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Measuring and Monitoring BEPS

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Summary

This policy brief makes the following key points:

- The G20/OECD Action Plan on Base Erosion and Profit Shifting (BEPS) aimed to address the adverse fiscal and economic impacts of international tax avoidance by multinational enterprises (MNEs). A key part of the project was to measure these impacts and identify indicators to help measure and monitor the impact of BEPS and BEPS countermeasures.
- BEPS Action 11 aimed to assess currently available data and measuring tools for BEPS analysis and to develop new metrics and indicators. Data limitations and limitations of BEPS measurements cause three main challenges for BEPS analysis, arising from difficulties in (1) separating BEPS from real economic activity; (2) separating BEPS from non-BEPS tax preferences; and (3) measuring the appropriate tax rate for BEPS analysis.
- The Action 11 Final Report Measuring and Monitoring BEPS proposed a dashboard of six BEPS indicators about MNE international tax planning on the basis of currently available data about foreign direct investment, profits of MNEs, effective and headline tax rates, levels of intangible assets and research and development (R&D) expenditure, and interest expense ratios.
- There have been many empirical studies of BEPS since the release of the Action 11 final report. Most studies focus on the sensitivity of profitability with respect to tax rate differentials of MNEs, and on specific profit shifting channels such as intra-group transfer pricing and debt financing. Recent studies have also attempted to empirically evaluate the effectiveness of BEPS countermeasures in reducing cross-border profit shifting.
- The Action 11 report also provided recommendations to achieve better data and tools for measuring and monitoring BEPS in the future. One important recommendation was for the OECD and Inclusive Framework on BEPS to compile a new data set, Corporate Tax Statistics. The OECD released the third edition of Corporate Tax Statistics in 2021, which for the first time draws on new Country-by-Country (CbC) reporting data of MNEs produced under BEPS Action 13 (see Policy Brief 9/2021).
- The OECD has committed to continue publishing the Corporate Tax Statistics but it has not updated the dashboard of BEPS indicators since the release of the Action 11 final report. This will be important to improve evaluation of BEPS and BEPS countermeasures in future.

Introduction

The G20/OECD Action Plan on Base Erosion and Profit Shifting (BEPS) aimed to address the adverse fiscal and economic impacts of international tax avoidance by multinational enterprises (MNEs). This policy brief discusses the challenges for measuring and monitoring Base Erosion and Profit Shifting (BEPS). It explains the data, metrics, indicators and empirical methods recommended by the BEPS Action 11 report *Measuring and Monitoring BEPS*.

Globally, MNEs have taken advantages of mismatches and gaps in international tax rules of different countries to conduct cross-border profit shifting, resulting in erosion of the corporate tax base. The OECD, in its Action 11 final report (2015, p.15) estimated that the loss of global corporate income tax revenue arising from BEPS activities could be between 4% to 10% of global corporate income tax revenues. This is equivalent to USD\$100 to \$240 billion annually.

This policy brief discusses the challenges for BEPS analysis arising from limitations of existing data and measuring tools. It critically examines the dashboard of six BEPS indicators recommended by the BEPS Action 11 report and summarises various recommendations for better data in the future. The brief then reviews recent empirical studies of BEPS in different countries and concludes with the actions that the OECD has taken since the release of the Action 11 report and that should be done in future.

1 What is BEPS?

The G20 declared the era of bank secrecy over in 2009 and later called for action to strengthen international taxation standards. The OECD responded with a 15-point Action Plan to address taxation issues with digitalisation (Action 1); and reform the international tax system to bring cohesion (Actions 2-5), restore substance (Actions 6-10), improve transparency (Actions 11-14), and develop a multilateral instrument (Action 15). This launched the international project to prevent Base Erosion (or double non-taxation) and Profit Shifting from jurisdictions where profitable activities take place: the BEPS Project.

OECD working groups developed technical policy proposals (released October 2015), recommending updates to the model tax convention, OECD-issued guidance, and domestic policy. From November 2016, the Multilateral Instrument would update more than half of the world's bilateral tax agreements.

OECD/G20 BEPS project participation is now almost global with the launch of multiple global forums and the Inclusive Framework (now 141 jurisdictions), membership of which requires commitment to the BEPS four 'minimum standards'. Having broadly addressed its mandate to implement the proposed package, the Inclusive Framework delivered in October 2021 Pillar-One (on a new nexus approach) and Pillar-Two (on a minimum global tax) as consensus proposals to tackle the digitalising global economy.

2 Action 11 – Measuring and Monitoring BEPS

What is the issue?

Measuring and monitoring the impact of BEPS and anti-BEPS reforms is difficult. There have been extensive empirical tax studies using different types of data and different methods to analyse BEPS, but there are still significant limitations of existing data and measuring tools. Currently available data for BEPS analysis range from highly aggregated macro-economic data (e.g. national accounts, foreign direct investment as well as trade and customs data) to detailed firm-level micro data (e.g. financial statements data and group structure data).

The use of firm-level micro data for evaluation allows the use of more sophisticated empirical methods such as panel data analysis. This enhances the credibility of more recent estimates of cross-border profit shifting ([Dharmapala, 2014](#)) but data limitations still exist. For example, [the OECD](#) is concerned that the coverage of MNEs in commercial databases such as Orbis or Amadeus is not random, and might not be representative of the overall population (OECD, 2015, p.19). The OECD also raises the concern about the underrepresentation of developing countries in all available databases ([Bradbury et al., 2018](#)).

