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Avoidance Policies – A New Conceptual Framework1

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ABSTRACT

This paper develops a general theoretical framework within which a heterogeneous group taxpayers confront a market that supplies a variety of schemes for reducing tax liability, and uses this framework to explore the impact of a wide range of anti-avoidance policies. Schemes differ in their legal effectiveness and hence in the risks to which they expose taxpayers - risks which go beyond the risk of audit considered in the conventional literature on evasion. Given the individual taxpayer's circumstances, the prices charged for the schemes and the policy environment, the model predicts (i) whether or not any given taxpayer will acquire a scheme, and (ii) if they do so, which type of scheme they will acquire. The paper then analyses how these decisions, and hence the tax gap, are influenced by four generic types of policy:

- Disclosure – earlier information leading to faster closure of loopholes;
- Penalties – introduction of penalties for failed avoidance;
- Policy Design – fundamental policy changes that design out opportunities for avoidance;
- Product Register - the introduction of GAARs or mini-GAARs that give greater clarity about how different types of scheme will be treated.

The paper shows that when considering the indirect/behavioural effects of policies on the tax gap it is important to recognise that these operate on two different margins. First policies will have *deterrence effects* – their impact on the quantum of taxpayers choosing to acquire different types schemes as distinct to acquiring no scheme at all. There will be a range of such *deterrence effects* reflecting the range of schemes available in the market. But secondly, since different schemes generate different tax gaps, policies will also have *switching effects* as they induce taxpayers who previously acquired one type of scheme to acquire another. The first three types of policy generate positive deterrence effects but differ in the switching effects they produce. The fourth type of policy produces mixed deterrence effects.

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Avoidance Policies – A New Conceptual Framework

Introduction

Tax avoidance is a major policy challenge to fiscal authorities in virtually all advanced economies. Not only does it account for a significant amount of revenue loss but it has a number of other problematic features.

- A considerable amount of economic resources are tied up creating, selling, implementing, countering and investigating tax avoidance schemes that are essentially artificial paper transactions that serve no economic purpose other than reducing tax liability.

- Because avoidance schemes are often very sophisticated, they are also expensive and so not available to all taxpayers. This leads to a situation where different taxpayers are paying tax at different rates on the same economic activity. This creates an inefficient allocation of resources, since taxpayers gain a competitive advantage not through superior technology or products but through greater access to and/or willingness to use avoidance schemes.

- This also produces a manifest sense of unfairness, producing both horizontal and vertical inequality.

A second reason why avoidance presents policy challenges is that there is a very active market in producing and devising avoidance schemes, so fiscal authorities need to consider the effects of their actions on not just the demand for schemes but also the supply.

Finally tax avoidance poses a significant policy challenge because avoidance schemes – at least those that are well devised and well implemented – are legal and therefore will not always be countered through the conventional methods of investigations that lead to the repayment of tax plus interest plus penalties. In addition to the possible use of penalties/investigations, fiscal authorities therefore have to consider other ways of countering avoidance:

- Policy design;
- GAARS; the "coherent principles" approach to tax law design[3];
- Information powers such as disclosure and retrospection.

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[3] See Pinder (2006)

To make sensible decisions about how best to counter avoidance, there are a number of things fiscal authorities need to be able to understand.

- What effects do these different policies have on the **level** of non-compliance?
- What effects do these different policies have on the **type** of non-compliance? Do measures to counter avoidance drive taxpayers towards tax planning or tax evasion?
- What effects do they have – both individually and in combination – on the tax gap and, more widely, on economic welfare?

Yet following Allingham and Sandmo (1972) the focus of virtually all the economic analysis of tax non-compliance has essentially been on evasion[4]. While these models produce useful insights they suffer from a number of limitations when it comes to thinking systematically about the above questions:

- The focus is on a single decision – how much of a reduction in tax liability a taxpayer would seek. It does not address the choice of *how* to obtain this reduction in liability.
- The focus is on a single taxpayer and does not consider the wider market for schemes.
- A limited number of instruments are considered – typically penalties and effectiveness of investigations.

The aim of this paper is to provide a new framework for thinking about avoidance and policies to counter it that overcomes the above limitations. In particular the framework has the following properties.

- Taxpayers confront a market that produces a range of possible avoidance schemes that will reduce their tax liability. These schemes can vary from very effective schemes that in some ways come close to tax planning through to less effective schemes that, in the limit, might be close to evasion. Taxpayers have to decide not only whether to acquire a scheme – and hence their *quantum* of tax non-compliance – but also which scheme to acquire
- To characterise the differences in the different schemes it is necessary to consider a multiplicity of different risks that taxpayers face – and not just a single risk of detection

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[4] Andreoni, Erard and Feinstein (1998), Cowell (1990), Slemrod and Yitzhaki (2002), provide overviews of much of the developments on behaviour. The paper by Feldstein (1999) has initiated a stream of work on measuring the welfare costs of non-compliance.

and penalties. Taxpayers can mitigate their risks through the choice of scheme to acquire.

- There is a multitude of taxpayers who differ in both the size of their tax base – and hence in their *incentives* to be non-compliant - as well as in their attitudes/values towards compliance – specifically the *reputational concern* they have about being identified as doing anything that might be deemed illegal and so possibly incur a penalty.

- The market can therefore be thought of as offering a range of products differing in a number of dimensions. If there were no differences in taxpayer attitudes these products could be ranked by a single quality index, and we would have a market which was <u>vertically differentiated</u> with higher quality products selling at a higher price. However, differences in taxpayer attitudes generate an element of <u>horizontal differentiation</u>, so the market is differentiated both vertically and horizontally.

- Although *de facto* the market for schemes is dominated by a number of large players, for the purposes of this paper I will take it that there is enough competition that prices are effectively determined by simply costs and so will not be affected by policies[5]. The framework explains which types of taxpayers acquire which types of scheme.

- There are many different types of policy instrument, and the framework produces comparative static predictions of the effects of different type of policy on both the amount and the nature of non-compliance, and hence on the size of the tax gap.

- An important implication of the framework is that when considering the impact of policies on the tax gap then in addition to the usual *direct effects* – the direct impact of policies on the magnitude of the tax gap associated with any particular type of scheme - there are now two different types of *indirect/behavioural* effects that need to be taken into account

    (i)   The first is the *deterrence effect* - taxpayers stop acquiring schemes that lower their tax liability. However in a framework that allows for different types of scheme there will be different deterrence effects on different schemes. So it may sometimes be the case that the deterrence effect of a particular policy is positive for some schemes but negative for others.

    (ii)   The second is the *switching effect* – taxpayers switch the *type* of scheme they acquire. The sign of the *switching effect* will depend on (a) the direction in

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[5] In a companion paper, Damjanovic and Ulph (2009) we explore the implications of having an imperfectly competitive market where prices are affected by policies, but this is for the simpler case where there is just a single type of scheme available.

which taxpayers switch; (b) the size of the tax gap for different types of scheme. As we will see, the tax gap for high quality avoidance schemes may be higher or lower than that for lower quality schemes.

Since the framework allows for there being a range of possible avoidance schemes it could, under some interpretations, be thought of as encompassing both pure tax planning and pure evasion as extreme cases. However this is not the interpretation that is proposed in this paper[6]. Therefore a full analysis that encompasses tax planning, tax avoidance and tax evasion would require a somewhat different framework than that employed here, one which treats both planning and evasion as somewhat discretely different from avoidance.

