ANALYSIS OF MISALIGNED PROFITS AND TAX RISKS FROM AGGREGATED AND ANONYMISED COUNTRY-BY-COUNTRY REPORT

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ABSTRACT

Indonesia faces a 15.6% decline in tax revenues due to the COVID-19 pandemics. As fiscal headroom tightens, the tolerance for international tax avoidance will decrease and globally untaxed income will be prioritized. As a part of 2020-2024 Strategic Plan, DGT intends to carry out tax administration reforms through the development of Compliance Risk Management (CRM). This study attempts to highlight the potential of Country-by-Country Report (CbCR) data to be used in CRM. We propose two methodologies to assess tax risks, using misaligned profits and OECD tax risk assessment indicators. In both measures, Australia, Cayman Islands, Iraq, Malaysia, Niger, and Singapore are flagged as risky jurisdictions, which could be used to inform CRM function to prioritize auditing affiliated party transaction related to these jurisdictions. The methodologies outlined here could also be replicated for individual CbCR data to create a risk profile that is more tailored to each MNE group.

Keywords: CbCR, compliance risk management, misaligned profits, tax risks

ABSTRAK

Indonesia mengalami penurunan penerimaan pajak sebesar 15.6% sebagai imbas pandemi COVID-19. Dengan semakin ketatnya ruang fiskal, toleransi terhadap penghindaran pajak internasional akan menurun dan pendapatan yang terpajaki secara global akan menjadi prioritas. Sebagai bagian dari Rencana Strategis 2020-2024, DJP bermaksud untuk melakukan reformasi administrasi perpajakan melalui pengembangan *Compliance Risk Management (CRM)*. Studi ini mencoba menyoroti potensi data *Country-by-Country Report (CbCR)* untuk digunakan dalam CRM. Kami mengajukan dua metodologi untuk mengukur risiko pajak, yaitu menggunakan laba yang tidak selaras dan indikator penilaian risiko pajak

dari OECD. Dalam dua pengukuran tersebut, Australia, Kepulauan Cayman, Irak, Malaysia, Niger, dan Singapura ditandai sebagai jurisdiksi yang berisiko. Hal ini dapat menjadi informasi bagi fungsi CRM guna memprioritaskan pemeriksaan atas transaksi afiliasi yang terkait dengan jurisdiksi ini. Metodologi yang diuraikan di sini juga dapat direplikasi untuk data CbCR individual untuk membuat profil risiko yang sesuai dengan masing-masing grup MNE.

Kata kunci: CbCR, kepatuhan manajemen risiko, laba tidak selaras, risiko pajak

1.   INTRODUCTION
1.1   Background

On 11 March 2020, the World Health Organization declared the coronavirus disease (COVID-19) as a global pandemic. As of 10 October 2020, this virus has spread throughout the world with a total of 37,182,214 cases and 1,073,776 fatalities globally (Worldometer, 2020), and a total of 328,952 cases and 11,765 fatalities recorded in Indonesia (The Jakarta Post, 2020a).

The pandemic has resulted in worldwide shock in economy. The VIX, which measures market expectation, shows the highest volatility in the last 5 years during March-May 2020 period (Bloomberg, 2020). Consequently, governments around the world increased stringency as the pandemic progressed (Hale et al., 2020). Various countries have also combined several policies to handle COVID-19 and provided a large economic stimulus (OECD, 2020a).

Indonesia also faces a slowdown in national economic growth, a decrease in tax revenues, an increase in state spending and financing as well as a worsening in the financial system as indicated by a decrease in various domestic economic activities (Director General of Taxes Decree Number KEP-389/PJ/2020). In the Law Number 2 of 2020, it is stated that the decline in Indonesia's economic growth is estimated to be 4% or lower, depending on how long and how badly the spread of the Covid-19 pandemic affects or even cripples community activities and economic activities.

The government announced the first two fiscal packages amounting to IDR 33.2 trillion (0.2% of GDP) for tourism and manufacturing sectors (UNESCAP, 2020). On May 18, 2020, the government further provided an additional package of IDR 405 trillion (2.6% of GDP), which was further expanded to IDR 677.2 trillion (4.2% of GDP) on June 4, 2020, as part of a national economic recovery program (IMF, 2020b). While state expenditure rose 10.6% yoy to IDR 1.53 quadrillion, the tax revenue as government's main source of income fell 15.6% yoy to IDR 676.9 trillion due to a sharp fall in corporate taxes and import taxes amid

slowing economic activity. Government expects the budget deficit to reach 6.34% of GDP in 2020 (The Jakarta Post, 2020b).

The financial strain stemming from the fiscal stimulus may be considerable, and government may need to consider ways of raising revenues to restore long-term fiscal sustainability and to fund the expenditures. As fiscal headroom tightens, the tolerance in developing countries for international tax avoidance will decrease and untaxed income globally will be prioritized (OECD, 2020a).

Currently, Directorate General of Taxes (DGT) still allocates 80% of tax auditors to carry out audits of small value, which corresponds to only 20% of the audit's extra effort. This is due to DGT not yet having a risk-based management system for resource allocation (Breuer et al., 2018). As a part of 2020-2024 Strategic Plan, DGT intends to carry out tax policy reform and tax administration reforms to increase taxpayer compliance, widen the tax base, and encourage investment which ultimately increases tax revenue.

A potential data source for risk monitoring purpose is Country-by-Country Report (CbCR). CbCR was developed to provide tax administrations with a high level overview of the operations and tax risk profile of Multinational Enterprise (MNE) group (OECD, 2017a). CbCR contain substantially consistent information on different MNE groups over time, broken down by tax jurisdiction. This means they may be used in a variety of ways to detect potential tax risks, e.g. to compare an MNE group's profile in one jurisdiction with that in another jurisdiction or with the group as a whole, to benchmark MNE groups against their sector, and to identify changes within a group over time (OECD, 2017f).

Studies about MNE groups' tax avoidance typically use tax return data (which is often limited in one country) or commerical database data (which are limited in coverage and disaggregated). This study is intended to be the first to leverage the newly available CbCR statistics for Indonesia to identify risky jurisdictions based on misaligned profits and other tax risk indicators. By identifying these high-risks jurisdictions, future tax audit could be focused on transactions related to those jurisdictions, thus enabling DGT to allocate resources more optimally and efficiently.