One of the key challenges in measuring and monitoring BEPS using currently available data and measuring tools is the difficulty in separating BEPS activity from real economic activity (OECD, 2015, p. 84). To measure BEPS, empirical studies must disentangle profits linked to BEPS activities and profits linked to non-tax factors and related to real economic activities. There is little agreement among analysts about how to define real economic activity and what economic activities generate profits. Some, such as [Hines and Rice \(1994\)](#), argue that profits are generated where the factors of production (labour and capital) are located. Others argue that profits are generated where sales occur (OECD, 2015, p. 85).

A further challenge is how to measure capital, labour or sales for empirical analysis. A key problem is how to treat intangible assets which are important generators of value in the global digital economy and are highly mobile. Investments in intangible assets, often through research and development (R&D) expenditure of firms, are generally deducted or expensed in the year of the investment in the financial statement and are not included in the value of total assets (unless acquired externally). Sales are often measured in countries where sales have originated rather than where the final consumers are located. Labour is often measured by the number of employees, but this measure may not distinguish between full-time and part-time employees, or differences in productivity or value added per labour hour (OECD, 2015, p. 85-86).

The BEPS project aims to stop particular kinds of international tax minimisation through BEPS and is not aimed at the adoption by countries of low tax rates or tax incentives more generally. This raises another challenge, which is the difficulty in separating BEPS from non-BEPS tax preferences (OECD, 2015, p.86). It is a challenge for analysts to separate MNE reported profits due to BEPS from other corporate activity motivated by domestic tax incentives or preferences, as taxation also plays a role in the location of investments regardless of any BEPS opportunities ([Bradbury et al., 2018](#)). This issue is not sufficiently addressed by many empirical studies and information about the magnitude of countries' tax incentives is generally not available to enable analysts to separate these two effects on reported profits (OECD, 2015, p.86).

A final challenge for analysts is to measure the appropriate tax rate for BEPS analysis. Most studies use headline statutory tax rates or average effective tax rates due to limited data availability (OECD, 2015, p.86).

What does the OECD Recommend?

In the BEPS Action 11 report, [the OECD proposed a dashboard of six indicators](#) to identify and measure the size and the scale of BEPS activities on the basis of currently available data. The six indicators can be categorised into four groups. The six BEPS indicators are:

1. Concentration of high levels of foreign direct investment (**FDI**) relative to Gross Domestic Product (**GDP**);
2. Profit rates of MNEs compared to their effective tax rates;
3. Differential profit rates of MNEs between low-tax locations and worldwide operations;
4. Effective tax rates of MNE entities relative to non-MNE entities with similar characteristics;
5. Concentration of high levels of royalties relative to research and development (**R&D**) spending; and
6. Interest expense to income ratios of MNE affiliates in high-tax locations.

Group 1 – Disconnect Between Financial and Real Economic Activities

The first indicator group comprises **Indicator 1**: concentration of high levels of FDI relative to GDP, which is a measure of real economic activity in a country. This macroeconomic indicator highlights a potential disconnect between financial and real economic activities. First, a ratio of the FDI stock (measured by either net FDI or gross inward FDI) to a country's GDP is calculated for various countries. Indicator 1 is then computed as the average FDI to GDP ratio of countries with relatively high values of this ratio, divided by the same ratio for the rest of the included countries (OECD, 2015, p.49).

A relatively high ratio of FDI to GDP indicates that there may be BEPS activity, locating investment in jurisdictions for purposes of profit shifting or base erosion. In the case of the net FDI calculation, countries with relatively high ratios are those with ratios over 50% of GDP; for the gross FDI calculation, relatively high ratios are defined as ratios in excess of 200% of GDP (OECD, 2015, p.50). According to Heckemeyer et al. (2021) and Klein et al. (2021), countries like Bahamas, Ireland, Luxembourg and Netherlands are regarded as high-ratio countries on the basis of either the net FDI calculation or the gross FDI calculation. On the other hand, Singapore, a well-known offshore location, only falls into the high-ratio country group based on the net FDI calculation, but it is treated as a low-ratio country based on the gross FDI calculation. This indicates that the proposed threshold used to classify countries is arbitrary, and the classification outcomes based on two FDI calculations are not consistent.

Another issue with this measure is that the numerator of this FDI ratio includes both foreign investments related to BEPS and investments related to real economic activity (Klein et al., 2021). Therefore, Indicator 1 cannot distinguish between BEPS and other transactions related to real economic activity. This means that these estimates and variation over time might be driven by non-BEPS related factors, such as business cycles, trade openness as well as the structure of a country's economy and domestic savings (Heckemeyer et al., 2021).

