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Seppo Kari

Corporate tax in an international environment—Problems and possible remedies

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Abstract: The paper addresses the problems of corporate taxation in a globalized world. It first considers recent trends in international practices and then reviews the literature on the effects of corporate taxes in closed and open economies. The paper emphasizes the severity of the problems caused by current international tax rules. It compares various national and international policy alternatives and considers two recent Nordic tax reform proposals as examples of national-level solutions. The problems of current international corporate taxation are fundamental. Introducing increasingly tight antiavoidance measures could serve as a medium-term approach but does not provide any promising long-term solution. There should be more research concerning initiatives that would reform the fundamental principles of the international tax system.

Keywords: corporation tax, international taxation, multinational firms, tax avoidance

JEL classification: H25, H32, H87, F23

1 Introduction

Corporate taxation has become a major issue in public debates in recent years. Often, you cannot open a newspaper without finding a story about some country cutting its corporate tax rate or of a prominent multinational company (MNC) paying virtually no taxes on its worldwide profits. There is also a growing academic literature that examines the effects of corporate taxation on the decisions of firms and countries.

Economists have long accused the conventional designs of corporate taxes of distorting the financing and investment decisions of incorporated firms, thus leading to losses in production and welfare. They have also suggested alternative designs free from such distortions. Another line of attack against corporate taxes questions the existence of a separate tax levied on corporations. After all, it is individuals who bear the burden of the taxes. Why not tax individuals directly? But, despite this criticism, corporate taxes live on and they continue to bring in an important share of countries' tax revenue.

Even if criticized for decades, the real challenge for corporate taxation arrived just after the deregulation of the capital markets and the increase in the importance of MNCs. In the new globalization era, business activity is more and more executed by MNCs with complex organizational structures and with owners commonly resident abroad. International trade has shifted from raw materials and manufactured goods to services. A larger share of this trade consists of intra firm transactions. Similarly, capital flows are not primarily associated with direct investments spent on equipment and structures but more and more with financial capital and intangible assets.

These changes have many important implications for conventional corporate taxes. Since so much of business is in the hands of MNCs, the question how the right to tax the profits of these firms is shared between the countries where the firms locate has grown in importance. However, due to the changes described above, it is much more difficult to define where profits are generated than it was when trade largely consisted of raw materials and manufactured goods.

These changes also open up new possibilities for tax planning. According to both casual and research evidence MNCs have ample opportunities to shift profits to low-tax countries in various ways. There is also increasing evidence that inconsistencies in the tax rules of bilateral tax treaties facilitate tax planning strategies that may even lead to avoiding corporate taxes entirely.

Individual countries and the international community have responded to these challenges in multiple ways. Countries have adopted antiavoidance rules to combat tax planning. The Nordics are well advanced in this respect. And there are coordinated actions too. Examples of supranational initiatives include the "Harmful Tax Competition" project of the Organisation for Economic Cooperation and Development (OECD) started in late 1990s

Seppo Kari: Associate Professor and Research Director, VATT Institute for Economic Research, E-mail: seppo.kari@vatt.fi

Table 1: Corporate tax rates in selected countries, %

	1995	2005	2014	Change btw. 1995–2014
Denmark	34.00	28.00	24.50	−9.50
Finland	25.00	26.00	20.00	−5.00
Iceland	33.00	18.00	20.00	−13.00
Norway	28.00	28.00	27.00	−1.00
Sweden	28.00	28.00	22.00	−6.00
France	36.66	33.83	36.4	−0.26
Germany	59.00	38.31	30.20	−28.80
Ireland	38.00	12.50	12.50	−25.50
Italy	53.20	37.25	31.40	−21.80
Poland	40.00	19.00	19.00	−21.00
Spain	35.00	35.00	30.00	−5.00
United Kingdom	33.00	30.00	21.00	−12.00
Canada	42.90	34.20	26.10	−16.80
Japan	49.98	39.54	35.64	−14.34
United States	39.61	39,28	39,13	−0.48
EU27	37,00	24.45	21.70	−15.30
EU15	37.73	29.95	25.77	−11.96

Source: VATT

(OECD (1998)), the European Union's (EU) informal "Code of Conduct in Business Taxation" and the OECD's 2-year campaign, Base Erosion and Profit Shifting (BEPS), started in 2013 following an initiative by the G20 (OECD (2013)). How effective these measures are is still unclear, however.

The aim of this article is to discuss the problems of conventional corporate taxes in a globalized environment where MNCs are responsible for an increasing share of production and trade. The aim is not to provide any comprehensive account of international tax rules or tax planning opportunities or economic evidence, but rather to provide a short discussion of the problems of the current international tax system and the potential remedies available to individual countries and the international community. In stressing the flaws of the entire architecture of international corporate taxation, this article is indebted to several recent contributions such as Auerbach *et al.* (2010); Devereux (2012) and Ault (2013).

The next section draws a picture of the trends in corporate taxation, paying attention to tax rates and revenues and also to the tax treatment of foreign-source income. After that, we illustrate some key problems of corporate taxes in the international environment using a simple comparison of the effects in closed and open economy contexts. After that, we survey recent evidence from empirical research concerning the responses of MNCs to tax differentials. The final discussion concerns potential domestic and internationally coordinated policy measures.

2 Recent trends in corporate taxation

Table 1 presents the evolution of statutory corporate tax rates in the Nordic countries and in 10 other developed economies. We observe that the tax rates of the Nordic countries, currently between 20 and 27 percent (2014), are internationally quite modest, clearly lower than in many large countries such as France, Italy, Japan, and the United States, but quite close to the EU averages (EU27 and EU15). Of the western reference countries, the UK and Ireland have low corporate tax rates.

