

ISSUES IN THE DESIGN OF TAXES ON CORPORATE PROFIT

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Abstract

This paper considers of the proposals of the Mirrlees (2011) review to introduce an allowance for corporate equity (ACE) in the corporation tax system. It assesses how an ACE would affect various dimensions of corporate decision making. Broadly, the ACE would introduce neutrality in decisions as to the scale of investment and the source of finance. But it would leave distortions to many mutually exclusive discrete choices, such as location decisions, and to profit shifting decisions. The paper presents some evidence on the likely impact of introducing an ACE, which depends on how the government makes up for foregone revenue for corporation tax. It also considers briefly more radical options such as a destination-based tax.

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1. Introduction

The Institute for Fiscal Studies has commissioned two large scale reviews of the tax system, in each case focusing on the UK, but with the ambitious aim of analysing what should be the characteristics of a good tax system, a question of relevance to all countries. Each of the review teams was chaired by a Nobel Laureate, the first in 1978 by James Meade,¹ and the second 33 years later in 2011 by James Mirrlees.² Each of the review teams contained a glittering array of academic talent. The Meade Review examined all direct taxes; the Mirrlees review was even more ambitious, covering all taxes.

Each of their reports reflects the contemporary theory and evidence of its time. A comparison of the two therefore affords an opportunity to assess the development of thought in the design of taxes over the last three decades; and a study of the Mirrlees review should reveal the state of current thinking. A detailed comparison of the two, and a detailed assessment of the Mirrlees review, would require another review team, and another sizable report. This paper is less ambitious, mainly because it addresses only a relatively small part of the entire tax system: the taxation of corporate profit.

A starting point for a comparison of the corporation tax proposals of the two reviews is their similarity. The Meade review proposed alternative versions of a flow of funds tax. Consistent with their proposals for an expenditure tax on individuals, essentially they proposed that the tax base in any period should be the net flows in that period. They distinguished between a tax only on real flows (the R base) and on real and financial flows (the R+F base, or equivalently the S base).³ In present value terms these taxes leave the normal return to capital untaxed, and levy a tax only on economic rent – profit over and above the normal required return to capital. In a simple setting in which the tax rate does not change, and the introduction of the tax does not change the valuation of a given future cash flow, then the net present value (NPV) of tax payments of such a tax is equal to the tax rate multiplied by the pre-tax net present value of the project, or the pre-tax economic rent. Such a tax is neutral in the sense that – as long as the tax rate lies between zero and 100% - an investment project that has a positive NPV before tax will also have a positive NPV after tax: if it is worth undertaking before tax, it will also be worth undertaking after tax.

¹ Meade et al. (1978).

² Mirrlees et al. (2011).

³ An R-based tax was also part of the X-Tax proposal of Bradford (1986).

Moving on 33 years, we find the Mirrlees review team proposing a tax with the same basic characteristics as the flows of funds tax. True, Mirrlees proposes an updated version, in which the timing of tax payments differs from that advocated by Meade. Specifically, Mirrlees advocates introducing an allowance for corporate equity (ACE), as proposed in 1991 by another IFS team, the IFS Capital Taxes Group, chaired by Malcolm Gammie.⁴ This allowance gives relief for a measure of the opportunity cost of equity finance; the size of the allowance is determined by applying a notional rate of return to a measure of the equity used in the company. The measure of equity includes net new issues and retained earnings, measured with reference to taxable profit. Introducing such a relief thus effectively equalises the treatment of debt and equity. Put another way, the ACE is designed to offset exactly the difference between the actual corporation tax base and the base in a flow of funds base.⁵ As a result, it has very similar economic properties to a flow of funds tax. Specifically, like the flow of funds tax, the NPV of tax on an investment project under the ACE is also proportional to the pre-tax NPV.

Perhaps this conformity in proposals more than 3 decades apart for the optimal way of taxing corporate profit should be comforting. It seems to imply that we have known for a long time how best to tax corporate profit, even if there are still details that could be improved. But if this represents a consensus in academic thinking, then it has not caught on with governments around the world. True, there have been experiments with ACE-like features in corporation taxes around the world. For example, Croatia experimented with an ACE between 1994 and 2001, Belgium has a notional interest deduction similar to the ACE, and Italy has also experimented with a form of the ACE.⁶ Other countries either have considered, or currently are considering, it. But these are the exceptions rather than the rule. As Section 2 indicates, the most common form of corporation tax reform over the last 3 decades, seen again and again virtually all over the world, is a rate-reducing, base-broadening reform: almost exactly the opposite direction to that proposed by both Meade and Mirrlees. It would seem that policy makers around the world have not (yet, at least) been persuaded of the merits of the Meade/Mirrlees approach.⁷

⁴ I should declare an interest as a member of this group. Malcolm Gammie was also a member of the Mirrlees review team. The ACE proposal grew out of a paper by Boadway and Bruce (1984). It was further refined and discussed by Devereux and Freeman (1991), and Bond and Devereux (1995, 2003). Others have made similar proposals, including Kleinbard (2007).

⁵ See IFS Capital Taxes Group (1991) and others.

⁶ For a review of the experience in Croatia, see Keen and King (2002); Klemm (2007) provides a more general review of experiences with ACE.

⁷ This point, and several other points made in this paper, have been made by Bond (2000).

This paper aims to offer a possible explanation, and in the process to question the Meade/Mirrlees consensus. It proceeds by considering a number of margins of corporate decision-making that may be affected by the taxation of corporate profit. In Section 3, it distinguishes four different types of margin, which are affected by different elements of the tax system. The central argument of the paper is that the flow of funds/ACE approach avoids distortions to only two of these four margins. These are two of the traditional margins investigated by economists: how tax affects the scale of investment spending, and how it affects the source of finance for investment. But there are other margins: which are the most important for social welfare is an empirical question. This paper does not attempt to provide a full review of the empirical literature – that is done elsewhere, as discussed below. However, it does draw on empirical evidence to attempt to shed light on the margins about which policy makers should be most concerned. In Section 4, it also explores some of the more technical issues that would arise in constructing an ACE system.