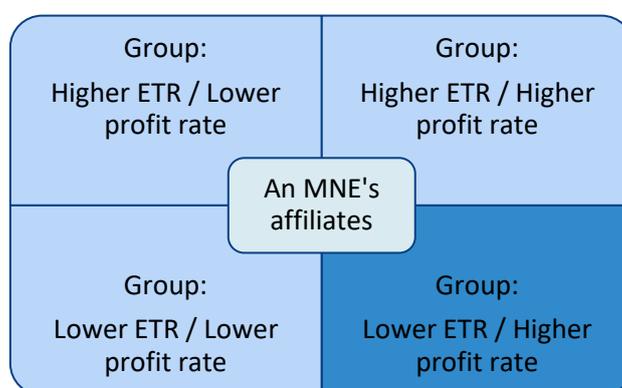
An improvement to Indicator 1 would be for the OECD to link it to statutory headline corporate tax rates across countries, as this is a key driver for BEPS-related FDI (Klein et al., 2021). Instead of grouping countries on the basis of high/low FDI ratio, it would be interesting to report variations in the FDI ratio between countries with high and low tax rates.

Group 2 – Profit Rate Differential within Top Global MNEs

This indicator group makes use of firm-level micro data to identify surprisingly low profit measures and consists of two indicators. **Indicator 2** reports differential profit rates compared to effective tax rates (ETRs) of MNEs.

Indicator 2 reports the percentage of income earned by affiliates in lower-tax countries with higher profit rates, by comparing the profit rate (i.e. profits/assets) to the ETR (i.e. tax expense/profit) of MNE affiliates for top global MNEs (OECD, 2015). The rationale behind this indicator is that when BEPS occurs, it is expected that profit rates of the lower-tax affiliates will exceed the worldwide profit rate of the MNE, as more profit are likely to be reported and taxed in low-tax countries (OECD, 2015). Figure 1 illustrates the computation of Indicator 2.

Figure 1: Illustration of Indicator 2



Source: Based on Figure 2.3 from the Action 11 final report, page 56.

Figure 1 shows that an MNE's affiliates can be separated into four groups. Lower, or higher-tax affiliates of an MNE are affiliates with ETRs that are less (or more) than the MNE group's worldwide ETR. Higher, or lower-profit affiliates of an MNE are affiliates with profit rates more than (or less than) the worldwide MNE group's profit rate. Indicator 2 focuses on the percentage of total reported profits earned by lower-tax, higher-profit affiliates (shown in the southeast quadrant highlighted in dark blue shade in Figure 1).

Indicator 3 reports differential profit rates reported in low-tax locations compared to the worldwide operations of MNEs. It is the ratio of the profit rate (i.e. profits as a proportion of assets) for a global MNE's affiliates in low-tax rate jurisdictions to that MNE's worldwide profit rate. Indicator 3 shows the extent to which reported profits, or profit rate in low-tax rate locations differs from the profit rate of the worldwide MNE group. A value of Indicator 3 above one shows that MNE affiliates in low-tax rate countries have higher reported profit rates than the worldwide rate for that MNE group and is therefore an indication that profit is being shifted into low-tax rate locations (OECD, 2015, p.56).

Both Indicator 2 and Indicator 3 have the same limitation. Indicator 2 cannot provide an indication about whether profit attributed to high profit rate and low-tax affiliates is a result of their real economic activity or operations, or a result of profit shifting (Heckemeyer et al., 2021). Neither Indicator 2 nor Indicator 3 provides a clear-cut separation between international profit allocation arising from geographic distribution of MNEs' production activities and from BEPS activities (Heckemeyer et al., 2021). The use of a counterfactual profit allocation benchmark that mimics a

situation without profit shifting could alleviate this problem. The OECD highlighted the importance of a counterfactual for BEPS analysis in Chapter 3 of the Action 11 report but only Indicator 4 involves the use of a benchmark.

Group 3 – MNE vs ‘Comparable’ non-MNE Effective Tax Rate Differentials

This indicator group comprise **Indicator 4**: effective tax rates of large MNE affiliates relative to non-MNE entities with similar characteristics. It measures the extent to which large MNE affiliates have lower ETRs than comparable non-MNE entities.

Unlike the other five indicators in the OECD dashboard, Indicator 4 relies on econometric techniques and regression model analysis. Statistically speaking, Indicator 4 captures the estimated ETR differential between MNE affiliates and non-MNE entities due to mismatches between tax systems, such as hybrid mismatch arrangements (see Policy Brief 2/2021). A negative estimated ETR differential signals BEPS activity.

For example, if MNE affiliates conduct hybrid mismatch arrangements, their ETRs would be lower than the ratio of non-MNE entities which do not have the same opportunities for cross-border tax planning. Indicator 4 also captures the effect of country preferential tax treatment if MNEs use them to a different extent than non-MNE entities, and profit shifting, in cases where profit shifting does not proportionally change financial tax expenses and reported pre-tax profits.

The regression analysis carried out for Indicator 4 allows researchers to control for a number of factors such as firm profitability, country, industry, size, patenting activity and position in the corporate group (OECD, 2015, p.58). To achieve a fair comparison between MNE affiliates and non-MNE entities, matching techniques, such as propensity score matching, are necessary.

A major advantage of Indicator 4 is that it includes a counterfactual or a benchmark that mimics a situation without profit shifting opportunities. This is an important tool to isolate the effect of BEPS on profit allocation from other effects related to real economic and production activities. However, the use of an ETR to capture cross-border profit shifting is highly questionable. At the affiliate level, ETRs can only capture book-tax non-conforming tax avoidance, but not book-tax conforming tax avoidance. In other words, while ETRs could capture some forms of hybrid mismatch or preferential tax treatment, intra-group transfer pricing and debt financing which are two important channels of cross-border profit shifting used by MNEs cannot be captured by ETRs. Variables constructed in empirical studies like [Egger et al. \(2010\)](#), [Li and Tran \(2020\)](#) and [Tran and Xu \(2021a\)](#) are more pertinent to measure BEPS via those two profit shifting channels.

