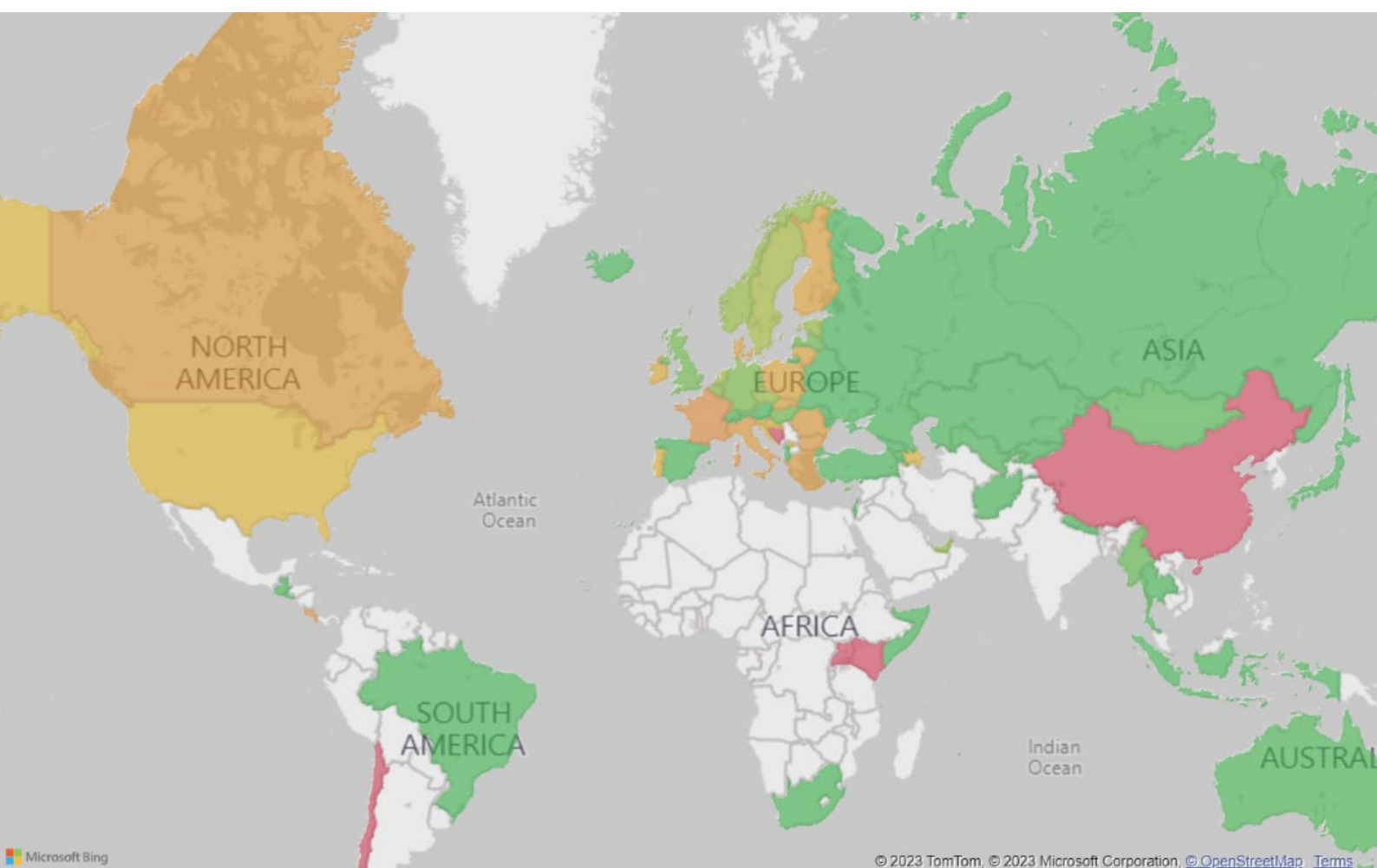


Technical Working Note:
GFS COFOG Expenditure Consistency Issues
On GFS Databases



Development Policy Paper

Discussion Draft 23 January 2023

1. Introduction

1. **As part of work to estimate the costs of corruption and inefficiency from weak public finance systems some consistency issues were discovered in Government Finance Statistics (GFS) data held on IMF fiscal databases.** GFS is an internationally recognized statistical reporting framework that was designed to help governments strengthen their capacity to formulate fiscal policy and monitor fiscal performance. The GFS framework establishes a common language that analysts can use to understand and guide complex government activities¹. The framework is also designed to work with other statistical systems, most importantly, the System of National Accounts (SNA)/ESA 2010), which is the standard for the compilation of measures of economic activity (e.g. GDP). In many countries the statistics compiled for the GFS system are used by national accounts statisticians as the starting point for compiling statistics for the SNA general government sector.

