assurance in addressing the underlying structural problem—the break in the VAT chain from

the zero-rating of intra-Union exports—is likely to come from a structural solution. For this it is not necessary to move towards a genuine origin-based approach to commodity taxation, and indeed doing so would be unwise (not least because it would introduce transfer pricing problems into the domain of the VAT). The most promising approach is to strengthen the implementation of destination-based taxation by building on the fractional nature of the VAT, which is its fundamental strength—not to undermine it (as would be done, for example, by further reverse charging, whether for selected commodities or for all B2B transactions). And in the absence of an over-arching EU-wide VAT, the two most appealing ways to do so are by adopting either a CVAT (which maintains domestic zero-rating of exports but imposes an EU-wide VAT on inter-union trade) or a VIVAT (which taxes all B2B transactions, throughout the Union, at a common rate while maintaining national discretion in rates applied to final sales). Each has its own advantages and disadvantages. One criticism of the VIVAT, for instance, is that it requires traders to treat differently sales to registered traders and to final consumers. This, however, is a distinction that seems likely in any event to become increasingly important: it is already made in respect of intra-union sales, and is at the heart of the Commission’s recent proposals for the treatment of international services. Either CVAT or VIVAT, in any event, offers scope for significant improvement over the current (and explicitly transitional) arrangements.

Excises on alcohol and tobacco

The UK levies excises on alcohol and tobacco which are substantially higher than in many other EU member states. In terms of their demand characteristics, these goods are not markedly different from many others. The estimates in Crawford, Keen and Smith (2008) suggest that beer and wine and spirits could be moderately complementary with hours worked, while tobacco products appear to have moderate substitutability with labour time. In neither case, however, would considerations of revenue-raising efficiency alone seem likely to justify taxing these goods so much more heavily than the generality of consumer spending. The externalities associated with consumption of these commodities are, however, appreciable, and justify taxing these goods at higher rates than the general VAT. Nevertheless, policy towards these goods need to be informed by a clearer appreciation of the nature and size of the externalities associated with their consumption.

In the case of tobacco taxes, the evidence is highly controversial. Given that smokers die early, saving the rest of society a significant burden in pension and old-age care costs, it is far from clear that the existing level of tobacco taxes can be justified solely on the basis of smoking externalities. Behavioural issues of time inconsistency and lack of self-control in consumption decisions, as discussed in the comment by Gruber (2008), may be particularly important in this area, and may justify higher taxes than would be warranted if decisions were being made by wholly rational, well-informed consumers.

Using alcohol taxes to reduce the externalities associated with alcohol consumption (and, especially, abusive overconsumption) involves targeting the incentive somewhat imprecisely to the underlying externality, since alcohol externalities are not proportional to alcohol consumption but are largely confined to abusive overconsumption by a subset of all consumers. Externality taxation of alcohol thus involves a compromise between the potential gains from reducing external costs of abusive consumption and the welfare costs of discouraging non-abusive consumption.

The external costs of tobacco and alcohol consumption are likely to be heavily affected both by the institutional arrangements for financing healthcare, pensions, and so on, and by the cultural context in which alcohol is consumed. It is therefore unlikely that estimates from the U.S. can be carried over without modification to the European context, or that externalities will be uniform throughout Europe. Because of the likely differences across European countries in external costs of smoking and alcohol consumption, it is unlikely that the optimal tax treatment of tobacco products and alcoholic drinks will be identical in all members of the EU. Imposing greater uniformity on the very diverse pattern of EU excises may thus involve some economic inefficiency. Experience has confirmed, however, that for these items there is significant risk of revenue erosion—and hence pressures towards setting tax rates lower than would be collectively desirable—from the legal cross-border shopping and the various forms of illegal smuggling and tax evasion that are encouraged by significant tax differences. The EU-wide floors to alcohol and tobacco excises have the potential to play an important role, both in preventing the various forms of smuggling and evasion which exploit the massive duty differentials between member states, and also in ensuring the sustainability of these duties at a level which properly reflects the external costs of consumption of these goods. The current level at which these excise floors are set provides however little constraint on tax rate decisions in member states, and so they make little practical contribution to preventing inefficient downward pressure on duty rates. Raising them to more appropriate rates—though clearly desirable—has however proved difficult, and will no doubt remain so.

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