Group 4 – The Use of Profit Shifting Channels

Group 4 consists of two indicators, which use macro or micro data to measure the use of profit shifting channels. **Indicator 5** measures the concentration of high levels of royalty receipts relative to R&D spending, providing an indirect measure of BEPS related to intangible property (OECD, 2015). **Indicator 6** measures interest expense to income ratios of MNE affiliates in high-tax locations, providing a measure of debt financing BEPS activity.

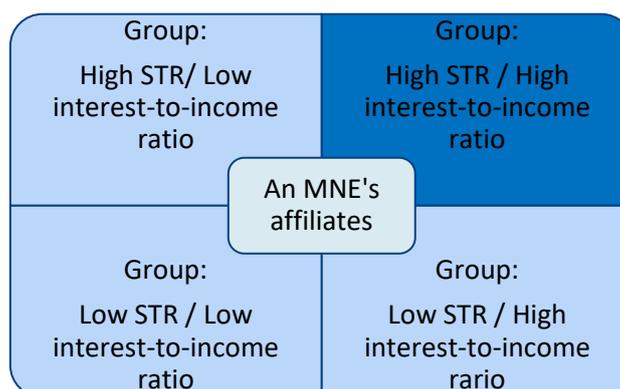
Indicator 5 uses aggregated macro-economic data and compares the average ratio of royalties received to R&D expenditures for a group of high-ratio countries to the average ratio for the other countries in the sample (OECD, 2015, p.60). A high value of this indicator suggests that the profits from intellectual property received in the high-ratio countries is significantly higher relative to other

countries, than would be expected given the actual R&D expenditures in these countries (OECD, 2015, p.61).

Indicator 5 has a limitation similar to Indicator 1. The rationale behind this indicator is that MNEs are likely to transfer and locate their highly profitable R&D activities to low-tax countries under tax minimising arrangements. However, the OECD did not create a direct link between this indicator and the corporate tax rate across countries, nor did it track the movement of intellectual property to countries with different corporate tax rates. There are also issues with how to account for R&D expenditure, which is highly cyclical (Heckemeyer et al. 2021). Considerable time lags between R&D expenditure and royalty income may exist. Therefore, this indicator is likely to vary depending on the business cycle and the dynamics of R&D expenditure.

Indicator 6 computes the interest-to-income ratio, which is the ratio of interest paid to earnings before interest, tax, depreciation and amortisation (EBITDA). The numerator includes interest on all debt, with affiliates and third parties. Indicator 6 can identify above-average interest-to-income ratios reported by MNE affiliates, in countries with above average statutory tax rates. This is an important technique of base erosion, as interest payments are deductible to those MNE affiliates in higher tax rate countries. Figure 2 illustrates Indicator 6.

Figure 2: Illustration of Indicator 6



Note: STR is the statutory tax rate.

Source: Based on Figure 2.6, Action 11 final report, p. 64.

The MNE affiliates are divided into four quadrants based on their interest-to-income ratio and their statutory tax rate. Indicator 6 is the excess ratio in the northeast quadrant highlighted in dark blue shade in Figure 2. Higher-tax countries are defined as countries with combined national and subnational STRs above the average STR (weighted by EBITDA) for all included MNE affiliates. An MNE affiliate's interest-to-income ratio is 'high' if it exceeds its MNE group's worldwide consolidated interest-to-income ratio. An excess ratio is calculated for each quadrant, being the difference between the weighted average interest-to-income ratio of affiliates in the quadrant and the weighted average interest-to-income ratio of all affiliates in the sample (OECD, 2015).

A limitation of Indicator 6, similar to Indicator 2 and 3, is that it does not introduce a benchmark of a situation without tax-motivated debt financing. Without such a benchmark, the increased debt levels in high-tax countries might reflect both cross-border profit shifting incentives as well as other non-BEPS factors like domestic tax incentives.

In addition to these six indicators, the OECD also presented two possible further BEPS indicators if new data becomes available. These are profit rates compared to effective tax rates for MNE domestic headquarters and foreign operations; and differential rates of return on FDI investment related to special purpose entities of MNEs.

To produce better data and tools for measuring and monitoring BEPS in the future, the Action 11 report recommended that the OECD should work with the Inclusive Framework on BEPS to compile a new data set, Corporate Tax Statistics. It also recommended that the OECD should work with all OECD members, G20 countries and any other willing governments to produce periodic reports on the estimated revenue impacts of proposed and enacted BEPS countermeasures (OECD, 2015, p. 262-263). Finally, the Action 11 report calls for governments to improve the public reporting of corporate tax statistics, particularly for MNEs, as well as non-tax data relevant to BEPS with wider country coverage, such as for FDI associated with intangible investments (OECD, 2015, p.264).

3 Examples of Empirical Studies on BEPS

This part discusses some recent empirical studies that seek to evaluate BEPS and BEPS countermeasures. Most studies rely on two existing analysis methods, while some studies have incorporated the Action 11 recommendations into their research design. The first analysis method measures the sensitivity of reported profit/profitability of MNE affiliates to tax rate differentials. The second analysis method focuses on specific profit-shifting channels, such as intra-group transfer pricing and debt financing.