Perhaps the most crucial question that is left unaddressed by the flow of funds/ACE approach is one that has grown considerably more important in the decades since the Meade review: where is profit earned by multinational companies? The existing international tax system, which dates back to a different world where such companies were much less dominant, requires taxpayers and tax administrations to identify the source of different elements of the profit of a multinational company. Not surprisingly, this is not only incredibly difficult in practice, but the methods used in practice have little conceptual basis.

Of course, the Mirrlees review team is well aware of such problems, and provides an elegant description of them. But its proposals do not address them, other than indirectly. Mirrlees is well aware, for example, of the incentive to shift profit from a jurisdiction with a high statutory tax rate to one with a low statutory tax rate. It therefore recognises that the level of the statutory corporate tax rate is important, even with economic rent as a tax base, as under the ACE proposal. But its solution is pragmatic: introduce the ACE allowance but do not raise the statutory rate, and accept the resulting lower revenue from the taxation of corporate profit.

This pragmatism reflects a broad issue facing anyone that seeks to assess any tax, or to propose a reform: where do you start from? The temptation for academic economists is to start from a clean sheet: given the state of the world in the absence of tax, what form of taxation would be optimal? Even then there is a question of whether the question refers to optimality for a single country, a group of countries, or the whole world. The opposite starting point would be the existing system,

and to consider what marginal reforms would enhance welfare. The latter approach may have more influence on the current generation of policy makers. But piecemeal reform over time does not generally end up with an optimal system – indeed, it would probably be safe to say that it never has.⁸ The Mirrlees team arguably end up somewhere between these two extremes, though without ever defining exactly where. It is clear that they are thinking long-term, but they would like to influence policy makers in the shorter term. Unfortunately, the resulting pragmatism then becomes ill-defined. The Mirrlees team state that “there are powerful intellectual arguments against source-based corporate income taxes, and enormous practical problems in their implementation”.⁹ Yet they “recognize that many countries are likely to operate source-based corporate income taxes for many years to come”,¹⁰ and so seek to offer advice on how to do so.

But such an approach raises the issue of whether the revenue generated by an ACE system with an unchanged statutory rate would be optimal. This turns on why we would want to tax corporate profit on a source basis at all. The main argument advanced by the Mirrlees team is that there may be country-specific economic rent that could be taxed away by the host country without deterring investment. A single tax applying to all companies resident in the host country would need to balance this opportunity with the resulting disincentive for other forms of investment. However, while governments may face this tradeoff, it provides very little practical guidance on the optimal statutory rate under an ACE. The Mirrlees pragmatic approach to some extent depends on this uncertainty: since we do not know the optimal revenue, we can allow it to decline, and instead seek additional revenue elsewhere. An alternative approach would be to introduce special taxes on sectors where there is likely to be location-specific rent (such as resource extraction), but otherwise to consider alternatives to source-based taxation. This approach is briefly considered in Section 5, and Section 6 concludes.

2. Trends in corporate taxation

This section briefly summarise the trends in corporation taxes around the world since 1983, updating and extending previous analyses by, for example, Devereux et al (2002) and Loretz (2008).

⁸ The Mirrlees preface cites Dick Taverne, then Director of the IFS, as explaining the motivation for the Meade review as being: ‘For too long, ... tax reforms have been approached *ad hoc*, without regard to their effects on the evolution of the tax structure as a whole. As a result many parts of our system seem to lack a rational base. Conflicting objectives are pursued at random; and even particular objectives are pursued in contradictory ways’, Mirrlees (2011).

⁹ Mirrlees et al. (2011), p. 432.

¹⁰ Mirrlees et al. (2011), p. 432.

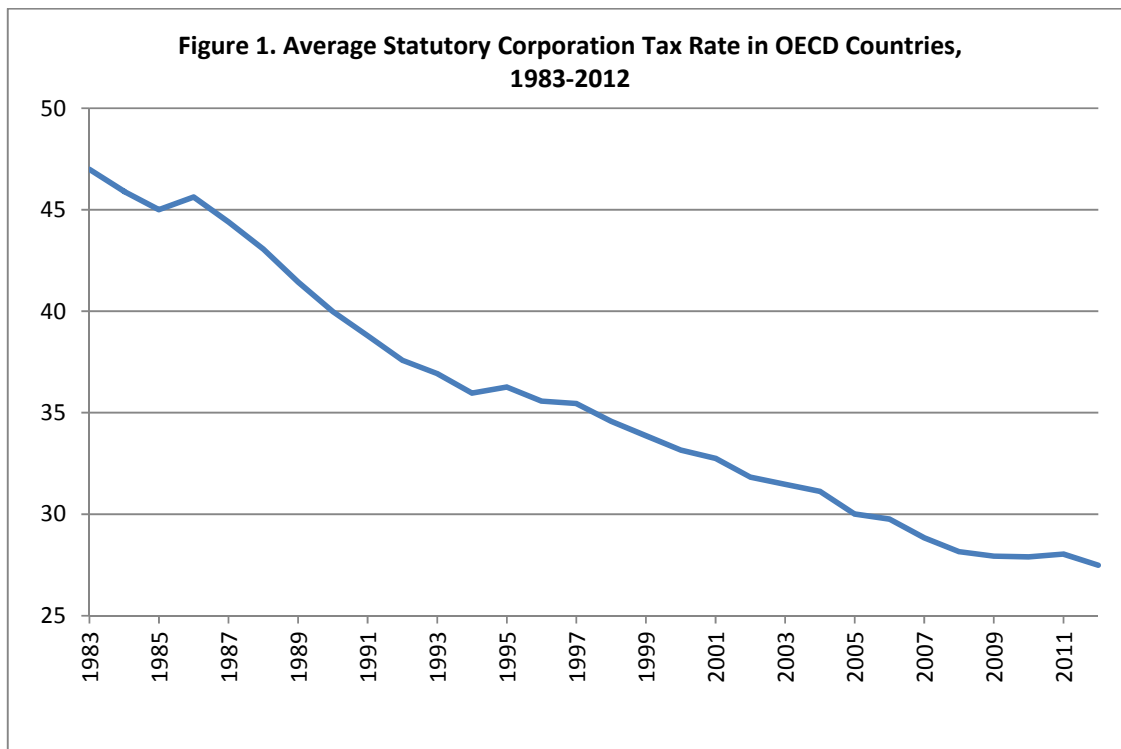
We present simple unweighted averages of the tax rate and tax base in 25 OECD countries.¹¹ The tax rate is defined as the statutory tax rate at national and sub-national levels. We assess the value of depreciation allowances for different forms of capital expenditure by calculating the net present value of such allowances over the life of the asset and expressing this as a percentage of the initial cost of the asset. For example, since a flow of funds tax would give immediate relief to capital expenditure, the allowance would have a value of 100%. As can be seen in Figure 2, however, most tax systems give less generous allowances than this. We include measures of investment in plant and machinery and industrial buildings dating back to 1983 in all of the countries listed. We also include a measure of allowances on investment in intangible assets in each country since 1999, based on the purchase of a patent.¹² Of course, there are many other important features that define the base of corporation taxes which are excluded from this simple analysis, including the treatment of losses, groups and international income. We do not attempt to summarise the development of other features of tax systems here, partly because of the difficulty in producing a simple quantitative measure. The description here is intended simply to provide a broad summary of the direction of reforms.