In line with trends in other major countries, the statutory tax rates of the Nordic countries have fallen over the last two decades. Cuts in tax rates have been moderate, however, and have been more common in the last few years than around the millennium. Iceland is the main exception here. Many reference countries have implemented dramatic cuts during the period covered—Germany, Italy, Ireland, and Poland, in particular. Germany's tax rate has fallen by nearly 30 percentage points. The Nordics differ here in that they reformed their corporate tax systems al-

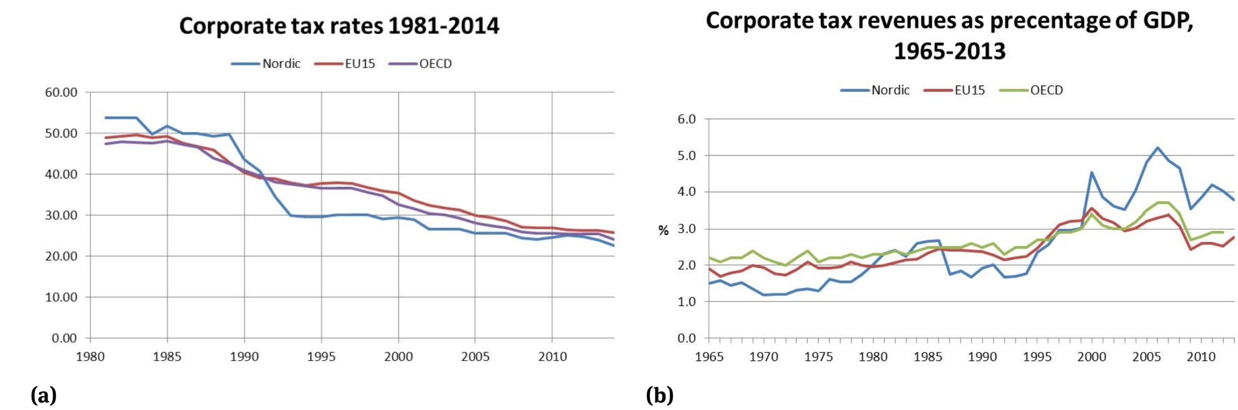

Figure 1: Source: (a) VATT. (b) Revenue Statistics 2014: Comparative tables. Organisation for the Economic Co-operation and Development (OECD) Tax Statistics (database).

ready a decade earlier, as illustrated in Figure 1a. Their average nominal tax rate fell from 50 to 30 percent in the late 1980s and early 1990s.

Even if harder to measure and illustrate, other aspects of corporate tax systems have changed as well. Many countries have broadened their tax bases by reducing depreciation allowances and special investment incentives, evidently in order to finance their tax rate cuts. Loretz (2008) provides evidence of this trend in a large group of developed countries. The trend seems to have continued into the 2000s, but has since slowed down considerably. This may reflect difficulties in broadening the tax base further after abolition of the principal tax expenditure rules. This pattern applies to the Nordic countries as well. They implemented reforms of this type in the early 1990s. More recently, many countries have strengthened their tax bases by introducing or tightening anti-avoidance measures such as the interest-limitation rules.

While there have been sharp cuts in tax rates, we cannot detect any noticeable fall in corporate tax revenues, as shown in Figure 1b. Revenue as a share of Gross Domestic Product (GDP) fluctuates over time, reflecting the sensitivity of corporate profits to business cycles, but there is no clear decreasing trend. The drop in the level of tax revenue in 2008 without any marked recovery in 2009–2011 may turn out to be protracted or even permanent, but it is still too early to assess whether it is related to low tax rates or other factors.

The puzzling combination of a downward trend in tax rates but no similar drop in tax revenues has been discussed much by tax economists, admittedly without any quantitative estimates of the importance of different factors (see *e.g.* Auerbach *et al.* (2010); Devereux *et al.* (2002); Loretz (2008); Sørensen (2007)). A natural explanation for the dilemma is that the base-broadening measures implemented by most (or even all) countries have counteracted the effect of tax rate cuts on revenues.

Secondly, the sustained level of revenues may reflect an increase in economic activity in a corporate form. In particular, part of this increase may be related to the fall in corporate tax rates. According to this explanation, low corporate tax rates may have led to a switch in the form in which entrepreneurs withdraw funds from their existing firms. Similarly, new corporations have been established for economic activity, which was earlier performed in the form of a sole proprietor or partnership. There is indeed evidence of such a phenomenon, at least in Europe (see *e.g.* Fuest and Weichenrieder (2002) and de Mooij and Nicodème (2008)).

A third explanation might be that some smaller European countries, which have drastically cut their tax rates, may have been successful in attracting foreign direct investment (FDI) and the profits of MNCs. If there are many small "winners" and only a few large "losers" in the tax competition game, our charts of unweighted average tax rates and trends in revenue shares should broadly be as they are in Figure 1a, 1b. In fact, theoretical models of (asymmetric) tax competition predict such an outcome (see Bucovetsky (1991); Keen and Konrad (2013)).

Finally, some have argued that the success of some sectors such as the financial and information technology (IT) sectors has contributed much to the favorable development of tax revenues. Devereux *et al.* (2002) refers to the financial sector. Finland seems to fit this picture well. The rise of the IT cluster around Nokia contributed much to corporate tax revenue until recently.

Next, we will look at a trend in international tax rules for corporate profits. The current practice, guided by the

Table 2: Treatment of foreign source dividends received by parent companies in selected countries

	1991	2005	2012	Change
Denmark	Exemption	Exemption	Exemption	-
Finland	Exemption	Exemption	Exemption	-
Iceland	Credit	Exemption	Exemption	c
Norway	Credit	Exemption	Exemption	c
Sweden	Exemption	Exemption	Exemption	-
France	Exemption	Exemption	Exemption	-
Germany	Exemption	Exemption	Exemption	-
Ireland	Credit	Credit	Credit	-
Italy	Credit	Exemption	Exemption	c
Poland	Credit	Credit	Exemption	c
Spain	Credit	Exemption	Exemption	c
United Kingdom	Credit	Credit	Exemption	c
Canada	Exemption	Exemption	Exemption	-
Japan	Credit	Credit	Exemption	c
United States	Credit	Credit	Credit	-

Sources: ZEW (2012): Effective tax levels using the Devereux/Griffith methodology, Final Report 2012, project for the EU Commission TAXUD/2008/CC/009, and OECD (1991): Taxing Profits in a Global Economy, OECD, Paris.

OECD Model Tax Convention on Income and Capital and implemented in bilateral tax treaties, can be illustrated by distinguishing between two basic principles that delineate national tax bases. Under the source principle, a country is permitted to tax all income that arises within its borders, whether such income accrues to residents or to foreigners. In an environment with cross-border income flows, the principle can be implemented by letting the country of source tax the income and exempting the income in the country of residence of the MNC.

The other is the residence principle, which recognizes the right to tax all income accruing to domestic residents whether from domestic or foreign sources. Hence, countries relying on the residence principle tax the worldwide income of domestic residents. This can be done by crediting foreign taxes against domestic tax on that income.

There has been a long debate as to which of the two principles best serves best individual countries or the international community. The residence principle has fared well in this debate, its merit being that it may lead to efficient allocation of capital across countries. The issue may be more complex than that (see *e.g.* Devereux (2008)), but the fact is that many large developed countries have traditionally taxed the worldwide income of their companies, providing relief against double taxation via the credit method.