Examples of recent studies in Australia

We discuss three recent empirical studies that seek to identify and measure BEPS activities and assess the effectiveness of BEPS countermeasures in Australia.

Tran and Xu (2021b) modify the economic approach developed by Hines and Rice (1994) to measure the sensitivity of profit before tax reported in Australia by foreign-owned Australian companies that are subsidiaries of foreign MNEs, to the tax rate differentials between Australia and other countries where the foreign MNE groups operate, during the period from 2007 to 2020. We find that the higher the Australian corporate tax rate relative to the tax rates of the immediate parent entity and ultimate parent entity, and the higher the ranking of Australian tax rate relative to the tax rate of other countries where foreign MNEs operate, the lower is the profit reported in Australia by foreign owned Australian companies.

Tran and Xu (2021b) also find that up to 2020 the extent of cross-border profit shifting by foreign-owned Australian companies did not change significantly since the implementation of BEPS countermeasures by the Australian government from 2013 onwards. Those countermeasures include actions taken by the Australian government to implement the BEPS recommendations as well as some unilateral measures such as the Multinational Anti Avoidance Law (**MAAL**) and the Diverted Profits Tax (**DPT**). The insignificant change in the profit shifting behaviour of foreign-owned Australian companies suggests that the current Australian BEPS countermeasures may not be effective in reducing profit shifting activities up to 2020. However, another reason for the result may be tax administrative or enforcement time lags.

Li and Tran (2020) investigate specific channels utilised by foreign-owned Australian companies to shift profits out of Australia by comparing the financial ratios of these companies with those of mainly domestic-owned listed Australian companies. This provides a counterfactual or benchmark that mimics a situation without outwards profit shifting incentives and opportunities. Domestic-owned listed Australian companies have little incentive to avoid Australian corporate tax because it can be passed to Australian shareholders as an imputation tax credit to offset their personal income tax. Their study focuses on the year 2012 and they detect cross-border profit shifting by foreign-owned Australian companies by means of intra-group transfer pricing and interest expense loading.

Tran and Xu (2021a) extend Li and Tran's (2020) one-year study period to a longitudinal period from 2007 to 2020. They also compare the financial ratios of foreign-owned Australian companies with those of mainly domestic-owned listed Australian companies as a benchmark. The study adopts two alternative matching methods (i.e. propensity score matching and coarsened exact matching) to match foreign-owned Australian companies with comparable mainly domestic-owned listed Australian companies.

Consistent with Li and Tran (2020), Tran and Xu (2021a) find the existence of outwards profit shifting by foreign-owned Australian companies, mainly by intra-group transfer pricing and to a less extent by interest expense loading, throughout the entire 14-year period, even after the implementation of related BEPS countermeasures.

Tran and Xu (2021a) find that on average foreign-owned Australian companies have lower gross profit to sales revenue ratios, lower earnings before interest and tax (**EBIT**) to sales revenue ratios, higher net financial expense to sales revenue ratios, lower profit before tax to sales revenue ratios and lower tax expense to sales revenue ratios than comparable mainly domestic-owned listed Australian companies. They also find that the main transfer pricing schemes used by foreign-owned Australian companies involve selling goods or services to affiliates in low-tax countries at depressed prices or purchasing goods and services from affiliates in low-tax countries at inflated prices. The study further finds that Australian BEPS countermeasures introduced since 2013 targeting transfer pricing and thin capitalisation are not effective up to 2020, perhaps also because of law enforcement or administrative time lags.

Examples of recent studies in other countries

There have been numerous studies of BEPS activity and that seek to identify revenue losses from BEPS. Dowd et al. (2017) use United States (US) tax return data, which is a high-quality data source recognised by the OECD in the Action 11 report, to study BEPS activities of US MNEs. This study measures the sensitivity of profit to tax rate changes of US MNEs and finds that the sensitivity of MNE affiliates in low-tax countries are generally different from that in high-tax countries. For example, a one percentage point reduction in a country's statutory tax rate from 30% to 29% would result in only an 0.7% increase in reported income, whereas the same one percentage point reduction in the statutory tax rate from 5% to 4% would increase reported income by 4.7%.

Clausing (2016) makes use of data from the US Bureau of Economic Analysis to measure the size of BEPS revenue losses in the US. She finds that profit shifting is likely to cause a reduction in corporate income tax revenues of between \$77 and \$111 billion of the US government during the period from 1983 to 2012, and these revenue losses have increased substantially in recent years. Clausing (2016) concludes that, roughly speaking, profit shifting to low-tax countries may be costing relatively high tax rate headquarter countries, including the US, as much as \$280 billion annually.

One study of profit shifting channels of MNEs by [Cristea and Nguyen \(2016\)](#) find that when the tax rate of a low tax jurisdiction decreases by 10 percentage points, the export unit values of Danish multinationals with affiliates in the low tax jurisdiction drop by between 5.7% and 9.1% compared to exporters without affiliates in low tax jurisdictions. Similar to Li and Tran (2020) and Tran and Xu (2021a), the analysis by Cristea and Nguyen (2016) makes use of a counterfactual that mimics a situation without outwards transfer pricing opportunities by including a sample of exporters without affiliates in low-tax countries as a control group.

