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Base Erosion & Profit Shifting: Strategies, Outcomes and Countermeasures^{*⊗}

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Summary

At the request of the G20 countries the OECD has launched a project on base erosion and profit shifting (BEPS), with the aim to analyze tax-minimizing strategies of multinational enterprises (MNEs) and to address situations where BEPS takes place. This essay provides an overview of existing empirical studies on strategies of MNEs to shift profits, the tax sensitivity of MNEs with respect to the location of taxable profits as well as BEPS countermeasures. The consensus semi-elasticity obtained from studies that regress a measure of the corporate tax burden on the tax base of MNEs is somewhat less than -1, i.e. evaluated at sample means an increase of the corporate tax rate by 1 percentage point reduces reported profits before interest and taxes by somewhat less than 1 percent. While there is little doubt that MNEs engage in profit shifting activities, the absolute amount of corporate tax revenue losses appears to be moderate. Estimates suggest that only a minority of large countries – though representing a majority of the population – would gain by completely abolishing BEPS through coordinated initiatives, at least in terms of corporate tax revenue. There is also evidence that especially MNEs from R&D-intensive sectors extensively have operations in low-tax countries, indicating that even among MNEs the opportunities to engage in profit shifting are unequally distributed. Besides shifting intangibles, MNEs financial policies are sensitive to taxation, too. An increase in the tax rate by 1 percentage point increases the leverage ratio by 0.2-0.4 percentage points. MNEs in high-tax countries are therefore more extensively financed via debt.

With respect to BEPS countermeasures econometric studies suggest that the introduction of thin capitalization rules (TCRs) decreases internal leverage by roughly 5 to 7 percentage points. CFC rules and transfer pricing legislation also seem to be effective instruments in constraining BEPS, but given the few empirical studies on this topic no clear policy implications emerge, in contrast to the TCR case. The drawback of studies analyzing countermeasures (as well as studies that calculate the revenue implications of BEPS) is that they do not take all possible incentives into account. MNEs might adapt to the existence of such countermeasures by simply relocating their headquarters. It is therefore uncertain whether it would be suitable to use the (static) estimates on revenue losses to calculate the revenue potential of eliminating BEPS. In addition, studies related to BEPS and BEPS countermeasures have to cope with problems arising from data limitations, endogeneity, unobserved heterogeneity, multidimensionality of BEPS countermeasures and adaption of MNEs to closing tax loopholes. From a practical point of view, it is highly probable that the abolishment of BEPS intensifies tax competition over production facilities. Thus, whether the elimination of BEPS would be (at least for a majority of citizens) welfare increasing, cannot be clearly answered based on existing findings.

JEL Classification Code: H24; H71.

Condensé

A la demande des pays du G20, l'OCDE a lancé le projet BEPS (Base Erosion and Profit Shifting) pour lutter contre l'érosion de la base d'imposition et le transfert des bénéfices.

Le projet a pour objectif d'analyser les pratiques visant à limiter la portée de l'imposition des bénéfices des multinationales et d'émettre des recommandations pour limiter les risques que l'érosion de la base d'imposition et le transfert des bénéfices font courir à l'économie. Le présent rapport donne un aperçu des études économétriques concernant les stratégies déployées par les multinationales pour opérer le transfert de leurs bénéfices et de la manière dont ces stratégies sont influencées par l'imposition des bénéfices des sociétés et par les mesures prises pour contrer l'érosion de la base d'imposition et le transfert des bénéfices. En faisant la synthèse de toutes ces études qui ramènent la charge fiscale des multinationales à leur assiette fiscale, on obtient une semi-élasticité d'à peine - 1, c'est-à-dire qu'une augmentation de l'impôt sur le bénéfice d'un point de pourcentage, évalué d'après la valeur moyenne de l'échantillon, conduit à une réduction du bénéfice des multinationales avant impôts et intérêts d'un peu moins de 1 %. Bien qu'il soit indubitable que les multinationales procèdent au transfert de leurs bénéfices, le manque à gagner en ce qui concerne l'impôt sur le bénéfice semble modéré. Les estimations en la matière montrent que seule une minorité d'Etats, même si ceux-ci représentent une majorité de la population, pourraient bénéficier de l'élimination complète de l'érosion de la base d'imposition et du transfert des bénéfices qui serait le fruit d'une coordination multilatérale, du moins en ce qui concerne les recettes de l'impôt sur le bénéfice. En outre, il existe des signes que les multinationales qui investissent fortement dans la recherche et le développement, en particulier, ont une tendance supérieure à la moyenne à entretenir des sociétés dans des régions à faible fiscalité, ce qui indique que, même au sein de la classe des multinationales, les possibilités de transfert de bénéfices diffèrent. Outre la déclaration et la fixation des prix de transfert concernant les biens économiques immatériels, des considérations fiscales pèsent également sur les décisions de financement des multinationales. Une augmentation de la charge de l'impôt sur le bénéfice d'un point de pourcentage augmente le taux de financement par des tiers de 0,2 à 0,4 point de pourcentage. Les sociétés implantées dans des pays à fiscalité élevée ont tendance à être plus fortement financées par des emprunts.

En ce qui concerne les mesures pour lutter contre l'érosion de la base d'imposition et le transfert des bénéfices, des études empiriques indiquent que les directives visant à une sous-capitalisation font baisser d'environ 5 à 7 points de pourcentage le taux de financement par des tiers au sein du groupe. Tant les directives en matière de prix de transfert que les règles relatives aux sociétés étrangères contrôlées semblent également être des instruments efficaces pour limiter les risques que l'érosion de la base d'imposition et le transfert des bénéfices font courir à l'économie, mais, en raison du peu d'études empiriques dont on dispose, contrairement aux directives visant à une sous-capitalisation, il ne faut pas tirer de conclusions définitives. L'un des problèmes des études qui analysent ce type de mesures (et aussi des études qui calculent les effets sur les recettes de l'impôt sur le bénéfice) est qu'elles ne prennent pas en compte tous les effets d'incitation qui en résultent. Les multinationales peuvent s'adapter aux mesures contre l'érosion de la base d'imposition et le transfert des bénéfices,

par exemple en transférant leur siège. C'est pourquoi il n'est pas certain qu'il soit justifié d'employer des estimations de recettes statiques pour fonder la détermination des recettes potentielles de l'impôt sur le bénéfice suite à l'élimination de l'érosion de la base d'imposition et du transfert des bénéfices. En outre, tant les analyses concernant l'érosion de la base d'imposition et le transfert des bénéfices que les analyses concernant l'efficacité des mesures pour lutter contre ces derniers soulèvent une série de problèmes. Il s'agit notamment de la pertinence limitée des données utilisées, et du caractère endogène, de l'hétérogénéité non observable et de la multidimensionalité des mesures contre l'érosion de la base d'imposition et le transfert des bénéfices et, enfin, de l'adaptation (non prise en compte) des multinationales lorsque les niches fiscales seront fermées. Du point de vue de la pratique, il est en outre très vraisemblable que la limitation de l'érosion de la base d'imposition et du transfert des bénéfices conduira à une concurrence fiscale croissante entre les sites de production des multinationales. C'est pourquoi il n'est pas possible de répondre en se fondant sur les études empiriques de manière concluante à la question fondamentale de savoir si l'élimination de l'érosion de la base d'imposition et du transfert des bénéfices (pour la majorité de la population) conduira à une augmentation de la prospérité.