As Table 2 illustrates, the situation has changed: we can detect a clear trend from the credit method to the exemption method over the last two decades. Of the 15 countries in Table 2, only Ireland and the United States still tax foreign income on a worldwide basis and there are three recent movers: Japan, Poland, and the UK. In 1991, a clear majority applied the credit system. Of the very few left, there has been a keen debate concerning the need for a reform in the United States.[1]

But, why do countries hesitate to tax worldwide income? The answer seems to lie in how residence-based taxation affects domestic MNCs in global markets. Desai and Hines (2003) have shown that taxing the worldwide profits of domestic MNCs puts them in a disadvantaged position in global markets compared to companies residing in exemption countries. This point was emphasized in the UK in connection with its decision to switch to source taxation, and the argument has an important role in the current US debate as well (see *e.g.* IFS Green Budget (2009), for the UK, and Toder and Viard (2014), for the United States).

1 For the debate in media, see, for example, “Obama faces business backlash over cash pile tax,” Financial Times, February 3, 2015, and “Help American businesses—tax their profits abroad,” Financial Times, July 7, 2013, (a column by L. Summers). Grubert and Altschuler (2013) provide an evaluation of some proposals.

3 The incentive effects of corporate taxation

This section illustrates the effects corporate taxation may have on the decisions of firms and individual countries. We start from a closed economy context and then consider how the effects change if we move to an international framework. In order to focus on some key effects of corporate taxation, we will keep the approach very simple. At the end of the section, we discuss the evidence of the effects in recent empirical research.

3.1 Closed economy

Consider a firm that produces only domestically and receives all its financing from domestic households, but may participate in foreign trade by importing and exporting goods. Assume also that the home country runs an income tax system where tax is levied on personal income and corporate profits.

There is a long-standing debate on the desirability of a separate tax levied on corporations. The debate has considered the double burden on corporate-source income that such a tax causes and the consequent distortions in the economy (Harberger (1962)). It has also asked why corporations should pay a direct tax on income. Since individuals bear the burden of all taxes, would it not be logical to tax individuals directly on such income?

That debate has raised at least two widely shared arguments for a separate tax. First, it may be reasonable to tax income at source on an accrual basis rather than to allow funds to be distributed to owners and try to catch them later (the withholding tax function). Taxing income later as the income of owners might cause higher administrative costs and lead to lower tax revenue. Similarly, any delay would mean that taxes levied successfully would have a lower present value. The second point has to do with the backstop role of corporate taxation in an income tax system. Without such a tax, individuals would face incentives to earn their income through corporations and draw down the funds in the form of leniently taxed forms of income such as fringe benefits and capital gains (at a low effective tax rate).

An obvious remark here is that if corporate tax systems were really designed based on these two principles, one would expect to see integration between tax types such that the total tax rate on corporate-source income would be the same as on income from other sources. However, consistent integration attempts have been more the exception rather than the rule. But, even if there were no original reasons for there being a separate corporate tax, these principles may be seen to be a justification for the existence of one.

Economists have criticized the conventional designs of corporate taxes on many grounds. One is the asymmetric treatment of costs for debt and equity resulting from the full deductibility of debt costs in business taxation but no similar deduction for equity costs. This distorts financing decisions and may lead to inefficiently high debt-to-equity ratios in corporations. [2]

But, in a closed economy, it is not crucial whether tax on corporate-source income is levied on the owner or the firm. It is the combined tax rate, which matters for the incentive effects. If double tax relief using any method relieves the over-taxation of equity income, it is not very important how high the corporate tax rate is. The situation is very different in an open economy, as we will see later. Nevertheless, the withholding and backstop functions of corporate tax speak for a fairly high tax rate in a closed economy, close to the highest marginal tax rates of individuals.

Some countries tried to alleviate the distortions caused by excessively high taxation by providing full or partial relief for double taxation. One common method in Europe was to credit the corporate-level tax on distributed profit against the owner's tax. This imputation system was applied by the four largest EU member states as well as Norway and Finland. A special feature of the Nordic applications was that they provided full credit for corporate tax and hence, eliminated double taxation of distributed profits entirely.[3] Norway even extended the relief to capital gains taxation. This approach has been called double asymmetry: while interest payments are deductible at the firm level but taxable in the hands of the financier, equity returns are taxed at the corporate level but exempt (or subject to a relieved tax) in the hands of the owner. This may lead to a neutral treatment of investment and the financing of firms at least in certain cases, but is not without its drawbacks. The fact that there are many differently taxed owner classes makes it difficult to find a satisfactory solution. Besides, most countries adopted just partial relief for double taxation of dividends.

2 See de Mooij (2012) for a recent review.

3 Also, Germany provided full credit for corporate tax. Instead, the British and French systems gave just a partial credit.

3.2 Open economy

Let us next move to consider the effects of domestic corporate taxes on firm behavior in an environment where investors may invest in foreign financial assets and firms may operate across borders. For brevity, we focus on corporate taxation and leave the taxation of savings flows aside.

How are MNCs taxed?

To understand the incentive effects of corporate taxation in an open economy, it is useful first to look at some stylized aspects of international tax rules. As discussed in section 2, most countries today apply the source principle in the taxation of foreign-source dividends of domestic parent companies. This means that subsidiaries' profits are taxed abroad in the host country and the repatriated dividends are tax-exempt at home. An important related aspect of current rules is that corporate groups are not taxed as a single unit. Rather, their subsidiaries are independent tax subjects. This is called the separate accounting. When this principle is applied, no country or international organization keeps track on the total tax bill of the group.

The alternative to the source principle, residence-based taxation, would go further since it, at least in its purest form, would tax the world-wide income of a corporate group and provide relief for double taxation using credit in the residence country.

But, when the taxation of the profit of a large corporate group is decentralized to the countries where the various units are located, the question arises of how the group-level profit is allocated to the countries where the group operates. The countries are certainly interested in the share of profit they are entitled to tax. How are their fair shares determined? The answer is that there is a common allocation method that was adopted in international tax coordination 100 years ago. It is the arm's-length principle, which requires the internal trade in goods and services between the different units of a corporate group to be based on prices that are comparable to the prices used between independent parties.

Incentives faced by MNCs

Consider now the choices of MNCs. Assume first that profits are allocated fairly between countries. There is no aggressive tax planning but firms take tax rules into account in their investment and financing decisions.