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[6] The approach underlying this paper is that tax avoidance arises whenever for a given allocation of *real* resources by a taxpayer (production/consumption plans) the taxpayer resorts to a set of artificial/paper transactions that converts the streams of income that would have arisen naturally from these real resources into different income streams which would have arisen naturally from an alternative real allocation of resources and so enables the taxpayer to obtain a lower tax rate. While there is an element of artificiality there is no concealment or misrepresentation of their affairs. By contrast pure tax planning involves taxpayers in rearranging their real affairs (production /consumption plans) to obtain the best outcome in terms of profits (firms) or utility (individuals) while paying tax at the statutory rates on the incomes that arise naturally from these real plans. To the extent that this rearrangement lowers the rate of tax they pay, this comes at a cost of having to choose a less attractive real allocation than would be desirable if there were no differences in tax rates. It is this real cost that taxpayers are avoiding by the use of avoidance schemes. Of course taxpayers using tax planning may need to pay for good advice in order to choose the best arrangement of their affairs and this be interpreted as using a scheme. But the crucial difference between tax planning and tax avoidance is that tax planning involves a real cost over and above that of acquiring the scheme/advice. On the other hand, tax evasion involves deliberate concealment or misrepresentation of the taxpayers' affairs and the certain knowledge that this is illegal, and the type of taxpayers willing to do this may not be the same as those willing to engage in tax avoidance. By way of illustration consider a firm facing different rates of corporation tax in different countries. It faces the choice of locating some production facility either in country A or country B. Gross profits would be higher in country A than in country B but if the tax rate in country B was sufficiently far below that in country A it might relocate to country B – tax planning. Alternatively it might seek to retain its production in country A but find some artificial way of shifting its profits to country B – albeit at a cost of setting up a complex set of artificial transactions – tax avoidance. Finally it could keep its production in country A but, in completing its tax return simply declare its profits as arising in country B – tax evasion.

The paper is in four sections. The first section sets out the basic model; the second derives the equilibrium predictions about which types of taxpayer acquire which type of scheme and hence the size of the tax gap. The third derives the comparative static predictions about the effects of different types of policies on taxpayer behaviour and the implications of this for the tax gap, while the fourth concludes.

Section 1 The Model

Consider a taxpayer with tax base Y.

The taxpayer considers acquiring a tax avoidance scheme that will lower the rate of tax on this base by the amount $\Delta t > 0$, giving a *potential* full tax saving $\Delta T = \Delta t.Y$ [7]. This avoidance scheme is one of a class of avoidance schemes that exploit a particular differential in tax rates between very similar activities. These different rates could reflect:

- the internal tax policies of a given jurisdiction -for example the fact that in the UK National Insurance contributions are imposed on earned income but not unearned income;

- differences in tax policies in different jurisdictions;

- opportunities to shift taxable income across time and so get a lower discounted tax rate.

In what follows the differential tax rate Δt will be referred to as the *tax wedge*.

There may be many different ways of constructing schemes that exploit any given tax rate differential. So the taxpayer faces a market in which there are a number of different schemes produced and sold by various companies[8]. They all deliver the same reduction Δt in the tax rate but differ in both the risks with which they face the taxpayer and their prices. To describe these risks and the prices consider for the moment a single generic scheme.

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[7] Implicit in this is the idea that this all refers to a specific period of time – say a tax year – over which tax is due.
[8] Since, as indicated above, all schemes are going to be sold at a price equal to their marginal cost, it would be possible to allow for in-house schemes produced by taxpayers that can match the least-cost technology in the market.

<u>1.1   A Generic Scheme</u>

Each scheme confronts the taxpayer with the following five risks.

Risk 1   Legal Effectivenes

The first risk is whether or not the scheme works in law – is legally effective.   The

significance of a scheme's being effective is that in this case the tax authorities have no

powers to recover any tax saved let alone impose any penalties for the use of such a scheme.

However if a scheme is ineffective, and if a taxpayer is detected and successfully challenged

for using such a scheme then the tax authorities can recover the tax saved (plus interest) and

may be able to impose a penalty - to the extent that the tax authority has a policy of

penalising failed avoidance schemes[9].

Whether or not a scheme works is ultimately determined by the courts. For a scheme to work

in law it must be that case that every step in what is often a very complex sequence of

transactions must work and must also be properly implemented. Assume that, for some

schemes at least, at the time that the taxpayer acquires the scheme, there could be some scope

for doubt as to whether or not it really does work. So let p_e, $0 \leq p_e \leq 1$ be the probability

that the taxpayer attaches at the time of acquisition to the scheme's being effective. This

probability will be based on advice that the taxpayer will have received when the scheme is

supplied. It is assumed that this is good advice and that p_e is the true probability of the

scheme's effectiveness and is the same for all taxpayers.

The value of p_e will vary across schemes.

Risk 2. Legislative Change

Even if a scheme works in law, there is still a risk that the tax authority[10] decides that the

arrangements on which the scheme depends for generating the tax saving involve the

exploitation of some "loophole" in the legislation and takes legislative action to close the

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[9] Such a policy would of course be controversial

[10] Strictly speaking it is ultimately Parliament that decides to pass legislation closing loopholes, this legislation being introduced by Ministers, this decision drawing on advice by tax authority. Bit for purposes of this paper these distinctions do not matter – all that matters is the probability of legislation being introduced. So, for simplicity, I will continue to talk about the tax authority as being the decision maker on this issue.

loophole thus making the scheme incapable of delivering the saving. Let p_u, $0 \le p_u \le 1$ be the probability that the legislation is *unchanged* so $(1 - p_u)$ is the probability that the loophole will be closed. Again these are the probabilities at the time of acquisition.

Whether or not the tax authority closes the loophole will depend on a number of factors amongst which is the number of taxpayers using the scheme – or anticipated to use it. For the purposes of this paper it is assumed that the likelihood of the loophole being closed depends solely on the nature of the loophole e.g. the extent to which it is thought by the tax authority to significantly breach the spirit of existing legislation. As above it is assumed that the taxpayer obtains good advice about this at the time of acquisition and so knows the true value of p_u

The probability p_u will vary across schemes. Although the authority's decision to close a loophole is assumed to depend solely on the nature of the loophole, the precise values of p_u and the way these values vary across schemes will depend on policies implemented by the tax authority – and in particular its willingness to give clear guidance. At one extreme the tax authority may have a very clear view of what types of scheme/loophole it will try to close and what types of scheme it will not close. So whether this clarity of viewpoint is communicated (effectively) to taxpayers, or whether they just come to learn it over time, we can characterise this situation as one in which there will be a broad range of schemes for which $p_u = 1$, another broad range of schemes for which $p_u = 0$, and only a very narrow range of schemes for which $0 < p_u < 1$. This is the case where the authority offers clear guidance or creates what are often called "bright lines". Alternatively the authority may be either unable or unwilling to give clear guidance on what types of loopholes it will seek to close and decide everything on a case-by-case basis, with perhaps just a few illustrations of the types of things that would definitely lead to legislative action and the types of things that would not. We could capture this situation by assuming that there is a very narrow range of schemes for which $p_u = 1$ (so authority will definitely take no legislative action) and another narrow range where $p_u = 0$ (so the authority will definitely take legislative action) there is a wide range of schemes for which it is unclear whether or not the tax authority will act, and so $0 < p_u < 1$. Indeed in the case of very considerable uncertainty, it could be that for most of

the schemes in this latter range $p_u = \dfrac{1}{2}$. We can therefore characterise policies such as purposive drafting that aim at giving greater clarity/ guidance to taxpayers as a policy that raises p_u for high quality schemes but lowers it for low quality schemes.

Risk 3 Speed of Legislative Action

If the scheme works in law, but will be closed through legislative action, the taxpayer has to think about the speed with which the loophole on which it depends will be closed down, and, if it is closed, whether there is any element of retrospection whereby any tax savings already made when the loophole is closed will be lost.   This can all be summarised in the parameter $\varphi,\;\; 0 \leq \varphi \leq 1$ that measures the fraction of the possible tax saving ΔT that the taxpayer expects to retain in the event of the tax authority's taking legislative action to close the scheme. The value of φ will be influenced by things like disclosure powers which will affect the speed by which the tax authority becomes aware of the existence of certain types of scheme and whether or not some element of retrospection applies.