Zusammenfassung

Auf Antrag der G20-Länder hat die OECD das Projekt „Base Erosion and Profit Shifting“ (BEPS) initiiert. Das Projekt verfolgt das Ziel steuerminimierende Praktiken multinationaler Unternehmen zu analysieren und Empfehlungen zur Eindämmung von BEPS auszusprechen. Dieser Aufsatz gibt einen Überblick über ökonomische Untersuchungen zu Gewinnverlagerungsstrategien multinationaler Unternehmen, deren Sensitivität bezüglich der Versteuerung der Unternehmensgewinne und Abwehrmassnahmen gegen BEPS. Als Konsens dieser Untersuchungen, welche die Steuerbelastung multinationaler Unternehmen auf deren Bemessungsgrundlage regressieren, erhält man eine Semi-Elastizität von knapp -1, d.h. eine Erhöhung der Gewinnsteuer um einen Prozentpunkt führt – evaluiert am Mittelwert des Samples – zu einer Reduktion der Gewinne vor Steuern und Zinsen multinationaler Unternehmen von etwas weniger als einem Prozent. Wenngleich es keinen Zweifel gibt, dass multinationale Unternehmen Gewinnverlagerungen durchführen, scheinen die Steuerausfälle bei der Gewinnsteuer moderat zu sein. Schätzungen zu den Mindereinnahmen deuten darauf hin, dass lediglich eine Minderheit von Staaten – gleichwohl repräsentieren diese eine Bevölkerungsmehrheit – von einer kompletten Eliminierung von BEPS infolge einer multilateralen Koordination profitieren würden, zumindest in Bezug auf die Einnahmen aus der Gewinnsteuer. Weiter gibt es Hinweise, dass insbesondere multinationale Unternehmen mit einem starken Forschungs- und Entwicklungsbezug überproportional häufig Gesellschaften in Niedrigsteuergeländern unterhalten, was ein Indiz dafür sein könnte, dass auch innerhalb der Klasse multinationaler Unternehmen die Möglichkeiten zur Gewinnverlagerung unterschiedlich sind. Neben der Anmeldung von und Verrechnungspreisgestaltung bei immateriellen Wirtschaftsgütern sind auch die Finanzierungsentscheidungen multinationaler Unternehmen von steuerlichen Erwägungen geprägt. Eine Erhöhung der Gewinnsteuerbelastung von einem Prozentpunkt erhöht die Fremdfinanzierungsquote um 0.2 bis 0.4 Prozentpunkte. Gesellschaften in Hochsteuerländern werden somit tendenziell stärker mit Fremdkapital finanziert.

Bezüglich der Abwehrmassnahmen gegen BEPS deuten empirische Untersuchungen darauf hin, dass Vorschriften zur Unterkapitalisierung die konzerninterne Fremdfinanzierungsquote um etwa 5 bis 7 Prozentpunkte senken. Sowohl Verrechnungspreisvorschriften als auch die Hinzurechnungsbesteuerung scheinen ebenfalls effektive Instrumente zur Eindämmung von BEPS zu sein, aber aufgrund der wenigen empirischen Untersuchungen sollten – anders als bei Unterkapitalisierungsvorschriften – keine endgültigen Schlüsse gezogen werden. Ein Problem der Studien, die solche Abwehrmassnahmen analysieren (als auch der Untersuchungen, welche die Wirkungen auf die Gewinnsteuereinnahmen kalkulieren) ist, dass sie nicht alle Anreizwirkungen berücksichtigen. Multinationale Unternehmen können sich an Abwehrmassnahmen anpassen, beispielsweise indem der Hauptsitz verlegt wird. Es ist deshalb unsicher, ob es gerechtfertigt ist, die statischen Einnahmenschätzungen als Grundlage für das Gewinnsteuereinnahmepotenzial infolge einer Eliminierung von BEPS zu verwenden. Darüber hinaus haben sowohl Analysen zu BEPS als auch Analysen bezüglich der Effektivität von Abwehrmassnahmen gegen BEPS mit einer Reihe von Problemen umzugehen. Diese betreffen u.a. die beschränkte Aussagekraft der verwendeten Daten, Endogenität, unbeobachtbare Heterogenität, Multidimensionalität der Abwehrmassnahmen gegen BEPS und (nicht berücksichtigte) Verhaltensanpassungen multinationaler Unternehmen, sobald

Steuerschluflöcher geschlossen werden. Aus Praxissicht ist es zudem sehr wahrscheinlich, dass die Eindämmung von BEPS zu einem sich intensivierenden Steuerwettbewerb um Produktionsstätten multinationaler Unternehmen führen wird. Daher kann auf Basis bestehender empirischer Untersuchungen die grundsätzliche Frage, ob eine Eliminierung von BEPS (für die Bevölkerungsmehrheit) zu einer Wohlfahrtssteigerung führt, nicht abschliessend beantwortet werden.

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1. Introduction

In July 2013, at the request of G20 Finance Ministers, the OECD launched its Action Plan on Base Erosion and Profit Shifting (BEPS). At their meeting in St. Petersburg on 5-6 September 2013, the G20 leaders fully endorsed the Action Plan and welcomed the establishment of the OECD/G20 BEPS project in which all non-OECD G20 countries participate along with the OECD member states. Fifteen focus groups work on different aspects (e.g. methodologies; hybrid mismatch; controlled foreign companies, transfer pricing documentation) of the project (OECD, 2013). The full set of recommended results is due by the end of 2015 and implementation of the decided measures will take place in the following years.

The BEPS project is the successor of previous endeavors initiated by the OECD. The OECD project against harmful tax competition (1998) addressed tax practices that were labeled as preferential tax competition and/or lacked transparency in international tax relations. Although some of the OECD's working groups discuss questions related to harmful tax practices, the nucleus has changed towards constraining profit shifting activities. The focus is therefore expanded to include different forms of behavior of multinational enterprises (MNEs) in exploiting the opportunities and tax loopholes offered by the existing regulatory framework. While actual cases such as Google or Apple have been extensively discussed within the media (e.g. Spiegel, 2013), the specific strategies of MNEs in minimizing their tax bill is dependent on the regimes and loopholes that countries' legislation, international treaties, guidelines, and their interaction offer. Although the spotlight and framing has changed from countries to companies, it is mainly through adaptation of the legislative framework that BEPS is sought to be constrained.

The aim of this paper is to provide a short overview, based on existing empirical findings, of the strategies employed to engage in BEPS, to summarize the empirical evidence on BEPS and to discuss the effectiveness of BEPS countermeasures. The paper complements recent overview essays in international taxation (de Mooij / Ederveen, 2008; Dharmapala, 2008; 2014; Genschel / Schwarz; 2011; Feld / Heckemeyer et al. 2011; Heckemeyer / Overesch, 2013; Keen / Konrad, 2012) by exclusively focusing on profit shifting issues. Furthermore, it examines the effectiveness of BEPS countermeasures, which have been neglected in previous reviews. Finally, by discussing open questions it aims to bridge the debate between academic researchers and policy-makers.

Section 2 starts with a brief description of income shifting strategies, whereas in section 3 studies focusing on the impact of profit shifting are summarized. Section 4 provides an overview of studies that look at the effectiveness of BEPS countermeasures. Transfer pricing legislation (TPL), thin capitalization rules (TCRs) and controlled foreign company legislation (CFC-rules) are analyzed. Section 5 discusses unresolved questions and the final section summarizes the main findings.

2. Strategies of Income Shifting and Tax Avoidance

2.1 Income Shifting

Although the different parts of a MNE are formally independent, they share the same objectives economically. Consequently, intra-company transactions can be used to shift profits outside high-tax jurisdictions.¹ The most important strategies to lower the tax burden in this manner, according to existing findings, are discussed below.²

2.1.1 Transfer pricing of tangibles

First, one opportunity consists of the manipulation of the transfer price for traded goods. Approximately 40 percent of U.S. trade consists of intra-company transactions (Clausing, 2003). One strategy is to over-invoice the transfer price for goods exported into high-tax countries, respectively to under-invoice the price of the traded good when exporting to affiliates in tax havens. Over-invoicing of exported goods lowers the income of the affiliate in the high-tax region, while the profitability of subsidiaries in tax havens rises by setting low transfer prices. The same relationship with opposite signs holds for imports.

2.1.2 Transfer pricing of intangibles

A second option for reallocating profits is the use of royalty payments and license fees. Patents as well as trademarks have the advantage of being non-homogenous goods. Compared to other goods it is more difficult for the tax administration to find equivalent arm's-length prices. While the mechanics of these transactions are more or less the same as under tangible goods (see 2.1.1), it would appear to be much easier to shift profits via intangibles. In addition, the strategic decision where to locate / hold the intangibles plays a more important role than in the case of tangibles. Especially contract R&D allows MNEs to separate ownership of intangibles from conducting research. The latter can be done in countries offering a pool of highly qualified researchers, whereas ownership (and the associated risk) is located in low-tax countries where the resulting revenue is taxed. Due to the special role of intangibles the OECD has established a separate focus group that analyzes "hard to value intangibles and cost contribution arrangements".

¹ There is no generally accepted definition what constitutes a tax haven – or its counterpart a tax hell. In many cases tax havens are defined as territories with low regulatory standards, strict bank secrecy laws and favorable tax treatment to businesses or financial investors (Palan, 2002). Some countries, for example the Benelux-countries, which share above-average tax rates, have been sometimes categorized as tax havens as well because they extensively provide preferential tax treatment to mobile activities of companies. These countries share therefore attributes of low-tax and high-tax jurisdictions. In the end, the construction of a dichotomous tax haven variable depends to some degree on the judgment of the researcher. A classification of countries into tax havens and non-havens can be circumvented if the researcher applies continuous measures, such as tax rates or an index of financial regulation.

