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The Tax Elasticity of Financial Statement Income: Implications for Current Reform Proposals

Abstract

Current reform proposals in international and corporate tax (most notably the OECD's GloBE proposal) envisage taxing financial statement income. This paper develops a conceptual framework – based on the literature on the elasticity of taxable income – for the welfare analysis of such proposals, and discusses the available evidence on the tax elasticity of financial statement income. The central conclusion is that the most relevant evidence suggests a large responsiveness of financial statement income to taxes (and hence, albeit with significant limitations and caveats, arguably a large deadweight loss). The paper also highlights the need for more evidence on this question.

JEL-Codes: H25, M41.

Keywords: international taxation, multinational firms, financial statement income, book-tax conformity.

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1) Introduction

There has been growing attention among policymakers and the general public to the taxation of multinational corporations (MNCs) in recent years. This paper analyzes aspects of current reform proposals that have combined this widespread concern over MNC taxation with an earlier strand of discussion regarding book-tax divergence among corporations (e.g. Desai, 2005; Shaviro, 2008; Desai and Dharmapala, 2009a). Most prominently, the ongoing work of the Organisation for Economic Co-operation and Development (OECD) and the G-20 group of governments on international tax reform has led to the Global Anti-Base Erosion (GloBE) proposal (also known as "Pillar Two"), foreshadowed in a public consultation document issued in late 2019 (OECD, 2019a). This envisages the use of financial statement income as a possible tax base for a global minimum tax on MNCs. Moreover, a number of policy proposals within the US – such as the "Real Corporate Profits Tax"[1] proposed by Senator Warren's Presidential campaign in April, 2019 – also seek to tax financial statement income.[2]

The various challenges that led the OECD (2019a) to contemplate taxing book income in its GloBE proposal are illustrated in Figure 1. Assume an MNC group consists of a parent in country A and an affiliate in a lower-tax jurisdiction B. The GloBE proposal aims to ensure that the MNC's income in B is subject to a minimum tax rate. The primary mechanism for this is an "income inclusion rule" involving the imposition by country A of an additional tax if the MNC's effective tax rate falls below the GloBE regime's minimum rate. However, it is far from straightforward to determine the MNC's effective tax rate on a global basis and to define the relevant tax base for the global minimum tax. In this context, it is helpful to distinguish between the tax base (denoted Y^T) and taxable income defined by tax law and tax accounting rules (Y^{TL}). Possibilities considered in OECD (2019a) include using the tax law of each country to compute the tax base (option (i) in Figure 1; however, this is subject to the concern that country B's tax law may strategically set a narrow tax base), and using country A's tax law to compute the income of all subsidiaries (option (ii) in Figure 1; however, this would entail large compliance costs by

[1] This proposed tax would be imposed at a 7% rate on the worldwide consolidated financial income of US-resident corporations. Unlike some other current proposals, this would be in addition to the regular corporate income tax, rather than being an alternative minimum tax – see the description and revenue estimate at: https://elizabethwarren.com/wp-content/uploads/2019/04/Saez-and-Zucman-Letter-on-Real-Corporate-Profits-Tax-4.10.19-2.pdf

[2] See Herzfeld (2020) for more extensive discussion of these proposals and of the wider policy context, and Devereux (2020) for an assessment of the GloBE proposal.

requiring complex calculations that the firm would not otherwise need to undertake). The solution mooted in OECD (2019a) is to use the consolidated (i.e. worldwide) financial statement income (denoted Y^F) of the MNC as the tax base for determining the effective tax rate for purposes of the global minimum tax.[3]

As noted in Shaviro (2020) and elsewhere, academic researchers in accounting appear to be uniformly opposed to any imposition of tax consequences on financial statement income. The main reasons include the potential reduction in the informativeness of accounting earnings when firms engage in tax-motivated downward earnings management, and the possibility of political pressure on financial accounting standard setting bodies by governments seeking to increase tax revenue (e.g. Hanlon and Shevlin, 2005; see also Freedman (2004) and Herzfeld (2020) for discussions of these and other concerns).

There are also important considerations grounded in public finance theory and tax policy design that are relevant to this issue. Tax policy does not necessarily share financial accounting's primary goal of measuring the income of the corporate entity from the perspective of investors. For instance, it may quite reasonably take account of personal as well as corporate tax burdens. The taxation of corporate income creates a variety of distortions (e.g. Dharmapala, 2017a), and some proposals to address them – for instance, a cash flow tax that exempts the normal return to capital – may entail further divergence from Y^F. A wide range of tax policy choices deliberately depart from financial accounting principles, for example because questions of timing are more important in the tax realm.

Notwithstanding these concerns, proponents of taxing Y^F argue that the political process by which tax law is determined is flawed, in particular by taxpayer lobbying that leads the tax base to be too small. Delegating the determination of the tax base to a nongovernmental institution that sets financial accounting standards may thus be viewed by proponents as a crucial advantage (although such delegation could also raise concerns over a loss of democratic accountability, as argued by Herzfeld (2020)).[4] More generally, it seems difficult to rule out on *a priori* grounds the

[3] OECD (2019a) is not completely clear on how, or to what extent, Y^F would subsequently be unconsolidated to allocate income across jurisdictions. However, reading OECD (2019a) in the light of the earlier Pillar One proposal (OECD, 2019b) suggests allocation by a formula based on factors such as the location of sales. This assumption is made for concreteness in the model developed in Section 2 below.