2. THEORETICAL BACKGROUND
2.1 Base Erosion and Profit Shifting Project

It is estimated that there are annual tax revenue losses of around 500 to 650 billion USD worldwide (Cobham & Janský, 2017; Crivelli et al., 2015). To mitigate the growing profit shifting activities by MNEs that ultimately lead to the erosion of tax base in many countries, Base Erosion and Profit Shifting (BEPS) Project was first initiated in 2013 (OECD, 2013). 15 Action Plans was then

formulated in the 2015 Final Report to introduce coherence in domestic rules affecting cross-border activities, reinforcing substance requirements in the existing international standards, and improving transparency and certainty (OECD, 2015a).

OECD subsequently expanded the network, inviting other non-OECD countries to join the BEPS Project insofar as they committed to adopt four minimum standards, which were the Action 5 (concerning Harmful Tax Practice), Action 6 (Preventing Treaty Abuse), Action 13 (Transfer Pricing Documentation and Country-by-Country Report), and Action 14 (Effective Dispute Resolution), as well as undergoing peer-review by other countries (OECD, 2017b). Collectively these countries formed the OECD/G20 Inclusive Framework on BEPS. Since 2013 Indonesia had indicated readiness to participate in the BEPS project (Arifin, 2014), and subsequently became one of the Initial BEPS Associates (Rosid & Daholi, 2018).

Indonesia has adopted all the minimum standards required to join the Inclusive Framework. Particularly for Action 13 related to Country-by-Country Report, the minimum standard has been implemented by the Minister of Finance Regulation Number 213/PMK.03/2016 and Director General Regulation Number 29/PJ/2017. (Rosid & Daholi, 2018).

2.2 Country-by-Country Reporting

Taxpayer has been required to document the application of arm's length principle for its related party transaction since 2010 by the Director General of Taxes Regulation Number PER-43/PJ/2010 (Rosdina et al., 2019). As an adoption of BEPS Action Plan 13 minimum standards, the Minister of Finance Regulation Number 213/PMK.03/2016 introduced provisions for standardized three-tiered transfer pricing documentation (Rosid & Daholi, 2018). The standardized transfer pricing documentation comprises of Master File, Local File, and Country-by-Country Report (CbCR). Prior to the implementation of BEPS Action Plan 13, tax authority relies much on domestic tax return and financial statements in order to understand a multinational enterprise (MNE) group structure. These sources do not paint a complete picture of the functions performed, assets used, and risks assumed by each of MNE's constituent entities, which hinders tax authority's ability to effectively deter and detect tax abuse. CbCR is intended to provide tax administrations with a high level overview of the operations and tax risk profile of MNE group (OECD, 2017a). It requires MNE group to publish how much profits and costs they incur in each country they operate in an aggregated basis, instead of a consolidated form as in the financial statements.

The document model template for CbCR consists of three tables as depicted by Figure 1 in the Appendix. The first table (CbC-1) contains financial information on the global activities of an MNE group, aggregated by tax jurisdiction. The second table (CbC-2), lists all subsidiaries (constituent entities) of the MNE group as

well as their tax jurisdiction and main activities. The third table (CbC-3) allows for additional information and comments. The tables are to be made using XML schema and exchanged by tax authority via a Common Transmission System (OECD, 2017d).

CbCR provides information regarding the financial indicators of the MNE group by tax jurisdiction and lists the MNE's entities as well as its functions in every jurisdiction where the MNE operates (OECD, 2015a). CbCR has some advantages over other data sources. Firstly, CbCR are prepared and filed by the ultimate parent entity which is usually in the best position to understand the global structure, activities and footprint of the MNE group. CbCR also provides an overview of what is happening throughout the whole of an MNE group that may not be available, or not easily available, from existing data sources (including tax information) such as information on the activities and financial position of entities in other parts of a worldwide group (OECD, 2017f).

CbCR must be filed by MNE groups, which is an MNE with two or more constituent entities resident in different jurisdictions (including an entity that is subject to tax through permanent establishment). The threshold for reporting obligation is set at EUR 750 million or a near equivalent amount in domestic currency in January 2015[1] (OECD, 2015a). This threshold

is intended to exclude about 85-90% of smaller MNE group, while still covering 90% of corporate tax revenues (OECD, 2015b).

Aside from being a new framework for transfer pricing documentation, CbCR is also a network of information exchange between tax authorities that have signed the Multilateral Competent Authority Agreement (MCAA) on the Exchange of CbCR which guides its exchange protocol and appropriate use (Hugger, 2019). Indonesia signed the MCAA on 26 January 2017, and as of April 2018, there have been 52 jurisdictions that have already chosen Indonesia as their country partner for reciprocal exchange of CbCR (Rosid & Daholi, 2018).

2.3 Aggregated and Anonymised CbCR Statistics

Whether a jurisdiction to be able to obtain and use CBCR is conditional upon its appropriate use. The appropriate use for CbCR is restricted to: (i) high level transfer pricing risk assessment; (ii) assessment of other BEPS related risks; and (iii) economic and statistical analysis where appropriate (OECD, 2017e; Director General of Taxes Circular Letter Number SE-38/PJ/2019).

One of the appropriate use of CbCR is for the economic and statistical analysis purpose. This statistical analysis is facilitated by a form of aggregated and anonymized tabulations, using a consistent format across

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[1] In the Minister of Finance 213/PMK.03/2016, the threshold of equivalence to 750 million Euro is set at 11 trillion Rupiah.

countries that provide governments with a complete view of the largest MNEs' global activities. The data published by the OECD on 8 July 2020 marks the first time aggregated and anonymized CbCR data has been made public[2]. The aggregated and anonymized CbCR statistics provide summarised information on the global tax and economic activities of nearly 4,000 MNE groups headquartered in 26 jurisdictions and operating across more than 100 jurisdictions worldwide (OECD, 2020b). Table 1 and 2 in the Appendix present the aggregated data for Indonesian headquartered MNE groups.

A restriction to CbCR only for high-level transfer pricing assessment means that it could not substitute a detailed transfer pricing analysis based on functional analysis and comparability analysis. It could not also be used as a conclusive evidence that the taxpayer's transfer prices are or are not appropriate or to be used to propose an adjustment based on global formulary apportionment. Hanlon (2018) noted that there is a clear and well-acknowledged disconnect of CbCR with transfer pricing rules based on arm's length principle, instead of formulary apportionment (or otherwise directly based on where economic activity occurs). In other words, CbCR could not be used to make direct transfer pricing adjustment in the course of a tax audit. However, it may help auditor to make further enquiries into the MNE's arrangement, for example, concerning its transaction related to a high-risk jurisdiction. (OECD, 2015a).