² Although there is extensive empirical work on transfer pricing issues, less resources have been devoted to other tax-planning activities such as hybrid mismatch or treaty shopping.

2.1.3 Financing structure

A third strategy of income shifting is to finance affiliates in high-tax regions with as much debt as possible. Because the interest payment of the affiliate is deductible from the tax base, the pre-tax profit of the affiliate declines. Thus, there is an incentive for MNEs to use debt instead of equity capital in the case of high-tax countries. A more complicated option is to finance affiliates through a financing center located in a third country. Consider the case of a Japanese affiliate paying interest on a loan to its German parent company. Whereas the interest payments – due to their deductibility from the tax base – reduce the income of the Japanese affiliate, the interest receipts raise the income of the German parent company. Although Germany taxes corporate profits at a somewhat lower rate than Japan, little is gained from that transaction. As long as the tax burden in Germany is still relatively high, the MNE could increase its tax advantage by choosing to finance the affiliate through a financing center in a low-tax region. In that case, the interest receipts would be taxed at the tax rate of the low-tax country.

2.2 Hybrid mismatches

A final option is to use so called hybrid mismatch arrangements. Hybrid mismatch arrangements exploit differences in the domestic laws of different countries. Common strategies are the use of hybrid entities or hybrid financing. For example, interest may be deductible in country A, but inclusion into taxable income in country B can be avoided. Thus, with respect to financial policies a hybrid mismatch arrangement is – from the viewpoint of a tax-minimizing MNE – the best possible outcome, because financial income remains untaxed in both countries, whereas the strategies discussed in 2.1.3 imply some (modest) taxation. A hybrid mismatch arrangement refers to a situation where a deduction is claimed in one state and the income is not part of the tax base in the other state, but other constellations, such as claiming a double deduction, are also possible (for a detailed description see: OECD, 2014a). In sum, all (intentional) cases of hybrid mismatch arrangements refer to a situation of double non-taxation.³ In a narrow sense, hybrid mismatch arrangements are not profit shifting;⁴ nevertheless, as the OECD's BEPS project also focuses on "base erosion", it is natural that hybrid mismatch arrangements are covered by the project. Focus group 2 analyzes these cases and will publish their recommendations in the fall of 2014.

³ Unintentionally, double taxation can arise from hybrid mismatch, too. Since the OECD BEPS-project focuses on the tax-planning activities of MNEs, addressing the case of double-taxation is not part of the BEPS-project.

⁴ Because hybrid mismatch arrangements refer to a situation where income remains untaxed, there is no need to manipulate transfer prices. Therefore, the tax gain stems from non-harmonized tax codes and not from transfer pricing.

2.3 Empirical results

Academic empirical research in the field is unbalanced. Some areas – such as the sensitivity of foreign direct investment (FDI) to taxes – are well researched, whereas in other areas, for example the effectiveness of profit shifting countermeasures, research has only recently started. In many cases researchers have estimated semi-elasticities, or at least provided information that can be used to calculate such a semi-elasticity. A semi-elasticity says that – for instance – an increase in the tax rate by 1 percentage point corresponds with a reduction/increase of the analyzed dependent variable by 1 percent.⁵ In their overview essay de Mooij / Ederveen (2008) report an average semi-elasticity of -3.3, i.e. an increase of the countries tax rate by 1 percentage point reduces foreign direct investment (FDI) by roughly 3.3 percent. A more recent survey by Feld / Heckemeyer (2011) indicates that the semi-elasticity may be lower (-1.7). Both studies have the disadvantage that they cannot differentiate between different behavioral responses of MNEs due to differences in taxation. The principal problem of an analysis of the tax-sensitivity of FDI is therefore that it mixes profit shifting with competition over production facilities.

In order to isolate the effects of profit shifting from the tax sensitivity of real capital, researchers have started to analyze the strategies MNEs use to shift profits. With respect to the financing structure, a marginal effect of 0.2-0.4 seems to be the consensus estimate. An increase in the affiliate's corporate tax rate by 1 percentage point increases the debt to asset ratio by 0.2-0.4 percentage points (e.g. Desai et al., 2004; Büttner et al., 2012). Thus, there is empirical evidence that the decision how to finance affiliates is at least in part driven by tax motives. A second result from the literature on financial structure is that internal debt financing reacts more sensitively to differences in tax rates than financing from third parties (Hines et al., 2004; Blouin et al., 2014). This result points to the importance of income shifting strategies, as tax-optimization is done through internal debt-financing, whereas external financing (often) occurs for other than tax reasons.

With respect to intangibles, the study of Karkinsky / Riedel (2012) is noteworthy, because it analyzes whether the application of patents is driven by tax considerations. First, patenting the product in a low-tax country has the advantage that other affiliates / third parties have to pay license fees if they want to use the patented product. Second, within a MNE transfer prices can be modified in order to shift patents to low-tax locations. Their central result is that an increase in the corporate tax rate by 1 percentage point reduces the number of patented products by 2.3 percent. In a similar vein is the study by Griffith et al. (2011), which focuses on newly introduced patent box regimes in Europe. Patent boxes offer favorable tax conditions to MNEs that generate revenues from intangibles. These patent boxes tax income from intangible assets via either a reduced statutory tax rate or a reduced tax base. Allowing the tax sensitivity to vary across different industries, firm sizes and countries, their results point to significant elasticities, which often exceed -1. Firms from the chemical and electrical industry react more sensitively

⁵ Semi-elasticities share an intermediate position between a marginal effect and an elasticity. A marginal effect interprets changes in the dependent variable by one unit due to a change in the explanatory variable by one unit, whereas an elasticity refers to a percentage change of the dependent variable due to a change of the explanatory variable by one percent. Semi-elasticities as well as elasticities are useful concepts only if one analyzes small changes.

to tax rate changes than those from the engineering industry. Among the countries with the highest elasticity with respect to (own) tax changes are Denmark, Finland, Luxembourg, Sweden and the UK. Apart from the UK, this result is in line with standard tax competition theory, which postulates that small countries face a more elastic tax base (Bucovetsky, 1991; Wilson, 1991). In the second part of the paper the authors simulate the effect of the introduction of patent boxes on the patent share in the remaining countries and its revenue implications. Unsurprisingly, if a country introduces a patent box, the share of patented products in other countries is reduced. This tax base diverting effect is however not accompanied by an increase in corporate tax revenue in countries that introduced patent boxes. Even if one neglects that the introduction of patent boxes triggers the incentive that other countries will start to implement such a regime, in countries offering patent boxes the tax base effect does not dominate the tax rate effect. Thus, introducing patent boxes is accompanied by revenue losses in all countries, including those countries offering favorable tax treatment.⁶ According to the results of this analysis, the introduction of patent boxes is a negative sum game in terms of corporate tax revenue for the countries involved.

Dischinger / Riedel (2011) look at the location of intangible assets, which might comprise other intangibles beyond patents. If the tax rate of an affiliate relative to the average tax rate of all other affiliates is reduced by 1 percentage point, investment in intangible assets increases by 2 percent. If the model is estimated in first differences instead of levels, i.e. focuses on the change in intangible assets, the estimated semi-elasticity shrinks to -1.

Studies on financing decisions as well as studies on intangibles look at quantities. However, BEPS refers mainly to the manipulation of transfer prices.⁷ Of course, if tax administrations share difficulties in controlling and estimating undistorted transfer prices in the concrete case, it will be even more difficult for a researcher to disentangle the mispricing of cross-border transactions. Clausing's (2003) results indicate that there is substantial evidence of tax-motivated transfer pricing in US intra-firm trade prices. There is a strong and statistically significant relationship between countries' tax rates and the prices of intra-firm transactions. The estimated elasticity ranges between 0.7 and 1. Christea and Nguyen (2013) provide further evidence. Danish MNEs that export products to affiliates in low-tax countries report on average prices that are 6-9 percent below prices charged when selling to non-affiliates.

⁶ Even if the direct effect, i.e. increasing corporate tax revenue, is negative, there is a rationale for introducing patent boxes. First, employment effects and income tax revenue might accompany the introduction of such a regime; second R&D typically involves large externalities, either through spillover effects from learning or through intensified competition within the R&D sector.