For simplicity it is assumed that φ does **not** vary with the scheme that is used, and that the taxpayer has a pretty good idea of the value of φ based on past experience of how quickly and frequently loopholes get shut.

Risk 4. Successful Challenge to Legally Ineffective Schemes

 If the scheme is ineffective (fails in law) the taxpayer has to consider the possibility that the tax authority successfully challenges it and recovers all the tax plus interest, plus, possibly, a penalty. Let $p_c,\;\; 0 \leq p_c \leq 1$ be probability that the tax authority successfully challenge the scheme. This is the product of 3 underlying probabilities:

- that the tax authority investigates the taxpayers;
- if it investigates, that it discovers the scheme has been used;
- if it discovers, it successfully demonstrates that the scheme fails and collects all the tax plus interest plus penalties.

For the purposes of this analysis, we do not need to keep track of these separate underlying probabilities.

For simplicity it is assumed that p_c does not vary across schemes or taxpayers. It would be relatively straightforward to introduce a more general treatment, but this is not central to the analysis. Finally it is assumed that through experience, interaction with other taxpayers, media coverage etc, taxpayers have a good understanding of the value of p_c.

Risk 5 Imposition of Penalty

The final risk that the taxpayer faces is that if the scheme is ineffective and is successfully challenged then the taxpayer will not only have to pay back all the tax (plus interest), but may in addition have to pay a penalty, which is typically a fraction of the tax saved by the scheme. In practice there is some discretion as to the extent of the penalty imposed , so let $f \geq 0$ be the *expected* fraction of the tax savings that will be imposed as a penalty. While in principle this could vary across schemes for simplicity it will be assumed that this is the same for all schemes.

It is important to recognise that some taxpayers may also suffer some reputational damage if they use an ineffective scheme that is effectively challenged. While there may be a number of factor's affecting the extent of this damage, for simplicity I will assume that it is proportional to the size of the taxpayer's tax base, Y. Let $\rho \geq 0$ be the factor of proportionality and call this the *reputational concern* of the taxpayer. This is a parameter that varies across taxpayers.

Finally let $C > 0$ be the cost of acquiring this particular scheme[11]. This will either be the cost of devising the scheme in house or else the price of buying the scheme in the market. In the latter case it is assumed that the price takes the form of an upfront fee. In general these costs will vary across schemes. In particular there are a number of reasons for thinking that schemes that are more likely to be legally effective will be more expensive:

- more – or more expensive - resources may be required to check that all the steps in a given scheme really do work in law;
- schemes that are to work in law will have to be installed more carefully;

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[11] The cost of acquiring a scheme includes the cost of implementing it. In principle these costs can encompass not just the costs of purchasing/devising and implementing the scheme but also any real economic costs the taxpayer faces in aligning its business with the tax system. The more artificial is a tax avoidance scheme, the lower these latter costs will be.

- schemes that are close to tax planning may involve the taxpayer in having to re-deploy real economic resources rather than using artificial paper transactions to lower taxes.

Bringing this all together, we can see that the net gain to a taxpayer with tax base Y and *reputational concern* ρ from acquiring any particular scheme is:

$$\pi(Y,\rho) = \Delta tY \left[p_e \left(p_u + (1-p_u).\varphi \right) + (1-p_e).(1-p_c) - (1-p_e).p_c.f \right] - \left(1-p_e\right) p_c \rho Y - C \ (1)$$

The first term on the RHS of (1) is the expected net financial benefit to the taxpayer from acquiring the scheme. The first term in square brackets is the expected fraction of the full tax saving, ΔtY, that the taxpayer will obtain from acquiring the scheme if it turns out to be effective   The second is the expected fraction of the full tax saving if the scheme is ineffective but the tax authority fails to successfully challenge it. The third terms is the expected loss to the taxpayer (as a fraction of the full tax saving) if the scheme turns out to be ineffective, the tax authority mounts a successful challenge and not only recovers all the tax (plus interest) but imposes a penalty.   The second term on the RHS of (1) is the expected cost to the taxpayer's reputation from acquiring a scheme that turns out to be legally ineffective and is successfully shown to be so by the tax authority. The final term on the RHS of (1) is the cost of acquiring (and implementing) the scheme[12], which, as noted, takes the form of an upfront charge

The expression in (1) can be re-written as:

$$\pi(Y,\rho) = \Delta tY \left\{ p_e \left[p_u + (1-p_u)\varphi \right] + (1-p_e)\left[1 - p_c(1+f) \right] \right\} - (1-p_e) p_c \rho Y - C \ . \ (2)$$

Let us make the standard and quite realistic[13] assumption that the probability of successful challenge of an ineffective scheme is sufficiently low that

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[12] Notice that what this brings out is that there is always *at least* one downside to avoidance – the cost of acquiring the scheme. For taxpayers with concerns about their reputation there will additionally be a downside associated with avoidance schemes that turn out to be ineffective and are successfully challenged.

[13] If this assumption failed to hold nobody would ever acquire a scheme that was close to pure evasion, i.e. $p_e \approx 0$, and yet evasion clearly takes place.

$$1 - p_c(1+f) > 0. \tag{3}$$

Given (3), the term in curly brackets on RHS of (2) is positive and less than 1 and represents the fraction of the full tax savings, ΔtY that the taxpayer can expect from the scheme. We can think of this as measuring the *quality* of the scheme – denoted by q, so

$$q = p_e\left[p_u + (1-p_u)\varphi\right] + (1-p_e)\left[1 - p_c(1+f)\right]. \tag{4}$$

In summary a scheme is characterised by:
- the 5 parameters $\left(p_e, p_u, p_c, \varphi, f\right)$ which capture the 5 risks faced by the taxpayer;
- the size of the tax wedge, Δt that this class of avoidance schemes is trying to exploit;
- the costs C of acquiring the scheme.

Given our assumptions two of the risk parameters - p_e and p_u - will vary across schemes as will the costs of acquiring a scheme. So the taxpayer can affect the risks by the decision about which scheme to acquire – albeit at a price. The probability of a scheme's being legally effective, p_e, is purely a feature of the scheme and cannot be affected by the government/tax authority. While p_u - the risk that the legislation on which a scheme depends will remain unchanged – will also vary across schemes depending on the details of the how they are constructed, the precise values of p_u attaching to various schemes will also be influenced by the tax authority through the guidance that it offers. The remaining risk parameters p_c, φ, f as well as the tax wedge Δt being exploited by this particular class of schemes are all constant across schemes and will all also be affected by policies pursued by the tax authority and/or government.

The five risk parameters affect the quality, q, of a scheme. Notice that quality is monotonically increasing in p_u and φ; monotonically decreasing in p_c and f. However it it will be monotonically increasing, constant or decreasing in p_e according as

$$p_u + \left(1-p_u\right)\varphi \underset{<}{\overset{>}{=}} 1 - p_c(1+f). \tag{5}$$

So a taxpayer will perceive a less legally effective scheme to be of higher quality if the risk of being effectively challenged and the consequent penalty is very low, while the risk of having the loophole changed quickly is quite high.

The final aspect of any given scheme that we need to understand is the tax-gap to which its acquisition would give rise. The tax gap is a measure of the amount of tax that the tax authority ultimately fails to collect through various types of non-compliance. There are definitional issues surrounding the tax gap and in particular the question of how avoidance gets treated. It would be generally agreed that if a taxpayer acquires a scheme that is illegal/ineffective, then the taxpayer has been non-compliant. However this will only give rise to a tax gap if the authority fails to successfully challenge the scheme and recover the tax – though it is important to note that the income raised from any penalties that are imposed is typically not counted as helping to reduce the tax gap.

