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# Measuring export concentration for identifying least developed countries

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# Measuring export concentration for identifying least developed countries

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**Abstract:** Export concentration has long been recognized as a key indicator of the development progress of least developed countries (LDCs). This paper presents the refined export concentration index recently included in the criteria used for identifying LDCs. The refined index is a Theil index that covers both concentration in the basket of exported products and concentration in the set of export markets, thereby capturing two dimensions of vulnerability due to undiversified export structures. The paper shows that relative to other developing countries, LDCs are less diversified both in terms of export products and export markets, contributing to their heightened vulnerability.

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# 1. Introduction

Export diversification – both by product type as well as destination country – is considered to be a key indicator of development progress. Diversifying the set of products that is being exported promotes economic transformation and increasing incomes. Because exporting firms are more productive than non-exporting firms (Melitz, 2003), product diversification contributes to raising overall economic productivity. It creates spillovers of technology and skills, triggering long-term structural change (Hausmann et al., 2007). Increasing the basket of products reduces the exposure of countries to product-specific demand and price-shocks. This is a particularly important for countries who predominantly export primary commodities that are often characterized by relatively volatile global demand and prices. Diversifying the set of destination countries reduces the exposure to country-specific demand shocks, whether these are caused by economic or political factors. Hence, both forms of export diversification can reduce macro-economic volatility, thereby overcoming an important barrier to investment and economic growth. Lastly, empirically countries with higher income have been found to export a larger basket of products and also serve larger sets of foreign markets, see among others Hummels and Klenow (2005).

Consequently, export diversification has been at the centre of economic policy interest by and advice for developing countries, particularly least developed countries (LDCs), for decades.<sup>1</sup> As far

back as 1970, the Committee for Development Planning of the United Nations (predecessor of the Committee for Development Policy (CDP), that is currently mandated to identify which countries should be on the list of LDCs), highlighted export concentration as a key feature of LDCs, alongside low income, predominance of primary activities and low education and health status (Committee for Development Planning Working Group, 1970). Consequently, export concentration has been one of the indicators used by CDP to identify LDCs since 1991.<sup>2</sup> In case CDP recommends an LDC for graduation, it also includes its suggestions on policy priorities and support needs of countries. These suggestions typically include a call for efforts to diversify the basket of exported products as well as the set of markets the country exports to. Due to the very limited availability of services trade data, the export concentration indicators used by CDP has always been and will continue to be confined to considering merchandise exports. Until 2023, CDP used an export concentration index that covered product concentration only, as no comprehensive index covering both types of export concentration has been available. The refined export concentration index to be used from 2024 overcomes this limitation.

While there exist several indicators for export product and export market concentration, these indicators typically measure either product or market concentration. For comprehensively measuring export concentration for the

<sup>1</sup> For an overview of policy thinking on LDCs over the past 50 years, see of UNCTAD (2021).

<sup>2</sup> The identification of LDCs is based on three LDC criteria: Gross national income (GNI) per capita, a human assets index (HAI) and an economic and environmental vulnerability index (EVI). HAI and EVI are composed of six and eight indicators respectively. Export concentration is one of the EVI indicators. For more information on the LDC criteria and the LDC identification process, see <http://bit.ly/CDP-LDCs> and CDP and UN DESA (2021).

identification of LDCs, a synthetic measure covering both product and market concentration is beneficial. In the context of LDC identification, export concentration is considered as just one dimension of vulnerability, equally weighted in the overall vulnerability index (EVI) with seven other dimensions related to economic and environmental shocks. Hence, the EVI consists of a relatively small set of indicators to capture key constraints to sustainable development in developing countries, creating space only for one indicator on export concentration. Therefore, CDP adopted for its 2024 triennial review a

refined export concentration measure that builds on the information on product concentration already used and adds to it information on market concentration. Thereby, the refined measure covers both dimensions of vulnerability stemming from undiversified export structures. The new measure allows for decomposing export concentration into product and market concentration for analytical purposes. This short paper briefly describes the methodology of this new index and presents some empirical results. It also presents an extension that covers both export and import concentration.