2. **Consistency issues emerged in two different classification systems for expenditure.** The first is the *economic type classification* system, which classifies expenditures according to payments for certain activities like compensation for employees, purchase of goods and services, acquisition of assets, and transfers like subsidies to companies, social benefits to vulnerable citizens and groups and grants to sub-national governments. The second is on *purpose of spending*. GFS applies the Classification Of Functions Of Government (COFOG) for purpose of spending, which are grouped under ten (10) functions of government such as health, education, economic affairs, and social protection. The two separate IMF databases that are used to report on the different expenditure classifications are where consistency issues emerged. These the Main Aggregates and Balances (MAB) database and the COFOG Database. A third database on detailed expenditures also had some consistency issues, but was not analysed to the same detail as MAB.

Box: 1. Consistency Metric Equation

$$C_{Public\ Sector\ Level} = \left| \left(\frac{Total\ Expenditure\ (MAB)}{Total\ Expenditure\ (COFOG)} - 1 \right) \right| \times 100$$

3. **A consistency metric was established to assess the level of consistency of two important GFS expenditure classification systems to help identify the extent of discrepancies.** The metric measures how much the two aggregates differ for every level of government reported. The metric is the absolute deviation of the MAB compared to the COFOG estimate. Basically a simple percentage of the difference between the two expenditure classifications for a particular year and sector or level of government (see Box: 1). Zero percent means the two expenditure estimates are exactly the same, while 100% can mean that there are estimates with zero for expenditure² or that the COFOG number is twice that of the MAB number.

¹ The GFS classification and accounting framework is available here: [IMF's Government Finance Statistics Manual 2014](https://www.imf.org/external/np/sta/gfsm/Manual2014) at <https://www.imf.org/external/np/sta/gfsm/>

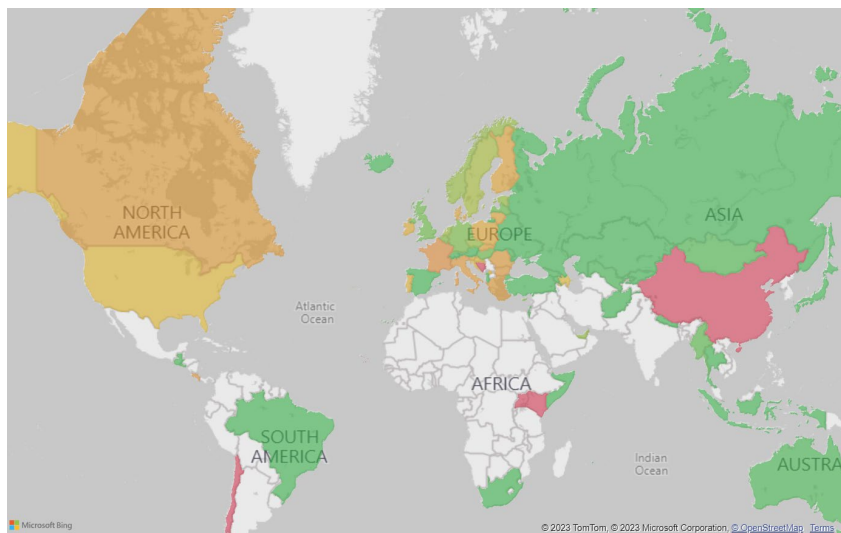
² Rather than blanks, as blanks in either COFOG or MAB datasets are excluded.