⁷ BEPS is at the intersection between tax-planning activities not containing BEPS (location decisions for a production plant that is partly tax-motivated) and criminal activities (which also do not constitute BEPS, since BEPS is by definition legal). In practical terms one would have for example to judge whether companies which fall under avoidance measures like for example TCRs or CFC-rules engage in BEPS if these rules are not codified in a double taxation agreement. Instead, one could conclude that countries unilaterally adopting such measures provoke a treaty override. It depends therefore on the point of view whether countries or companies engage in "immoral" practices. From this, it follows that every analysis of BEPS depends on the counterfactual situation chosen by the researcher. Since the definition of the counterfactual situation involves some subjective element, this will show up in the estimated numbers on the intensity of BEPS.

These different pieces of research show that MNEs adopt several profit shifting strategies. However, these studies do not rank the relative importance of these strategies. Knowledge on their relative importance is useful, because it affects the decision whether and which countermeasures should be adopted. This is done by a final strand of the literature, which is in its early stages. It addresses the question which of these strategies are more important in channeling revenue from high-tax into low-tax locations. Whereas Grubert (2003) finds evidence that financing techniques and other strategies contribute almost equally to profit shifting, recent studies by Dharmapala / Riedel (2013) as well as Heckemeyer / Overesch (2013) challenge this result. Heckemeyer / Overesch (2013) report in their meta-analysis a contribution share of 28 percent for financing techniques, i.e. non-financial strategies contribute 72 percent of all shifted profits. Due to the conflicting evidence and the small number of comprehensive studies, the question regarding the relative importance of financial strategies and the mispricing of goods remains open.

3. Impact of profit shifting

The instruments discussed in section 2.1-2.2 have in common that reported pre-tax profitability should rise in low-tax countries and shrink in countries where MNEs are heavily taxed. For example, if the parent company in a high-tax region under-invoices the price of the exported good, the pre-tax profitability of the parent will be low, while the profitability of the affiliate is high. Therefore, an empirical assessment of profit shifting activities can analyze the outcomes of profit shifting as well. If profit shifting is severe, one should expect that the pre-tax profitability, in most studies either defined by scaling profits by assets or by sales, is higher in low-tax countries.

3.1 Location of profits

The relationship between corporate tax rates and MNEs' profitability has been extensively analyzed. Heckemeyer / Overesch (2013) use information reported from 25 different studies and end up with 238 semi-elasticities for their meta study. Thus, on average roughly 10 semi-elasticities are reported per study. The dataset comprises single-country studies analyzing affiliate profitability in different countries as well as studies focusing on OECD (or European) countries. Whereas the latter are exclusively based on microdata, single country studies utilized micro- as well as macrodata. The reported semi-elasticity for their benchmark case, i.e. a study based on macrodata, which does not control for investment in real capital and financial policies and fails to control for worldwide tax policy incentives, is -4.1. That is, an increase in the tax rate by 1 percentage points decreases reported profits before taxes and interest by 4.1 percent, which would be a very strong response to a difference in tax rates. However, studies that control for the size of the affiliates' investment and are based on microdata report significant smaller semi-elasticities, resulting in a decline of the benchmark semi-elasticity by -0.56 and -2.02 (for an analysis based on microdata). It appears therefore that macro-level studies do not control for important differences in cross-country variation that could explain differences in MNEs' profitability levels. When

controlling for all of these potential biases, a semi-elasticity of somewhat less than -1 emerges as the consensus estimate in the empirical literature.

3.2 Corporate tax revenues

While it is important to know how taxable profits of MNEs shrink when taxes are increased the focus of policymakers has been on the revenue implications of BEPS. Given the estimated semi-elasticities, it is possible to infer which countries win and which lose from BEPS activities. Clausing (2009) estimates the amount of profits shifted by US-MNEs. She derives the result that income shifted out of the US in 2002 amounted to 87 billion US dollars or more than 20 percent of US-corporate tax revenue. Although this is a substantial amount, some caveats are necessary in interpreting this result correctly. First, the semi-elasticity used in Clausing's analysis is far above the consensus semi-elasticity found by the meta-analysis of Heckemeyer / Overesch (2013). Second, tax rate differences between the USA and other countries widened in the nineties. Therefore, even small semi-elasticities will aggregate to substantial revenue losses. Finally, the analysis focuses on the effects for a single country, but from a global perspective BEPS creates winners and losers. Therefore, estimating the overall consequences of BEPS on corporate tax revenue requires a multi-country perspective.

One early multi-country study that tries to identify the revenue effects is Huizinga / Laeven (2008). The authors analyze a panel of MNEs investing in European countries. Their reported semi-elasticity is -1.3 and is somewhat higher, but not too far from the consensus semi-elasticity found by Heckemeyer / Overesch (2013). The overall amount of revenue losses due to shifted profits is quite small, estimated at roughly 1 billion US dollars.⁸ Of the European countries analyzed, only Germany and – to a lesser extent – Italy lose tax revenue.

Although BEPS has on aggregate rather moderate revenue effects, an abolishment of BEPS is not simply Pareto-superior because countries are affected differently by BEPS.⁹ As it is crucial to know the reaction of the tax base due to changes in taxes, one needs to establish whether the estimated semi-elasticities are stable over time or not. In other words: An increasing semi-elasticity could indicate that BEPS is becoming more severe over time.¹⁰ Interestingly, the meta-analysis of Heckemeyer and Overesch (2013) reports a fall in the semi-elasticity in recently conducted studies (which also use more recent sample periods).¹¹ This observation could be explained either by an increasing awareness of

⁸ The study focuses on European countries. Thus, the revenue effects in important large countries like Japan or the USA are neglected.

⁹ Although the effects on corporate tax revenue are modest, substantial revenue effects could result from the loss/gain of personal income tax revenue. Unfortunately, to date no study has addressed this issue and it is uncertain how an elimination of BEPS affects personal income tax revenue.

¹⁰ Besides the semi-elasticity the degree of cross-border integration plays a role when examining the revenue implications of profit shifting. A stable semi-elasticity accompanied by an increase in the number of MNEs over time would imply that profit shifting increases over time.

¹¹ Studies using alternative approaches point to an increasing importance of BEPS. Grubert (2012) shows that during the time span 1996-2004 the difference between the growth of foreign income and foreign sales of US affiliates was 12 percentage points. Still, this result is not necessarily in contradiction with the observation of Heckemeyer / Overesch (2013). While an increasing number of MNEs might contribute to the effect observed by Grubert (2012), a fall in the semi-elasticity indicates that the tax

researchers with respect to methodological issues (Dharmapala, 2014), by a lower tax sensitivity of new MNEs as the number of MNEs has increased in the past decades or by an increasing awareness of BEPS by policymakers. If the latter explanation is accurate, then a growing trend towards the introduction of (unilateral) countermeasures should be observed over time, accompanied by a positive impact of these (unilateral) instruments in constraining BEPS.

3.3 Welfare effects

An evaluation of the welfare effects of BEPS should move beyond an analysis of its effects on corporate tax revenue. Because BEPS interacts with decisions regarding the location of production facilities, at least the following points should be considered for a comprehensive evaluation of BEPS:

- Employment effects / income tax revenue
- Effects of BEPS on competition between MNEs and purely national firms
- Beyond the distributional impact of BEPS, i.e. the allocation of capital and revenue across countries, BEPS may lower the user cost of capital, thereby increasing the aggregate, worldwide capital stock and (temporarily) fostering economic growth.

While BEPS has some definite distributional consequences – mainly between small and large countries (Bucovetsky, 1991; Wilson, 1991) – the above-mentioned issues should be evaluated from a global point view. Some of these issues, for example employment effects or the impact on personal income tax revenue, may involve distributional conflicts among countries, whereas others – distortions in competition between MNEs and purely national companies – may be present in small and large countries alike. For example, a recent study by Eggert et al. (2010) suggests that MNEs pay substantially less taxes than SMEs. Hines (2010) and Genschel / Schwarz (2013) show that low-tax countries experienced stronger growth and employment effects from FDI than high-tax countries.

While it is unsurprising that low-tax countries gain from tax competition, the literature on the global welfare effects is still sparse. Desai et al. (2006) show that the existence of BEPS using tax havens is not necessarily harmful for high-tax nations. If BEPS increases the after tax rate of return to capital, then the favorable tax treatment in tax havens may reduce the required pretax marginal product of capital for non-haven operations of firms that invest in tax havens and non-havens. In this sense, the existence of BEPS is beneficial for tax havens as well as for high-tax countries. Given the lack of empirical studies that share a global perspective on BEPS issues, it is – at the current stage – impossible to evaluate the welfare effects of BEPS in a comprehensive manner.

sensitivity per MNE has declined. What matters for corporate tax revenue is the combination of tax sensitivity and the number of MNEs, i.e. the (mobile) tax base.