[4] For example, a recent defense of proposals to tax book income (Clausing, Saez and Zucman, 2020, p. 8) argues that a "minimum tax on . . . global book profits . . . can be seen as a monitoring device that alerts the IRS to failures to set an adequately broad tax base" and that while a "first-best solution . . . is to make sure the tax base reflects policy-makers best assessment of how taxable income should be defined . . . if such policy changes are too politically

possibility that the welfare costs of introducing a small distortion to financial accounting reports might be outweighed by welfare gains elsewhere - for instance, from increased tax revenue or from reduced deadweight costs of tax planning (e.g. Shaviro, 2008; Desai and Dharmapala, 2009a).

Ultimately, whether this is the case is an empirical question that depends on factors such as the responsiveness of Y^F to the imposition of a tax (i.e. on the tax elasticity of Y^F). This paper discusses how to conceptualize what evidence might be relevant, and outlines some of the existing evidence. It takes as its starting point the influential literature in public finance on the elasticity of taxable income (ETI). Feldstein (1999) established that the ETI is a sufficient statistic for the deadweight loss from taxation under fairly general conditions (and regardless of whether Y^T changes due to real responses or to tax avoidance, as the marginal costs of each activity are equated to the tax rate by optimizing taxpayers).

This paper presents a simple model of profit shifting (based on Dharmapala (2017a)) and characterizes the circumstances in which the magnitude of profit shifting is a sufficient statistic for its deadweight cost. The model is then modified to represent a scenario in which Y^T is redefined as Y^F and the firm is able to engage in (costly) downward earnings management to reduce Y^F. This formulation is used to characterize the circumstances in which the tax elasticity of Y^F is a sufficient statistic for the deadweight cost of earnings management. As is well-known, there are significant exceptions to the claim that the ETI is sufficient to assess deadweight loss. Most relevant for our setting is the situation in which the costs incurred by a firm engaging in tax avoidance (or tax-motivated earnings management) are not social costs but transfers (such as payments to accountants and other professionals). The framework developed in this paper suggests, however, that the circumstances in which the ETI of Y^F is not a sufficient statistic for the deadweight loss from earnings management are very similar to the conditions under which the ETI of Y^{TL} is not a sufficient statistic for the deadweight loss from profit shifting. Thus, if one believes that profit shifting is a significant concern based on estimates of the magnitude of profit shifting, one should also believe that a large ETI of Y^F indicates a large deadweight loss from taxing Y^F.[5]

contentious, a minimum tax on book income may be a second-best way to ensure that companies perceived as profitable pay some minimum amount of tax."

[5] It is possible that profit shifting may be a problem – due to revenue losses or "optics" – even if the deadweight loss is small. However, especially given the relatively modest role of the corporate income tax in generating tax revenue, efficiency considerations should arguably play a major role in assessing profit shifting and policies to combat it.

Representative estimates of the ETI for corporate income under current arrangements (where the tax base is typically Y^{TL}) are around 0.2 (or less) with respect to the net-of-tax share (e.g. Gruber and Rauh, 2007; Devereux, Liu and Loretz, 2014). There are no explicit estimates of the ETI for Y^F. However, an episode from the 1980s in the United States can potentially shed some light on this question. The Tax Reform Act of 1986 (TRA86) introduced the corporate Alternative Minimum Tax (AMT), which for tax years 1987-1989 involved what was known as the Book Income Adjustment (BIA) or Business Untaxed Reported Profit (BURP) adjustment. This entailed that firms facing the AMT were required to add 50% of Y^F to Y^{TL} in determining their tax base for AMT purposes. There is a substantial accounting literature from the 1990s that analyzes earnings management in response to the BIA. While generally finding statistically significant effects, this literature does not discuss the magnitude (and of course does not use the ETI concept, which was developed later in public finance). However, it is possible to infer an implied ETI from some of these studies (e.g. Dhaliwal and Wang, 1992; Manzon, 1992); this turns out to be much larger than that for Y^{TL}, in the range of about 1.4 to 2.1 with respect to the net-of-tax share.[6]

One possible interpretation is that downward earnings management of Y^F is relatively unconstrained by financial accounting rules (which have developed primarily to police the overstatement of Y^F), while downward management of Y^{TL} is quite strongly constrained by tax law. Of course, there are many caveats with respect to the estimates inferred from studies of the BIA. Within the accounting literature, significant questions have been raised about the robustness of the results to alternative scaling variables and control groups (Choi, Gramlich and Thomas, 2001) and about the extent to which treatment and control groups are randomly assigned (Shackelford and Shevlin, 2001). The results may also reflect short-run responses (although there are also a number of reasons why they may under-estimate the responsiveness of Y^F).

If the results from the BIA literature are not viewed as being credible or relevant, we are left with the prior beliefs of scholars in financial accounting, which lean very much towards an expectation that the effects would be large (implying a large deadweight cost in the ETI framework). The paper concludes that the challenge for proponents of current proposals to tax Y^F is to produce evidence showing a small and precisely estimated impact of taxes on Y^F, or to explain why a large ETI of Y^F is not relevant for assessing the normative desirability of these proposals.

[6] While there are other published studies of earnings management in response to the BIA (e.g. Boynton, Dobbins and Plesko, 1992), it is not feasible to infer an ETI from their reported results and descriptive statistics.

Section 2 describes the ETI concept and presents a simple model characterizing the welfare consequences of profit shifting and of tax-motivated earnings management. Section 3 discusses empirical estimates of the (reported or implied) ETI for Y^{TL} and Y^{F}. Section 4 discusses the implications and various caveats, and Section 5 concludes.