For statistical purposes, CbCR is not intended to disclose individual taxpayer specific information (OECD, 2015b). As such, jurisdictions were asked to provide as much detail insofar as it is allowed by their confidentiality standards (OECD, 2020c). As a result, some countries do not disclose their data to the agreed template for aggregate reporting, and this makes it difficult to understand the profit shifting patterns of MNE groups whose UPE is resident in their jurisdictions (TJN, 2020b). The OECD also includes a caveat against the inconsistent treatment for intracompany dividends among jurisdictions, which may result in result in artificially low profit or effective tax rates (OECD, 2020c).

2.4 Unitary Taxation and Misaligned Profits

For our first risk assessment measures, we use estimation of misaligned profits based from the principle of unitary taxation, based on the assumption that the income of the firm results from the synergy of its activities as whole, and therefore is earned by the firm as a whole (Picciotto, 2016). Under unitary approach, profit is allocated among the various jurisdictions in which MNEs operate

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[2] With the exception of the US Internal Revenue Service publishing their own aggregated statistics of US-headquartered MNEs in January 2019 prior to OECD's publication.
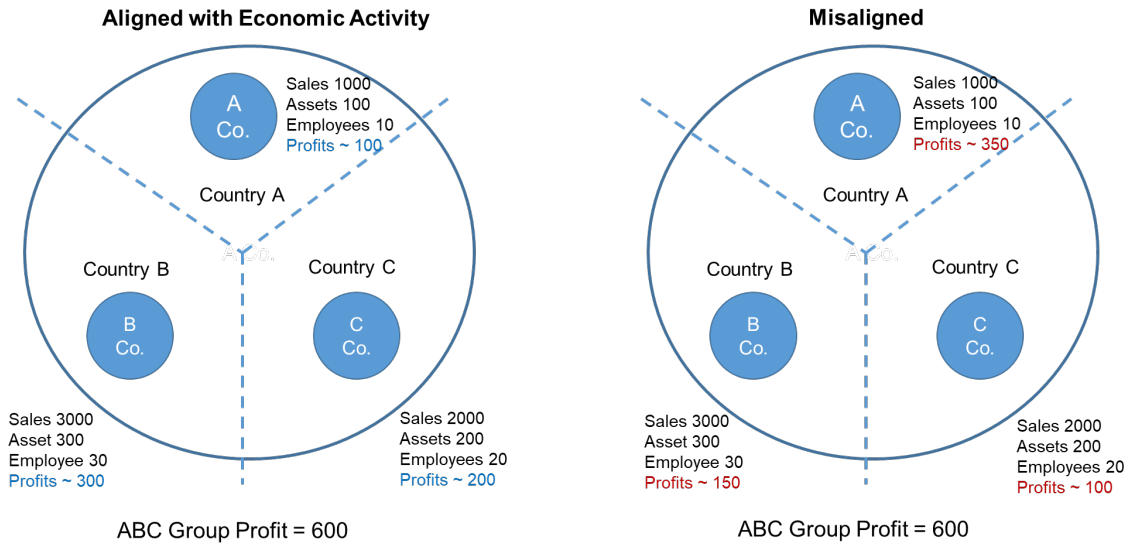
Figure 1 Illustration of Misaligned Profits
Source: Author Illustration

via a formula typically comprised of easy-to-observe factors that indicate the economic activity in the jurisdiction (e.g., sales, payroll expenses, and assets), according to the relative weight of its indicators (Avi-Yonah & Benshalom, 2011). A simplified illustration is as follow.

In the stylistic example above, an MNE group ABC is operating in 3 countries, with constituent entities A Co. B. Co, and C. Co. ABC group as a whole earns 600 in profits. Under unitary approach, profits in of A Co, taking into account its functions (indicated by level of sales and employees) and assets, should be approximately 100. B Co. and C Co. respectively should earn 300 and 200 in profits. A misalignment occurs if the profits in each entity deviate from the approximation, in effect, how much taxable profit is in the 'wrong' place (Cobham &

Janský, 2017). In this example, profits are booked disproportionately in A.

Misaligned profits can be estimated by using "weighting" of multiple revenue factors, such as 1/2 revenues-1/2 employees weights (TJN, 2020b). Other weighting schemes include 1/3 revenues-1/3 employees-1/3 assets weight based on the Massachusetts formula (Clausing & Avi-Yonah, 2007) and 1/3 revenues, 1/3 assets, 1/6 employees, and 1/6 payrolls based on European Union Common Consolidated Corporate Tax Base (CCCTB) (Cobham & Janský, 2017; Garcia-Bernardo et al., 2019). Although this unitary approach is simple, it does not take into account the distinctive circumstances of MNE investments in different jurisdictions. Consequently, the choice of formula factors, their

measurement, and the relative weight – are therefore not precise indicators. (Avi-Yonah & Benshalom, 2011).

Nevertheless, previous study using aggregated Bureau of Economic Analysis (BEA) dataset by Clausing (2016) indicated that there were misaligned profits disproportionately booked in low tax jurisdiction despite there being little sales, assets, or employees. Using similar aggregated BEA data, Cobham and Janský (2017) found around 660 billion USD of profit shifting from US MNE alone, which correspond to 1% of world GDP. The majority of misaligned profits were identified in near-zero tax jurisdiction such as Netherlands, Ireland, Bermuda, and Luxembourg, contributing to around $130 billion of tax revenue losses in 2012. Similar study by TJN (2020b) found $467 billion worth of corporate profit shifted by multinational firms into corporate tax havens, with associated corporate tax losses of $117bn.

2.5 Tax Risk Indicators

Aside from constructing theoretical profits against which misalignment could be detected, there are a number of indicators derived from the information contained in an MNE group's CbCR that can be used to detect potential tax avoidance risks (OECD, 2017f). The indicators are:

1. The footprint of a group in a particular jurisdiction, e.g. where a CbC Report indicates that a group has total revenues in the jurisdiction above a set threshold.

2. A group's activities in a jurisdiction are limited to those that pose less risk, e.g. where a group only has a holding company in a particular jurisdiction (or has only limited other activities).

3. There is a high value or high proportion of related party revenues in a particular jurisdiction. Where an entity receives a significant amount of related party revenue (e.g. related party revenues / total revenues = high), this increases the potential that an error in the transfer prices applied could give rise to a significant tax difference.

4. The results in a jurisdiction deviate from potential comparables, either those of other jurisdictions within the group; with the group as a whole; with potentially comparable entities outside the group; or with industry averages (e.g. from commercial databases or built up using a tax authority's own data).