4. Countermeasures

By the end of the BEPS-project, the majority of countries will face far-reaching changes in their tax legislation, because the project can be seen as the first significant step towards a broad coordinated approach in international corporate taxation. It consists of 15 different action points that address the question how to constrain BEPS in future. Therefore, it is important to know which instrument would be effective in constraining BEPS. Less work has been done on countermeasures than on the strategies and the extent of BEPS, but some studies exist which evaluate the impact of these countermeasures. In most cases, these measures have been unilaterally introduced (often by high-tax countries). In the following, transfer pricing legislation (TPL), controlled foreign company rules (CFC rules) as well as rules against thin capitalization (TCR) will be discussed in more detail.

4.1 Transfer pricing legislation

A MNE faces constraints when setting transfer prices. First and perhaps less important, a mispricing of goods has organizational consequences. For example, one has to keep two different books and it will be more challenging to evaluate the performance of (local) executives if transfer prices are distorted. Second and more important, transfer prices have to be in conformity with the “arms-length-principle” (OECD, 2010, Chapter I). This means that transfer prices for traded goods have to be set as if the transaction were carried out with a third, independent party. Governments use several methods to constrain tax optimization via the manipulation of transfer prices. Furthermore, if the home and the foreign country use different methods in estimating the “true” (i.e. undistorted) transfer price, the MNE bears the risk of double taxation. Even if there is no double taxation, alternative methods in different countries may raise compliance costs due to increasing documentation requirements (European Commission, 2001).

Countries differ in the extent to which they apply these rules. Some countries do not have TPL, whereas others have introduced TPL in the last decade. Among those countries that have TPL, differences exist in terms of documentation requirements, imposed penalties or the possibility to enter into advanced pricing agreements (APAs). Perhaps due to the complexity in evaluating all these different dimensions of TPL, we are aware of only one study on this issue. Lohse / Riedel (2013) analyze the relationship between TPL and earnings before interest and taxes for a panel of MNEs. Compared to countries that do not have TPL, the amount of profits shifted is reduced by up to 50 percent. However, the estimated semi-tax elasticity is sensitive to the inclusion of TPL into the regression equation. If TPL is not included, an increase in the statutory corporate tax rate by 1 percentage point decreases profits by only 0.4 percent. If TPL is introduced into the regression equation, the tax coefficient is ten times larger, perhaps because there is an overlap between these variables. Because the effective number of cases is small for both variables, it is then very difficult to estimate a stable relationship between these variables and

corporate profits.¹² It seems that countries that are more prone to profit shifting of MNEs are also more likely to introduce TPL.

4.2 CFC-rules

While TPL is one important step to constrain BEPS, it has the drawback that tax administrations sometimes lack the resources to evaluate transfer prices in a comprehensive manner. Moreover, especially intangibles are hard to value and allow MNEs to exert a certain discretionary power. Governments have responded to these incentives by increasingly introducing CFC-rules (or passive income legislation). They are usually restricted to so-called passive income. The exact definition of passive income differs from country to country, but most rules have in common that the definition at least contains interest receipts, income from royalty payments and income from asset and fund management. Thus, income derived from intangibles as well as financial income often falls into the range of application of this instrument. The application of passive income legislation or CFC-rules is restricted to controlled foreign companies. The exact threshold and definition of “control” differs from country to country. Finally, CFC-rules only kick in if the passive income earned by the controlled foreign company is subject to a low tax rate. The exact threshold is specified either in terms of a tax rate or as a percentage of the residence country’s tax rate. The former has the shortcoming that it should be adjusted whenever the residence country implements a major tax reform. For example, Germany still uses a 25 percent-threshold, although the tax reform in 2008 was accompanied by a tax cut.¹³ Sometimes, governments apply internal black lists (for example: Italy or Portugal) instead of a threshold. In those cases income generated in blacklisted countries is treated differently compared to income derived from non-blacklisted countries. Thus, three conditions have to be fulfilled that CFC rules apply:

- The parent company has significant control over its subsidiaries
- The subsidiary earns passive income and
- The subsidiary earns income in a blacklisted or low-tax country.

The consequences of passive income legislation are significant. In countries applying the tax credit method it does not matter anymore whether the subsidiary repatriates or reinvests its profits in the foreign country. Deferral is denied and foreign profits are taxed immediately in the residence country. In countries using the exemption method, governments switch from exemption to tax credits when taxing passive income of foreign subsidiaries (in a blacklisted or low-tax country where the threshold is exceeded). Thus in both cases, the effective tax rate of the MNE is the residence countries’ tax rate.

A couple of studies have addressed the relationship between CFC-legislation and the opportunities to shift profits. Karkinsky/ Riedel (2012) show that the number of patented products shrinks if the residence country of the parent company applies CFC-rules, but this result is not robust across different

¹² While studies based on microdata analyze thousands of cases, statutory tax rates or TPL vary across countries and not across cases.

¹³ Ironically, in some cases Germany would classify itself as a low-tax country. The statutory corporate tax burden comprises the corporate income tax of 15% and the local business tax, whose rates can be set by the German municipalities. In municipalities which levy a low local business tax the tax burden of companies would be below the 25%-threshold.

specifications. Closely related to this study, Griffith et al. (2011) show that the presence of a CFC-regime protects a country against income shifting into a country with one of the recently introduced patent regimes. Patent boxes have come under scrutiny, at the EU Code of Conduct group as well as within the BEPS project. The results signal that CFC-legislation could serve as an instrument to deter companies from utilizing patent boxes.

A comprehensive evaluation of the German legislation is done by Ruf / Weichenrieder (2013), who analyze the responses of German MNEs to CFC-rules. Passive assets – their dependent variable – which is defined as total financial assets net of equity in affiliated firms and lending to affiliated firms contains only a subset of those income streams that are subject to German CFC legislation.¹⁴ The fraction of passive assets to total assets is highest for German MNEs investing in the USA, Netherlands, UK, Cayman Islands and Luxembourg. The reported semi-elasticity is -3.6, i.e. an increase of the host country tax rate by one percentage point reduces the amount of passive assets located abroad by German MNEs by 3.6 percent. In an alternative specification the authors interact the tax rate with two dummy variables, which clarify whether German CFC rules are binding or not. The coefficient on the tax rate when the rules are not binding, i.e. when the host country tax rate exceeds 25 percent, is larger than in the case where the host country tax rate is between 0 percent and 25 percent. The authors interpret this result as evidence for the restrictiveness of the German CFC rules. If the regime is binding, it does not matter whether the host country tax rate is 0 percent or 25 percent since the German tax rate becomes the relevant tax rate. Alternatively, the effectiveness of German CFC rules can be evaluated by introducing a simple dummy, measuring whether the rules are binding, into the regression equation. Conditional that no change in residence occurs, the German CFC legislation seems to be an effective tool. If it is binding, it reduces passive income located in low-tax countries by roughly 75 percent.

Altshuler / Hubbard (2003) examined the impact of changes in US CFC rules on financial services firms. Changes in the legislation made it more difficult to defer taxes on overseas financial income held in low-tax jurisdictions. In contrast, active income was not affected by the revision of US CFC rules. Before the amendment, the location of assets in financial subsidiaries was responsive to differences in host country taxation. After the revision and tightening of the CFC rules, differences in host country taxation do not explain anymore the location of assets in financial services firms. This result is taken as evidence that the tightening of CFC rules has made it more difficult for financial services firms to circumvent taxes.

The results of Altshuler / Hubbard (2003) and Ruf / Weichenrieder (2013) stand in contrast with those of Altshuler / Grubert (2006), who argue that US-CFC-rules are quite ineffective. In the same vein, Overesch / Wamser (2014) show for German outbound FDI in 36 countries that thin capitalization rules (TCRs) are much more effective in reducing the affiliates' ratio of net borrowing to total capital than CFC rules. One reason why TCRs perform better is that they are more narrowly designed and address specific problems around the profit shifting process (i.e. financial policies) than broad measures such as CFC rules.

¹⁴ For example, German CFC rules classify income from intangibles – as long as the income stream stems not from self-developed products – as passive income, too.

CFC-rules deter (passive) investments in low-tax countries. Given that these rules make it more difficult to shift profits into low-tax countries a natural question is whether MNEs have an incentive to change their residence? To the best of our knowledge, Voget (2011) is the only study that addresses this question. During the period 1997-2007 around 6 percent of the companies in his dataset relocated their headquarters. The results indicate that MNEs operating in countries with CFC rules are more likely to relocate their headquarters to other countries. Especially if the CFC-rules exhibit strict income thresholds, a relocation of the headquarter becomes more likely. A 10 percentage point decrease in the foreign tax rate increases the likelihood of relocation by 2.2 percent. Thus, while there is some evidence on the effectiveness of CFC-rules, it is also probable that the introduction of such rules would trigger a relocation of headquarters from high-tax to low-tax jurisdictions.