Figure 1 presents the evolution of statutory rates in OECD countries over the last three decades. There has clearly been a substantial fall in these rates over this period, from an unweighted average of around 47% in 1983 to around 27% in 2012. Moreover this pattern of decline seems to have been consistent throughout the period. Of course, this Figure masks considerable variation across countries in all of these years, which still exists.

Figure 2 presents the evolution of allowances for capital expenditure since 1983 and investment in intangibles since 1999. Investment in plant and machinery has always received more generous allowances than investment in buildings: this is not surprising since plant and machinery generally has a shorter life and therefore needs to be depreciated more quickly. Allowances for both forms of expenditure have fallen over the period considered. However, it is clear that there has been a more marked reduction in the generosity of allowances for buildings, the present value of which has fallen from an average 57% of the initial cost to only 44% of the initial cost.

¹¹ Australia, Austria, Belgium, Canada, Chile, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Korea, Mexico, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, UK and USA.

¹² This follows the approach of Devereux et al (2010).

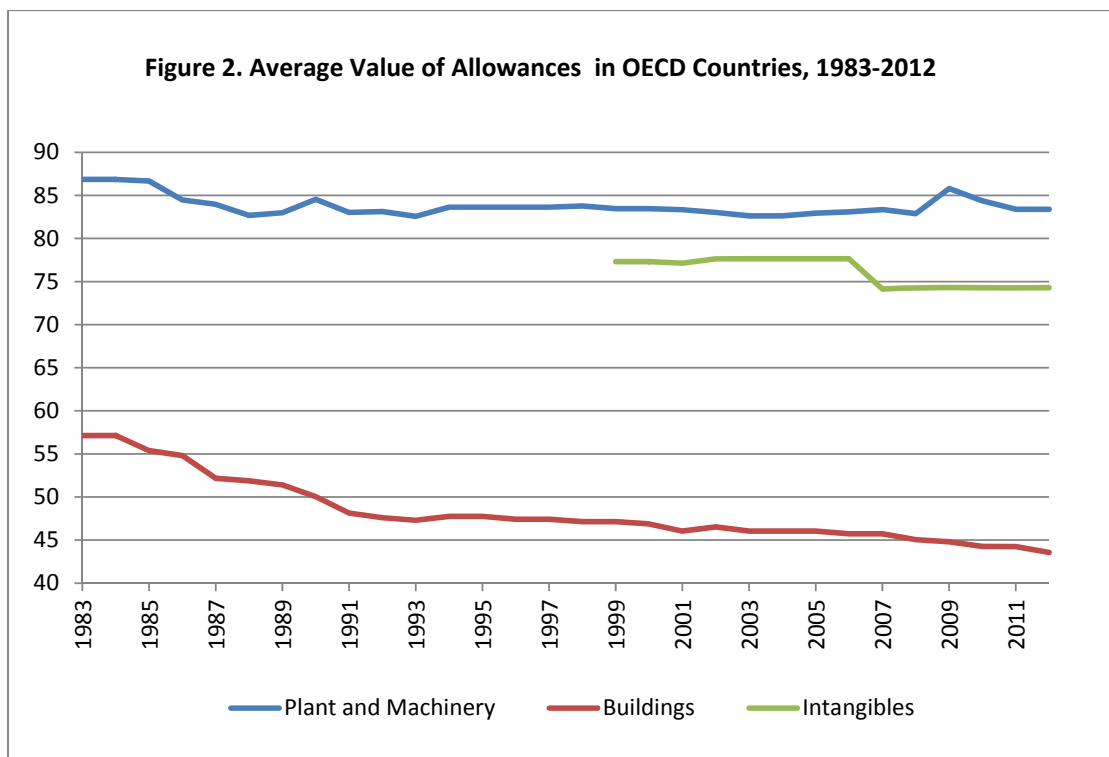


The treatment of purchase of patents lies between these two, and is slightly less generous than the treatment of plant and machinery. It too has become less generous over the last decade.

The broad conclusion from this brief description is to reinforce the claim made in the Introduction: that the trend in corporation taxes over the last 30 years has been to broaden the base and to reduce the rate. The Meade/Mirrlees prescription goes in the opposite direction and could therefore perhaps be seen as an attempt to stem the tide of history.