4. **The level of precision is shown for the different levels of the public sector.** There are eight (8) different levels³ established under GFS. Under the European system of accounts (ESA 2010) there are five (5) – General Government, Central Government, State government, Local government and Social security funds. GFS has four different versions of Central government, which explains the difference. The methods used to estimate COFOG expenditures are not disclosed in IMF observance reports available on the IMF Dissemination Standards Bulletin Board (DSBB). The methods used to calculate COFOG expenditures can have some bearing on the differences between the two different types of expenditure statistics. The Eurostat mechanism establishes a robust validation system to ensure consistency between expenditure aggregates at different sector levels.⁴ However, analysis of the IMF database, indicates that consistency is not always achieved at different levels of government. This could be a database or a source data issue, which is yet to be assessed. A rapid review of consolidated Eurostat data confirmed consistency achieved between 2012-2021 for all EU27 countries. A similar review of UK’s ESA2010 aggregates (tables 2 and 25) for economic and function data at the general government sector also confirmed consistency with only minor differences detected⁵

Results of IMF Database Consistency Check: GFS-COFOG Total Expenditure

5. **The results of the consistency testing exercise are presented** at Table 1. The table provides the consistency results in heat map form for 6 years between 2015 and 2020 for all public sector divisions (levels of government) for MAB and GFS databases downloaded on 22 December 2022. Colour thresholds used to signify size (absolute percentage difference) set are: 0.3% Green, 20% Yellow, Above 20% Red. Some differences can be explainable in the mapping from country classification system to IMF GFS system and other possible differences, such as if COFOG tables are cash rather than accrual, though figures out by greater than 20% would be unusually high.

Figure 1. QA of General Government Economic and COFOG Reporting 2016-20



³ 1-General government, 2-Central government (incl. social security funds), 3-Central government (excl. social security funds), 4-Budgetary central government, 5-Extrabudgetary central government, 6-State governments, 7-Local governments, and 8-Social security funds.

⁴ The EU Manual on sources and methods for the compilation of COFOG statistics provides an overview of the different COFOG methodologies used by member states. COFOG consistency check methods are provided on p20-23. See here: <https://ec.europa.eu/eurostat/documents/3859598/10142242/KS-GQ-19-010-EN-N.pdf/ed64a194-81db-112b-074b-b7a9eb946c32?t=1569418084000#page=116&zoom=100,109,133>

⁵ Of the years checked between 2015 and 2021, 2015 were exact, 2017-2018 had difference of less than 0.01%, and 202-21 of 0.4%).

Table 1. QA of General Government Economic and COFOG Reporting 2016-20

Sector Name Long	2016	2017	2018	2019	2020	Total
1-General government						
Austria	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Hong Kong	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Georgia	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Spain	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Indonesia	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Brazil	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Afghanistan	0.00%	0.00%				0.00%
Switzerland	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Macao	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Iceland	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
South Africa	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Turkey	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Ukraine	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Thailand	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Moldova	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Japan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Nepal				0.00%	0.00%	0.00%
Israel	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Belarus	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Albania	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Russia	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Kazakhstan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Guatemala	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Kyrgyz Republic	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
New Zealand	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Somalia		0.00%				0.00%
Armenia	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%
El Salvador	0.00%	0.00%	0.00%	0.00%	0.07%	0.02%
Uzbekistan	0.00%	0.10%	0.04%	0.15%	0.15%	0.09%
Mauritius	0.00%	0.00%	0.51%	0.00%	0.00%	0.10%
Australia	0.08%	0.06%	0.09%	0.09%	0.34%	0.14%
Mongolia	1.63%	0.01%	0.00%	0.00%	0.00%	0.31%
Kiribati	0.00%	0.00%	0.14%	2.01%	0.00%	0.50%
Myanmar	0.78%	0.60%	0.90%	0.30%		0.60%
Latvia	0.90%	0.92%	0.99%	1.12%	0.42%	0.86%
Hungary	0.76%	0.84%	0.93%	1.03%	0.84%	0.89%
United Kingdom	2.26%	0.75%	0.92%	0.28%	2.00%	0.91%
Cyprus	1.28%	1.28%	1.03%	1.29%	0.85%	1.12%
Germany	1.18%	1.18%	1.21%	1.18%	1.09%	1.16%
Belgium	1.41%	1.44%	1.42%	1.40%	1.28%	1.39%
United Arab Emirates	0.59%	4.28%	4.13%	0.00%	0.00%	1.57%
Norway	1.63%	1.66%	1.69%	1.70%	1.63%	1.66%
Estonia	1.67%	1.69%	1.68%	1.76%	1.70%	1.70%
Czech Republic	1.68%	1.74%	1.81%	1.85%	1.50%	1.71%
Netherlands	1.84%	1.88%	1.90%	1.86%	1.65%	1.82%