If the taxpayer acquires a scheme that is effective and if the authority decides not to change the legislation on which the scheme depends for its effectiveness then this suggests that the scheme complies with both the letter and the spirit of the legislation and so acquiring such a scheme would not count as non-compliance. However if the authority decides to close the loophole then the taxpayer has not complied with the spirit of the legislation, and the purchase of this scheme would constitute non-compliance. If a scheme is effective the tax authority has no powers to recover tax so the extent to which this non-compliance gives rise to a tax-gap depends on the speed with which the legislation is closed.

Let g denote the fraction of the potential tax saving $\Delta t.Y$ that will ultimately fail to be collected if a taxpayer purchases a generic scheme. Given our above discussion this is defined as

$$g = p_e.\left(1-p_u\right).\varphi + \left(1-p_e\right).\left(1-p_c\right) \geq 0. \tag{6}$$

Notice that $g = 0$ if an only if a scheme is fully compliant with the letter and the spirit of the legislation that forms the basis of its effectiveness, and which consequently will not be changed.

Now other things being equal the tax authority prefers schemes with lower tax gaps to those with higher tax gaps. The interesting question is therefore how its ranking of schemes compares to the quality ranking by taxpayers and whether their views are always opposed to one another or might sometimes be aligned. From (4) and (6) we see while an increase in p_u raises the quality of a scheme it lowers the tax gap. However the tax gap will be monotonically increasing, constant or decreasing in p_e according as

$$(1-p_u)\varphi \gtrless 1-p_c. \qquad (7)$$

So if

- the chances of successfully challenging a scheme if it is ineffective is quite high,
- schemes in this area are typically not compliant with the spirit of the law so the tax authority is very likely to want to close the loophole,
- but it just takes a long time to spot and change the legislation,

then the tax gap will be higher the more legally effective is the scheme.

The following proposition summarises the circumstances under which the perception of quality by the taxpayer is aligned with that of the tax authority.

Proposition 1 Schemes that are perceived to be of higher quality by the taxpayer will have lower tax gaps if:

(i) they have the same degree of legal effectiveness;

(ii) they have the same probability, p_u, that the legislation on which they depend will be changed and if $(1-p_c)-(p_u+p_c f)<(1-p_u)\varphi<1-p_c$.

1.3 The Market for Schemes

As mentioned above we want to think of there being a differentiated products market that produces a variety of schemes within a particular class that all bring about the same reduction Δt on a given tax base Y. The schemes work in different ways and so offer taxpayers different exposures to the 5 risks identified above. Schemes differ in:

- p_e - the probability that they work in law;

- p_u - the perceived probability that the tax authority will leave unchanged the legislation on which the scheme depends;

- C - the costs of acquiring the scheme.

In relation to the costs to the taxpayer of acquiring a scheme, C, in this paper it is assumed that:

    (i)   the market for schemes is perfectly competitive;

    (ii)   each type of scheme is produced at a constant marginal cost.

Given these assumptions the cost to the taxpayer of acquiring the various schemes are constant and unaffected by the various policies pursued by the tax authority[14].

While there could be very many schemes in the market with different types of taxpayer acquiring different schemes, it will simplify the analysis greatly if we assume that there just two schemes. The first is a *pure avoidance* scheme for which $p_e = 1$, $p_u \leq 1$ while the second is a scheme that lies in the grey area where $p_e < 1$, $p_u < 1$ and, moreover the value of p_u is lower for this scheme that got the first.

As noted above there is no guarantee that just because the first scheme is certainly legally effective it is of a higher quality than the second scheme. But in fact the most interesting analysis follows by assuming that this is the case and this is the assumption that will be maintained throughout the analysis in rest of the paper. So call the first scheme the high quality scheme and the second the low quality scheme and characterise then by

$$0 < p_e^L < p_e^H = 1; \quad 0 < p_u^L < p_u^H \leq 1;$$
$$0 < q^L = p_e^L \left[p_u^L + \left(1 - p_u^L\right)\varphi \right] + \left(1 - p_e^L\right)\left[1 - p_c(1 + f)\right] < q^H = p_u^H + \left(1 - p_u^H\right)\varphi \leq 1 \tag{8}$$

If the costs of acquiring the two schemes are denoted by C^H, C^L respectively, then the net gains from acquiring these two schemes are:

$$\pi^H(Y, \rho) = \Delta t.Y.q^H - C^H \tag{9}$$

$$\pi^L(Y, \rho) = \Delta t.Y.q^L - \left(1 - p_e^L\right)p_c.\rho.Y - C^L \tag{10}$$

Notice that if $C^H \leq C^L$ then all taxpayers would prefer the high quality scheme to the low quality scheme, and the low quality scheme would not be supplied in the equilibrium.. So to have an interesting case where both schemes exist in equilibrium it is necessary to assume that the high quality scheme sells at a higher price than the low quality scheme. Indeed, as will become apparent, it is necessary to make the stronger assumption that the cost differential is greater than the quality differential:

$$\frac{C^H}{C^L} > \frac{q^H}{q^L} > 1.$$
(11)

Finally notice that the tax gaps associated with these two schemes are:

$$g^H = \left(1 - p_u^H\right)\varphi < q^H;$$
$$g^L = p_e^L\left(1 - p_u^L\right)\varphi + \left(1 - p_e^L\right)\left(1 - p_c\right) > q^L$$
(12)

so the high quality scheme may have a higher or lower tax gap than the low quality scheme.

This completes the basic description of the model. The next section sets out the predictions concerning the nature of the equilibrium.

Section 2:   Equilibrium Predictions

In order to understand the impact of policy changes introduced by tax authority, we first need to determine which taxpayers acquire a scheme and which one this is. A taxpayer will acquire a particular scheme if and only if:
(i)   it gives at least as great an expected net gain as the other scheme;
(ii)   the expected net gain is positive.

2. 1   Who acquires what

Consider first the conditions under which each of the two schemes makes a positive return for the taxpayer.   If we start with the high quality scheme, then since it works for sure in law, we see from (6) that reputational risk is not a factor affecting this consideration, and that the high quality scheme will be profitable as long as the taxpayer has a sufficient large tax base. Specifically the high quality scheme is profitable so long as

$$Y > Y^{H0} = \frac{C^H}{\Delta t . q^H} . \qquad (13)$$

Here Y^{H0} is the critical size of the tax base at which a taxpayer is just indifferent between acquiring the high quality scheme and having no tax scheme.

Now consider the low quality scheme. Let

$$\overline{\rho}^L = \frac{\Delta t . q^L}{\left(1 - p_e^L\right) . p_c} > 0 , \qquad (14)$$

and notice that, from (10), it follows that for all $\rho \geq \overline{\rho}^L$ the net gain from the low-quality scheme is negative – no matter what the values of Y and C^L. In other words, there is a group of taxpayers with a sufficiently high reputational concern who will never acquire the low quality scheme – however cheap it is and however large is their tax base.

Those who have a lower reputational risk factor will be prepared to acquire the low quality scheme if their tax base is sufficiently high. So, from (10) the low quality scheme generates a positive expected net gain so long as

$$Y > Y^{L0}(\rho) = \frac{C^L}{\Delta t . q^L - \left(1 - p_e^L\right) . p_c . \rho} \qquad (15)$$

$$\rho < \overline{\rho}$$

Here $Y^{L0}(\rho)$ is the critical size of the tax base at which a taxpayer with low reputational concern is just indifferent between acquiring the low quality scheme and having no tax scheme. Notice that

$$Y^{L0}(0) > 0; \quad \frac{dY^{L0}}{d\rho} > 0; \quad Y^{L0}(\rho) \to \infty \quad \text{as} \quad \rho \to \overline{\rho}. \qquad (16)$$

It is also easy to see that, given (11),

$$Y^{L0}(0) < Y^{H0}. \qquad (17)$$

Now consider which of the two schemes gives the highest net gain for any given taxpayer.