International investors provide the MNCs financing, requiring a fixed return r (gross of investor-level taxes). Consider now an increase in the corporate tax rate in country A, where r is the same for all firms everywhere and other countries keep their taxes unchanged. The increase in country A's tax rate on profits raises the before-tax rate of return required on investment in country A and, therefore, reduces investment there. As a result, the capital intensity of production is likely to fall, which reduces the productivity and wage level in the country. In an open economy, an increase in the corporate tax rate is likely to hurt labor and other domestic (more) immobile factors of production. Domestic and foreign investors still get the same internationally equalized gross return on their savings and do not necessarily bear any part of the burden of corporate tax.

But, the MNCs' capital stock mainly consists of real capital installed in machinery and buildings. It cannot freely flow to other countries with lower corporate taxes. This reflects the imperfect mobility of the existing capital stock. The outcome is rather that the high-tax country's capital stock depreciates gradually due to wear and tear while most new investment by domestic corporations is made abroad.

In this simple framework, individual countries face incentives to lower the rates of their source-based corporate taxes. Gordon (1986) suggests that in a simplified special case where MNCs face no excess profits from locating in a country, the optimal source-based corporate tax rate is zero. Recent literature refers to this as a race to the bottom. The key intuition to understanding this result is that in this model, corporate tax is effectively a tax on labor since labor bears the burden of the tax. Corporation tax, however, is a less efficient way to tax labor than direct taxes on wage income since corporate tax distorts the capital stock and reduces productivity.[4]

The extreme result of a race to the bottom assumes that production in the country does not enjoy any special benefits from natural resources, skilled labor or good infrastructure. If we add in such aspects, the results are likely to be less extreme, but still the incentives to outsource production from a high-corporate tax country are present.

4 Gordon (1986) result is, in fact, an application of the classic Diamond–Mirrlees (1971) production efficiency theorem in an open economy framework. The classic result implies that taxes should not distort production decisions but should rather be levied on final consumers.

We observe that the working of the tax system is very different in an open economy than in a closed economy. In a closed economy, it is the total tax wedge on capital that is relevant for domestic investment. In an open economy, the level of corporation tax has a direct effect on domestic investment and this is likely to be larger than the corresponding effect in a closed economy. Domestic taxation of personal-level capital income does not have a direct effect on investment. Domestic savings now have a lesser role in financing investment. If there is a gap in financing resulting, for example, from weak domestic savings incentives, foreign investors may easily fill the gap, at least in the medium run. One implication for the tax policy of an individual country is that a high corporate tax rate combined with double tax relief for equity income at the personal level is no longer desirable. Rather, reforming corporate taxation combined with just some relief for dividends and capital gains at the personal level would be a desirable policy.[5]

One consequence of a low tax rate on corporate income is that the withholding tax and backstop functions of corporate taxation discussed above no longer work or do so weakly. Therefore, the incentive to cut corporate tax rate is likely to have spill-over effects on the whole income tax system in the form of tax revenue losses and administrative and compliance costs. These spill-over effects may justify a slightly higher corporate tax rate in order to avoid a very large gap between personal and corporate tax rates but also lower tax rates for personal-level income.

Relocation of profits and activities of MNCs

We focused above on a firm that invests in order to gradually expand the scale of its capital stock. In that framework, it is the tax treatment of marginal investment, that is, new investment that provides a return such that it is just worth implementing it, that determines the effects of taxation on investment. The relevant measure to illustrate the tax burden is the marginal effective tax rate (METR).

But, this view of firms' operations is quite narrow. Companies establish new production plants, service centers, internal banks, and other types of units that may well earn high profits in today's imperfectly competitive markets. In what way does taxation affect these high-yielding investments? The scale of these "lumpy" investments in entire production plants may well be sensitive to the METR. But, the location choice probably is not. Recent economic analysis suggests that it is the average effective tax rate (AETR) that determines how tax rules affect location decisions. Choices of location might also be particularly sensitive to tax rules. Consider, for example, an American MNC trying to find a suitable site for its new subsidiary in Europe. If there are two alternative locations where the other aspects are equal but with a difference in the AETR, it would appear plausible that even a small difference in the tax rate could become pivotal.

As explained previously, the allocation of the taxable profit of an MNC rests upon the arm's-length principle, which requires that transactions between various units of an MNC should be priced in the same way as transactions between unrelated parties. If this is satisfied, the allocation of taxable profits is similar as within an independent group of firms. However, proper reference prices are often difficult to obtain, and, therefore, the system may leave corporations with considerable scope for over- or under-invoicing internal transactions.

Therefore, the combination of source-based taxation and arm's-length pricing is sensitive to tax planning where profits accrued in a high-tax country are shifted to a low-tax country by manipulating the transfer prices of internal trade. The incentive to engage in this activity is greater the higher the nominal tax rate difference between the countries is. We may now summarize that tax rules affect various decisions by MNCs in different ways. The METR affects the scale of investment, the AETR the location of lumpy investment, and the nominal marginal tax rate the incentive to shift profits.

Profit-shifting may take many forms. One is manipulating transfer prices of internal trade in goods and services. Another is debt-shifting, which exploits the tax-deductibility of interest costs. To minimize taxes, debt issues within an MNC should be located in high-tax countries, and internal financial transactions should be designed so that a subsidiary located in a low-tax country (an internal bank) provides debt financing for units in high-tax countries. A third variant makes use of relocating intangible assets such as patents and trademarks to a tax haven or to a country with a special low-tax regime for intellectual income (Patent Box). The MNC may gain a substantial tax saving since royalty payments are deductible business costs for those units that have used the services of the asset.

5 For a Nordic debate on the desirability of owner-level double tax relief, see Apel and Södersten (1999); Lindhe and Södersten (2012); Sørensen (2005).

3.3 Evidence of MNCs responses to incentives

For some, the abundant anecdotal evidence of corporate responses to tax rate differences and tax planning opportunities reported in the media is enough to convince them that firms do respond to tax incentives and avoid taxes. There is also a lot of aggregate statistics showing strange facts about how financial and direct investment flows are channeled throughout the world. A few small countries such as Luxembourg, the Netherlands, Mauritius, and Cyprus (with low tax rates or special tax regimes) are responsible for disproportionate shares of the total capital stock. While other institutional arrangements may also be relevant, taxation should necessarily have a role here. Furthermore, the sizes of the abnormal structures are felt to be indicative of strong effects (see *e.g.* Zuckman (2013) and IMF (2014)).

In spite of such stylized evidence, it is important to have more direct and detailed empirical information on the responses of firms to some particular tax rules. There is, in fact, a large and increasing number of studies, which consider many broader aspects, such as the effects of taxes on foreign direct investment, profit-shifting, headquarter relocation, location of intangible assets such as patents, etc. Even if the quality of this research line has probably improved due to better data and new microeconometric methods, it may still be unclear how successful it is in analyzing the true causal link between international tax rules and MNC behavior. Therefore, the results should be interpreted with care.