Two very recent reforms are worth comment in this context. Both the UK and Italy currently face large fiscal deficits and both have implemented plans to reduce their deficits by a combination of higher taxes and lower public spending. But both also see economic growth as vital to improve the public finances. In an effort to stimulate growth, they have both relaxed corporation taxes. But they have done so in very different ways. The UK has reduced the tax rate – progressively it is being reduced from 28% to 22% - and this has partly been financed by a further reduction the tax base.¹³ By contrast, Italy has attempted to stimulate investment by introducing a form of the ACE. It is the contrast between these two approaches that is the subject of this paper, and in particular, the next section, which considers the different margins of corporate decision-making.

¹³ Currently, for example, investment in buildings in the UK receives no depreciation allowance at all.



3. Margins of corporate decision-making, and the impact of taxation

Business decisions can be conveniently divided into four broad types. It is important to distinguish these since the elements of the tax system play a different role in each.

a. Choice between discrete options

First, there are decisions that require a choice between a number of discrete options. Suppose there are two mutually exclusive options available to a business, generating net present values (NPVs) before tax of X^* and Y^* , both of which are positive. In the absence of tax we would expect the business to choose the option that generated the higher of these two NPVs. Suppose that in the presence of tax, the NPVs are X and Y . Now we would expect the business to choose the option with the higher of the post-tax NPVs. The impact of tax on the decision depends on effective average tax rates (EATR), which we can define as $t_x = (X^* - X) / X^*$ and $t_y = (Y^* - Y) / Y^*$. These EATRs can in principle depend on all aspects of the tax system. In the special case of a flow of funds tax, or

a tax with an ACE, this measure of the EATR would be equal to the statutory rate, since in NPV terms, the tax base would be equal to the pre-tax NPV. It is clear that a difference in the EATRs applied to the two options may result in the business making a choice that is different from the choice that would have made in the absence of tax. That is, it is possible that $X^* > Y^*$, but $Y > X$.

There are many examples of such decisions. One is the choice of technology to use in producing a given output. For example, a business may have the option of using either high-tech production methods involving R&D, or low-tech production methods. In general, the choice between these possibilities may be affected by the generosity of treatment of R&D expenditure and other forms of capital expenditure. However, if these options arise within the context of a single company that faces a pure flow of funds tax or tax with an ACE, then the tax would not distort the decision. This is because the EATR would be equal to the statutory rate for all types of investment. If the same tax rate were applied to all forms of income within the company, then the same proportion of the pre-tax NPV would be taken in tax for all types of investment and there would be no distortion.

However, in other cases even a tax with an ACE can generate a distortion. A second example is the choice of whether to incorporate a business or not. In most countries, though not the USA, incorporation usually implies a liability to corporation tax, while non-incorporation implies a liability to personal tax. Hence there is typically a difference in the EATRs between the two options, and the business choice may be affected. Removing this distortion would require both forms of business to be taxed in the same way.

In an international context, there are also several such discrete choices. Perhaps the most obvious is the choice of location of a particular aspect of the business, whether it is the corporate headquarters, a production plant, a finance facility, or some other aspect of the multinational company. As long as the business has the opportunity to choose a location (for a new venture, or to move an existing venture), then the EATR applying in each location may in principle affect the location choice.¹⁴ Even if all countries applied a flow of funds tax or a tax with an ACE, there would still be distortion to location decisions if tax rates differed between countries.

One particular form of this choice is whether the business wishes to have any activities outside its home country, or whether it should do all its activities at home, and export a final product to foreign markets. Another is whether an expansion – domestic or cross-border – is undertaken with new

¹⁴ See Devereux and Griffith (1998, 2003).

capital expenditure (greenfield investment) or the acquisition of an existing company that already owns the fixed assets, as well as possibly intangible assets such as brands or local know-how. In the latter case, the value of the acquisition to the acquirer is the difference between the value of the target company in the acquirer's possession and the purchase price. The latter will depend on the bargaining power of the acquirer and target: if there are many potential acquirers for a single target, then the acquisition price is likely to leave the entire surplus with the vendor, driving the NPV to the acquirer to zero, or close to zero. This may mean that tax has little or no effect on the location of a target chosen by an acquirer. But the choice of form of expansion – ie. greenfield v acquisition – even if in the same country, depends instead on the means by which the acquirer can generate a surplus. If the surplus arises from increasing the price to customers through exploitation of a brand, or by cutting the wage bill, then the post-tax surplus will be affected primarily by the statutory rate.¹⁵ If the alternative is that the business instead undertakes a greenfield investment with comparable output, then the NPV in that case will be reduced by a more general EATR. The comparison in this case would then not even be a comparison of EATRs, but rather a comparison of an EATR with the statutory rate. Again, though, since these rates are the same under a flow of funds tax or a tax with an ACE, with such taxes there would only be a distortion where tax rates differed, as is likely in an international context.

b. Choice of scale of investment

The second type of business decision has two elements: whether or not to undertake an investment project and, more generally, the scale of investment of a given project. The first of these is simpler than the choice described above. Suppose that the business has the opportunity of undertaking the investment project that yields a NPV of X^* . But suppose now that undertaking this investment does not preclude any other activities of the company, and that the profitability of all other activities does not depend on whether this project is undertaken. If $X^* > 0$ then the project would be worth undertaking in the absence of taxation. The decision of the business would only be affected by tax if the sign of the NPV changed after tax, for example, if $X^* > 0$ but $X < 0$ (though the opposite is also possible). One way of expressing this is that the EATR as defined above lie between zero and 100%.

However, we can also consider an investment that does not have a fixed scale, but where the scale can be varied. Following the traditional approach, we assume that the scale of the investment would be increased up to the point at which the marginal net gain of an extra unit of investment was zero.

¹⁵ This is discussed in more detail by Arulampalam et al (2012).