2) The Elasticity of Taxable Income as a Measure of the Efficiency Cost of Taxation

2.1) The Elasticity of Taxable Income

A central challenge in public finance is to draw inferences that are relevant for normative analysis from parameters that can feasibly be empirically estimated. In a major contribution that has given rise to a large literature on the elasticity of taxable income (ETI), Feldstein (1999) argues that it is possible – under certain assumptions – to infer the deadweight cost of taxation simply from the responsiveness of reported income to the tax rate. Denoting taxable income by *Y* and the tax rate by *t*, ETI is typically defined with respect to the net-of-tax rate (1 – *t*) as follows:

$$ETI = \frac{\frac{\partial Y}{\partial(1-t)}}{\frac{Y}{1-t}} \tag{1}$$

Under this definition, the ETI is typically positive; it can be approximated by the percentage change in taxable income divided by the percentage change in the net-of-tax rate. The ETI reflects avoidance and evasion as well as real responses. In Feldstein's (1999) framework, the taxpayer equates the marginal cost of avoidance and its marginal benefit (which is the tax rate *t*), while also equating the marginal cost of reducing labor supply to *t*. It follows that it does not matter for calculating the deadweight cost whether the responsiveness of *Y* is due to real responses or to avoidance. This result provides public finance scholars with a simple and elegant approach for computing the deadweight loss of taxation without considering the channels through which these effects operate (e.g. Dharmapala, 2017b).

This basic framework views the ETI as being determined by preferences and constraints (such as the "technology" of tax avoidance). However, as analyzed by Slemrod and Kopczuk (2002), it is also possible to view policymakers as choosing the tax base, and therefore the ETI. The exercise below involves comparing two alternative tax bases (Y^{TL} and Y^{F}) that potentially have different elasticities; arguably, this implicates the elasticity of the tax base, rather than that of taxable income for a given tax base.

It is well-known that there are circumstances in which Feldstein's (1999) result fails to hold (e.g. Saez, Slemrod and Giertz, 2012). Some of these – such as when taxpayers shift income across personal and corporate tax bases – are unlikely to be directly relevant here. Intertemporal shifting of income is clearly of relevance, and is discussed below. Also pertinent is that the result depends crucially on the cost of avoidance being a social cost rather than a transfer (Chetty, 2009). Taxpayers equate their marginal *private* cost of avoidance to *t*. If this is (at least in part) a transfer to other agents whose welfare enters into the social welfare function, then it will not be the case at the taxpayer's optimum that the marginal *social* cost of avoidance equals *t* (and therefore the ETI is not a sufficient statistic for the deadweight loss). In these circumstances, the nature of the taxpayer response that generates the change in taxable income matters for welfare analysis.[7]

2.2) The Deadweight Loss from Profit Shifting

Before proceeding to discuss how the ETI approach can potentially be applied to the taxation of financial statement income, we begin by characterizing the circumstances in which the magnitude of profit shifting is a sufficient statistic for its deadweight cost. This formulation uses a simple model of profit shifting from Dharmapala (2017a), based on the framework in Dharmapala and Riedel (2013). Consider an MNC that consists of affiliates in countries a and b. These affiliates earn exogenous pretax profits π_i and face corporate tax rates t_i, where $i \in \{a, b\}$. Assume that the MNC is a resident of country a, which is the higher-tax country (i.e. $t_a > t_b$). Country a is assumed to have an exemption system under which the MNC's foreign profits are not taxed by the residence country. The MNC can shift reported profit between the two affiliates by incurring an increasing, convex cost $C(y)$, where y is the amount of profit shifted.

The most natural interpretation of $C(y)$ is that it consists of payments (such as wages) to tax planning professionals. Assuming that the tax planners are located in the headquarters country a, it follows that $C(y)$ is tax-deductible in country a (although this assumption is not crucial to the results). These payments in themselves are merely a transfer (i.e. as the tax planners' welfare enters into the social welfare function, their gains offset the (private) cost $C(y)$ borne by the MNC). However, tax planning gives rise to a social cost if tax planners' output in their best alternative occupation would have been socially valuable (in contrast to their tax planning activity, which

[7] For instance, Slemrod (1990) suggests a hierarchy of taxpayer responses, with the timing of transactions being the most responsive, followed by financial transactions giving rise to income shifting, with real decisions being the least responsive; the potentially differing welfare consequences of each response must be taken into account when welfare analysis cannot rest solely on the ETI.

simply generates transfers). In a competitive labor market, they would earn a negligible premium over what they would have earned in this alternative occupation, so $C(y)$ is a reasonable approximation of the deadweight cost of the misallocation of effort from socially valuable to socially wasteful activities. The assumption above that profits are exogenous rules out other forms of deadweight loss (for instance, from the reallocation of real activity from a to b), in order to focus on this particular social cost (which is relatively similar in nature across the two types of tax bases that we study).[8]