Let

$$Y^{HL}(\rho) = \frac{\left(C^H - C^L\right)}{\Delta t.\left(q^H - q^L\right) + \left(1 - p_L^e\right).p_c.\rho} > 0. \qquad (18)$$

This defines the critical level of income at which a taxpayer with reputational risk factor $\rho \geq 0$ would be just indifferent between the high quality scheme and the low quality scheme. A taxpayer with a larger tax base than Y^{HL} would strictly prefer the high quality scheme, because the return on the higher base would better offset the higher cost of the better quality scheme. A taxpayer with a smaller tax base than Y^{HL} would strictly prefer the low quality scheme, because the lower tax base could not justify the higher cost of the high quality scheme. Notice also that Y^{HL} is a strictly decreasing function of ρ. Greater reputational risk makes the low quality scheme less attractive and so taxpayers will be prepared to switch to the high quality scheme at a lower tax base.

It is easy to see that it follows from (11) that

$$Y^{HL}(0) > Y^{H0}. \qquad (19)$$

Finally let $\hat{\rho}$ be the critical value of ρ for which $Y^{HL}\left(\hat{\rho}\right) = Y^{H0} = Y^{L0}\left(\hat{\rho}\right)$. This is defined by

$$\hat{\rho} = \frac{\Delta t q^L}{\left(1 - p_e^L\right) \cdot p_c} \cdot \left(1 - \frac{q^H}{q^L} \cdot \frac{C^L}{C^H}\right). \tag{20}$$

From (11) and (14) it follows that

$$0 < \hat{\rho} < \overline{\rho}^L. \tag{21}$$

From the above analysis we can work out how any given taxpayer ranks the three options:

- buy neither scheme;
- buy scheme 1;
- buy scheme 2,

and hence which of these decisions they make.

All these ideas can be summarised in the two Figures shown below in the Annex. In Figure 1 all the various curves discussed above are illustrated. Figure 2 in the Annex shows which taxpayers make which decision. This is a more schematic version of Figure 1 in which sections of curvilinear functions have been represented by straight lines. Here Points A, B and E correspond to the levels $Y^{HL}(0)$, Y^{H0}, and $Y^{L0}(0)$, respectively of the tax base. Point F corresponds to the critical reputational factor $\hat{\rho}$ at which the three curves $Y^{HL}(\rho), Y^{L0}(\rho)$ and Y^{H0} intersect. The line AD is a linear representation of a section of the curve $Y^{HL}(\rho)$, while ED is a linear representation of a section of the curve $Y^{L0}(\rho)$.

Taxpayers with characteristics that lie above the curve *ADC* acquire the high quality scheme. Those with characteristics in the area *ADE* acquire the low quality scheme, while those with characteristics that lie below *0EDC* acquire neither scheme.

Now taxpayers' reputational risk factors are not readily observable - by either tax authorities or social researchers – though there is some interesting research to be done to investigate this

further. However there are 4 key predictions about how behaviour relates to the size of a taxpayer's tax base.

(a)   The poorest taxpayers – those for whom $Y \leq Y^{L0}(0)$ - will acquire neither scheme. This is essentially because their tax base is too small to justify the up-front costs of acquiring a scheme.

(b)   There is a group of "lower tax base" taxpayers – those for whom $Y_0^{L0} \leq Y \leq Y^{H0}$ - who will acquire either the low quality scheme or nothing at all.

(c)   There is a group of "middle tax base" taxpayers - those for whom $Y^{H0} \leq Y \leq Y_0^{HL}$ - who will be observed to acquire either the low quality scheme or the high quality scheme.

(d)   The richest taxpayers – those with $Y \geq Y_0^{HL}$ - will all acquire the high quality scheme.

Finally notice that in the theory developed here there are four key drivers of behaviour:

- *Opportunities for avoidance*. These are given by Δt which affects the benefit/demand for avoidance and C^H, C^L which capture supply side factors that determine the ease of getting advice/schemes.

- *Incentives for avoidance* In this model this is captured by the parameter Y.

- *Attitudes towards avoidance*. In this model this is captured by the parameter ρ

- *Risks from avoidance* These are captured by the 5 parameters $\left(p_e, p_u, p_c, \varphi, f \right)$

Having determined who acquires which scheme, it is now possible to calculate the tax gap.

2.2   The Tax Gap

Assume that the two parameters (Y, ρ) that characterise taxpayers are jointly distributed across R_+^2 according to the density function $f(Y, \rho) > 0$ which, for simplicity, is assumed to be everywhere positive. Then it follows from the above analysis of who buys what that the aggregate tax gap, *G,* expressed in absolute terms is given by

$$G = \Delta t \left\{ \begin{array}{l} g^L \int_0^{\hat{\rho}} \int_{Y^{L0}(\rho)}^{Y^{HL}(\rho)} Yf(Y, \rho)dYd\rho + \\ g^H \left[\int_0^{\hat{\rho}} \int_{Y^{HL}(\rho)}^{\infty} Yf(Y, \rho)dYd\rho + \int_{\hat{\rho}}^{\infty} \int_{Y^{H0}}^{\infty} Yf(Y, \rho)dYd\rho \right] \end{array} \right\}. \tag{22}$$

We can see that any policy change will have three different type of effects:

- *Direct Effects* - these are defined as the effects that arise through the impact of policy changes Δt, g^L, g^H holding taxpayer behaviour constant.

- *Indirect Effects*: these are defined as the effects that through the impact of policy changes on taxpayer behaviour – whether or not they acquire a scheme, and, if so which one they acquire – holding Δt, g^L, g^H constant.

Notice that, to first order, changes in $\hat{\rho}$ have no impact on G so these indirect or behavioural effects can broken into

- *Deterrence Effects*. These arise when taxpayers who previously acquired a scheme no longer do so[15]. These can be further classified and defined as:

  o *Deterrence Effects on Low Quality Schemes* . These arise when policy changes raise $Y^{L0}(\rho)$ on $[0,\hat{\rho}]$. Formally

  $$dG^L = -\Delta t.g^L \int_0^{\hat{\rho}} Y^{L0}(\rho) f\left[Y^{L0}(\rho),\rho\right] dY^{L0}(\rho) d\rho . \qquad (23)$$

  o *Deterrecet Effects on High Quality Schemes*. These arise when policy changes raise Y^{H0} and will affect taxpayers for whom $\rho \geq \hat{\rho}$. Formally

  $$dG^H = -\left[\Delta t.g^H Y^{H0} \int_{\hat{\rho}}^{\infty} f\left(Y^{H0},\rho\right) d\rho\right] dY^{H0} \qquad (24)$$

- *Indirect Switching Effects* These will arise to the extent that the policy changes affect $Y^{HL}(\rho)$ on $[0,\hat{\rho}]$. We have

  $$dG^S = \Delta t.\left(g^L - g^H\right) \int_0^{\hat{\rho}} Y^{HL}(\rho).f\left[Y^{HL}(\rho),\rho\right] dY^{HL}(\rho) d\rho . \qquad (25)$$

  The sign of this depends on not just the direction in which $Y^{HL}(\rho)$ is shifted by policy but also on whether the tax gap is greater for the low quality scheme than for the high quality scheme. Since at this level of generality there is no restriction on the latter, all that we will be able to establish in the next section is the direction in which $Y^{HL}(\rho)$ is shifted by policy. We will say that there has been a *Switching Effect Towards Low (resp. High) Quality* according as $dY^{HL}(\rho) > 0$ $(resp. < 0)$.

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[15] Obviously this can happen in reverse and taxpayers who previously did not acquire a scheme now choose to do so. In this case the deterrence effect will be negative and could be referred to as an acquisition effect.