Some recent global studies try to construct new methods in order to achieve more accurate BEPS analysis. Corresponding to the OECD's concern about data limitation, [Crivelli et al. \(2016\)](#) develop an approach using country-level corporate income tax revenue and corporate tax rate data, which are available for many developing countries, to measure the scale of BEPS.

This approach is further re-estimated by [Cobham and Janský \(2018\)](#). An advantage of these two studies is that they use more than one tax rate measure, including statutory tax rates, forward-looking average effective tax rates and backward-looking average effective tax rates. This could partially address the OECD's concern related to the inappropriate choice of tax rates for BEPS analysis in the literature.

Other recent studies seek to evaluate BEPS countermeasures, as do the above studies in Australia. Two recent studies have empirically examined the effect of Country-by-Country (CbC) reporting in the European Union (EU). [Joshi \(2020\)](#) treats the implementation of CbC reporting which is required for MNEs with €750 million turnover, as a shock to private disclosure requirements and examines its effect on corporate tax avoidance. Graphical evidence of the post-implementation period from 2016 to 2018 reflects a positive discontinuity in the ETRs of MNEs at the €750 million cut-off point.

The study by Joshi implies a decline in tax avoidance by firms within the reporting regime. Regression results indicate that the ETRs of firms within the reporting regime are 1 to 2 percentage point higher than those of firms outside the regime, which further signals a decline in tax avoidance in the period.

[De Simone and Olbert \(2020\)](#) focus on the effect of CbC reporting obligations on the organisational structure of MNEs. Their results suggest that MNEs above the €750 million reporting threshold have fewer tax haven subsidiaries, fewer total subsidiaries as well as fewer hierarchical tiers compared to MNEs below the threshold after the implementation. This indicates that in response to CbC reporting, MNEs shut down some tax haven operations and unwind obsolete entities in order to reduce organisational complexity.

4 What comes next?

The OECD Action 11 report presents a future path of measuring and monitoring BEPS which is illustrated in Figure 3.

Figure 3: Future path of BEPS measurement

Current State	Future State	Ideal
<ul style="list-style-type: none"> • Indicators of BEPS with available data; • Analyses of economic impact of BEPS and countermeasures with available data. 	<ul style="list-style-type: none"> • New and refined indicators of BEPS with better data; • Refined analyses of economic impact of BEPS and countermeasures with better data. 	<ul style="list-style-type: none"> • True measures of BEPS and countermeasures.

Source: Based on Figure 2.1, Action 11 final report, p. 44

A key issue for the development of refined BEPS indicators and improved BEPS analyses is improved availability and quality of data about the economic activities, legal structure, and taxes of MNEs. The new data set produced by the OECD, Corporate Tax Statistics, was first released in November 2018 and aims to address some of these issues. The Corporate Tax Statistics dataset is a valuable addition to help us understand the impact of BEPS activity and BEPS reforms.

The OECD Corporate Tax Statistics data set contains data on corporate tax revenues, statutory corporate income tax rates, corporate effective tax rates and tax incentives related to R&D and innovation for participating countries. Since the second edition of the Corporate Tax Statistics, the OECD released new data which provides fresh insights into the activities of MNEs, derived from the CbC reports filed by MNEs. It provides aggregated information on the global tax and economic activities (e.g. unrelated and related party revenues) of nearly 4,000 MNE groups headquartered in 26 jurisdictions and operating across more than 100 jurisdictions (OECD, 2020).

In the third edition of the Corporate Tax Statistics released in 2021, the data set has extended to corporate tax revenues of 109 jurisdictions, statutory corporate income tax rates (2000-2021) of 111 jurisdictions, corporate effective tax rates (2017-2020) of 77 jurisdictions and tax incentives related to R&D and innovation of 48 jurisdictions. The third edition also includes more information on intellectual property regimes such as patent boxes with lower tax rates, implemented in many countries. This covers both non-harmful intellectual property regimes and their related tax rate deductions and harmful intellectual property regimes.

It would also be valuable for the OECD and Inclusive Framework to review and update the six BEPS indicators which have not been updated since 2015, taking account of criticisms and limitations that have become apparent in various empirical studies. This will be an important step to improve BEPS evaluation in future.

References

Bradbury, D., Hanappi, T. and Moore, A. (2018) 'Estimating the Fiscal Effects of Base Erosion and Profit Shifting: Data Availability and Analytical Issues', *Transnational Corporations Journal*, Vol. 25, No. 2, 91-106.

Clausing, K. A. (2016). 'The Effect of Profit Shifting on the Corporate Tax Base in the United States and Beyond', *National Tax Journal*, vol. 69, no. 4, 905-934.

Cobham, A. and Janský, P. (2018) 'Global Distribution of Revenue Loss from Tax Avoidance: Re-estimation and Country Results', *Journal of International Development*, vol. 30, no. 2, 206-232.

Crivelli, E., de Mooij, R. and Keen, M. (2016) 'Base Erosion, Profit Shifting and Developing Countries', *FinanzArchiv: Public Finance Analysis*, vol. 72, no. 3, 268-301.

Cristea A.D. and Nguyen, D.X. (2016) 'Transfer Pricing by Multinational Firms: New Evidence from Foreign Firm Ownership', *American Economic Journal: Economic Policy*, vol. 8, no. 3, 170-202.