4.3 Thin capitalization rules

Within the class of countermeasures, TCRs have been analyzed the most. Büttner et al. (2012) utilize data from German outbound FDI in 24 highly developed countries during the period 1996-2004.¹⁵ As with other countermeasures governments have become increasingly aware of the adverse effects on corporate tax revenues and started to introduce TCRs in the last decade. During that time span the share of countries analyzed which have imposed TCRs increased from 50 percent to 75 percent. In line with previous studies on financial policies, an increase in the corporate tax rate in the source country increases the debt to asset ratio of German subsidiaries by 0.4 percentage points. If the foreign source country operates a TCR however, leverage is reduced by roughly 5 percentage points. The effect is more pronounced in high-tax countries, because these countries stand to gain most from the introduction of TCR. In a similar vein Overesch / Wamser (2014) show that the existence and tightness of TCRs in the host country affects bilateral leverage of German outbound investment. For example, if the maximum internal debt ratio were reduced from 3:1 to 1.5:1 the internal debt share of German affiliates would be reduced by approximately 10 percent.

Focusing again on the German case, Weichenrieder and Windischbauer (2008) as well as Overesch / Wamser (2010) analyze changes of the German TCR. In contrast to Büttner et al. (2012) these studies focus on inward FDI. German TCR were introduced in 1994 and allowed a debt to equity ratio of 3:1 at the beginning. This safe haven was reduced in 2001 towards 1.5:1. Both studies find an impact of the German TCR on internal debt financing after it was reformed. Weichenrieder and Windischbauer (2008) show that especially very thinly capitalized companies, i.e. those German affiliates with a ratio of intra-firm debt received from foreign affiliates to total equity above 1.5, show the strongest response after the tightening of the German TCR in 2001. However, this response did not involve any significant change in real investment, but was solely due to a deleveraging effect through increasing equity capital.¹⁶ Wamser (2013) finds that after the maximum debt to equity ratio was reduced from 3 to 1.5 in 2001, those firms for whom the TCR was binding in Germany prior to 2001 increased their external debt to

¹⁵ TCRs look on the relationship between debt and equity-financing. A close relative to TCRs are so-called earnings stripping rules that relate (net) interest expenses to the EBITDA.

¹⁶ Büttner et al. (2012) derive a similar result for German outbound FDI. Countries imposing TCRs do not deter German companies in investing in these countries.

capital ratio by 2.5 percent after the reform. Thus, internal debt was partly substituted by external debt. Overesch / Wamser (2010) show that especially holding companies quickly changed their capital structure after the German TCR was tightened.

Drawing on the German experience, one might reach the conclusion that TCRs are quite effective tools in reducing debt to asset ratios. However, TCRs can differ in many ways among countries and it is therefore useful to evaluate their effectiveness beyond the German case. Blouin et al. (2014) assess the impact of TCRs of US-affiliates operating in 54 countries for the period 1982-2004. They analyze the total leverage of the affiliate, i.e. its total debt to assets ratio, internal leverage, i.e. its ratio of internal debt to equity and the affiliate's internal debt share. On average, TCRs reduce total leverage by 1.9 percent, the internal leverage ratio by 6.3 percent and the internal debt share by roughly 1 percentage point. Unsurprisingly, the impact of TCRs is stronger and roughly three times larger on internal leverage, i.e. borrowing from the parent or other affiliates, than on total leverage. Still, TCRs have also an impact on total leverage. This result indicates that in the presence of TCRs internal debt is not completely substituted by external debt from third parties, e.g. loans from banks. One reason for an incomplete substitution are information asymmetries between internal and external loan providers. Another reason is that TCRs sometimes refer to total debt and not only to internal leverage. However, even if solely restrictions on borrowing from the parent are analyzed, these rules reduce the affiliate's total debt to assets ratio by 0.8 percent. An additional interesting result is that rules that apply automatically i.e. disallow an arm's length test, are more effective in curbing thin-capitalization than discretionary TCRs.

What are the revenue implications of TCRs? First, a tightening of TCRs does not seem to exert strong effects on the allocation of real capital. Instead, MNEs change their financial structure in order to cope with interest deductibility limitations. Since internal debt is partly substituted by external debt, the revenue effects of TCRs should be modest. In sum, fears that companies will close down their subsidiaries as well as very optimistic views, which claim that the introduction of TCRs generates substantial additional corporate tax revenue by extending taxation at source, are exaggerated.

5. Open questions

5.1 Data issues

Although there is ample evidence showing that BEPS is taking place, one has to keep in mind that the data used exhibit important shortcomings.

Empirical tax rates contain BEPS: A first data problem relates to the use of tax rates. Previous studies have either used legislation-based tax rates or empirical tax rates. The latter divide tax payments by profits before taxes (and interest). Empirical tax ratios have the drawback that the denominator contains profits that are distorted by BEPS and the numerator (tax payment) is indirectly dependent on profits. Thus, this measure is flawed because it contains BEPS. This problem holds regardless, whether macro- or micro-based empirical tax ratios are used in the empirical analysis.

Legislation-based tax rates are heterogeneous: An alternative is to use legislation-based tax rates to study BEPS issues. Economic theory suggests that the statutory corporate income tax rate is relevant for the decision to undertake BEPS. While this is in principle true, two problems arise when using statutory corporate tax rates. First, even those countries who secure their tax base unilaterally via

adoption of countermeasures against BEPS offer sometimes special regimes to MNEs which may create opportunities for BEPS. One heavily debated example are patent boxes. If the researcher uses the “standard” statutory corporate tax rate, such regimes cannot be captured. If some countries specialize in such a form of preferential tax competition, the use of statutory corporate tax rates produces flawed results. For example, the Benelux countries have above-average standard statutory corporate tax rates, but anecdotal evidence suggests that they offer strongly preferential tax treatment to different sources of mobile income.

Heterogeneity in federal countries: Third, researchers look on differences across countries but do not take the heterogeneity within a country seriously. This problem is especially severe in federal countries, but it may also be present in countries that offer special business zones. Researchers have sometimes addressed this problem by using average statutory corporate tax rates, but of course tax competition is also present within federal countries and the main mechanisms of tax competition should be also at work within a country. Switzerland, for example, has statutory corporate tax rates ranging from 12.1 percent (Lucerne) to 24.2 (Geneva) in 2012. It is therefore of crucial importance in which region within a country the MNE operates. This issue has not been taken seriously in previous studies.¹⁷

BEPS refers mainly to (mis-)pricing, not quantities: A fourth problem relates to the use of the dependent variable. A majority of studies focuses on the outcomes of profit shifting, i.e. profitability ratios. This tells policy-makers little about the strategies MNEs use to shift profits. Thus, the way MNEs shift profits remains unknown. This black box is analyzed in studies related to the strategies of profit shifting, but almost no study uses price data. For example, studies on affiliate financing focus on debt ratios, instead of interest rates that may (not) be in accordance with the arm’s length principle. Studies on intangibles focus on the location of patents instead of patent prices. While these studies nonetheless offer valuable insights in MNEs’ tax planning strategies, they share the difficulties that their analysis is not based on a comparison of arm’s length prices. Therefore these studies analyze tax-planning activities of MNEs, but not profit shifting decisions.

Profits are too aggregated: Those studies analyzing the impact of profit shifting used profits before taxes (and often interest) as a measure of the outcome of the profit shifting process. While this measure is suitable from a theoretical point of view, it is highly aggregated. If, say, 20 percent of the MNE’s profits are due to profit shifting, such a measure contains 80 percent ordinary profits or – in econometric terms – noise. Moreover, the ratio of shifted to “ordinary” profits is not necessarily the same across countries. Tax competition theory suggests that small countries face a more elastic tax base and therefore a larger share of overall profits should be attributed to shifted profits. These differences in ordinary and shifted profits (across countries and perhaps also across MNEs) could yield biased coefficients.

Countermeasures contain many dimensions: Another data issue relates to the analysis of countermeasures. First, it is an under-researched area and it would be fruitful to expand empirical research in the future towards the effectiveness of such measures. Otherwise, recommendations of the OECD-BEPS project have to rely on a few studies that are based mainly on German or US data.