The tax law of country a defines taxable income as $Y_a^T = Y_a^{TL} = \pi_a - y - C(y)$; country b defines taxable income as $Y_b^T = Y_b^{TL} = \pi_b + y$. The MNC's global after-tax profits, denoted by Π, are:

$$\Pi = (1 - t_a)\big(\pi_a - y - C(y)\big) + (1 - t_b)(\pi_b + y) \tag{2}$$

The MNC chooses y to maximize Π, setting:

$$C'(y) = \frac{t_a - t_b}{1 - t_a} \tag{3}$$

Global welfare can be characterized as the sum of the MNC's after-tax global profits and countries' tax revenue:[9]

$$W_{a+b} = \Pi^* + t_a(\pi_a - y - C(y)) + t_b(\pi_b + y) \tag{4}$$

Assuming t_b is fixed, the welfare impact of a small change in t_a can be found by differentiating W_{a+b} with respect to t_a while holding t_b constant. Π^* in Equation (4) is the maximized value of the MNC's profits, so an envelope theorem argument (analogous, for example, to that used in Chetty (2009)) implies that behavioral responses can be ignored when differentiating Π^* with respect to t_a. Thus, holding t_b constant:

$$\frac{dW_{a+b}}{dt_a} = -(\pi_a - y - C(y)) + (\pi_a - y - C(y)) + t_a \frac{d(\pi_a - y - C(y))}{dt_a} = t_a \frac{dY_a^T}{dt_a} \tag{5}$$

Thus, under the assumptions made above, Equation (5) shows that the responsiveness of taxable income Y_a^T to the tax rate is a sufficient statistic for the marginal deadweight loss from profit shifting.

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[8] Moreover, if we adopt the common definition of tax avoidance as "the lawful reduction of tax obligations, while maintaining the same substantive economic outcome" (Dharmapala, 2017b, p. xv), then isolating the deadweight cost of tax avoidance *per se* entails abstracting from real responses.

[9] In its policy choices, it is more realistic to assume that country a maximizes its national welfare W_a rather than global welfare (Dharmapala, 2017a). However, this does not affect the results here, as W_a differs from Equation (4) only by omitting country b's tax revenue.

2.3) The Deadweight Loss from Earnings Management

Now suppose instead that taxable income is defined as the MNC's worldwide consolidated financial statement income Y^F, including discretionary accruals or other adjustments that are not part of tax law, denoted A (which is defined here as being positive to reflect the incentives for downward earnings management in this setting, though this could be relaxed without affecting the conclusions). The MNC is assumed to incur an increasing convex cost $M(A)$ to engage in earning management to reduce its reported Y^F. As with the cost of profit shifting $C(y)$, the most natural interpretation of $M(A)$ is as payments to accounting practitioners. In a manner closely analogous to our prior discussion, earnings management creates social costs if accountants' foregone output is socially valuable, and in a competitive labor market, $M(A)$ is a reasonable approximation to this deadweight cost. Assuming that $M(A)$ is treated as a cost under financial accounting rules, $Y^F = \pi_a + \pi_b - A - M(A)$.

It is not entirely clear from OECD (2019a) how Y^F would be allocated across countries under the GloBE proposal. However, reading OECD (2019a) in the light of the earlier Pillar One proposal (OECD, 2019b) suggests that Y^F may be allocated by a formula based on factors such as the location of sales. Thus, we assume here that each country is allocated an exogenous share of Y^F denoted f_i, where $i \in \{a, b\}$.[10] This formulation implies that our comparison of the alternative tax bases Y^{TL} and Y^F also implicates the choice between separate accounting (as in the profit shifting model above) and formulary apportionment (FA). The choices are conceptually separable: for instance, an FA system could in principle be based on tax law definitions of income. However, the taxation of Y^F is bundled with FA in the OECD's proposals; more generally, it may in practice be difficult to unbundle these because of the typically consolidated nature of Y^F.[11]

Under the assumptions above, the MNC's taxable income subject to tax by country i is $Y_i^T = f_i Y^F$. The MNC's global after-tax profits are:

$$\Pi = \pi_a + \pi_b - M(A) - t_a f_a(\pi_a + \pi_b - A - M(A)) - t_b f_b(\pi_a + \pi_b - A - M(A)) \quad (6)$$

The MNC chooses A to maximize Π, setting:

[10] It would be natural to assume further that $f_a + f_b = 1$, but this is not necessary for the points being made here.

[11] As is well-known (e.g. Altshuler and Grubert, 2010), a potentially important type of distortion from FA entails changes in firms' ownership of assets across borders to influence the apportionment factors. The assumption here that profits are exogenous entails ignoring this distortion, but it should be borne in mind as an additional cost of taxing Y^F when that is combined with FA.

$$M'(A) = \frac{t_a f_a + t_b f_b}{1 - t_a f_a - t_b f_b} \tag{7}$$

Global welfare is:

$$W_{a+b} = \Pi^* + t_a f_a(\pi_a + \pi_b - A - M(A)) + t_b f_b(\pi_a + \pi_b - A - M(A)) \tag{8}$$

As before, Π^* in Equation (8) is the maximized value of the MNC's profits, and the envelope theorem argument invoked earlier implies that behavioral responses can be ignored when differentiating Π^* with respect to t_a, while holding t_b constant:

$$\frac{dW_{a+b}}{dt_a} = -f_a Y^F + f_a Y^F + t_a f_a \frac{dY^F}{dt_a} = t_a \frac{dY_a^T}{dt_a} \tag{9}$$

Thus, under the assumptions made above, Equation (9) shows that the responsiveness of taxable income $Y_a^T = f_a Y^F$ to the tax rate is a sufficient statistic for the marginal deadweight loss from tax-motivated earnings management.