Section 3:   Comparative Static Predictions

This section examines the impact of various types of policy on taxpayer behaviour and hence, from (23) – (25) the *indirect* effects of these policies on the tax gap. Changes in all six of the policy parameters $p_e, p_u, p_c, \varphi, f$ and Δt will be examined, but it will be useful to group them under four different types of policy.

3.1 *Penalties*

The first policy is that of increasing the penalty on failed avoidance, which in this model is captured by an increase in f. From (8), (13), (15) and (18) it is easy to see that this has no effect on q^H and hence on Y^{H0}, but will lower q^L and hence increase $Y^{L0}(\rho)$, lower $Y^{HL}(\rho)$ and reduce $\hat{\rho}$.   Formally

$$\frac{dq^H}{df} = 0, \frac{dq^L}{df} < 0 \quad \Rightarrow \quad \frac{dY^{H0}}{df} = 0; \frac{dY^{L0}(\rho)}{df} > 0; \frac{dY^{HL}(\rho)}{df} < 0. \qquad (26)$$

The intuition behind this is very straightforward and we have:

Proposition 2   An increase in the penalty for failed avoidance will produce:

- a positive *Deterrence Effect on the Low Quality Scheme*;
- a zero *Deterrence Effect on the High Quality Scheme;*
- a *Switching Effect Towards High Quality.*

This is illustrated in Figure 3 in the Annex where the new boundaries are represented by dashed lines. What this shows is that taxpayers in the area HGDE who previously acquired the low quality scheme now acquire no scheme – the *Low Quality Deterrence Effect* - while those in the area ADGF now *switch* from acquiring the low quality scheme to acquiring the high quality scheme – the *High Quality Switching Effect.*

3.2 *Disclosure/Information*

The second policy is that of *disclosure* or of greater information powers for tax authorities to learn what schemes are in the market and who is using them.   This has two parts. First it requires companies that market schemes to reveal their existence and how they work as soon

as they are brought to market. Each scheme is then given a number by the tax authority and any taxpayer who acquires and uses a scheme is required to put the number of the scheme on their tax return. Corresponding to these two different features of the policy we can think of *disclosure* having two effects.

(a) For schemes that are effective but where the tax authority would have wanted to close the loophole on which they depend for their effectiveness, the tax authority discovers the schemes are in operation more quickly and closes them down faster. This can be captured in the model as a reduction in φ [16].

(b) For ineffective schemes it raises the probability of detection and, probably, the effectiveness of investigation, which can be captured in the model as an increase in p_c.

Consider these effects in turn

3.2.1 Earlier Closure of Loopholes

Earlier closure of loopholes will obviously lower the potential return on both types of scheme making them less attractive to taxpayers. This shows up in the formal model in the fact that, as is easily seen from (8), a reduction in φ lowers both q^H and q^L and hence, from (13) and (15) raises both $Y^{L0}(\rho)$ and Y^{H0}. Formally

$$-\frac{dq^H}{d\varphi}<0, -\frac{dq^L}{d\varphi}<0 \quad \Rightarrow \quad -\frac{dY^{H0}}{d\varphi}>0; -\frac{dY^{L0}(\rho)}{d\varphi}>0 \qquad (27)$$

However the impact of this policy on the difference in quality between the two schemes and hence, from (18), on $Y^{HL}(\rho)$ and so the *Switching Effect* is ambiguous. The reason is that the high quality scheme is more likely to be effective - and so it is more likely that loophole closure is a relevant risk to be considered – but the risk of having the loophole closed is lower so it is not clear that closing loopholes faster matters more for high quality schemes than for low quality schemes. Formally

$$-\frac{d\left(q^H-q^L\right)}{d\varphi}=p_e^L\left(1-p_u^L\right)-\left(1-p_u^H\right)\gtrless 0 \quad \Rightarrow \quad -\frac{dY^{HL}(\rho)}{d\varphi}\gtrless 0. \qquad (28)$$

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[16] A special case of the policy of greater information powers is that of *retrospection*. Under this provision taxpayers are told (in advance) they will required to repay all tax savings made on any scheme that is closed. This can be captured in the model as a special case in which φ is driven to zer.

These results are summarised in:

Proposition 3   Earlier closure of loopholes will produce:

- a positive *Deterrence Effect on the Low Quality Scheme*;
- a positive *Deterrence Effect on the High Quality Scheme;*
- a *Switching Effect* that can go in either direction..

The effect of earlier closure of loopholes is illustrated in Figure 4 for the case where

$-\dfrac{dY^{HL}(\rho)}{d\varphi} < 0$ and so the *Switching Effect* is towards the *High Quality* scheme and in Figure

5 for the case where $-\dfrac{dY^{HL}(\rho)}{d\varphi} > 0$ and so the *Switching Effect* is in the other direction. In

Figure 4 the *Low Quality Deterrence Effect* is represented by the area HGJDE while the
High Quality Deterrence Effect is represented by the area JKLD. The *Switching Effect
Towards the High Quality Scheme* is represented by the area AJGF.   . In Figure 5 the *Low
Quality Deterrence Effect* is represented by the area HGDE while the *High Quality
Deterrence Effect* is represented by the area JKLDG. The *Switching Effect Towards the High
Quality Scheme* is represented by the area AGJF.

3.2.2   Higher Risk of Successful Challenge

It is it is intuitively obvious and easy to see more formally from (8) that an increase in the
risk of successful challenge has exactly the same qualitative effect as an increase in the
expected penalty that will be imposed conditional on being challenged. So the predictions
are as in (26) and as illustrated in Figure 3.

Proposition 4 A greater risk of successful challenge has exactly the same behavioural effects
as an increased penalty on failed avoidance The latter are stated in Proposition 2

3.3   *Designing Out Avoidance*

The third type of policy that we can consider is that of reducing the incentive for avoidance
through re-designing tax policy in a way that reduces the wedges in the tax system under
which very similar activities get taxed at the different rates. Within the framework adopted
here we can think of as this as a reduction in Δt . From (8) this has no impact on either

q^H or q^L though from (13), (15) and (18) this directly increases $Y^{H0}, Y^{L0}(\rho)$ and $Y^{HL}(\rho)$.

Formally

$$-\frac{dY^{H0}}{d\Delta t} > 0; -\frac{dY^{L0}(\rho)}{d\Delta t} > 0; -\frac{dY^{HL}(\rho)}{d\Delta t} > 0. \qquad (29)$$

Proposition 5 Policy reforms which lower the opportunity for avoidance will produce:

- a positive *Deterrence Effect on the Low Quality Scheme*;
- a positive *Deterrence Effect on the High Quality Scheme;*
- a *Switching Effect Towards Low Quality..*

The intuition is clear. Lowering the tax wedge reduces the gain from acquiring an avoidance scheme, while costs remain unaltered, so creating a deterrence effect on both types of scheme. On the other hand precisely because one scheme is of higher quality than another the reduction in the tax wedge will have a bigger reduction in its net return than in that of the lower quality scheme, causing taxpayers to switch towards the low-quality scheme. The comparative static predictions are illustrated in Figure 5, where the interpretation is just as above in section 3.2.1

3.4 *Better Guidance*

The final type of policy that will be analysed is that of giving better guidance as to how well various tax schemes fit with the spirit of the legislation – and so the likelihood of the legislation on which schemes depend for their effectiveness being changed. As indicated in Section 1 this policy can be captured in the current framework as an increase in p_u^H and a reduction in p_u^L. This makes high quality schemes more attractive and low quality schemes less attractive. The way this shows up is that, from (8), the effect of these changes in p_u will be to increase q^H and lower q_u^L. From (13), (15) and (18) these changes will in turn lower both Y^{H0} and $Y^{HL}(\rho)$ and raise $Y^{L0}(\rho)$. Formally:

$$\frac{dq^H}{dp_u} > 0, \frac{dq^L}{df} < 0 \quad \Rightarrow \quad \frac{dY^{H0}}{dp_u} < 0; \frac{dY^{L0}(\rho)}{dp_u} > 0; \frac{dY^{HL}(\rho)}{dp_u} > 0. \qquad (30)$$

Thus we have

Proposition 6 A policy of giving better guidance will produce:

- a **positive** *Deterrence Effect on Low Quality Schemes*;
- a **negative** *Deterrence Effect on High Quality Schemes*;
- a *Switching Effect Towards High Quality.*

These effects are illustrated in Figure 6 where area EHGJ represents the positive *Deterrence Effect on Low Quality Schemes*; area DLKJ represents the negative *Deterrence Effect on High Quality Schemes*; and area ADJGF the *Switching Effect Towards High Quality*.