¹⁷ While this is true in the case of cross-country studies analyzing BEPS issues, there exist some single-country studies (e.g. Hines, 1996) that analyze the relationship between local taxes and FDI.

Additionally, this strand of the literature also faces data difficulties. When analyzing countermeasures in a cross-border context, the researcher faces the problem of how to classify these different measures. Of course, a classification into a simple dummy variable (legislation is present in the country or not) is an option to circumvent these problems, but it has the drawback that it provides (too) little insight for policy-makers. Take TCRs as an example. This measure

- can be based on a stand-alone or group-wide basis
- can be based on a balance sheet (i.e. debt to equity ratio) or an income statement ((net) interest income in relation to total income) test
- may allow companies to prove that the transaction accords to the arm's-length-principle whenever the safe haven is crossed or not
- may allow for an "excess" interest carry forward or not.

Each of these options can be combined with the others and similar problems arise with other countermeasures. In addition, it is one thing what the law in a country looks like and how the law is applied in reality. Owing to these problems, it is perhaps preferable to concentrate on MNEs investing in one single country. Some studies have chosen such a research design. They are however limited to those countries, i.e. USA, Germany and Japan, that have a comprehensive data base of their MNEs. Unfortunately, under that design identification of an impact is only possible if the rule changes (significantly), because potentially every MNE investing in the country is confronted with the rule.

Small number of cases: A further problem is that the increasing use of microdata covers one problem that is inherent to all of these studies. Researchers observe the behavior of thousands of MNEs, but the effective number of cases with respect to differences in legislation is much smaller. If there is no/little variation in tax legislation over time and MNEs adopt similar tax-planning strategies, a sample of 30 countries contains 30 different cases with respect to TCRs, TPL or CFC-rules, although thousands of MNEs are analyzed. Standard errors that are calculated for these thousands of cases are then flawed, because effectively 30 and not say 30000 cases are analyzed.

Endogeneity: As with many issues in the social sciences a final problem is endogeneity and reverse-causality. Tax rates appear on the right side of the regression equation, but could be influenced by the dependent variable. For example, a negative relationship between tax rates and profitability ratios is taken as evidence in favor of profit shifting. An alternative interpretation is that low profitability ratios force governments to increase CIT rates in order to cope with their revenue constraint. For this reason, researchers sometimes use instruments such as country size instead of tax rates (e.g. Hines / Rice, 1994). While this is a suitable strategy in a cross-sectional analysis, instruments referring to geography and/or population do not exhibit (much) variation over time. Thus, in a panel data context they cannot be used.

Definition of BEPS: Every estimate of BEPS requires a counterfactual situation where BEPS is absent. In empirical analyses, differences in tax rates are regressed on a measure that either contains BEPS in aggregated form or focuses on the tax tactics of MNEs. BEPS is at the intersection between tax-planning activities not containing BEPS (location decisions for a production plant that is partly tax-motivated) and

criminal activities (which also do not constitute BEPS, since BEPS is by definition legal). From this it follows that every analysis of BEPS depends on the counterfactual situation and the perspective of the researcher.

5.2 Policy issues

BEPS involves many highly contested questions, which have not yet been addressed, but are highly relevant for economic policy.

A lack of empirical research can be identified in the following research areas:

- **Relationship between competition for real capital and BEPS:** The literature on tax competition is inconclusive concerning to what extent shifting real activity and BEPS are substitutable or complementary. These activities are complementary, i.e. go hand in hand, if for example increasing requirements regarding substance – as discussed within the OECD BEPS project – promote greenfield investments and create jobs in low-tax countries. This is done in order to uncover the displacement of highly mobile activities and passive income sources into low-tax countries and to cope with the tightening of substance requirements. Instead, these two forms of competition are likely to be substitutes if the BEPS project will be completely successful in constraining profit shifting from high-tax into low-tax locations, because then a relocation of production facilities from high-tax into low-tax countries becomes more likely. In that case, little is gained if one constrains BEPS. Many countries already have countermeasures against BEPS in place (e.g. TCRs, TPL or CFC rules). For example, the aim of CFC rules is to protect tax revenue in the home country if the profit of the subsidiary stems mainly from passive income sources. On the one hand, CFC rules protect corporate tax revenue in high-tax nations, because they make BEPS more difficult; on the other hand, they could promote a loss in tax revenue if the multinational company decides to change its headquarters and settles (completely) in low-tax countries. Empirical evidence (Voget, 2011) shows that MNEs respond in a way that is in line with this proposition. Thus, it may be too optimistic to use the estimates on the (static) revenue effects when eliminating BEPS. They have to be evaluated against the potential loss of real economic activity in high-tax countries.
- **Coordinated versus unilateral approach to BEPS:** G20 countries decided to address BEPS through a coordinated approach, but countermeasures against BEPS – either by extending residence taxation through CFC rules or by extending source taxation (for example through TCRs) – have already been introduced unilaterally in the past. There is a rationale for a coordinated approach if countries are trapped in a prisoner's dilemma: Consider the case of two high-tax countries A and B, which both have one resident company, which is a MNE and invests in the other country. Let us assume that both countries charge a 20percent corporate tax and both MNEs each earn profits of 100 Euro. The introduction of a third country – a tax haven – offering a zero tax rate, creates the incentive to shift profits of both companies to the tax haven, with some transaction costs (of say 10 Euro per MNE). Overall welfare under the “BEPS regime” for one high-tax nation includes the MNE's profit less the transaction costs of profit shifting. Now

if country A unilaterally introduces a CFC rule, the foreign profits of its MNE can no longer be shifted to the tax haven. Instead, the MNE has to pay tax in the foreign country B. The welfare effect to country A of the unilateral introduction of a CFC rule depends on the transaction costs of profit shifting relative to the corporate tax rate in B. If the tax payment to the foreign treasury exceeds the transaction costs, it would be better from a single country point of view to allow for profit shifting. If, however, both high-tax countries agree to introduce CFC rules in a coordinated manner, both can do better compared to the BEPS-equilibrium. Therefore, there is some rationale to introduce countermeasures by coordinated collective action.¹⁸

- **Intensity of tax competition:** It is uncertain how “classical” tax havens are affected by the elimination of BEPS. Recent theoretical work suggests that the existence of tax havens reduces tax competition among countries (Johannesen, 2010). In the absence of tax havens, governments have a strong incentive to compete over mobile capital. If (from a tax perspective) highly competitive tax havens exist, then the incentive to compete shrinks, because no country is able to offer such tax rates as tax havens. The same logic holds for preferential tax competition among high-tax countries (Keen, 2001; Hong / Smart, 2010). The existence of preferential regimes and intentional loopholes allows governments to target tax competition only to mobile tax bases. Of course, if the alternative is an ideal world, where the tax systems of most countries and for almost all tax situations are harmonized, then the existence of tax havens or preferential tax regimes promotes tax competition. However, the change of the status quo has to be evaluated by feasible policy reforms. As long as efforts towards multilateral harmonization are still partial in nature, either because the geographical scope of the initiative is limited or because not all details of the tax base are harmonized, it remains uncertain whether the departure from the status quo is an improvement. Insofar it remains uncertain whether the elimination of BEPS reduces or intensifies competition.
- **Efficiency issues I:** On the one hand, corporate tax competition over real capital may increase efficiency of resource allocation and could promote growth (at least temporarily) if competition increases the after tax rate of return to capital and the worldwide capital stock is allowed to be determined endogenously.¹⁹ On the other hand, corporate tax competition over real capital violates capital export neutrality, if investments are mainly undertaken because of tax considerations. Capital export neutrality corresponds with the application of the residence principle, i.e. foreign income is taxable in the residence country of the investor and therefore

¹⁸ See Dharmapala (2014) for a more detailed discussion of this example. The results of this stylized example depend however on tax rate differences between the high-tax nations. If for example country A charges a much higher tax rate (say 50%) than country B and applies the tax credit method, then it could do better compared to the BEPS equilibrium by introducing unilaterally CFC rules. Although this example points to the superiority of a coordinated approach it has the drawback that the heterogeneity across countries is neglected, because both countries A und B charge a 20% corporate tax. Heterogeneity however, can be better addressed through uni- or bilateral approaches. In addition, this example neglects distributional aspects. Fairness considerations among taxpayers that can utilize these strategies and those that are unable to do so can move the equilibrium outcome towards a unilateral introduction.