This implies that we need to measure the taxation that applies at the margin. This is typically done by computing the cost of capital: the marginal rate of return on the investment that generates an NPV of zero – ie. that just breaks even. We can define the effective marginal tax rate (EMTR) as the percentage difference between the cost of capital in the absence and presence of tax.¹⁶

We would expect the tax to affect the determination of the marginal investment except in a special case where the cost of capital is unaffected by taxation, and so the EMTR is zero. This is exactly what is achieved by the flows of funds tax and a tax with an ACE. Because these taxes apply only to economic rent, then no tax is levied on marginal investments. In principle then, these taxes should not affect decisions of the scale of investment.¹⁷

c. Choice of form of income

The third type of business decision we consider is the choice of form of income. By judicious planning a business may be able to opt for income to appear in a more or less lightly taxed form. The most straightforward example is the choice of an owner/manager of a corporation to take her compensation in the form of profit and dividends, or as salary. In the absence of taxation the owner may be indifferent between these two options, since they both result in a similar personal income stream. However, it is possible that the owner has a preference for one form over the other, perhaps, for example, if salary can be paid more regularly with lower administrative costs. However, these two forms of income are likely to face different statutory tax rates, and the difference is likely to have a significant effect on the form of income chosen.¹⁸

A second example of choosing a more lightly taxed form of income is for a multinational company to engineer corporate income to appear in a jurisdiction with a lower tax rate. In the context of a source-based tax there are many ways to achieve this, even if tax authorities seek to minimise such tax planning. The ease of doing so can be related directly to the problem discussed above that it is difficult to know, either conceptually or in practice, where the source of profit is located. In practice, for example, companies can shift profit by lending from a subsidiary in a low tax jurisdiction to

¹⁶ This classic approach was originated by Jorgensen (1963) and Hall and Jorgensen (1967), and has been widely used since.

¹⁷ The tax would only be neutral in the case of a value-maximising company which faces no financial constraints. When these conditions do not hold, even the ACE will not be neutral in this sense: see Keuschnigg and Ribi (2009) and Koethenbueger and Stimmelmayer (2009).

¹⁸ Mirrlees (2011) is well aware of this issue, and proposes greater co-ordination of personal and corporate tax rates to reduce or eliminate the difference. I leave this issue to one side to focus on the form of the corporation tax.

another subsidiary in the same group in a higher tax jurisdiction. The payment of interest from the latter to the former triggers tax relief at the high tax rate, with a corresponding tax on the interest paid at the low tax rate. The other main approach is by the sale of an intermediate good – which may be an intangible – from one part of the group to another. The appropriate price for this good may be unknown, but there is a clear tax incentive to manipulate the price to generate income in the low tax jurisdiction instead of the high tax jurisdiction.

Whatever the means of the manipulation of income, the main point of the discussion here is that the incentive to shift profits between different forms or locations depends at the margin on statutory tax rates. Neither the flow of funds tax nor a tax with an ACE can address this problem. Indeed, since the tax base in both cases is relatively narrow, then a revenue-neutral reform that introduced either form of tax would require a high statutory rate, which would in turn encourage business to declare its income in some other form or some other jurisdiction.

d. Source of finance

A fourth element of the possible effects of taxation on corporate decision-making is in the sources of finance used by the company. In most corporation taxes, interest payments are deductible, but the normal return to equity finance is not. Unless this is offset by corresponding tax payments on the receipt of interest by the lender, then this discrimination generates a clear distortion in favour of the use of debt finance. This distortion is similar to the allocation of income between different forms in that it depends at the margin on the statutory tax rate. One possible rationale for such discrimination stems from corporation tax being seen as a proxy for a tax on profits retained in the company that contribute to an increase in the shareholder's wealth but are not easily allocated to shareholders. However, given both the globalization of portfolio capital flows, and the range of different tax treatments of financial intermediaries, this rationale is no longer convincing. There is virtual unanimity amongst economists that such discrimination is not justified.

Two elements of this distortion should be distinguished. The more traditional concern is that the tax advantage of debt finance would induce companies to borrow more heavily, making them inherently more risky, and thereby increasing the probability of financial distress and its associated costs. This concern has of course become much more prominent following the financial crash and the extreme

financial positions taken by banks. While the consensus is that tax discrimination was not the main factor causing the financial crisis,¹⁹ it certainly appears to have been a contributing factor.

However, as described above, the distinction in the treatment of debt and equity also creates profit shifting opportunities in an international environment. This occurs primarily because the international tax system follows domestic treatment with the result that location of taxes on the returns to international investment depends on how that investment was financed. To see this, suppose a UK multinational seeks to invest in a wholly-owned subsidiary in, say, France. Under current rules, if this marginal investment is financed by an injection of new equity, the profit will be taxed in France and can be repatriated to the UK without further tax. But if it is financed by lending to the subsidiary, then the subsidiary can claim tax relief on the interest payment back to the parent, which in turn will be taxed in the UK. It is hard to think of a good rationale for this tax arrangement, which effectively allows multinational companies to choose where they would like to be taxed. This clearly has very different welfare implications from the first form of discrimination: the choice of how a wholly-owned subsidiary is taxed has no implications for the risk of the multinational company as a whole, though it may for the subsidiary itself.

One of the primary aims of introducing an ACE is to equalise the treatment of debt and equity. Broadly, this would be achieved in a purely domestic context. But introducing an ACE allowance on its own does not address these international issues. These issues are discussed further below.

4. The effects of an allowance for corporate equity

Where does this discussion of decision margins leave the Meade/Mirrlees proposals for a tax on economic rent, and in particular, should governments seriously consider introducing an ACE?

Two issues arise. First, the importance of each of the decision-making margins described in the previous section is an empirical question. Based on conceptual reasoning we cannot infer either the scale of the response to taxation on each margin, or the consequences for social welfare. There are two ways of approaching this question. There is a large empirical literature that seeks to estimate the effects of taxes on each of the margins described, and a rather smaller literature on measuring the welfare consequences. There are several recent surveys and meta-studies that attempt to summarise the lessons of the empirical literature: see for example, Ederveen and De Mooij (2008),

¹⁹ See Shackelford, Shaviro and Slemrod (2010), for example.