The discussion in OECD (2019b) envisages that a normal or routine return would be exempted from the income that is apportioned by formula. This can be accommodated by assuming that exogenous returns $\bar{\pi}_a < \pi_a$ and $\bar{\pi}_b < \pi_b$ are subtracted from the income that is allocated. In addition, Equation (6) assumes implicitly that the MNC's "true" profit does not include *A*. It might instead be assumed (as many proponents of taxing financial statement income would contend) that its "true" profit is better measured by Y^F. With these changes, Equation (6) can be rewritten as:

$$\Pi = \pi_a + \pi_b - A - M(A) - t_a[f_a(Y^F - \bar{\pi}_a - \bar{\pi}_b) + \bar{\pi}_a] - t_b[f_b(Y^F - \bar{\pi}_a - \bar{\pi}_b) + \bar{\pi}_b] \tag{10}$$

However, the result in Equation (9) is not fundamentally affected by this reformulation.

3) The ETI for Tax Law Income versus Financial Statement Income

3.1) Empirical Estimates of the ETI of Corporate Tax Law Income

The early ETI literature (reviewed in Saez, Slemrod and Giertz (2012)) focused primarily on taxpayer responses to the individual income tax. More recently, there has developed a body of research seeking to estimate the ETI for corporate income. Implicitly, this pertains to the elasticity of what we have termed tax law income (Y^{TL}) with respect to taxes, as that is how taxable income is generally defined in the settings that have been studied. While there are other estimates of the corporate ETI in the literature, two studies (Gruber and Rauh, 2007; Devereux, Liu and Loretz, 2014) are used in Table 1 for illustrative purposes.

Gruber and Rauh (2007) use Compustat data on publicly-traded US firms over 1960-2003 to estimate the corporate ETI. Although they use financial statement data, it is important to emphasize that their aim is to infer taxable income Y^{TL} from information in the financial statements; it is not their objective to estimate the tax elasticity of Y^F. Using this inferred Y^{TL} and a measure of effective tax rates (ETRs) computed from financial statement data, they find an ETI (with respect to the net-of-tax share, as defined in Equation (1)) of about 0.2, as shown in Table 1. This is comparable to the magnitude of the ETI for individual income (e.g. Saez, Slemrod and Giertz, 2012) and implies a relatively modest marginal deadweight loss from corporate taxation.

Devereux, Liu and Loretz (2014) estimate the ETI for UK firms using confidential company tax returns over 2001-2009 provided by Her Majesty's Revenue and Customs (HMRC). Their analysis – following an approach developed by Saez (2010) - infers the ETI using the extent of bunching at "kinks" in the company tax schedule (i.e. at income levels where the marginal tax rate changes). Around the kink at £300,000, they estimate an ETI of between 0.13 and 0.17 (as also shown in Table 1).[12]

The estimates described above do not relate specifically to profit shifting across jurisdictions (although that is implicitly among the potential mechanisms of tax avoidance for those firms that are MNCs). Dharmapala (2014) surveys the evidence on profit shifting and reports a representative consensus estimate from the literature of a semi-elasticity of reported income with respect to the tax rate differential across countries of 0.8. This entails that a ten percentage point increase in the tax rate difference between an affiliate and its parent would increase the income reported by the affiliate by eight per cent. As it is derived from a log-linear specification, the semi-elasticity varies across different tax rates, and is typically evaluated at the sample mean tax rate. For instance, suppose that both countries *a* and *b* initially have a tax rate of 35%. Then, a reduction in country *b*'s rate to 25% (which represents an increase of about 15.4% in the net-of-tax share in country *b*, from 0.65 to 0.75) would lead to an 8% increase in affiliate *b*'s reported income. If this is the only response of affiliate *b* to the tax change,[13] then the implied ETI would be about 0.5, which is somewhat larger than those in the fourth column of Table 1, but much smaller than those discussed below for Y^F.

[12] They find a larger ETI around the £10,000 kink, but this is not as relevant for the discussion here because of the extremely small size of these firms.

[13] Note that these studies seek to isolate profit shifting from real responses such as changes in the location of economic activity (e.g. by controlling for capital inputs). Thus, this elasticity arguably only reflects profit shifting.

3.2) Inferring the ETI for Financial Statement Income

Our aim is to compare the ETI for situations in which taxable income is defined by tax law ($Y^T = Y^{TL}$) to the ETI in situations where taxable income is defined as being equal to financial statement income ($Y^T = Y^F$). The latter is not readily observable, because – even though different jurisdictions differ in their degree of book-tax conformity - financial statement income is generally not explicitly taxed. One exception that, albeit now quite far in the past, provides an important potential source of evidence is the Book Income Adjustment (BIA) that was an element of the corporate Alternative Minimum Tax (AMT) created by the Tax Reform Act of 1986 (TRA86) in the United States.

In general, corporations are required under the AMT regime to pay the greater of their tax liability under "regular" tax law and under the AMT (which applies a lower rate to a more extensive base). For a brief period (the tax years 1987, 1988 and 1989) the AMT base included an adjustment based on book income: the BIA, also known as the "Business Untaxed Reported Profit" (BURP) adjustment (e.g. Dhaliwal and Wang, 1992). Specifically, denote income under "regular" tax law by Y^{TL} and the AMT tax base by Y^F. Let P be the statutory preferences and deductions that are allowed under regular tax law but disallowed under the AMT. The BIA entailed adding 50% of the difference between a firm's financial statement income Y^F and its (tentative) AMT income (i.e. excluding the BIA itself) to the AMT base. That is:

$$\text{BIA} = 0.5(Y^F - (Y^{TL} + P)) \tag{11}$$

Thus, the AMT base can be expressed as:

$$Y^{AMT} = Y^{TL} + P + 0.5\big(Y^F - (Y^{TL} + P)\big) = 0.5(Y^{TL} + P + Y^F) \tag{12}$$

Over the relevant period, the AMT was imposed at a 20% rate on Y^{AMT}. Thus, those firms that were subject to the AMT (i.e. those for which the AMT liability exceeded their tax liability under the regular tax) faced what amounted to a 10% tax on Y^F. The BIA is thus one of the closest analogs to the current proposals for taxing Y^F that has ever been implemented (although there are of course some significant differences between the BIA and the current proposals).