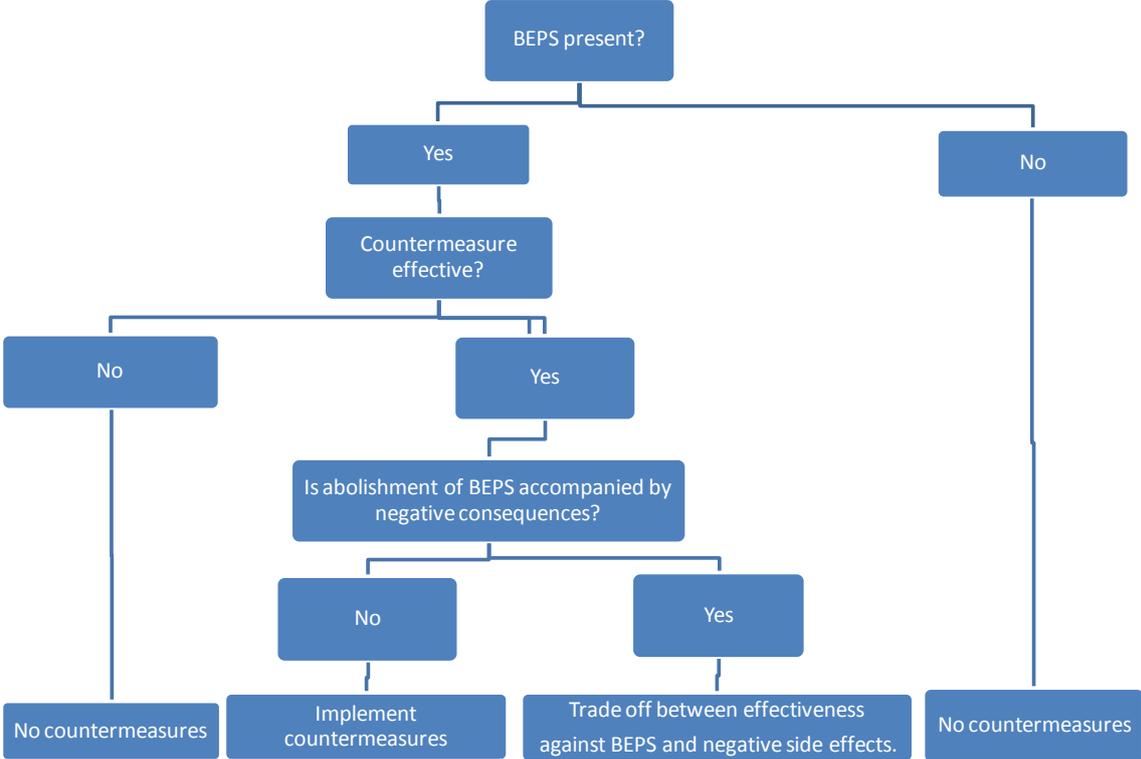
¹⁹ Standard tax competition models assume that the worldwide capital stock is fixed, i.e. does not depend on the net interest rate. The primary problem is then how to allocate this given capital stock to the competing countries.

differences in the tax burden between the home and the host country should not matter. Investment decisions are therefore based on the pre-tax rate of return to capital. However, the majority of countries do not use tax credits, but exempt foreign income of MNEs. This creates an incentive to locate real capital in countries with low tax rates. Existing opportunities for BEPS allow MNEs to operate in high-tax countries as long as profits can be shifted into low-tax countries. Thus, while revenue is misallocated across countries, production decisions are not distorted. If BEPS is eliminated, such distortions in production decisions could increase. Therefore, there is a tradeoff between production and revenue distortions.

- **Efficiency issues II:** With a non-harmonized tax system it is impossible for capital export and import neutrality to hold at the same time. Capital import neutrality corresponds to the benefit principle. The benefit principle assumes a close connection between the tax payment and the benefits from the provision of public goods. For an MNE that competes in the same local market as small and medium enterprises (SMEs), the question is open whether it has a tax advantage and this advantage may likely alter competition. The opportunity to undertake BEPS offers MNEs a big tax advantage that is not available to SMEs. On the other hand, the tax burden of MNEs includes several payments (for example source taxes) which local companies do not bear. Thus, it is an empirical question whether competition between MNEs and SMEs is distorted via BEPS or whether the opportunity to undertake BEPS is an incentive to cope with the obstacles (e.g. rising transaction costs) in a cross-border context. Not much empirical work has been done in this area, but a recent study by Eggert et al. (2010) suggests that MNEs pay substantially less taxes than SMEs. Furthermore, the differences between MNEs and purely national companies should increase, whenever countries introduce targeted tax measures that cannot be used by domestic firms to the same extent as by MNEs. From this point of view, the elimination of BEPS could promote a level-playing field between SMEs and MNEs.
- **Shift in competition instruments:** If a restriction of BEPS intensifies tax competition over real capital, little is gained from an introduction of additional countermeasures. The correct answer would be then to harmonize corporate tax policies in general across all countries. Regardless of the practical feasibility of such a proposal, even a complete harmonization would in turn imply that jurisdictions would compete more intensively in other areas (e.g. regulatory policies or subsidies).

While there is ample evidence in favor of BEPS and some evidence on the effectiveness of countermeasures, it remains uncertain whether the OECD's project will improve upon the current (non-harmonized) status quo. Figure 1 summarizes the questions that need to be answered for a comprehensive evaluation of BEPS. Only if BEPS is present, if countermeasures are effective and the abolishment of BEPS is not accompanied by negative side-effects such as intensified competition over real capital, reactions to counter BEPS would be (for the majority of citizens) welfare-improving. Owing to these contested issues, it is impossible to provide any recommendations as to whether, from a normative point of view, an elimination of BEPS is – even for citizens in high-tax countries – preferable to the current status quo.

Figure 1: Decision tree to evaluate BEPS



Source: own illustration.

6. Conclusion

What we know: Numerous studies have been conducted in order to analyze and quantify the channels and outcomes of profit shifting activities. The consensus semi-elasticity obtained from studies regressing a measure of the corporate tax burden on the tax base of MNEs is somewhat less than -1, i.e. an increase in the corporate tax rate by 1 percentage point reduces profits before interest and taxes by somewhat less than 1 percent. While there is little doubt that MNEs engage in profit shifting activities, the absolute amount of revenue losses appears to be moderate. Only a minority of countries would gain by completely abolishing BEPS.²⁰ However, these powerful countries are able to steer and influence the debate within the OECD and the G20. There is also evidence that especially R&D-intensive sectors have substantial operations in low-tax countries. Consequently, the opportunities to engage in profit shifting are unequally distributed even among MNEs. This result is in line with anecdotal evidence

²⁰ Although a minority, these countries present a majority of the population.

presented by cases such as Google or Apple (Spiegel, 2013). Finally, MNEs' financing structures are sensitive to taxation. An increase in the tax rate by 1 percentage point increases the leverage ratio by 0.2-0.4 percentage points. The total debt ratio, including debt from third parties, is less sensitive to taxation than the internal debt ratio of affiliates.

Recently, some studies have addressed the effectiveness of countermeasures on BEPS. For example, econometric studies suggest that the introduction of a TCR would decrease internal leverage by roughly 5 to 7 percentage points. Empirical research with respect to the specific design of such TCRs is however in its beginning. A recent study by Blouin et al. (2014) shows that rules that apply automatically, i.e. disallow an arm's length test, are more effective in curbing thin-capitalization than discretionary TCRs. CFC rules and TPL also seem to be effective instruments in constraining BEPS. Given the limited number of empirical studies in these areas, especially as compared to the TCR case, one has to exercise care when drawing conclusions.

Open questions: At the present stage, it is still unclear what the relative importance of strategies for shifting profits is. This is a problem, because the details of countermeasures against BEPS have to correspond with the strategies used by MNEs to undertake BEPS. While for intangibles as well as for financing structures a number of studies have been conducted, there is lack of systematic evidence.

The drawback of studies analyzing countermeasures (as well as those calculating revenue implications of BEPS) is that they do not take all possible incentives into account. MNEs might adapt to the existence of such countermeasures by simply relocating their headquarters. It is therefore uncertain whether it is suitable to use the (static) estimates regarding revenue losses to calculate the revenue potential if BEPS is eliminated. It is highly probable that the abolishment of BEPS intensifies tax competition over real capital, especially if the abolishment is accompanied by a strong coordinated reaction, since it is likely that a coordinated policy response is (more) effective than unilateral measures against BEPS.

Thus, the most important question, whether an elimination of BEPS would be welfare-increasing, remains open. In a static framework, big countries would definitely gain (corporate tax revenue) from an elimination of BEPS, but it is uncertain whether this result still holds in a dynamic setting, taking into account that MNEs adapt to a changing legislative environment.

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