Feld and Heckemeyer (2011), Feld, Heckemeyer and Overesch (2011) and Bilicka and Maffini (2012). This paper does not attempt a detailed review of this literature. Instead it summarises results from the alternative approach of a CGE model, which draws on the elasticities estimated in empirical studies. In particular, to illustrate the effects of introducing an ACE in different ways, below we briefly summarise some of the results of De Mooij and Devereux (2011), based on a CGE model of the 27 EU member states.²⁰

Second, various issues arise in the design of an ACE which are not addressed by the Mirrlees review, or earlier studies. In particular, although a corporation tax with an ACE treats debt and equity financed investments in similar ways, the tax system still requires the distinction to be drawn between the two. This distinction raises two issues of tax avoidance. The first is the extent to which tax can be avoided by charging a high interest rate, implying that the tax base may fall short of total economic rent.²¹ The second is whether there is a clear link between the source of funds and the form of repayment, or whether sophisticated financial instruments or tax planning might be able to break this link to reduce tax liabilities. This also relates to the issue described above, of multinational companies being able to choose the location of their taxable income.

a. Estimating the effects of introducing an ACE

To estimate and combine the different margins described above, we draw on the simulation analysis of De Mooij and Devereux (2011). This analysis is based on the CORTAX CGE model, described in detail Bettendorf and van der Horst (2008); only a very brief summary is presented here. The model uses parameters drawn from the elasticities found in the empirical literature and attempts to replicate aggregate data from national accounts in 2005 and company accounting data from ORBIS. It encompasses all 27 EU countries, together with the USA and Japan.²² The model is designed to simulate the economic implications of unilateral and multilateral corporate tax reforms.

The model incorporates households that choose labour supply and savings, as well as governments, whose behaviour is exogenous. The corporate sector is modelled with one representative domestic and one representative multinational corporation resident in each country, each owned by domestic residents. Each multinational wholly owns a subsidiary in each foreign country. Each company

²⁰ Earlier papers have also explored the impact of introducing an ACE in a CGE framework: see, for example, Fehr and Wiegard (2003), Keuschnigg and Dietz (2007), and Radulescu and Stimmelmayer (2007).

²¹ Of course, this question arises in a standard corporation tax as well.

²² It draws on the model of Peter Birch Sorensen, originally developed in Sorensen (2001).

maximises its value subject to accumulation constraints and a production function using three factors: labour, capital, and a fixed factor.

Labour is assumed to be immobile across borders and wages are therefore determined on national markets. Capital is assumed to be perfectly mobile internationally so that the post-tax return to capital is given for each country on the world capital market. Capital investment is determined by the cost of capital. Inward FDI in a country therefore depends on the effective marginal tax rate. The fixed factor in domestic firms is location-specific (e.g. land) and is supplied inelastically. The fixed factor in subsidiaries is firm-specific (e.g. a brand name). The income from the fixed factor reflects an economic rent. The model captures the effects of taxation on the infra-marginal location choice of the multinational by allowing the net value of the fixed factor in each foreign subsidiary to depend on the corporation tax rate in the host country, and allowing the multinational to reallocate this factor across countries.²³

Companies finance their investment by issuing bonds and by retaining earnings; their choice of financial structure depends on the difference between the after-tax cost of debt and equity. The marginal cost of debt finance increases in the debt share. The model allows for profit shifting within the group of 29 countries and to outside tax havens. Profit shifting takes place through mispricing of intra-firm trade which depends on the statutory tax rate in each location, as well as a convex cost associated with manipulating transfer prices.

The model therefore addresses almost all of the margins described in the previous section, although it does not incorporate income shifting between labour and capital income. The welfare effects of policy changes are computed as the compensating variation, equal to the transfer that should be deducted from households to maintain their utility at the pre-reform level. We express this as a proportion of GDP. Of course, in the light of uncertainty about parameter values, the numerical outcomes of the model should be interpreted with care.

Table 1 presents the results of introducing ACE in each of the EU countries unilaterally. That is, we consider introducing ACE separately in each country and identify the effects in that country. The table presents the average of these effects across countries. Column 1 first investigates introducing the ACE, but leaving other aspects of the corporation tax system, including the rate, unchanged. It is assumed that total revenue is made up through a non-distorting lump-sum tax. According to these estimates, before accounting for behavioural responses, introducing the ACE would reduce

²³ Note that location choices between the EU and other regions are not endogenous.

corporation tax revenue by an average of 1.3 percent of GDP. This is a substantial fall, since corporation tax typically raises around 3 percent of GDP. However, allowing for behavioural responses, the estimated fall in corporation tax revenues is much smaller at only 0.3 percent of GDP.

This difference can be traced to the behavioural effects shown in the table. Importantly, introducing the ACE reduces the cost of capital, stimulating additional investment. The additional capital makes labour more productive which increases the demand for labour, reflected in both higher employment and a higher wage. That in turn leads to an increase in GDP of 2.3%. The increase in welfare is smaller than this at only 0.6 percent of GDP. This is for two reasons: the higher income generated is partly achieved by less leisure, and the greater investment is partly generated by capital imports, the returns from which flow abroad.

Table 1. Economic effects of unilateral introduction of ACE

	Lump-sum tax adjustment	Consumption tax adjustment	Corporate tax rate adjustment
Corporation tax rate (% Δ)	-	-	17.0
Corporate tax revenue (ex-ante) (% GDP)	-1.3	-	-
Total tax revenue (ex-post) (% GDP)	-0.3	-	-
Effective tax rate on consumption (ex-post) (% Δ)	-	1.1	-
Debt share (Δ %)	-4.7	-4.7	-3.3
Cost of capital (Δ)	-0.5	-0.5	-0.3
Wage (%)	2.3	2.3	0.6
Investment (%)	6.3	5.9	3.9
Employment (%)	0.8	0.4	0.2
GDP (%)	2.3	1.9	0.8
Welfare (Δ % in GDP)	0.6	0.4	-0.2

Source: De Mooij and Devereux (2011).