The approaches and findings of this field have been summarized in several survey articles. The meta study by Heckemeyer and Overesch (2013) summarizes studies of profit-shifting. Their conclusions strongly support the idea that multinational companies do reallocate profits across countries to minimize their tax burden. They calculate that the "consensus" estimate of the size of the response, measured as semielasticity, is –0.8. This tells us that, for example, a 10 percentage point increase in the corporate tax rate decreases the tax base by 8 percent. The study also finds that debt-shifting, that is, shifting profits using relocation of debt and interest deductions, is important but has a lesser role than nonfinancial forms of profit shifting. For a recent review of this literature, see Dharmapala (2014).

De Mooij and Ederveen (2008) and Feld and Heckemeyer (2011) consider the investment responses. Both studies estimate a high semielasticity. The "consensus" estimate found in Feld and Heckemeyer (2011) is in the range of –1.2 to –2.5. Hence, a 10 percentage point increase in the corporate tax rate would decrease the business tax base of MNCs by an average of at least 12 percent.

There are also several studies on corporate tax competition, that is, on potential strategic responses between countries in setting tax rates. Devereux and Loretz (2013) survey this literature. The authors warn of the difficulties in distinguishing between different reasons for changes in tax rates and, therefore, in drawing strong conclusions supporting the hypothesis of tax competition. They suggest, however, that the literature seems to confirm that there is competition between countries in setting tax rates, particularly in Europe, where a large number of smaller countries are compressed into a small area. Small countries seem furthermore to be the most active players in this game.

4 What are the policy options?

In this section, we briefly discuss potential unilateral and coordinated measures to address the responses of MNCs to current tax rules and loopholes in them. We will start with the pros and cons of some more fundamental ways to reform corporate tax systems and then move on to evaluating some more gradual antiavoidance measures. Both sets of reform options are discussed from the point of view of a unilateral reform. In the last sections, we discussed some coordinated policy alternatives.

4.1 Options for fundamental tax reform

We consider first whether a move to the residence principle would be a workable remedy to the problems of current corporate taxes. Then we assess two widely discussed proposals for reforming the domestic corporate tax base. The first is the ACE model (allowance for corporate equity), which was developed in the study by Boadway and Bruce (1984) and wrapped up later into an implementable tax system by the Institute for Fiscal Studies (IFS Capital Taxes Group (1991)). Under this model, the normal return on a firm's equity capital is exempted and tax is only levied on excess profit. The second is the CBIT model (Comprehensive Business Income Tax) first proposed by an American tax commission (US Department of the Treasury (1992)). It disallows the deduction for interest payments on debt and, therefore, broadens the tax base. We ask whether these measures would help and, if so, are there other reasons why they are not feasible?

Residence-based tax

As we discussed in Sections 2 and 3, the current international taxation of corporate profits relies on the source principle, which broadly means that profits are taxed in the place where they are generated. This practice provides MNCs with incentives to relocate investments and profits to low-tax countries. This, in turn, encourages national governments to lower tax rates and provide special tax regimes to attract MNCs' activities.

The alternative approach, the residence principle, generally means that countries tax their residents on their worldwide income irrespective of where it is earned. Under this principle, the host countries of the MNCs' subsidiaries are still entitled to levy tax on profits earned within their borders, but the residence country gives full credit for these taxes against its corporate tax on the worldwide profit. If this were (really) implemented perfectly, foreign profits would be taxed at the same effective rates as domestic profits. Taxation would not provide any incentive to outsource investment even if the domestic tax rate were high. This principle would lead to efficient allocation of capital, and countries would not face incentives to cut their tax rates to attract investment.

However, this rosy view is more or less just theory. The residence principle in its purest form is difficult to implement. Most actual practices have limited the foreign tax credit to the amount of domestic tax due on the same income. Furthermore, credit has been provided only when foreign profits have been repatriated in the form of dividends. Therefore, high domestic tax on foreign source dividends can be avoided by deferring the repatriation. Anecdotal evidence and empirical research from countries with residence-based taxation show that firms have indeed reacted to the "repatriation tax." This has led to an accumulation of profits in the form of financial assets in low-tax countries. Desai *et al.* (2001, 2007) provide evidence of the effect on repatriations. Foley *et al.* (2007) show that the high cash holdings of US-domiciled MNCs are partly explained by the incentives to collect profits in tax havens. Arena and Kutner (2015) investigate the responses of MNCs to the switch from residence to source-based taxation, in Japan and the UK, and find increased repatriation and decreased holdings of cash in foreign units.

Thus, actual applications of residence-based taxation are far from ideal, and, therefore, they produce many similar adverse incentive effects to source-based taxation. Countries also face weak incentives to choose the residence principle and, therefore, a wider switch towards it would necessarily need international coordination. As we pointed out in Section 2, one reason for such reluctance is that a combination of the residence-principle and a high domestic tax rate would put domestic firms at a disadvantage in global markets. Domestic MNCs will earn a lower return after taxes on their assets in foreign low-tax countries than do MNCs domiciled in countries that exempt foreign-source profits. This issue has been debated much in the United States, one of the few countries that still applies the credit method. For an early economic analysis of this issue, see Desai and Hines (2003), and for later discussions, Griffith *et al.* (2010); Toder and Viard (2014) and Grubert and Altschuler (2013).

One consequence is that MNCs resident in a credit country face incentives to relocate their headquarters to low-tax countries with the exemption method. Many such cases of so-called corporate inversion in the United States have recently been reported in the media (*e.g.*, Athanasiou (2014). Voget (2011) provides evidence of the effects of tax rules on relocation of headquarters. A higher repatriation tax rate is shown to increase the likelihood of switching fiscal domicile. This sensitivity is found to apply when the MNC resides in a credit country but is absent when foreign profits are tax-exempt.

Reforming the tax base: ACE and CBIT

A natural way to introduce these two tax models is to start from their shared background. Both models aim to address the aspect of conventional corporate taxes that debt financing is favored compared to equity. This non neutrality is founded on the practice of allowing deduction for interest on debt but not for equity. It is feared that this could lead to excessive leverage, distortions to risk taking, and tax arbitrage. The two reform options approach this issue, but in very different ways.

Under the ACE model, the "normal" return (*i.e.* a return that corresponds to interest on government bonds) on a corporation's equity-financed investment is exempted from corporate tax. As a result, the normal return on both equity and debt is exempt and tax is levied only on excess profit (rent). In contrast, CBIT disallows the tax deductibility of debt costs and, therefore, the full return on investment is taxed independent of the source of finance (debt or equity).