5. The results in a jurisdiction do not reflect market trends. For example, if the market for a group's products is expanding, and the level of sales by the group is growing, it would be expected that the profitability of entities contributing to those sales would

increase. If the group's results are not consistent with these expectations, this could indicate a possible transfer pricing or other BEPS-related risk which might warrant further investigation.

6. There are jurisdictions with significant profits but little substantial activity. CbC Reports contain useful information on the level of revenues, profits and activity, which can be used as initial indicators that MNE groups have entities in certain jurisdictions with earnings that appear to be disproportionate to their level of economic activity. Among others, this may be indicated by:
    - Low substantial activities in proportion to revenues or profit before tax
        - o total revenues or profit before tax / total employees = high
        - o total revenues or profit before tax / tangible assets = high
    - High return on equity (pre-tax or post-tax)
        - o profit before tax / (stated capital + retained earnings) = high
        - o (profit before tax – income tax accrued) / (stated capital + retained earnings) = high
    - Low cost base (high profit margin)
        - o profit before tax / total revenues = high

7. There are jurisdictions with significant profits but low levels of tax accrued, e.g. income taxes accrued / profit before tax = low. A potential tax risk may be highlighted where an MNE group has substantial profits in a particular jurisdiction, but has no tax or only a low level of tax accrued for the period.

8. There are jurisdictions with significant activities but low levels of profit (or losses). Where there is a low (or negative) profit before tax which cannot be readily explained due to the existence of entities engaged in profit-generating activities (manufacturing or production; sales, marketing or distribution; provision of services to unrelated parties; regulated financial services), the tax authority in that jurisdiction may flag this for further enquiry.

9. A group has activities in jurisdictions which pose a BEPS risk. This may include, for example, foreign jurisdictions with a low or zero level of corporate tax, or those with tax rules and treaty policies which facilitate the use of entities as conduits to pass through payments within a group.

10. A group has mobile activities (holding or managing IP; purchasing or procurement; sales, marketing or distribution; internal group finance or insurance) located in jurisdictions where

the group pays a lower rate or level of tax.

11. There have been changes in a group's structure, including the location of assets

12. Intellectual property (IP) is separated from related activities within a group, i.e. whether the ownership and management of IP is in a different jurisdiction to the group's activities that give rise to the IP or use it to create value, including research and development, manufacturing or production, sales, marketing or distribution, and the provision of services to unrelated parties

13. A group has marketing entities located in jurisdictions outside its key markets, for example, if there are entities engaged in marketing located in jurisdictions where the group does not have a significant level of sales

14. A group has procurement entities located in jurisdictions outside its key manufacturing locations

15. Income tax paid is consistently lower than income tax accrued. In most cases and over time, it should be expected that the level of tax accrued in a jurisdiction, and the level of tax paid in that jurisdiction, should broadly align, e.g. income tax paid / income tax accrued = 1. Where the level of tax paid in a jurisdiction is materially lower than

the level of tax accrued, this may be an indicator of possible tax risk.

16. A group includes dual resident entities

17. A group includes entities with no tax residence

18. A group discloses stateless revenues in Table 1. Any material level of stateless revenues on Table 1 is likely to be flagged as a potential risk by all tax authorities in jurisdictions where the group has operations

19. Information in a group's CbC Report does not correspond with information previously provided by a constituent entity, such as in the tax return, master file, local file or in other documentation.

3. METHODOLOGY

This study utilized quantitative method. Our main data is taken from the OECD Aggregated and Anonymized Country-by-Country Reporting Statistics, which at the time of this study is only available the fiscal year of 2016 (although the method could be similarly applied for subsequent releases of CbCR statistics). For our primary analyses, we would utilize the list of jurisdiction and financial information in each jurisdiction as specified by the CbC-1 table. Information on revenues, assets, and employees are readily available in the CbCR, while payrolls are constructed by multiplying number of employees by GDP per capita (Garcia-Bernardo et al., 2019). The information for

GDP per capita in 2016 is taken from the World Bank.

While the data here is limited in an aggregated form, OECD itself suggested that global macro data be used to estimate profit shifting (Tørsløv, Weir, & Zucman, 2018). A macro study using US statistics in similar vein have been done by, inter alia, Clausing (2016) and Gravelle (2009). For a more globalized perspective, Crivelli, de Mooij and Keen (2015) and Tørsløv, Weir, and Zucman (2018) also use global macro data to study profit shifting all the world's multinationals and the implications of this phenomenon for each OECD country, the main emerging economies, and tax havens.

3.1 Risk Measure: Misaligned Profits

Profit shifting to country or jurisdiction i, denoted as S_i is measured from the profit booked π_i, and theoretical profit P_i, i.e.

$$S_i = \pi_i - P_i$$

where the information of profit booked π_i is taken from the "profit (loss) before tax" segment in CbC-1 table (TJN 2020b), P_i is calculated by multiplying the total profit booked $\sum_i \pi_i$ with the share of economic activity. The share of economic activity is calculated on the basis of unrelated party sales, R_i, and number of employees, E_i all with equal weighting, thus:

$$P_i = \sum_i \pi_i \cdot \left(\frac{\frac{1}{2} \cdot R_i}{\sum_i R_i} + \frac{\frac{1}{2} \cdot E_i}{\sum_i E_i} \right)$$

Additionally, we also employ different weighting scheme using the so-called "Massachusetts formula" and CCCTB formula. Massachusetts formula, uses equal weights on property, employment, and sales (Clausing & Avi-Yonah, 2007), while CCCTB is derived from one-third sales, one-third tangible assets, and one-third split equally between compensation cost and number of employee (Garcia-Bernardo et al., 2019).

Unlike sales and assets-only weights, these two provide several advantages. First, the asset portion of the formula is compatible with the desire to have the corporate tax incidence borne by capital. Second, a three-factor formula more adequately captures the supply side of the process that generates profit, whose merit was recognized as far back as Marshall (1997). Third, to the extent that firms are able to manipulate the destination of their sales, a multiple-factor would make that type of avoidance more pronounced. Indeed, the inclusion of tangible assets as real economic activity weight enable us to still account for MNE groups that may still perform real economic activities with a low level of labor but a significant capital investment (Clausing & Avi-Yonah, 2007).