The second column of Table 1 assumes instead that the government raises taxes on consumption to cover the loss of corporation tax revenue arising from introducing the ACE. This is effectively the reform that Mirrlees had in mind. Ex-post, the effective tax rate on consumption, measured as the total tax as a proportion of the consumption tax base, must rise by 1.1 percentage points. The effects of this reform are similar to column 1. The cost of capital changes by the same amount and there is a similar effect on the share of debt used by companies. Consequently there is still a significant rise in investment. That does not have quite such an effect on the labour market since the

rise in consumption taxes has a negative effect on labour supply relative to column 1. As a result, wages still rise by 2.3%, but employment only rises by 0.4%. The effects on GDP and welfare are therefore also a little smaller than in column 1.

Column 3 investigates the case where the reform to corporation tax is required to be revenue-neutral, at least ex-ante. On average a 17 percentage point increase in the corporation tax rate is required to make the reform revenue-neutral. The higher tax rate does not affect incentives to invest at the margin. However, it does affect the location of the fixed factor, which in turn affects the productivity of capital and labour. Investment, employment, wages and GDP all rise, but by a lower amount than before. However, overall welfare falls. This is partly because of the effects described above. However, in this case there is an additional effect through greater outward profit shifting induced by the higher tax rate. Although this does not affect investment, it does affect government revenue and hence welfare.

Given the results of Table 1, what can we conclude about the Mirrlees proposal to introduce an ACE, but to permit a reduction in revenue from corporation tax, probably made up for by an increase in taxes on consumption? Column 2 indicates that this would enhance welfare if introduced unilaterally in one of the EU countries. But there may be many ways of making marginal improvements to the overall tax system. The improvements shown in column 2 arise because the distortions arising from corporation tax are greater than the distortions arising from taxes on consumption. But if this is true, it seems likely that a still better reform would be to abolish corporation tax altogether. The Mirrlees proposals therefore seem to be more of a suggestion for a relatively marginal reform to the system, rather than a radical reconsideration of the nature of the tax.

Further, whilst introducing an ACE would reduce some of the distortions inherent in a corporation tax, many of the fundamental problems remain. We now turn to a brief consideration of some of these.

b. Some issues in the design of an ACE²⁴

The ACE gives similar treatment to equity-financed investment as interest deductibility gives to debt-financed investment. But while similar, the treatments are not the same. A key difference is that the

²⁴ Cooper (2012) addresses practical issues of introducing an ACE.

interest deduction is based on actual interest payments, whilst ACE is based on a notional deduction. We can compare this with a more general notional deduction for the cost of finance of all investment expenditure, which could replace interest deductions. These two approaches have been compared by Bond and Devereux (2003), who call the former a “shareholder tax” and the latter a “firm tax”.²⁵ Under the firm tax, as long as the notional deduction exactly compensated for the required marginal return on capital (adjusting for risk)²⁶ then the NPV of tax would be proportional to the NPV of the pre-tax economic rent generated. Under the shareholder tax, the NPV of tax would be proportional to the NPV of the pre-tax economic rent captured by the shareholders. These would be the same when the interest rate charged represented the true marginal cost of finance in a competitive financial market. But if, by contrast, lenders had some market power which enabled them to share in the economic rent by charging a higher interest rate, then the shareholder tax would have a smaller tax base.

This difference may also generate tax avoidance opportunities in the design of financial instruments. A financial instrument which was treated as equity when issued would generate an increase in the base for calculating the ACE allowance thereafter. If the return from that instrument was treated as an interest payment then it would also receive an interest deduction. The drafting of tax legislation would therefore need to ensure that any payment treated as interest was not associated with a source of finance that had also generated an ACE allowance.

Similar problems may arise in international transactions. Consider a country that does not tax the inflow of dividends from foreign subsidiaries of domestic companies. The basic principle of the ACE is that any purchase of shares in another company (for example, a foreign subsidiary), should reduce the base for calculating the domestic ACE, and hence reduce subsequent allowances. This is because the equity finance would no longer be used in the domestic company, and would therefore not be generating income subject to domestic taxation.²⁷ But, as noted above, this does not apply to the case when the investment in the foreign subsidiary is financed by lending by the parent company. The receipt of interest on that loan is taxable in the domestic country, and hence the original loan

²⁵ The more general deduction was analysed by Bond and Devereux (1995) and also proposed by Kleinbard (2007). Bond and Devereux show that the two cases analysed by Meade are special cases of these more general taxes: the R-based flow of funds tax is a special case of the firm tax, and the R+F base (or S-base) is a special case of the shareholder tax.

²⁶ See Bond and Devereux (1995, 2003) for a discussion of the required rate of deduction under both forms of tax.

²⁷ An alternative approach, explored by Becker and Fuest (2011) would be to introduce an S-based tax on outflows of equity capital; this would be similar to having a separate ACE for outbound investment and taxing the returns of such investment.

should not affect the base for the ACE allowance. The potential tax avoidance opportunity here is similar: the tax avoider would seek to treat the initial investment as debt, but the return as a dividend. Convertible debt, for example, could have this property.

There appear to be two ways to guard against this. One is to make sure that the legislation can rule out such tax avoidance opportunities. This would presumably need to involve tracing rules that would identify the ultimate source of an incoming dividend payment. But a second approach would be more fundamental, and would address more directly the arbitrary distinction in international taxation noted above: that equity-financed outbound investment is taxed abroad, while debt-financed outbound investment is taxed at home.

One of the basic reasons for introducing an ACE, or its equivalent, is to harmonise the treatment of debt and equity. Yet one of the most glaring differences in the treatment of these two sources of finance is this inconsistency in international taxation; the basic ACE proposal leaves this unaddressed. This difference in treatment goes to the heart of the question of where profit should be taxed. But let us leave that issue to one side until the next Section, and instead assume that there is some good reason for taxing profit on a source basis, as is the standard case for equity-financed investment.²⁸ That is, profit earned abroad by a subsidiary (or branch) of a domestic company should not be subject to domestic taxation. The fact that part of that profit is paid in the form of interest to lenders does not justify different tax treatment.