Apart from being neutral with respect to financing decisions, ACE has other attractive properties as well. Since the tax burden of ACE only falls on rents, the model is neutral with respect to marginal investment decisions, which means that the distortion to the scale of investment vanishes. Furthermore, the distortions produced by inaccurately set depreciation rates for tax purposes and the sensitivity of investment to inflation disappear. This means that, in addition to the efficiency benefits, the tax system may be easier to design and administer under ACE. ACE is also seen being able to provide a basis for neutral tax treatment of risk taking. (See *e.g.* Mirrlees *et al.* (2011))

By contrast, CBIT does not offer all these neutrality properties. It transforms the tax into a broad-based tax on all corporate-source income. Both normal and excess return are taxed at the same rate. This means that, all other things being equal, a move to CBIT raises the tax burden on marginal investment, and, therefore, increases the distortion to the scale of investment. Nor are the problems with inflation, depreciations, or risk-taking addressed. Yet, CBIT has the advantage that the tax base is broadened substantially. In a revenue-neutral reform, it allows for a substantially lower corporate tax rate. This rate cut may mitigate the existing and introduced distortions even substantially.

In an open economy where MNCs have a prominent role, the relative benefits of CBIT can be still bigger. The low nominal tax rate would make the country an attractive place for investments and profits. At a more detailed level, the composition of inward investment is likely to change. Due to the full taxation of normal return, the country would not be particularly attractive for low-yielding debt financed investment. But, since rents are taxed at a low tax rate, the system is competitive for high-yielding assets. On top of this, comes the obvious benefit from the repeal of interest deduction. The system becomes immune to international debt shifting.

In contrast, the benefits of the ACE model do not compound when we move from a domestic to an international context. ACE allowance makes the corporate tax base narrower compared to a conventional corporate tax, which tends to reduce corporate tax revenues. In a balanced budget tax reform, this revenue loss must be recovered in some way. One natural alternative is to raise the corporate tax rate.[6] In an open economy, this would be problematic for several reasons. First, due to the high tax on rents, the country would become an unattractive location for highly profitable investment and firms. Second, the high tax rate on the narrow base would provide incentives for MNCs to shift rents to low-tax countries. The probable outcome would be that MNCs resident in the country would enjoy the benefits of the ACE allowances but report most of their excess profits in low-tax countries.

Both ACE and CBIT have recently been assessed by the Nordic governments. In June 2014, a commission submitted its final report, where it focused on reforming the Swedish corporate tax system with the aim of reducing the debt bias and curbing international debt shifting (SOU (2014); Lodin (2014)). After considering a wide range of alternative measures, it ended up proposing a variant of CBIT. This application would disallow any deductibility of net costs of debt financing. Hence debt interest (and other related expenditure) would be deductible up to the amount of income earned on lending transactions but the excess amount is nondeductible.

The ACE model was thrown aside. This was justified by the tax-base effect, which would have required compensating adjustments, most likely by increasing the corporate tax rate. The commission preferred a tax rate cut financed form base-broadening. It referred to calculations reported in a study of de Mooij and Devereux (2011), where the authors compare ACE and CBIT reforms using a general equilibrium model describing the European Union countries and the United States and Japan. The study reports that, while the ACE model could be welfare-improving when implemented jointly as an EU-wide reform, the CBIT model would work much better than ACE as a unilateral measure. This is especially so when the budget is balanced using the corporate tax rate. Interestingly, the country-level results showed that some western European countries with a large open sector would benefit greatly from introducing CBIT. The biggest welfare gains would be experienced by Sweden and the Netherlands, but Denmark and Finland were among the winners as well.

The Norwegian tax commission, which submitted its report in December 2014, abandoned both CBIT and ACE and proposed a corporate tax cut from 27 to 20 percent combined with some base-broadening measures such as bringing depreciation rates for taxation purposes closer to the economic depreciation and tightening existing interest limitations (NOU (2014)). The commission justified the rejection of ACE by a preference for a broad tax base combined with a low rate. But, the commission did not see CBIT as a workable solution either. A very low corporate tax rate facilitated by CBIT would make it more difficult to maintain the balance in the overall income tax system. A low corporate tax rate would cause lock-in effects and make it difficult to deter income-shifting between the personal and corporate tax bases.

Aspects of the CBIT model have been discussed for a longer time, but there seems to be no analysis concerning

6 Not all experts have seen the substantial revenue loss as a necessary consequence of an ACE reform. To minimize the initial loss Griffith *et al.* (2010) propose a gradual transition to the system by granting the allowance only to additional equity built up after the reform. They also argue that, since the incidence of the tax lies on the domestic owners of factors, it should not be necessary to compensate the potential revenue loss by raising the corporate tax rate.

the spill-over effects on other countries. For example, does a move by one country to adopt CBIT aggravate the reallocation of debt to countries that still have a conventional corporate tax? This seems probable and in that case, the question arises how these other countries respond. They may cut their tax rates and put new antiavoidance measures into operation.

4.2 National anti avoidance measures

Let us consider next three types of unilateral anti avoidance measures that are used by many countries, the Nordics included. We will discuss how effective these measures are and whether there is scope to emphasize them even more in future.

CFC legislation

We already discussed the pros and cons of residence-based taxation and saw that it probably is not an option that could be counted on as a unilateral measure. Implementing it efficiently has proved to be difficult and it may put domestic MNCs at a competitive disadvantage compared to firms resident in exemption countries.

Despite this there might be potential partial steps towards residence basis that might be useful. One is controlled foreign corporation (CFC) rules, currently in use in a large number of countries among them all Nordic states. These rules trigger an immediate inclusion of passive income earned in low-tax affiliates (*e.g.* interest income on internal loans by an MNC) in the tax base of the parent company of a domestic MNC. The ensuing double taxation of such income is relieved using foreign tax credit in the home country. The conditions for applying these rules usually include i) an ownership threshold (commonly 25 or 50 percent), ii) a requirement that the income arises from nonproductive activities such as passive asset holdings, and iii) a requirement that the subsidiary or affiliate faces a tax rate below some threshold level (*e.g.* one-half or two-thirds of the domestic tax rate). The Nordics are among those countries that have CFC rules (see Folkvord and Riis Jacobsen (2014)).