Therefore this case, instead of using half-revenue half-employee as weights, we use weighting from unrelated party revenue, employees, and tangible assets A_i, each with equal weighting, thus for the Massachusetts formula, the estimation is based on:

$$P_i = \sum_i \pi_i \cdot \left(\frac{\frac{1}{3} \cdot R_i}{\sum_i R_i} + \frac{\frac{1}{3} \cdot A_i}{\sum_i A_i} + \frac{\frac{1}{3} \cdot E_i}{\sum_i E_i} \right)$$

while for the CCCTB formula, the estimation is based on:

$$P_i = \sum_i \pi_i \cdot \left(\frac{\frac{1}{3} \cdot R_i}{\sum_i R_i} + \frac{\frac{1}{3} \cdot A_i}{\sum_i A_i} + \frac{\frac{1}{6} \cdot E_i}{\sum_i E_i} + \frac{\frac{1}{6} \cdot P_i}{\sum_i P_i} \right)$$

where P_i is calculated by multiplying number of employee with the GDP per capita.

To obtain estimates of profit shifting, S^C is then defined as the sum of positive values of S_i for countries where the effective tax rate is below 15% (TJN, 2020b), such that:

$$S^C = \sum_i S_i'^C - P_i$$

where

$$S_i'^C \begin{cases} S_i^C \text{ if } S_i^C > 0 \text{ and } ETR_i^C < 15\% \\ 0 \text{ otherwise} \end{cases}$$

This correction allows us to remove some resource-rich countries with large profits and high tax rates, therefore obtaining a more conservative estimate of profit shifting. The global tax revenue loss, TRL^C is then calculated by multiplying shifted profit S^C with the average effective tax rate $\widehat{ETR^C}$.

$$TRL^C = S^C \cdot \widehat{ETR^C}$$

where $\widehat{ETR^C}$ is our measure of effective tax rate in countries that is higher than 15%, weighted by the measures of real economic activities. Following the above-mentioned estimation strategy, we calculated the $\widehat{ETR^C}$ as

$$\widehat{ETR_\iota} = \sum_{i\epsilon\{N-c:ETR_i\geq15\%\}} ETR_i \left(\frac{\frac{1}{2} \cdot R_i}{\sum_i R_i} + \frac{\frac{1}{2} \cdot E_i}{\sum_i E_i} \right)$$

for revenues-employees weighting,

$$\widehat{ETR_\iota} = \sum_{i\epsilon\{N-c:ETR_i\geq15\%\}} ETR_i \left(\frac{\frac{1}{3} \cdot R_i}{\sum_i R_i} + \frac{\frac{1}{3} \cdot A_i}{\sum_i A_i} + \frac{\frac{1}{3} \cdot E_i}{\sum_i E_i} \right)$$

for Massachusetts formula weighting, and

$$\widehat{ETR_\iota} = \sum_{i\epsilon\{N-c:ETR_i\geq15\%\}} ETR_i \left(\frac{\frac{1}{3} \cdot R_i}{\sum_i R_i} + \frac{\frac{1}{3} \cdot A_i}{\sum_i A_i} + \frac{\frac{1}{6} \cdot E_i}{\sum_i E_i} + \frac{\frac{1}{6} \cdot P_i}{\sum_i P_i} \right)$$

for CCCTB weighting.

The parameter ETR_i is calculated by dividing cash Tax Paid with the Profit (Loss) Before Tax in CbC-1[3], following the methodology by TJN (2020b). This measure will be denoted hereinafter by Cash ETR (CETR). However we also apply accrual ETR, calculated by dividing Tax Accrued with the Profit (Loss) Before Tax in CbC-1[4]. The latter

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[3] Tax Paid element contains the total amount of income tax actually paid during the relevant fiscal year, including withholding taxes.

[4] Tax Accrued element contains the accrued current tax expense in the current year and (excluding deferred taxes or uncertain tax liabilities)

will be denoted hereinafter by ETR and be operationalized along the same line with GAAP ETR from Hanlon and Heitzman (2010) which is not affected by deferral strategies but affected by permanent difference.

3.2 Risk Measure: OECD Tax Risk Assessment Indicators

Due to its being aggregated and anonymized, not all the indicator above (especially those involving qualitative information from CbC-2 Table) could be applicable in this study. For example, "profit-generating activities", "mobile activities", "IP location separated from related activities", "marketing entities located in jurisdictions outside its key markets", or "procurement entities located in jurisdictions outside its key manufacturing location" are only relevant only when we use individual CbCR data. In the similar vein, indicators such as "a group includes dual resident entities", "a group includes entities with no tax residence" and "a group discloses stateless revenues in Table 1" cannot be applicable in jurisdiction-aggregated data.

As such, we will calculate the jurisdiction-level risks based on the mathematical formula provided above, i.e.
1. Proportion of related party revenues / total revenues;
2. Total revenues / total employees;
3. Profit before tax / total employees;
4. Total revenues / tangible assets;
5. Profit before tax / tangible assets;
6. Profit before tax / (stated capital + retained earnings);
7. Profit before tax / (stated capital + retained earnings);
8. (Profit before tax – income tax accrued) / (stated capital + retained earnings);
9. Profit before tax / total revenues; and
10. Income tax paid / income tax accrued.

Each of the above mentioned indicator would be calculated, resulting in ratio denoted x_i. To indicate the risk in a certain jurisdiction relative to the risk in other jurisdiction, we employ standardized value instead of using arbitrary "high" / "low" qualifier, i.e.

$$z_i = \frac{x_i - \bar{x}_i}{S_i}$$

where z_i is the standardized value, x_i is the raw value, $\bar{x}_i$ is sample mean, and S_i is the standard deviation of the sample. A composite factor F_j is then formed by averaging z-scores following the methodology used by Asness, et al. (2019) and FTSE Russell (2015) for their studies of risk indices, i.e.

$$F_i = \sum_{i=1}^{M} \alpha_i * z_i$$

where M equals to the number of indicators in the data, and α_i equals to 1/M.