The obvious treatment of outbound debt-financed investment is to treat it in the same way as outbound equity-financed investment. It should reduce the domestic equity base and hence reduce subsequent domestic relief under the ACE. Also, the interest received on that lending should not be subject to domestic taxation. Alternatively, under the “shareholder tax”, the lending could be netted off against domestic borrowing, so that domestic interest deductions would be reduced. In either case, there would be symmetric treatment of debt and equity.

Thus, one obvious extension of the ACE in an international context is to align the treatment of debt and equity across borders. It might be objected that debt-financed investment might then not be taxed at all, either in the source or residence country. But it would remain open to the source country not to permit an interest deduction if the interest was being paid to a county that would not

²⁸ See Desai and Hines (2003) and Becker and Fuest (2010) for cases where source-based taxation might be optimal.

tax the receipt. In any case, this problem is quite general, and occurs whenever a tax-exempt institution lends to a company, for example.

5. Other international options

While this extension to the ACE could have a significant effect on opportunities to shift profits between countries (especially if it was introduced in many countries), such a reform would still not address the basic question of how to split the worldwide profit of a multinational company into country-specific pieces for the purposes of national taxation. The problem has been set out elsewhere,²⁹ and will not be repeated at length here.

Briefly, though, many locations play a necessary part in the determination of worldwide profit. Such profit requires individual shareholders, possibly located throughout the world, a headquarter company, many aspects of firm activity including R&D, production, marketing, finance, all of which could be located in different places or more than one place, and consumers also possibly located throughout the world. There is simply no answer to the question: in which country is profit generated? All these elements of the company's activities play a part in generating worldwide profit. The combination of them almost certainly plays an additional part. The idea on which the international tax system appears to be based – that the “source” of profit is where the various “productive” activities take place - is actually an historical burden which creates substantial institutional barriers to reform.

It is perhaps understandable that, in the light of such institutional barriers, Mirrlees decided not to address this issue. But in setting it to one side, the team overlooked an urgent need for a full reconsideration of the international corporation tax system. It is based on an arbitrary division of profit across countries,³⁰ yet has increasingly and hugely complex rules to defend that division, it leads to significant resources being devoted to tax planning and avoidance, which in turn affects the domestic design of the tax, and it affects the location of real economic activity. Moreover, all this would still be true even if all countries adopted the Mirrlees proposals.

²⁹ See, for example, Auerbach, Devereux and Simpson (2010).

³⁰ See Keuschnigg and Devereux (2011), for example, for an analysis of the distortions created by the arm's length pricing principle.

So could the Mirrlees team have been more radical? The European Commission has proposed a more radical overhaul of international corporation taxes in the EU.³¹ Under their proposal for a Common Consolidated Corporate Tax Base (CCCTB), all EU member states would move to the same definition of taxable profit. Even more radically, though, corporations operating in more than one member state would only calculate their EU-wide profits – there would be no requirement to assess the amount profit made in each separate country. Instead, taxable profit would be allocated to individual member states on the basis of an apportionment formula, similar to that used elsewhere, for example amongst states in the USA. The formula would be based on the location of assets, employment and sales. Individual member states would apply their own tax rate to the profit allocated to them.

Some elements of this proposal are welcome. The most advantageous element is that, in principle, the incentive to shift profits between countries within the EU would be removed. However, the incentive to shift profits out of the EU altogether would remain, and it has even been argued that by not harmonising withholding taxes on payments to third countries, there would still remain incentives to shift profit within Europe.³² The proposal does not deal with the other dimensions of corporate decision-making described above. There would still be an incentive to shift activities to low-tax countries by taking advantage of the allocation mechanism. The proposal does not include any feature that would harmonise the treatment of debt and equity, and it is not targeted towards economic rent.

A longer-term solution that does address all the margins described above is to move away from taxing the “source” of the profit to the place of “destination” of the final product (ie. where the final good is consumed). This could be achieved by a border adjustment, allowing income from exports to be untaxed, but applying a tax to imports. Combining this with the Meade R-base would actually generate a tax that had a similar substance, if not form, as VAT. In fact the key difference from a VAT is that value added is equal to the sum of economic rent and labour income. A destination-based, R-based corporation tax would fall only on economic rent, leaving the labour component of VAT untaxed.

The properties of such a tax have been explored in detail by Auerbach and Devereux (2011).³³ They compare the distortions arising from various R-based taxes that differ in the allocation of profit

³¹ European Commission (2011).

³² See Devereux and Loretz (2012).

³³ See also Bond and Devereux (2002), EEAG (2007), and Auerbach, Devereux and Simpson (2010).

across jurisdictions: a source-based tax, a destination-based tax, and a tax based on formula apportionment. They confirm the claim made by Mirrlees that a source-based tax can fall partly on foreign owners of domestic companies, but show that such a tax induces distortion into the allocation of activity across countries. They demonstrate that the destination-based tax does not create distortions to any margins of decision (at least in their model), but falls on residents of the destination country. A destination-based tax thus has sufficiently good properties in theory at least that it would merit further more detailed and practical attention.

6. Conclusions

The Mirrlees (2011) review has presented a proposal for the reform of corporation tax that is essentially an updated version of the proposals of the Meade Committee, thirty years earlier. It is true that the proposed structure of the tax has distinct advantages over existing corporation tax. It solves the problem of discrimination in favour of debt finance, and by taxing only economic rent it avoids distorting marginal investment decisions. These would be significant gains if they were introduced in practice.

However, Mirrlees did not make any proposals designed intended to address one of the most difficult and intractable problems in international taxation, and one that has become increasingly important since the Meade Committee reported: where profit should be taxed. The problems encountered internationally are similar to some of those encountered domestically: how tax affects the choice between mutually exclusive options, and how income can be manipulated into forms that are taxed less heavily. But both of these issues become particularly important in an international context, with taxes affecting the location of real economic activity and the location of paper profits. Admittedly there are strong institutional barriers to fundamental change. But it is disappointing that Mirrlees chose not to examine these questions.

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