Sector Name Long	2016	2017	2018	2019	2020	
Sweden	1.89%	1.98%	2.08%	2.03%	2.07%	2.02%
Kosovo	0.00%	0.00%	0.00%	17.81%	0.00%	3.31%
Azerbaijan	0.07%	0.04%	0.21%	14.34%		3.95%
United States	4.40%	4.49%	4.33%	3.72%	3.91%	4.15%
Croatia	8.65%	7.47%	7.30%	0.00%	0.00%	4.40%
Portugal	1.51%	1.42%	1.50%	9.14%	10.50%	4.99%
Slovenia	6.26%	4.69%	4.77%	4.84%	5.93%	5.31%
Ireland	5.80%	5.65%	6.75%	5.63%	5.64%	5.89%
Poland	6.24%	6.62%	5.99%	5.66%	7.26%	6.39%
Lithuania	7.26%	6.46%	6.61%	6.41%	7.35%	6.84%
Finland	7.10%	6.72%	6.84%	6.82%	7.18%	6.94%
Denmark	6.35%	6.61%	7.43%	6.79%	7.78%	7.02%
Slovak Republic	5.16%	5.78%	7.22%	7.13%	9.65%	7.12%
Canada	10.60%	10.55%	10.28%	8.58%	2.58%	8.07%
Romania	8.89%	8.16%	9.01%	7.17%	8.27%	8.26%
Greece	5.21%	5.91%	8.28%	8.03%	13.70%	8.40%
Bulgaria	7.20%	9.72%	10.32%	5.37%	9.77%	8.55%
Italy	7.61%	8.65%	8.10%	8.04%	10.37%	8.60%
Malta	8.14%	8.74%	10.51%	9.12%	8.30%	8.97%
Costa Rica	11.07%	15.51%	4.50%	8.26%	6.37%	9.06%
France	10.35%	10.91%	10.15%	10.14%	10.15%	10.33%
Luxembourg	11.19%	11.76%	11.86%	11.71%	11.48%	11.61%
Singapore	17.45%	20.97%	17.63%	14.46%	7.35%	14.54%
Cabo Verde	19.04%					19.04%
Seychelles	0.00%		0.00%			47.46%
Chile	0.00%	0.00%	0.00%			70.28%
Nauru	0.00%	0.00%	0.00%			93.80%
China	97.77%	97.20%	97.37%	97.28%	97.16%	97.33%
San Marino				0.00%	0.00%	143.14%
Bosnia and Herzegovina	0.00%	0.00%				180.23%
Kenya					31.17%	331.53%
Uqanda	1.11%					529.73%

Figure 2. QA of Budgetary Central Government Economic and COFOG Reporting 2016-20