In summary, the analysis in this section has shown that the various policies can have very different effects on behaviour. Policy design and the earlier closure of loopholes will have deterrence effects on both high and low quality schemes, and while the former definitely switches taxpayers towards low quality schemes the switching effect of the latter can go in either direction. Increased penalties and the more effective challenging of taxpayers are effectively identical and generate deterrence effects only on low quality schemes and switch taxpayers towards high quality schemes. Better guidance also switches taxpayers towards high quality schemes and while it deters the acquisition of low quality schemes will promote the acquisition of high quality schemes.

Section 4: Conclusions

This paper has provided a framework within which to understand the effects of a wide range of anti-avoidance policies that have been introduced or are under discussion by many tax authorities. Such a framework needs to take seriously the supply side of tax avoidance and in particular the fact that the industry supplies a range of differentiated products. An important feature of the approach is that it focuses on the various risks that different types of ways of reducing tax liability confront the taxpayer, and so recognises the multi-dimensional nature of the product differentiation that is in operation.   A corollary is that to have an interesting analysis it is also necessary to recognise the heterogeneity of taxpayers who can differ in both their incentives fir tax reduction and their attitudes towards different ways of achieving this.

Despite this richness the framework generates some clear predictions about the different effects of different policies, which are summarised at the end of the previous section. However in order for tax authorities to determine how these policies affect the tax gap they need to develop an understanding of how the tax gap varies across different types of scheme.

The analysis has been conducted for a particular case in which the ratio of cots is higher than the ratio of qualities – expression (11) – and the assumption that the higher quality scheme had greater legal effectiveness. It is straightforward to check that:
- if the inequality in (11) were reversed then the low quality scheme would never be acquired and the only relevant margin on which policies would operate is that of the deterrence effect on high quality schemes;
- if the scheme with greater legal effectiveness is of lower quality, then there will be an initial regime where taxpayers with low reputational concern acquire only the low quality scheme, and thereafter the analysis will be much as above.

So the analysis can be straightforwardly generalised beyond the specific case considered here, and there has been no essential loss of generality in restricting attention to this case.

Nevertheless the framework considered here is extremely simple and there are many extensions that need to be made.
- The framework assumes risk neutral taxpayers, and that the only way in which attitudes/values get to play a role is through reputational considerations. It is important to examine the implications of a more general treatment of risk and values.
- The supply side is very under-developed. A proper treatment of the supply side would recognise that the market for schemes is highly oligopolistic and that the prices of various schemes are endogenous, and so influenced by policy. Damjanovic and Ulph (2009) do this for the case where there is a single homogeneous product and show that many standard predictions in the tax literature can be reversed when the price of tax products is endogenous.
- Finally while paper examines the impact of policies on the tax gap the full welfare implications have not been developed. This warrants more careful treatment.
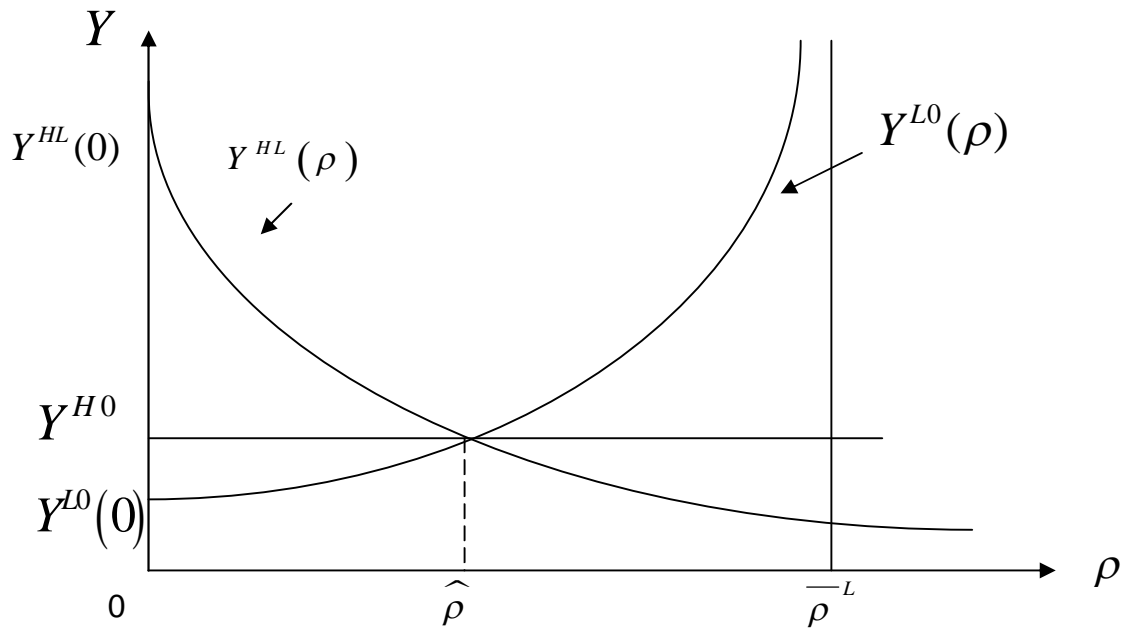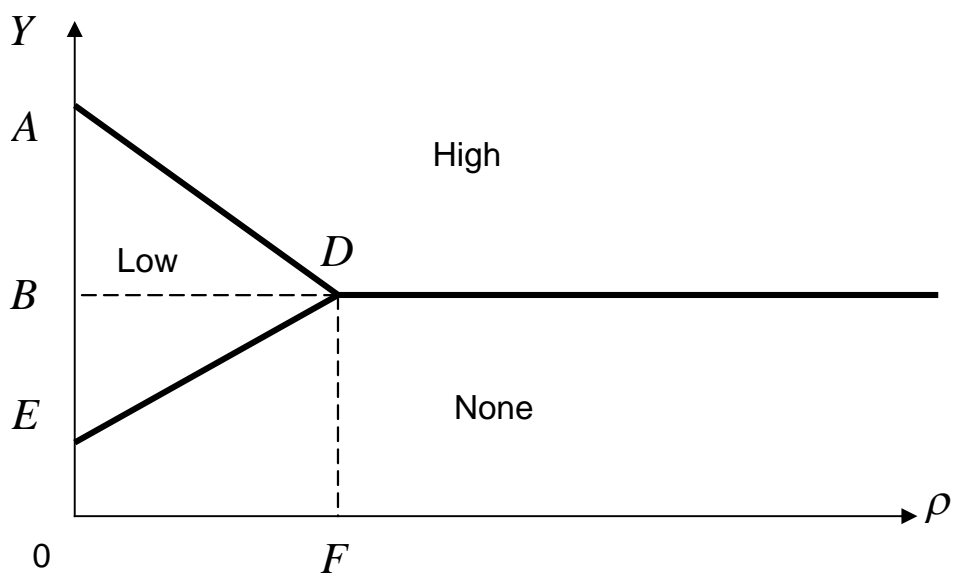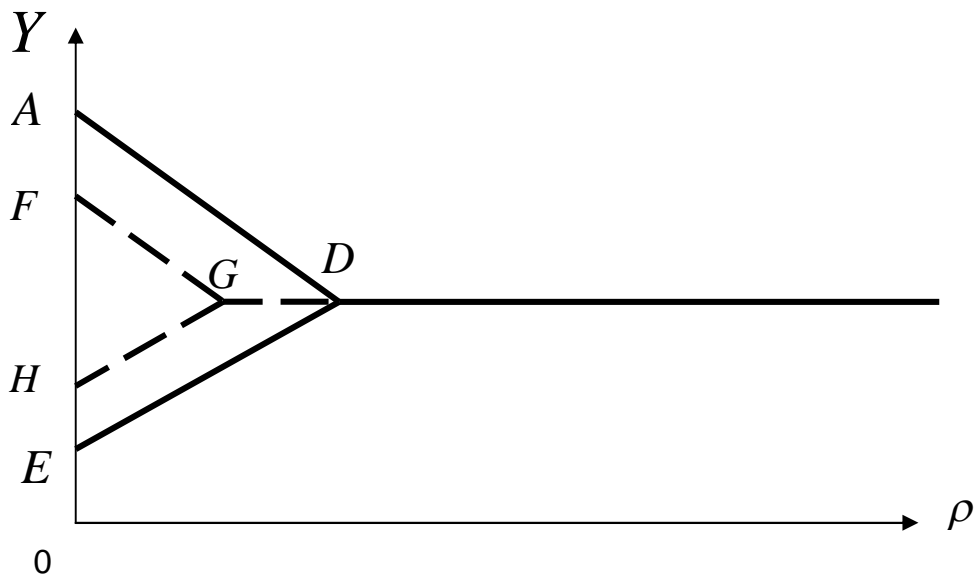
Annex