As foreshadowed in TRA86 at the time of is enactment, the BIA was replaced in 1990 and subsequent years by an adjustment that did not reference financial statement income, and has not been revived since. Thus, the taxation of Y^F represented a short-lived experiment in US tax law. Nonetheless, there is a significant academic literature in accounting from the 1990s seeking to test whether firms subject to the AMT managed their financial statement income downwards in the

affected years (1987-1989). It does not refer to the concept of the ETI, which was only developed in the public finance literature at a later time. Indeed, the papers on the BIA do not even discuss the magnitude of their estimates of tax-motivated earnings management; they were written at a time when (not only in accounting but across empirical disciplines) it was common to focus primarily on the statistical significance of estimated coefficients rather than on the implications of the magnitudes of these coefficients. Nonetheless, it is possible (under certain assumptions) to derive an implied ETI from the published estimates and descriptive statistics.

Dhaliwal and Wang (1992) use Compustat data over 1985-1988 to compute ETRs, and classify firms with ETRs below 23% in 1986 as being potentially affected by the AMT and BIA. In essence, their approach estimates the change in the book-tax gap scaled by book income (in our notation, $(Y^F - Y^{TL})/Y^F$) for the affected group of firms once the AMT comes into effect in 1987. Their estimated coefficient in a regression of the scaled book-tax gap on the ETR implies that the scaled book-tax gap falls by 0.27 in 1987 for affected firms relative to unaffected firms.[14] Dhaliwal and Wang (1992) do not report the baseline scaled book-tax gap prior to the reform, but in the Compustat data used in Desai and Dharmapala (2006, 2009b) the mean scaled book-tax gap is -0.14.[15] Then, taking account of TRA86's reduction in the corporate tax rate, the regression results in Dhaliwal and Wang (1992, Table 4) imply a 17% decline in Y^F from 1986 to 1987, in response to a decrease in the net-of-tax share by 10% (i.e. from 1 to 0.9) when the firm is subject to the AMT and the BIA. This corresponds to an ETI of approximately 1.7 for Y^F, as shown in Table 1.[16]

Manzon (1992) uses hand-collected data on firms that are subject to the AMT (as revealed in the relevant footnotes of their disclosures). Among these firms, Manzon (1992) identifies variation in the degree of exposure to the AMT and BIA based on the availability of net operating losses (NOLs), unused investment tax credits (ITCs) and foreign tax credits (FTCs). In particular,

[14] They estimate a coefficient of 0.744 for 1987 (Table 4). The mean ETR for affected firms is 3.3% while that for unaffected firms is 40.2%, and 0.744*(0.033 – 0.402) = -0.27.

[15] See Desai and Dharmapala (2009b, Table 1), where the book-tax gap (scaled by assets) is -0.0074 and pretax (book) income scaled by assets is 0.0544, yielding a ratio of -0.14.

[16] The 0.27 fall in the scaled book-tax gap implies a fall from -0.14 to -0.41. Normalizing Y^F in 1986 to \$1, it follows that Y^{TL} = \$1.14 in 1986, while $((Y^F - Y^{TL})/Y^F)$ = -0.41 in 1987, which implies that $1.41Y^F = Y^{TL}$ in 1987. Assuming Y^{TL} is fixed (i.e. the same in 1987 as in 1986), $1.41Y^F = Y^{TL}$ = 1.14, which implies that Y^F = 0.81 (a 19% decline from its normalized 1986 value of \$1). However, TRA86 reduced the corporate tax rate from 46% in 1986 to 40% in 1987. This decline in the tax rate entails an increase in the net-of-tax share from 0.54 to 0.6 (i.e. by 11%). Using the Gruber and Rauh (2007) estimate of an ETI of 0.2, Y^{TL} would rise by a little over 2%, from 1.14 to 1.165. Then, $1.41Y^F = Y^{TL}$ = 1.165 in 1987, implying that Y^F = 0.83 (a 17% decline from its normalized 1986 value of \$1).

Manzon (1992) divides the sample into firms that face a 10% marginal tax rate on Y^F (in the absence of either tax shield), those that only have unused ITCs and face a 7.5% marginal tax rate, and those with sufficient NOLs or FTCs that they face a 1% marginal tax rate. The reduction in the corporate tax rate in TRA86 created an incentive to shift taxable income from 1986 to 1987. If conforming tax avoidance methods were used for this purpose, book income would incidentally be shifted to 1987, biasing estimates of tax-motivated earnings management downward. To address this possibility, Manzon (1992) focuses on discretionary accruals related to long-lived assets because these accruals are treated differently for book and tax purposes. In particular, the analysis uses non-cash writedowns (NCW) scaled by assets as its measure of earnings management. Manzon's (1992) results imply an ETI in the range of 1.4 to 2.1 (as shown in Table 1).[17]