Table 1 Estimated Misaligned Profits from Indonesian MNEs
Source: Author Calculation

(in million USD)	Revenues-employees weight		Massachusetts formula		CCCTB formula	
	Cash ETR	ETR	Cash ETR	ETR	Cash ETR	ETR
Australia	6.0	6.0	5.9	5.9	6.2	6.2
American Samoa	19.8	19.8	20.7	20.7	20.7	20.7
Cayman Islands	26.7	26.7	27.3	27.3	26.9	26.9
Iraq	16.4	-	0.1	-	8.8	-
Malaysia	110.4	-	50.9	-	80.9	-
Niger	14.1	14.1	14.2	14.2	14.2	14.2
Seychelles	0.0	0.0	-	-	-	-
Singapore	24.7	24.7	-	-	-	-
Timor-Leste	8.4	8.4	10.0	10.0	9.8	9.8
Total	226.5	99.8	129.2	78.2	167.5	77.8

4.   RESULTS AND DISCUSSION
4.1   Risk of Misaligned Profits

An analysis of CbCR statistics from Indonesian MNE groups presented in Table 2 shows that the biggest amount of misaligned profits occurs in Malaysia (50 to 110 million USD), followed by Cayman Islands (26 to 27 million USD), Singapore (around 24 million USD), and American Samoa (19 to 20 million USD). Collectively, there exist misaligned profits of at least 78 million USD and as much as 226 million USD due to the activities of MNE group whose UPE is resident in Indonesia.

Among various weighting schemes and measures of tax rates, there appears to be some consistency with regards to detection of misaligned profits to Australia, American Samoa, Cayman Islands, Niger, and Timor Leste. On the other hand, Iraq and Malaysia only appears when Cash ETR is used as tax measure in lieu of (accrual) ETR. This points out to the fact that in the data, income tax paid in Iraq and Malaysia consistently lower than income tax accrued there. There is 6.7 million USD tax accrued in Iraq, while zero is actually paid by Indonesian MNE groups. In Malaysia, the income tax accrued amounts to 39 million USD, while only 61,940 USD is actually paid. OECD (2017f) suggest that may be due to account payments (and repayments) of tax with respect to profits earned in earlier periods, as well as advance payments made in the current year and withholding tax incurred on payments to a jurisdiction. In this case, income tax accrued for the current year is more directly related to the amount of profit before tax reported in a specific period. (OECD, 2017f).

Discrepancy also occurs if parameters related to employment are included or excluded from the analysis, such is the case for Seychelles and Singapore. Indeed, there are substantial amount of tangible assets recorded in Seychelles and Singapore (111 million USD and 1.4 billion USD in values, respectively). On the other hand, there is relatively fewer personnel employed there (0 in Seychelles and 278 in Singapore). This may be explained either by capital-borne corporate tax incidence or that the MNE groups nevertheless perform economic activities with a low level of labor but significant amounts of capital (Clausing & Avi-Yonah, 2007).

TJN (2020b) methodology further allows us to calculate worldwide tax revenue losses[5] from Indonesian MNE groups. There are approximately 16 to 44 million USD of worldwide tax revenue losses depending on the choice of weight and tax measure. The result is presented in Table 2.

4.2 Risk Based on OECD Tax Risks Assessment Indicators

Our second analysis based on composite z-scores derived from OECD tax risk assessment indicators as presented in the Figure XX yield "stateless" as the riskiest jurisdiction, followed by Algeria, Iraq, Niger, Japan, Canada, Cayman Islands, Australia, Malaysia, Austria, Singapore, Hong Kong, and Nigeria. Note that this measures cannot be used to indicate whether there exist misaligned profits or worldwide tax revenue losses, but only a jurisdiction risk relative to

Table 2 Estimated Worldwide Tax Revenue Loss from Indonesian MNEs
Source: Author Calculation

(in million USD)	Revenues-employees weight		Massachusetts formula		CCCTB formula	
	Cash ETR	ETR	Cash ETR	ETR	Cash ETR	ETR
Australia	6.0	6.0	5.9	5.9	6.2	6.2
American Samoa	19.8	19.8	20.7	20.7	20.7	20.7
Cayman Islands	26.7	26.7	27.3	27.3	26.9	26.9
Iraq	16.4	-	0.1	-	8.8	-
Malaysia	110.4	-	50.9	-	80.9	-
Niger	14.1	14.1	14.2	14.2	14.2	14.2
Seychelles	0.0	0.0	-	-	-	-
Singapore	24.7	24.7	-	-	-	-
Timor-Leste	8.4	8.4	10.0	10.0	9.8	9.8
Total	226.5	99.8	129.2	78.2	167.5	77.8

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[5] Due to CbCR being an aggregated data, the tax revenue loss comprises the tax revenue loss from jurisdictions where Indonesian MNE groups operate worldwide.

Figure 2. Aggregated z-Score from Tax Risk Assessment Indicators
Source: Author Calculation
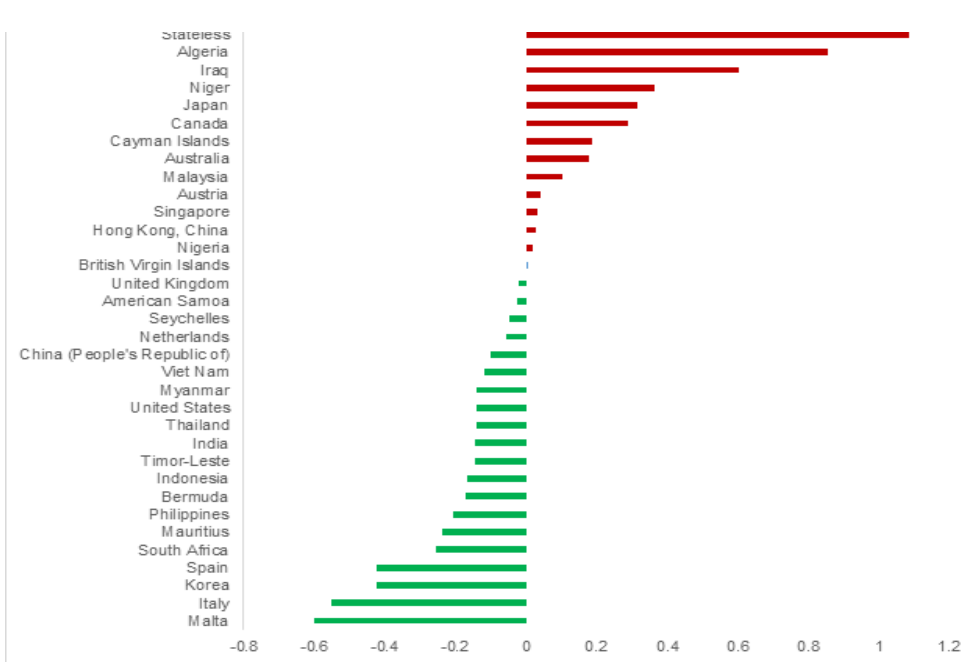
the other. The overall result is presented on Figure 2.