De Simone, L. and Olbert, M. (2020) 'Real Effects of Private Country-by-Country Disclosure', Working paper 2019, Stanford University. Available here: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3398116, viewed 13 October 2021.

Dharmapala, D. (2014) 'What Do We Know About Base Erosion and Profit Shifting? A Review of the Empirical Literature', *Fiscal Studies*, vol. 35, no. 4, 421-448.

Dowd, T., Landesfeld, P. and Moore, A. (2017) 'Profit Shifting of U.S. Multinationals', *Journal of Public Economics*, vol. 148, 1–13.

Egger, P., Eggert, W. and Winner, H. (2010) 'Saving Taxes Through Foreign Plant Ownership', *Journal of International Economics*, vol. 81, 99-108.

G20 (2009) 'London Summit – Leaders' Statement: 2 April 2009'. Available here: https://www.imf.org/external/np/sec/pr/2009/pdf/g20_040209.pdf, viewed 19 August 2021.

G20 (2013) 'Communique of Meeting of G20 Finance Ministers and Central Bank Governors: Moscow, February 16, 2013'. Available here: <http://www.g20.utoronto.ca/2013/2013-0216-finance.html>, viewed 19 August 2021.

OECD (2013) 'Action Plan on Base Erosion and Profit Shifting'. Available here: <https://www.oecd.org/ctp/BEPSActionPlan.pdf>, viewed 19 August 2021.

Heckemeyer, J., Nicolay, K., Spengel, C. (2021) 'What Will the OECD BEPS Indicators Indicate?' ZEW - Centre for European Economic Research Discussion Paper No. 21-005, Available here: <https://ssrn.com/abstract=3783644> or <http://dx.doi.org/10.2139/ssrn.3783644>, viewed 29 September 2021.

Hines, J.R. and Rice, E.M. (1994) 'Fiscal Paradise: Foreign Tax Havens and American Business', *The Quarterly Journal of Economics*, vol. 109, no. 1, 149-182.

Joshi, P. (2020) 'Does Private Country-by-Country Reporting Deter Tax Avoidance and Income Shifting? Evidence from BEPS Action Item 13', *Journal of Accounting Research*, vol. 58, no. 2, 333-381.

Klein, D., Ludwig, C.A., Nicolay, K., Spengel, C. (2021) 'Quantifying the OECD BEPS Indicators – an Update to BEPS Action 11'. ZEW Discussion Paper No.21-013, January 2021. Available here: <https://ftp.zew.de/pub/zew-docs/dp/dp21013.pdf>, viewed 29 September 2021.

Li, X. and Tran, A. (2020) 'An Empirical Study on Cross-Border Profit Shifting in Australia', *eJournal of Tax Research*, vol. 17, no. 2, 193-232. Available here: <https://www.business.unsw.edu.au/research-site/publications-site/ejournaloftaxresearch-site/Documents/An-empirical-study-on-cross-border-profit-shifting-in-Australia.pdf>.

OECD (2013) 'Addressing Base Erosion and Profit Shifting'. Available here: https://read.oecd-ilibrary.org/taxation/addressing-base-erosion-and-profit-shifting_9789264192744-en, viewed 28 September 2021.

OECD (2015) 'BEPS 2015 Final Reports'. Available here: <https://www.oecd.org/ctp/beps-2015-final-reports.htm>, viewed 19 August 2021.

OECD (2015) 'Measuring and Monitoring BEPS, Action 11 - 2015 Final Report'. Available here: https://read.oecd-ilibrary.org/taxation/measuring-and-monitoring-beps-action-11-2015-final-report_9789264241343-en, viewed 28 September 2021.

OECD (2017) 'Model Tax Convention on Income and on Capital: Condensed Version 2017'. Available here: <https://www.oecd.org/ctp/treaties/model-tax-convention-on-income-and-on-capital-condensed-version-20745419.htm>, viewed 19 August 2021.

OECD (2017) 'OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations 2017'. Available here: <https://www.oecd.org/tax/transfer-pricing/oecd-transfer-pricing-guidelines-for-multinational-enterprises-and-tax-administrations-20769717.htm>, viewed 19 August 2021.

OECD (2016) 'Multilateral Convention to Implement Tax Treaty Related Measures to Prevent BEPS'. Available here: <https://www.oecd.org/tax/treaties/multilateral-convention-to-implement-tax-treaty-related-measures-to-prevent-beps.htm>, viewed 19 August 2021.

OECD (2020) 'New Corporate Tax Statistics Provide Fresh Insights into the Activities of Multinational Enterprises', Media Release on 08/07/2020, Available here: <https://www.oecd.org/newsroom/new-corporate-tax-statistics-provide-fresh-insights-into-the-activities-of-multinational-enterprises.htm>, viewed 30 September 2021.

OECD (2021) 'Corporate Tax Statistics – Third Edition'. Available here: <https://www.oecd.org/tax/tax-policy/corporate-tax-statistics-third-edition.pdf>, viewed 30 September 2021.