How efficient are these national-level measures as tools? The OECD seems to trust on this measure since it has proposed tightening national CFC rules to counter the aggressive tax planning of large MNCs such as Google and Amazon (OECD (2013)). Indeed, there is evidence that CFC rules do affect debt-to-equity ratios and passive income reported in tax haven countries. Altschuler and Hubbard (2003) studied a change in the US rules in 1986 and found evidence of reduced deferral of passive income abroad. Ruf and Weichenrieder (2012) studied the impact of a German reform and observed that CFC rules had an effect on the shifting of passive assets. But, these benefits do not accrue without costs. Strict CFC rules are likely to raise the cost of capital of domestic MNCs abroad and place them in a worse situation than competitors resident in countries with lax or no CFC rules. Egger and Wamser (2011) provide evidence for this investment effect using German data. One implication of this outcome is that it might not be in the interest of governments to tighten their CFC rules unilaterally.

The main problem with CFC rules, however, is that recent rulings of the European Court of Justices (ECJ) have impeded the efficient use of CFC legislation. In particular, in its judgment in the 2006 Cadbury-Schweppes case, the court ruled that the British CFC legislation implied a restriction against the freedom of establishment. As a consequence, many EU countries have stopped applying the CFC rules within the European Economic Area (EEA) (Ruf and Weichenrieder (2013)). Also, the Nordic countries have adjusted their CFC rules to comply with the rulings of the ECJ (Folkvord and Riis Jacobsen (2014)).

Interest limitation rules

A second class of measures, which may be seen rather as a way to strengthen source-based taxation, has to do with setting restrictions on the deductibility of debt interest. There are broadly two main approaches. So-called thin capitalization rules define a threshold level for the acceptable size of the debt-to-equity ratio for subsidiaries of foreign MNCs. If the firm's actual "gearing" exceeds the threshold, any deductibility of internal debt costs is disallowed. The rules vary between countries but they are usually targeted at address cross-border internal debt within MNCs.

Thin capitalization rules take no account of the size of interest payments even if these payments are the key means for transferring income, implying that these rules are not able to address the use of over-pricing of internal debt. The second approach is income-stripping rules. They restrict the net interest costs of a unit of a domestic or international corporate group to a share of gross earnings. Only deductions in excess of this ceiling are disallowed (wholly or partially). The rules are not only directed at MNCs but also apply to domestic corporate groups. Following the German reform in 2008, several European countries have adopted this type of rules, among them Finland and Norway. Denmark was the first country to adopt interest limitation among the Nordic states. Its current rules combine the asset-based and income-based approaches. Sweden also limits excess interest payments on internal loans. The rules differ from the two standard types explained in this section (for a detailed comparison, see Folkvord and Riis Jacobsen (2014)).

How efficient are these measures as tools? Again, there is evidence that both types of restrictions do affect the tax-sensitivity of the debt-to-equity ratios of MNCs in a significant way (Büttner *et al.* (2012); Wamser (2013); Blouin *et al.* (2013)). The internal debt of an MNC is shown to decrease, compensated partly by an increase in external debt. However, both theory and evidence imply that the rules may have some unintended side effects. They seem to reduce domestic investment in high-tax countries (Büttner *et al.* (2014)). Theoretical considerations also suggest that a unilateral tightening of CFC rules might not be attractive from the point of view of a single country. Haufler and Runkel (2012) construct a model where countries compete over mobile and immobile inputs through both tax rates and interest limitation rules. They predict that tax competition between identical countries leads to low tax rates and lax limitation rules. Furthermore, if countries differ in size, small countries tend to compete more aggressively. These results seem to suggest that the fight against international profit shifting should not rely too much on unilateral implementation of anti avoidance regulations.

Transfer pricing rules

A more discretionary approach to address international debt shifting is to rely on the arm's-length-pricing principle. The question is then to make sure that the prices applied by MNCs correspond to those between unrelated parties. Over the last few decades, governments have indeed increasingly responded to the threat of international profit shifting by introducing provisions and developing assessment methods to monitor internal pricing of MNCs.[7] But, since intra company transactions tend to be firm-specific, identifying comparable transactions requires information that is difficult or even impossible to find.

One response of countries to this difficulty has been the introduction of regulations that require companies to submit detailed documentation to the tax authorities where they justify their pricing practices. This responsibility to document pricing rules in advance makes the monitoring work of authorities easier, especially in cases where comparable prices are not available.

One apparent problem of transfer-pricing rules is that implementing the rules in practice requires resources and imposes high administrative and compliance costs. Therefore, the efficiency of the rules is a critical question. Luckily, their effects have been the subject to some recent studies. Lohse and Riedel (2013) classify countries into three groups depending on the scope and strictness of their rules, and assess the relationship of this measure to profit-shifting. They find that stricter rules significantly reduce profit-shifting. Beer and Loeprick (2014) and Büttner *et al.* (2014) provide additional evidence.

4.3 Coordination based options

The above quick review of the gradual national-level reform options suggests that they might be efficient, but for now, they all have their limits. More extensive use of CFC legislation is impeded by the rulings of the ECJ and the arm's length principle might be administratively burdensome to apply. Interest limitation rules appear more promising, but in the assessment of the Swedish tax commission (SOU (2014)), even they were seen as complex and, therefore, less desirable. However, the biggest drawback of these measures is that countries face weak incentives to implement them on a unilateral basis. From the more fundamental reform options, CBIT looks more promising, but is not tested in practice yet, and, therefore, implementing it requires substantial courage. Hence, it seems plausible that without coordinated measures, distortions in investment locations, profit-shifting, and tax competition are likely to continue. But, how much can the international community do and what are the options for reform?

Let us start with the OECD's recent project "Base Erosion and Profit Shifting", BEPS (OECD (2013)). This project aims at a reform of the existing international tax framework. Its action plan, containing 15 measures, was launched in July 2013, and in September 2014, the OECD published a set of reports to address seven of the actions in the BEPS Action Plan. Some items in the plan aim at improving the coherence of corporate tax rules between different countries and preventing the abuse of the bilateral tax treaty network, so that there would be much less room for aggressive tax-planning strategies, which are now able to result in zero taxation. The project also attempts to design model tax rules to prevent base erosion through interest deductions, and suggests strengthening national CFC

7 For different methods for monitoring transfer pricing, see OECD (2010), and for a survey of country practices, see Lohse *et al.* (2012).

rules. New options to address the difficulties in the taxation of digital goods and services are also on the agenda.