The risk profile based on OECD indicators result in some overlaps with jurisdictions as flagged by our misaligned profits risk measure (Australia, Cayman Islands, Iraq, Malaysia, Niger, and Singapore). American Samoa, Seychelles, and Timor Leste, however, are deemed less risky based on OECD indicator. In their place, Japan, Canada, Austria, Hong Kong, and Nigeria are deemed riskier. This discrepancy may partly be explained due to the fact that the two approached use different angles (misaligned profits risk is based on difference between "real economic activity" profit and profits as actually booked, while OECD risks are based on the profits or revenue as actually booked). Further study is warranted as to whether these differences are reconcilable or whether they complement each other. However, those are beyond the scope of our study.

5.   CONCLUSION

This study attempts to highlight the potential of CbCR data to be used to measure tax avoidance risks of MNE groups in general and be implemented in the CRM system in particular. We propose two methodologies to assess tax risks, using misaligned profits and OECD tax risk assessment indicators.

Our analysis of misaligned profits employ three weighting schemes: 1) revenue-assets weights, 2) Massachusetts formula's

revenues-employment-assets weights, and 3) CCCTB's revenues-assets-employment-payrolls. Using these methods, our analysis suggests there are 78-226 million USD of misaligned profits due to the activities of Indonesian MNE group. Among the countries flagged as risky are Australia, American Samoa, Cayman Islands, Iraq, Malaysia, Niger, Seychelles, Singapore, and Timor Leste. Our analysis further suggests that Indonesian MNE groups also contribute to a worldwide tax revenue losses of 16 to 44 million.

Our second risk measure is based on standardized scores from 10 indicators of tax risks, e.g. proportion of related party revenues / total revenues, total revenues / total employees, and profit before tax / total employees for each jurisdiction, which will then be used to construct a composite factor to indicate each jurisdiction's risk. Our analysis suggests "stateless" as the riskiest jurisdiction, followed by Algeria, Iraq, Niger, Japan, Canada, Cayman Islands, Australia, Malaysia, Austria, Singapore, Hong Kong, and Nigeria.

Both the above mentioned approach results in some juridical overlaps. Countries such as Australia, Cayman Islands, Iraq, Malaysia, Niger, and Singapore are flagged as risky in both risk measures. This result could be used to inform DGT's CRM function to prioritize auditing affiliated party transactions related to these jurisdictions.

6. IMPLICATION AND LIMITATION
6.1 Implication

DGT still allocates majority of its of tax auditors to carry out audits of small value. As a part of 2020-2024 Strategic Plan, DGT intends to carry out tax policy reform and tax administration reforms. One of the programs related to tax administration reform is the implementation of a risk-based supervision and law enforcement, *inter alia* through the development of CRM. Consequently, taxpayer supervision could be made more resource-efficient and targeted in accordance with the taxpayer's risk level.

The implication of this study can be used in the light of DGT's limited resource for tax audit. Following the result of this study, DGT may therefore flagged the taxpayer's transactions with affiliated parties in Australia, Cayman Islands, Iraq, Malaysia, Niger, and Singapore as riskier, and be selected for transfer pricing audit. Further, the methodologies outlined here could be applied in individual instead of aggregated CbCR data, resulting a risk profile that is more tailored to each MNE group.

6.2 Limitation

There are several limitation to this study. First, this study utilises Aggregated and Anonymised CbCR data consisting, instead of individual CbCR data from each MNE group. The risk profile here are thus of a

more "macro" picture of corporate tax avoidance that lacks granularity.

Second, owing to the use of aggregated data, we could not construct a risk profile based on indicator that use information from CbC-2 Table (e.g. "significant profit-generating activities", "mobile activities", "IP location separated from related activities", "marketing entities located in jurisdictions outside its key markets", or "procurement entities located in jurisdictions outside its key manufacturing location") as it would only be applicable for individual CbCR data which is limited due to confidentiality (similar to individual tax return). There is also potentially inconsistent treatment of intracompany dividends which may or may not be included as revenues in some jurisdictions (OECD, 2020c).

Third, while there are some jurisdictions that overlaps in both of our risk measures (i.e. Australia, Cayman Islands, Iraq, Malaysia, Niger, and Singapore), there are also some disagreement between the two (i.e. American Samoa, Seychelles, and Timor Leste, Japan, Canada, Austria, Hong Kong, and Nigeria). Lastly, as CbCR obligation is a relatively new taxation regime, only the data from fiscal year 2016 is available for this study. Further study is warranted as to whether the aforementioned juridical differences are reconcilable or whether they complement each other, as well as how their risk profiles evolved over time.

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APPENDIX

Table 1. Overview of allocation of income, taxes and business activities by tax jurisdiction

Name of the MNE group:
Fiscal year concerned:
Currency:

Tax Jurisdiction	Revenues			Profit (Loss) Before Income Tax	Income Tax Paid (on cash basis)	Income Tax Accrued – Current Year	Stated capital	Accumulated earnings	Number of Employees	Tangible Assets other than Cash and Cash Equivalents
	Unrelated Party	Related Party	Total							

Table 2. List of all the Constituent Entities of the MNE group included in each aggregation per tax jurisdiction

Name of the MNE group:
Fiscal year concerned:

Tax Jurisdiction	Constituent Entities resident in the Tax Jurisdiction	Tax Jurisdiction of organisation or incorporation if different from Tax Jurisdiction of Residence	Main business activity(ies)												
			Research and Development	Holding/managing intellectual property	Purchasing or Procurement	Manufacturing or Production	Sales, Marketing or Distribution	Administrative, Management or Support Services	Provision of services to unrelated parties	Internal Group Finance	Regulated Financial Services	Insurance	Holding shares or other equity instruments	Dormant	Other²
	1.														
	2.														
	3.														
	2.														
	3.														

Table 3. Additional Information

Name of the MNE group:
Fiscal year concerned:
Please include any further brief information or explanation you consider necessary or that would facilitate the understanding of the compulsory information provided in the country-by-country report.