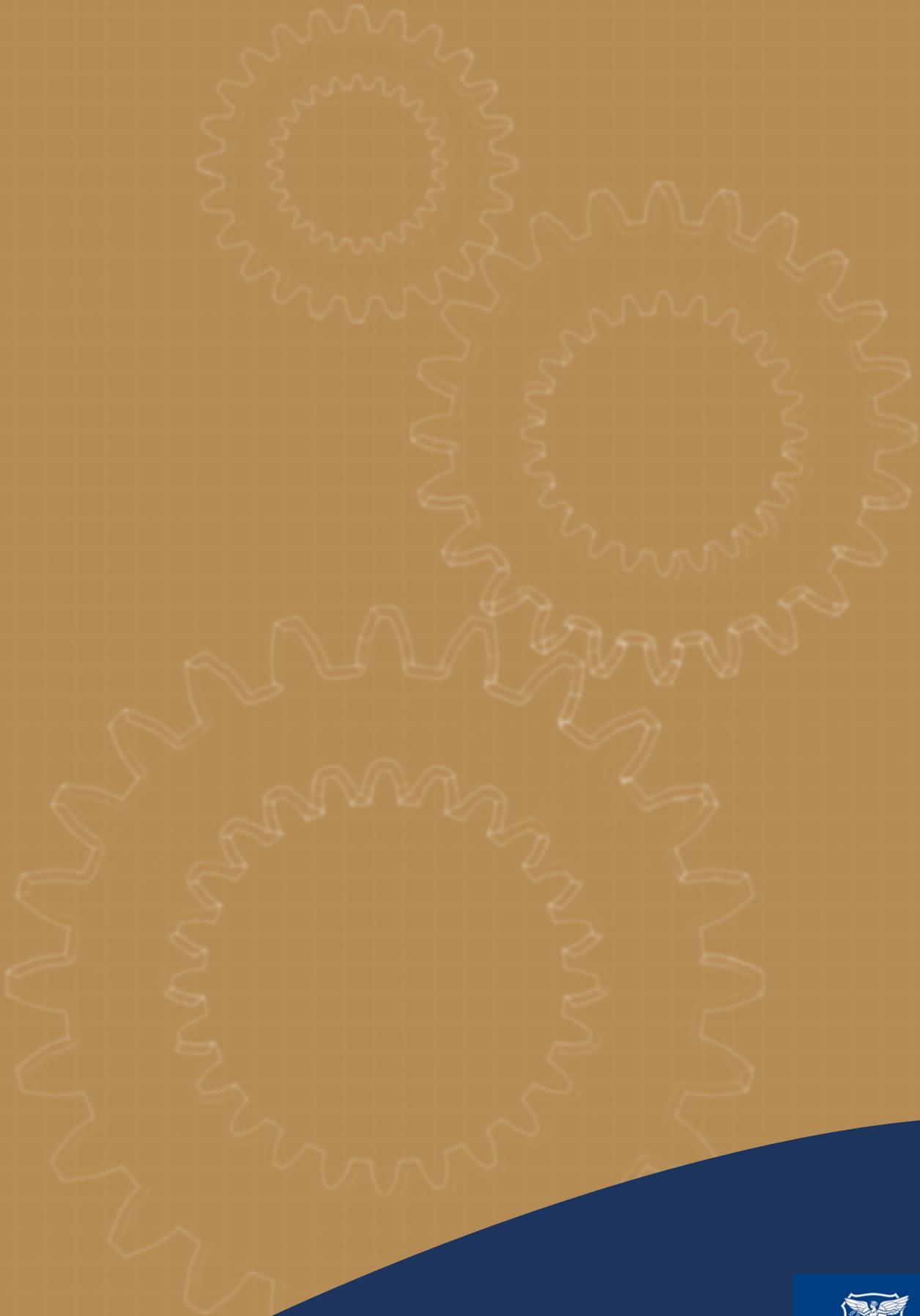
OECD (2021) 'Statement on a Two-Pillar Solution to Address the Tax Challenges Arising from the Digitalisation of the Economy – 1 July 2021'. Available here: <https://www.oecd.org/tax/beps/statement-on-a-two-pillar-solution-to-address-the-tax-challenges-arising-from-the-digitalisation-of-the-economy-july-2021.htm>, viewed 19 August 2021.

OECD/Inclusive Framework on BEPS (2020) 'Tax Challenges Arising from Digitalisation – Report on Pillar One Blueprint'. Available here: <https://www.oecd.org/tax/beps/tax-challenges-arising-from-digitalisation-report-on-pillar-one-blueprint-beba0634-en.htm>, viewed 19 August 2021.

OECD/Inclusive Framework on BEPS (2020) 'Tax Challenges Arising from Digitalisation – Report on Pillar Two Blueprint'. Available here: <https://www.oecd.org/tax/beps/tax-challenges-arising-from-digitalisation-report-on-pillar-two-blueprint-abb4c3d1-en.htm>, viewed 19 August 2021.

Tran, A. and Xu, W (2021a) 'A Study of Profit Shifting Using the Hines and Rice Approach'. TPI Working Paper 12/2021. Available here: https://taxpolicy.crawford.anu.edu.au/sites/default/files/publication/taxstudies_crawford_anu_edu_au/2021-07/complete_wp_tran_xu_july_2021.pdf, viewed 30 September 2021.

Tran, A. and Xu, W (2021b) 'A Study of Profit Shifting Channels'. TPI Working Paper 18/2021. Available here: https://taxpolicy.crawford.anu.edu.au/sites/default/files/publication/taxstudies_crawford_anu_edu_au/2021-11/complete_tran_xu_nov_2021.pdf.



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