4) Discussion

The studies of the impact of the BIA summarized in Table 1 suggest a high degree of responsiveness of Y^F to taxes in circumstances where the tax base is defined as Y^F. This seems contrary to a common intuition that is often expressed by proponents of taxing Y^F. As described, for instance, in Desai and Dharmapala (2009a), this intuition is that taxing Y^F would make tax avoidance more costly by imposing a financial market consequence of having to report lower Y^F to investors (as well as making upwards earnings management more costly by imposing higher tax liability on inflated reports of Y^F). This is a valuable insight, but the evidence reviewed above (along with other relevant evidence in the accounting literature) seems to point to an opposing intuition, that the structure of tax law has developed over time to constrain the under-statement of Y^{TL}, while financial accounting has evolved to limit the overstatement of Y^F. At least if left to its own devices, financial accounting has little reason to significantly constrain downward earnings management, as suggested by Watrin, Ebert and Thomsen (2014, p. 58), who refer to the "the near absence of penalties for under-reporting financial income compared with over-reporting financial income." The implication is that downward earnings management may be a more powerful tool for tax avoidance (if $Y^T = Y^F$) than is tax planning under the current system where $Y^T = Y^{TL}$.

[17] Manzon (1992, Table 5, Panel A) reports a difference of -0.01 in scaled NCW for firms facing AMT rates of 7.5% or 10% (relative to those facing AMT rates of 1% or less). The mean book income scaled by assets is 0.07 (Manzon, 1992, Table 2). Thus, at the mean, Y^F is about 14% lower for firms facing net-of-tax shares of either 0.925 or 0.9, relative to those facing net-of-tax shares of either 0.99 or 1.

Under the conditions discussed in Section 2 above, a large ETI implies a large marginal deadweight cost. As foreshadowed in Section 2, it is quite possible to imagine circumstances in which the ETI is not a sufficient statistic for the deadweight cost of taxation. However, the similarity of Equation (5) and Equation (9) suggests that the conditions under which the ETI is normatively relevant are closely parallel for profit shifting and for earnings management. That is, if one is skeptical that a large responsiveness of Y^F to taxes (when taxable income $Y^T = Y^F$) indicates a large deadweight loss, then it would generally follow that one should also be skeptical that a large responsiveness of Y^{TL} to taxes (when $Y^T = Y^{TL}$) implies a large deadweight loss. The latter position, however, would (at least on efficiency grounds) be somewhat in tension with the assumed urgency of the GloBE proposal and other measures to combat profit shifting.

It may be argued that the response of firms to the BIA merely involves a timing effect, with Y^F being shifted outside the relatively short period in which the BIA was operative. This point has some validity, and because the BIA was in effect only for three years, it is not necessarily possible to infer long-run responses from studies of the BIA. However, it should be remembered that earnings management is always primarily a matter of timing. It is also possible that the responsiveness of Y^F to taxes may be reduced by making adjustments to Y^F when using it as a tax base. To the extent that such modifications mirror tax accounting rules, however, this approach calls into question why one might wish to use Y^F as a tax base in the first place.

The foregoing discussion generally accepts the credibility of the estimates reported in the accounting literature on the BIA. However, a number of significant concerns have been highlighted within the accounting literature itself. Choi, Gramlich and Thomas (2001) raise questions about the robustness of the results in the BIA literature to a variety of factors, including the use of alternative scaling variables and the use of different treatment and control groups. They conclude that while they "do not claim that earnings were not managed in response to the BIA . . . we wish . . . to convince readers that the case is not closed" (p. 578).[18] Shackelford and Shevlin (2001, p. 369) argue that the treatment and control groups of firms used in the studies (in most cases, firms that are inferred to be subject to the AMT and those that are not) may be subject to self-selection. In particular, the BIA was intentionally directed at firms with low Y^{TL} and high Y^F, and the

[18] See also the response by Dhaliwal (2001).

earnings management practices of these firms (which tend to be those in the treatment group subject to the AMT) may not be representative of firms in general.

While many of these concerns are valid, it should also be noted that there are number of potential factors that would result in an underestimation of the effect. In particular, TRA86 reduced the corporate tax rate, and so created an incentive to shift Y^{TL} from 1986 to later years. This may have had the effect of also shifting some component of Y^F in the same direction through conforming tax avoidance methods. The AMT was creditable against the firm's regular corporate tax liability in later years, mitigating (in present value terms) the burden of being subject to the AMT. In addition, the BIA literature's finding of a large amount of earnings management in response to the BIA is arguably broadly consistent with the results of a more recent cross-country literature. The latter studies (e.g. Watrin, Ebert and Thomsen, 2014; Blaylock, Gaertner and Shevlin, 2015) compare earnings management at firms based in countries with different degrees of book-tax conformity, and generally tends to find that earnings management is more prevalent among firms facing high levels of conformity (i.e. where Y^{TL} and Y^F are more similarly defined).

Ultimately, if we do not find the estimates in the BIA literature to be credible, that leaves us with the priors of the most relevant scholarly community, namely financial accounting researchers. As noted previously, this community is strongly opposed to the taxation of Y^F, in part because of an expectation that Y^F would be highly responsive to taxes under such a regime (and applying the ETI approach from public finance would further imply that this high responsiveness may entail significant deadweight costs). To overcome this strong prior, one would need to show a "precise zero" estimate – i.e. that the BIA or other instances in which Y^F is subject to tax consequences lead to a small and precisely estimated impact on Y^F. However, no such estimates have emerged in the literature, and recent proponents of taxing Y^F have not produced evidence of this nature in support of their proposals. It is also worth bearing in mind that the responsiveness of Y^F to taxation is not merely important for revenue estimation, but is also potentially relevant for understanding the deadweight loss - and hence the normative desirability - of these proposals.