Figure 1. CbCR Template

Table 1. Indonesian Aggregated and Anonymised Data-Raw (CbC-1 Table)

PARTNER_J	UNRELATED	RELATED	TOTAL_REV	PBT	CASH_TAX	ACCRUED_TAX	CAPITAL	EARNINGS	EMPLOYEES	ASSETS
Australia	24.5	0.5	25.0	7.6	-	-3.8	31.3	11.0	2.0	17.0
Austria	-	1.6	1.6	0.6	0.2	0.2	0.1	0.7	7.0	0.0
Canada	82.6	-	82.6	1.2	0.0	-	0.0	5.7	69.0	-
Italy	12.4	0.5	12.9	0.2	0.2	0.2	0.6	-0.0	20.0	0.0
Japan	32,151.5	474.2	32,625.6	54.1	0.3	23.5	136.8	548.1	96.0	49.6
Korea	-	-	-	-0.1	-	-	0.1	-0.1	2.0	-
Netherlands	400.5	45.1	445.5	2.8	0.5	0.5	3,549.3	-370.7	8.0	26.8
Spain	-	-	-	-0.1	-	-	0.4	-1.9	-	-
United Kingdom	2.8	2.0	4.8	0.6	0.0	0.0	49.0	10.8	158.0	0.6
United States	31.9	0.4	32.3	-0.9	-	-	0.4	4.0	11.0	9.3
Algeria	40.5	50.0	90.6	23.3	13.8	12.3	-	33.1	83.0	-
American Samoa	38.9	-	38.9	22.5	1.6	2.9	22.1	-	13.0	1.1
Bermuda	-	-	-	-0.0	-	-	1.0	-	-	-
British Virgin Islands	0.0	4.3	4.3	-3.7	-	-	223.9	30.5	2.0	56.3
Cayman Islands	29.1	5.7	34.8	28.7	-	-	243.3	-19.6	10.0	0.0
China (People's Republic of)	247.1	58.3	305.4	10.8	0.4	0.6	227.3	63.2	1,611.0	438.9
Hong Kong, China	37.1	8.7	45.8	-6.4	-	1.6	102.6	57.1	106.0	82.6
India	107.7	-1.2	108.9	2.2	0.4	-	38.9	-9.2	672.0	34.4
Indonesia	93,757.6	21,397.9	115,900.7	15,715.5	3,097.8	3,250.2	62,655.0	64,809.2	388,211.8	148,260.9
Iraq	56.2	41.4	97.6	20.1	-	6.7	-	18.6	8.0	498.5
Malaysia	110.8	242.7	353.5	118.8	0.1	39.1	266.3	49.3	71.0	1,778.4
Malta	-	-	-	-0.2	-	-	84.7	-89.9	-	0.3
Mauritius	-	-	-	-0.0	-	-	0.0	3.5	-	-
Myanmar	84.2	-	84.2	11.2	0.0	-	14.2	23.9	844.0	36.5
Niger	-	38.2	38.2	14.3	0.5	0.2	0.0	13.4	7.0	0.0
Nigeria	0.9	1.0	1.9	0.3	-	0.0	9.2	-0.6	24.0	7.0
Philippines	0.7	0.0	0.7	0.0	0.0	0.0	2.9	-1.7	3.0	0.3
Seychelles	-	-	-	0.0	-	-	402.5	201.3	-	111.1
Singapore	228.0	458.8	686.8	44.7	1.9	6.0	1,936.1	410.0	278.0	1,456.7
South Africa	2.8	-	2.8	0.1	0.0	0.0	-	1.3	3.0	0.7
Thailand	26.7	-	26.7	-1.6	-	-	10.0	3.1	306.0	12.9
Timor-Leste	41.8	3.1	44.9	13.4	-0.1	1.2	6.0	14.3	118.0	1.6
Viet Nam	703.3	107.4	810.7	44.5	1.9	2.4	704.5	-228.1	4,267.0	697.0
Stateless	23.0	-	23.0	1.9	1.1	0.5	-	-	36.0	-

Table 2. Indonesian Aggregated and Anonymised Data-Raw (CbC-2 Table)

PARTNER_J	RD	HOLD_IP	PURCHASE_PROCURE	MANUFACTURE_PRODUCTION	SALES_MARKETING	ADMIN_MGMT	SERVICES	INTERNAL_FINANCE	REGULATED_FINANCE	INSURANCE	HOLD_SHARES	DORMANT	OTHER
Australia	-	-	40	7	39	7	6	20	-	-	4	5	-
Austria	-	-	-	2	-	-	-	-	-	-	1	1	-
Canada	3	-	-	18	8	1	7	-	-	-	6	19	19
Italy	-	-	-	1	1	-	10	-	-	-	7	3	-
Japan	-	-	-	-	1	-	-	-	-	-	-	1	-
Korea	-	-	-	-	-	1	-	-	-	-	-	-	-
Netherlands	-	1	-	-	3	1	-	2	-	1	3	-	1
Spain	-	-	-	1	-	-	-	-	-	-	-	-	-
United Kingdom	-	-	-	-	-	-	-	-	1	-	-	-	2
United States	-	-	-	-	-	-	-	-	-	-	2	7	-
Algeria	-	-	-	-	3	-	4	-	-	-	-	-	-
American Samoa	-	-	-	-	-	-	-	-	1	-	-	-	-
Bermuda	-	-	-	-	-	-	-	1	-	-	-	1	-
British Virgin Islands	-	-	-	-	1	-	-	-	-	-	4	1	3
Cayman Islands	-	-	-	-	1	-	-	-	1	-	-	-	1
China (People's Republic of)	-	-	-	1	1	-	-	-	1	-	-	2	5
Hong Kong, China	-	-	-	1	2	-	-	-	3	-	7	3	3
India	-	-	-	2	-	-	-	-	-	-	-	-	-
Indonesia	66	14	124	129	138	133	66	11	18	13	34	27	43
Iraq	-	-	-	-	-	-	-	-	-	-	1	-	-
Malaysia	-	-	1	1	5	1	-	-	1	-	4	-	-
Malta	-	-	-	-	-	-	-	-	-	-	-	-	1
Mauritius	-	-	-	-	-	-	1	-	-	-	1	-	-
Myanmar	-	-	-	1	-	-	-	-	-	-	-	-	-
Niger	-	-	1	-	-	-	-	-	-	-	1	-	-
Nigeria	-	-	-	1	-	-	-	-	-	-	-	-	-
Philippines	-	-	-	-	1	-	-	-	-	-	-	-	-
Seychelles	-	-	-	-	3	-	-	-	-	-	-	-	-
Singapore	1	6	2	5	35	1	1	2	10	2	42	68	7
South Africa	-	-	-	-	1	-	-	-	-	-	-	-	-
Thailand	1	-	1	1	1	1	1	1	-	-	1	-	-
Timor-Leste	-	-	-	-	-	-	-	-	1	-	1	-	-
Viet Nam	-	-	4	19	15	10	7	-	-	-	7	8	14
Stateless	-	-	-	-	-	-	3	-	-	-	-	-	-