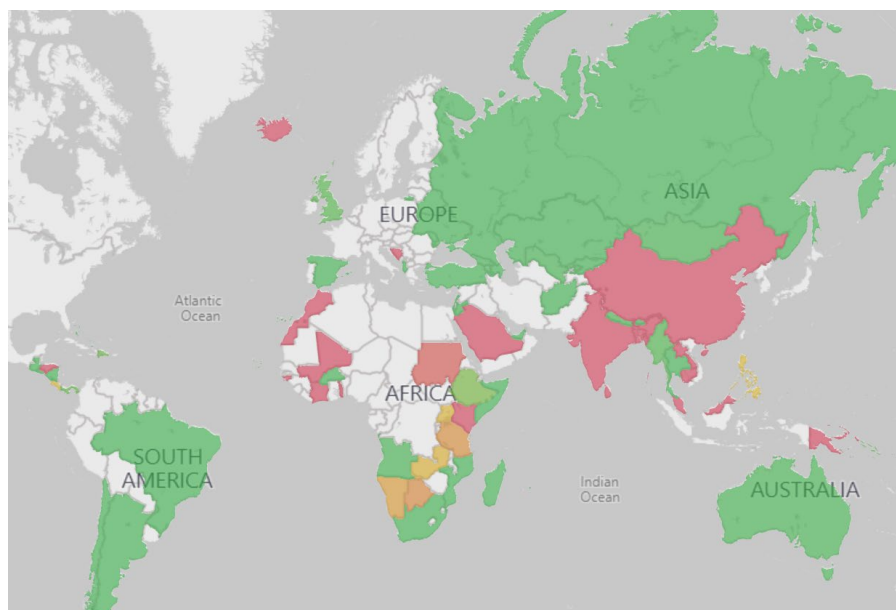


Table 2. QA of Budgetary Central Government Economic and COFOG Reporting 2018-20

Sector Name Long	2016	2017	2018	2019	2020	Total
4-Budgetary central government						
Georgia	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Spain	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Afghanistan	0.00%	0.00%				0.00%
Guatemala	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bhutan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Macao	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
South Africa	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Samoa	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Turkey	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Brazil	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Argentina	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Seychelles	0.00%	0.00%	0.00%			0.00%
Ukraine	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Russia	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Thailand	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Mauritius	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Nicaragua	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Belarus	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Moldova	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
United Arab Emirates	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Albania	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Israel	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
El Salvador	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Lebanon	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Kazakhstan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Kyrgyz Republic	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Burkina Faso	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bahamas	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Armenia	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Somalia		0.00%				0.00%
Bahrain	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%
Jordan	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%
Madagascar	0.00%	0.01%	0.01%	0.00%	0.00%	0.00%
Mozambique	0.00%	0.00%	0.00%	0.00%	0.04%	0.01%
Chile	0.00%	0.00%	0.00%	0.02%	0.03%	0.01%
Azerbaijan	0.00%	0.00%	0.13%	0.00%	0.02%	0.03%
Kiribati	0.00%	0.00%	0.13%	0.13%	0.00%	0.06%
Uzbekistan	0.00%	0.14%	0.01%	0.20%	0.16%	0.11%
Angola	0.00%	0.00%	0.01%	0.68%		0.13%
Australia	0.09%	0.08%	0.13%	0.12%	0.21%	0.13%
Mongolia	0.91%	0.00%	0.00%	0.00%	0.00%	0.17%
Nepal	17.91%	0.00%	0.00%	12.64%	0.00%	0.19%
Myanmar	0.49%	0.31%	0.93%	0.05%		0.35%
Solomon Islands	0.49%	0.58%	0.47%	0.85%	0.00%	0.47%
United Kingdom	1.80%	0.02%	1.37%	0.13%	1.68%	0.50%
Panama	0.11%	0.10%	0.02%	11.94%	13.12%	0.73%
Dominican Republic	5.37%	0.00%	0.00%	0.00%	0.00%	0.89%
Cabo Verde	3.38%	1.82%	0.00%	0.00%	0.93%	1.06%
Ethiopia	0.00%	0.00%	6.13%	0.00%	0.00%	1.20%
Fiji	0.19%	13.43%	0.00%	0.00%	0.00%	2.97%
Costa Rica	5.86%	2.55%	0.43%	9.83%	2.55%	3.17%
Philippines	0.00%	14.86%	9.64%	3.16%	4.42%	3.17%
Uganda	0.00%	0.00%	0.00%	20.12%	0.00%	3.85%
Zambia	0.14%	0.04%	0.11%	0.63%	29.98%	4.45%
Namibia	1.94%	0.12%	0.01%	51.64%	0.00%	7.78%
Tanzania		18.08%	24.01%			9.79%
Botswana	20.83%	24.92%	0.54%	5.45%	0.05%	10.60%
Singapore	16.22%	20.37%	16.62%	14.00%	7.30%	14.02%
Sudan	17.40%					17.40%
Kenya		10.28%	0.00%	0.00%	12.96%	20.11%
Papua New Guinea		0.00%	0.00%	0.00%	0.00%	21.64%
India	20.82%	22.51%	22.16%			21.89%
Palau	7.65%	16.21%	7.14%	0.68%		24.07%
Iceland	0.00%	0.00%	0.00%	0.00%		24.49%

Sector Name Long	2016	2017	2018	2019	2020	Total
Sri Lanka	0.74%	0.66%	0.46%	0.41%		27.65%
Malaysia	0.00%	0.00%	0.00%	0.00%		27.73%
Micronesia	37.87%	52.75%	25.15%	24.31%	28.17%	33.12%
Nauru	0.00%	0.00%	0.00%			93.80%
China	96.28%	95.47%	96.09%	95.93%	95.41%	95.82%
Togo	0.02%	0.00%				103.65%
Guinea-Bissau		0.00%				103.81%
San Marino				0.00%	0.00%	147.04%
Mali	0.00%	0.00%				160.91%
Bosnia and Herzegovina	0.00%	0.00%				194.85%
Cambodia	0.00%	0.00%				205.14%
Morocco	21.63%	9.81%				218.13%
Honduras					0.00%	374.65%
Lao PDR	0.00%					422.10%
Saudi Arabia	0.00%					499.05%
Côte d'Ivoire	0.00%					502.03%
Bangladesh	0.00%					625.91%