The OECD project's starting point is the current international tax system. If it is able to reduce inconsistencies in tax rules between different countries and if new anti avoidance measures prove to be effective, the program may bring improvements to the current framework. Combined with unilateral action, the effect may be larger. But, as some observers have remarked, this is not necessarily enough (Ault (2013); **?**); IMF (2014)). The architecture of the international tax system remains as it is. Its cornerstones still are the source principle and arm's-length pricing. The BEPS project would update it but not alter its basic structure. Tax rate differences between countries still affect the location of investment and taxable profits. Some have suggested that the incentives for high-tax countries to cut tax rates will even grow since these countries will have to compensate domestic MNCs for the higher taxation (Hines (2014)). The new legislation will also increase the complexity of the current system. Tax competition may eat into anti-tax-avoidance rules too. Implementation of the proposed changes will be based on national decisions. There is unlikely to be any supranational legislation requiring national governments to comply with the agreements. The incentive for countries to follow the OECD's suggestions may be weak and this may reduce the effects of the BEPS project.

Recent debate has also raised some more far-reaching options. By way of a benchmark, consider first the evidently unrealistic option of harmonizing corporate tax rates. This model was raised by the Ruding committee (1992) two decades ago in the form of a minimum rate, which has since been discussed in several studies (*e.g.* Brøchner *et al.* (2006); Keen and Konrad (2013)). This proposal could even solve the distortions discussed here altogether, but getting agreement on such a model would be very difficult under the current unanimity rule for tax policy decisions in the EU.[8]

Consider next, the idea of a unitary tax combined with a formulary allocation of taxable profits between countries. In this model, taxable profit is calculated for an entire corporate group and then allocated to the various locations (countries) using an agreed formula. This formula would replace the arm's-length pricing of intra firm transactions as a means of allocating profits between countries. The European Commission's proposal for a Common Consolidated Corporate Tax Base (CCCTB) follows this idea. This approach would get round most of the problems associated with profit-shifting from high-tax to low-tax countries, certainly an attractive aspect in the current framework where profit-shifting is a major problem.[9] Furthermore, the observation that the formulary approach is a standard element of state-level corporate taxes in many (or even most) federations, such as Germany, Canada, and the United States, also suggests that it has some merits in a framework of many small jurisdictions. But, the model has many disadvantages too, one being that it still provides incentives to move real activity to low-tax countries. The proposal also favors debt financing and distorts the scale of investment. There is also the major difficulty of reaching a global, or even an EU-wide, agreement on the rules. Therefore, the model may look attractive in theory but is less so in practice.

A third coordination-based reform option would replace the current source and residence principles of international corporate tax rules with destination-based taxation (Bond and Devereux (2002)). This model would tax corporate profit where the products are sold to a third party for consumption purposes. This tax would, in effect, be broadly similar to value added tax (VAT), the main distinction being that the cost of labor would be deductible from the tax base. Hence, the tax burden would fall on profits. The tax would have several advantages. First, since investment expenditure is deductible, the tax is neutral with respect to investment. Second, because the model disallows any deduction for the costs of debt, the tax is neutral with respect to financing and, therefore, does not provide incentives for debt bias or international debt shifting. The destination principle also leads to the outcome that the location of real activity is unaffected by the tax. There is also much less scope for shifting profits and the tax does not produce any major incentives for countries to indulge in tax competition. Mirrlees *et al.* (2011) saw this model as a future solution that is not realistic in the short run but possibly later. The outline of a destination based corporate cash flow tax looks promising; future work should focus on its practical implementation and transition issues.[10]

8 For a summarizing discussion, see Griffith *et al.* (2010).

9 While the unitary tax approach avoids certain forms of profit-shifting, the CCCTB generally is not necessarily free of such problems. There are, for example, significant border lines that may provide opportunities for tax optimization: between the national system and CCCTB and between member countries and third countries. Similarly, the definitions concerning a corporate group and physical presence in a country might become subject to tax planning. (Fuest (2008); see also Raimondos-Møller *et al.* (2010)).

10 Devereux and de la Feria (2014) elaborate some aspects of an implementable system.

5 Concluding words

Corporate tax has a potentially useful role in the tax system of a developed country. It helps in taxing corporate-source capital income at low administrative costs and it works as a backstop for individual income tax, thus curbing income-shifting from the personal to the corporate income tax base.

In the current international environment, conventional corporate tax systems seem to work badly. They provide firms with incentives to move the location of profits and real activity to low-tax countries and countries with incentives to cut their tax rates. Casual evidence reported in the media may suggest that the problem is extreme. However, research evidence suggests that while firms do respond to these incentives the magnitude of the responses is probably modest rather than huge.

The problems of corporate taxation are nevertheless serious since their roots are in the fundamental architecture of the international tax system. More and more countries have adopted the source principle. Under this principle, profits are taxed where they are earned (or rather reported). The other crucial elements are separate accounting and arm's-length-pricing. The source principle provides incentives to relocate activities to low-tax countries and the allocation mechanism provides firms with scope for shifting profits to low-tax countries.

There are many alternative ways in which the system could be improved. Countries could act on a unilateral basis and adopt anti avoidance measures such CFC rules and restrictions on interest deductions. The national-level options also include better functioning systems such as the ACE model and the CBIT model. As an example of actions by the international community, the OECD has proposed an action plan to update the current international tax system through 15 specific measures. The European Commission has issued a proposal for a harmonized corporate tax base augmented with unitary taxation of corporate groups.

There is evidence that anti avoidance measures such as CFC legislation, interest limitation rules and tighter implementation of the arm's length principle can be effective. Therefore, more extensive use of these measures either in a unilateral or coordinated (BEPS) manner could reduce relocation. But, there are clear weaknesses in this pragmatic approach. First, the measures have side effects, may cause double taxation and reduce investment. Second, national governments do not face clear incentives to implement these rules strictly. If the coordination-based approach cannot produce any binding agreement, these measures will not become effective enough to stop profit-shifting. Third, a scenario where complex new legislation is introduced without sufficient impact on behavior is not promising. As a result, tax competition will continue even if more slowly, tax revenues will decline, and the administrative and compliance costs of the whole system will increase. We conclude that gradual improvements by tightening anti avoidance measures can hardly be a viable long-term solution.

At first glance, the CBIT model looks promising as a unilateral measure, and is clearly better than the ACE model, which seems to have drawbacks in an international framework. But, CBIT may distort investment and undermine the backstop function of corporate taxation. Furthermore, there should be more research of the consequences of the reform, among them the possible strategic responses of other countries.

It would also be advisable to invest in research into the more fundamental approaches, the CCCTB model and destination-based cash-flow tax. The former probably cannot form the basis of a perfect solution, but could be a functional compromise if the group of countries adopting it were sufficiently large. The latter, in turn, relies on sound principles and is, therefore, the most promising candidate for a long-term solution. In the meantime—which should not last too long—the more gradual approaches such as the interest limitation rules and removing inconsistencies between countries' tax rules seem to provide a reasonable approach.

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