5) Conclusion

The idea of taxing financial statement income is undergoing a significant revival, especially in view of the OECD's (2019a) GloBE proposal. This paper develops a conceptual framework – based on the ETI literature – to assess the normative desirability of such proposals in terms of the

responsiveness of financial statement income to taxes. It also discusses the available evidence on the tax elasticity of financial statement income. The central conclusion is that the most relevant evidence (from the BIA literature, although it has significant limitations) suggests a large responsiveness of financial statement income to taxes (and hence, albeit with important caveats, arguably a large deadweight loss). The paper also highlights the need for more evidence on this question before proceeding with the current proposals.

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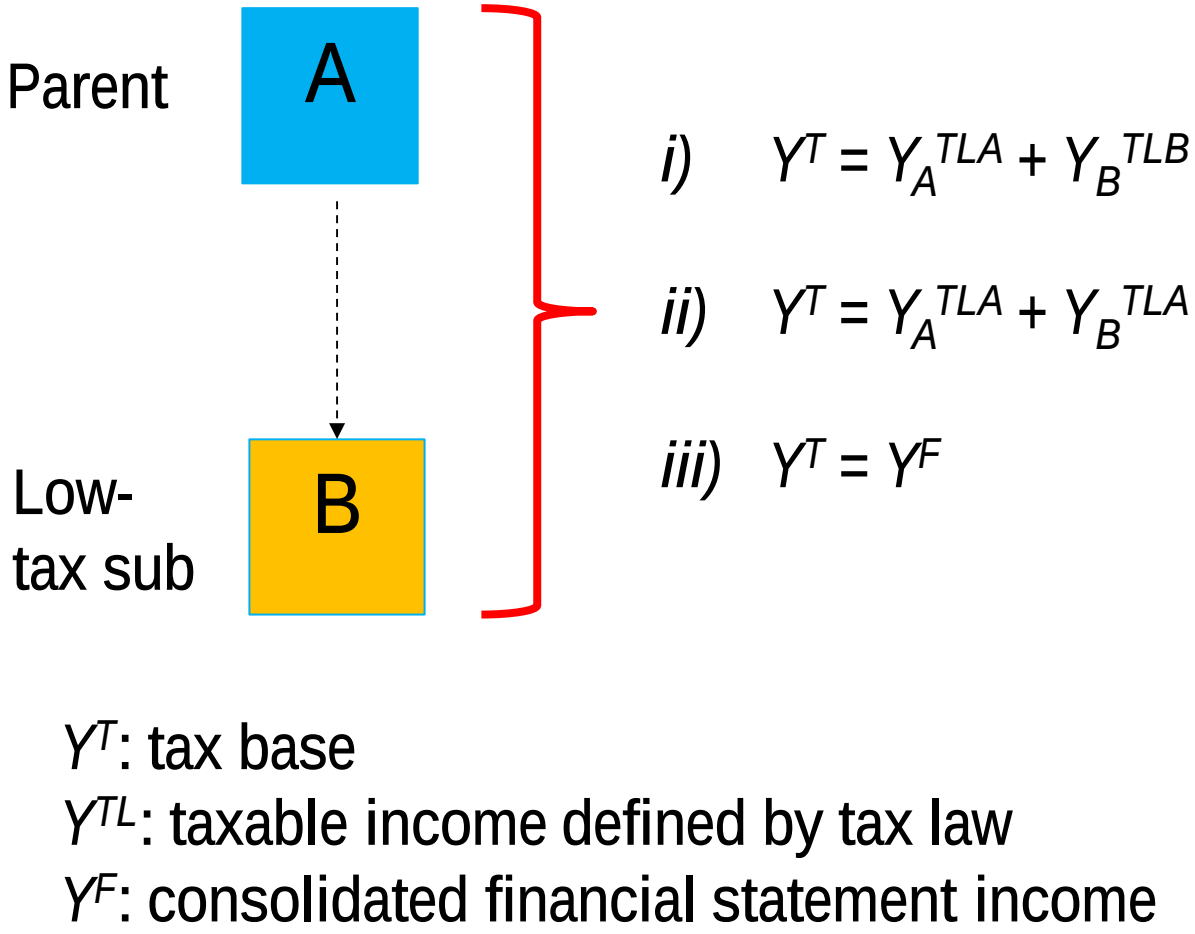
Figure 1: Alternative Tax Bases for the OECD GloBE Proposal



Note: This figure represents alternative tax bases considered in OECD (2019a). Y^{TLA} is taxable income defined by the tax law of country A, and Y^{TLB} is taxable income defined by the tax law of country B.

Table 1: Reported and Implied Elasticities of Taxable Income (ETI)

Tax Base	Study	Sample	Reported ETI	Implied ETI
Tax Law Income ($Y^T = Y^{TL}$)	Gruber and Rauh (2007)	US firms (Compustat)	0.2	
	Devereux, Liu and Loretz (2014)	UK firms around £300,000 "kink" (tax return data)	0.13 to 0.17	
Financial Statement Income ($Y^T = Y^F$)	Dhaliwal and Wang (1992)	US firms (Compustat)		1.7
	Manzon (1992)	US firms subject to the AMT (hand-collected)		1.4 to 2.1

Note: See text for details.