Figure 1

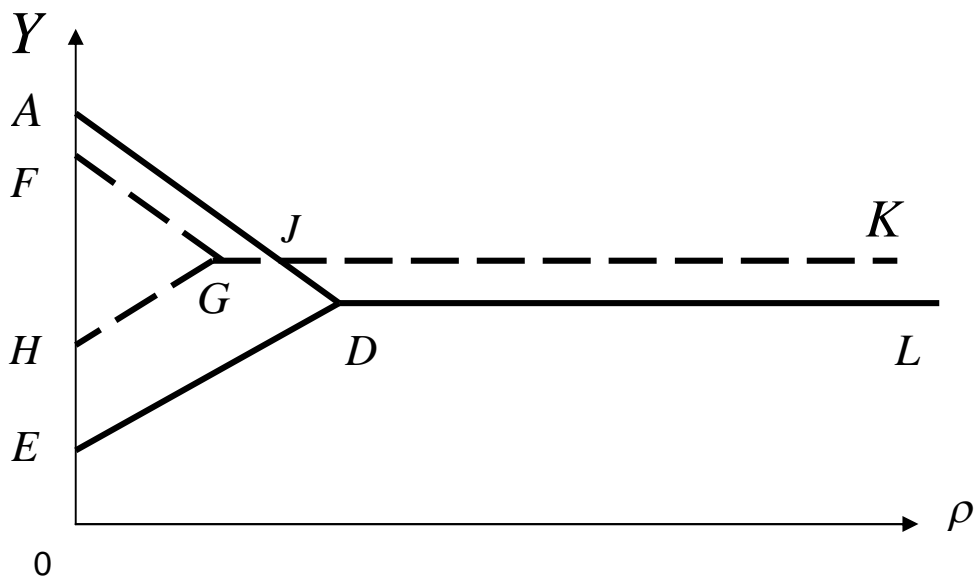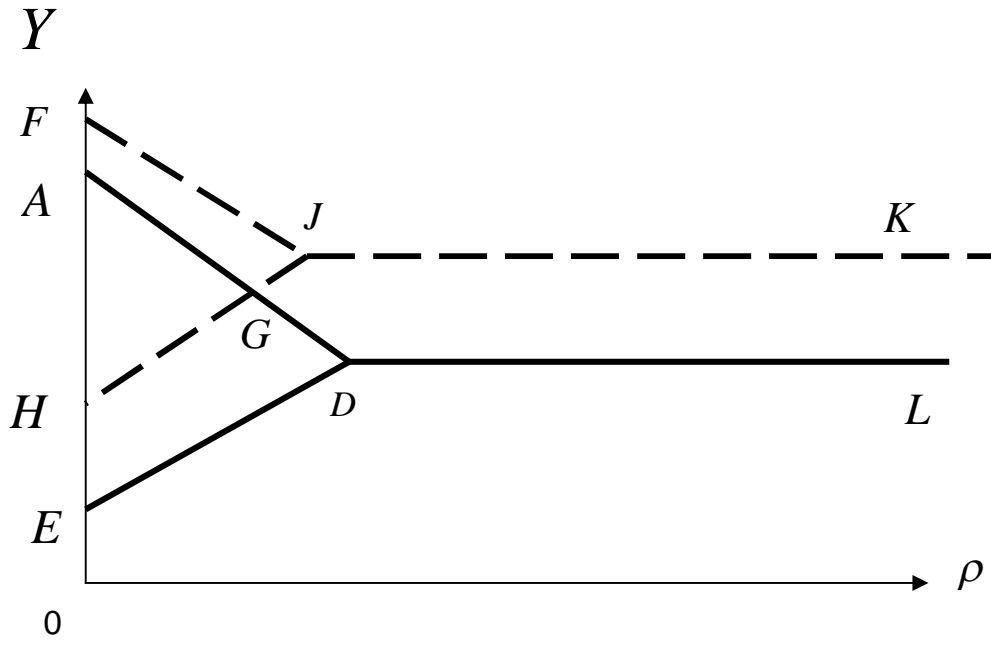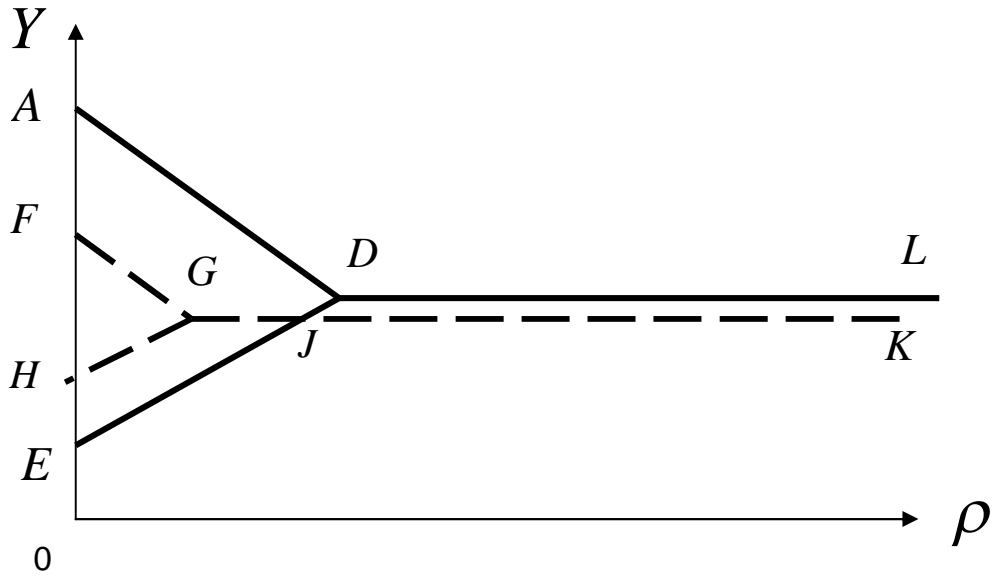# Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

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