## 2. The Committee for Development Policy's refined export concentration index

It is possible to combine the two dimensions of export related vulnerability in different ways: we present here the refined export concentration index used by the CDP, which is a Theil index (Theil, 1972). Theil indices have been frequently used for measuring export product concentration, see in particular Cadot et al (2011) and subsequent literature. The main advantage of a Theil index compared to a Herfindahl-Hirschman index which has been used previously by CDP<sup>3</sup>, is the decomposability property of the Theil index. This allows to express export concentration as the sum of concentration in products and in markets, reflecting that the refined index to be used by CDP does not replace the concept of product concentration but rather keeps it and adds market concentration as complementary component. Unlike earlier literature using a Theil index for measuring export concentration, the refined indicator to be used by CDP considers each product/market combination as a separate flow rather than looking at products only.

Formally, there are  $n$  different (potential) products and  $m$  different (potential) markets these products are exported to from a given country, with  $X_{kj}$  denoting exports of product  $k$  to market  $j$ . Following Theil (1973), the export

concentration index for a given country at a certain point in time is given by:<sup>4</sup>

$$T = \frac{1}{n \times m} \sum_{k=1}^n \sum_{j=1}^m \left( \frac{X_{kj}}{\mu} \ln \left( \frac{X_{kj}}{\mu} \right) \right), \text{ with } \mu = \frac{1}{n \times m} \sum_{k=1}^n \sum_{j=1}^m X_{kj} \quad (1)$$

The index  $T$  can range between 0 (in case the same amount of each product to each market) and  $\ln(n \times m)$  (in case a country exports a single product to a single market.<sup>5</sup> For convenience and highlighting the decomposability, we define the share of product  $k$  in total exports and the share of market  $j$  in the exports of product  $k$  as:

$$x_k = \sum_{j=1}^m X_{kj} \times \left[ \sum_{k=1}^n \sum_{j=1}^m X_{kj} \right]^{-1}, \text{ and } x_{j,k} = X_{kj} \times \left[ \sum_{j=1}^m X_{kj} \right]^{-1} \quad (2)$$

With this notation and using the well-known decomposability property of the Theil index, we can decompose our export concentration index  $T$  into an export product concentration index  $T_p$  and an export market concentration index  $T_m$ , i.e.,  $T = T_p + T_m$ , with

$$T_p = \left( \sum_{k=1}^n x_k \times \ln x_k \right) + \ln n \quad (3)$$

<sup>3</sup> The Herfindahl-Hirschman index (HHI) measures concentration (in industries or in exports) as sum of the squares of individual shares. Following common practice, CDP used a normalized version of the HHI.

<sup>4</sup> As  $X_k$  can be zero and the natural logarithm of zero is undefined, we follow standard practice by utilizing that  $\lim_{x \rightarrow 0} (x \times \ln x) = 0$ .

<sup>5</sup> Formally,  $T$  is zero if all  $X_{kj}/\mu$  are equal to 1, which requires all  $X_{kj}$  being equal;  $T$  is equal to  $\ln(n \times m)$  if there is one product-market flow where  $X_{kj}/\mu$  is equal to  $n \times m$  while all other flows are zero.

$$T_M = \left( \sum_{k=1}^n x_k \times \sum_{j=1}^m x_{j,k} \ln(x_{j,k} \times m) \right) \quad (4)$$

Here,  $T_p$  is the ‘between’ component of standard Theil decompositions and equals the export product concentration index considered in Cadot et al (2011) and others. The second term,  $T_M$ , is the ‘within’ component of a Theil decomposition and equals the weighted sum of Theil indices

measuring the market concentration for each exported product, with shares of each product in total exports as weights. It should be noted that  $T_M$  is an aggregate measure for market concentration of individual products, rather than a measure of the market concentration of total exports.<sup>6</sup> To reduce the influence of short-term fluctuations, the CDP uses the average of the latest three years as its indicator.

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<sup>6</sup> The overall export concentration index  $T$  could also be decomposed into a ‘between’ component measuring the market concentration of total export and a ‘within’ component measuring the concentration of exported products to different markets. However, this approach is not further explored in this paper.



# 3. Empirical results

The indicator is calculated using data from the merchandise trade matrix from the United Nations Conference on Trade and Development (UNCTAD).<sup>7</sup> The trade matrix is also the source of the export concentration index previously used by CDP, the export product concentration index published by UNCTAD. It is based on the widely used United Nations COMTRADE database on merchandise trade which provides data on export and import values in dollar by partner and product while using data from the International Monetary Fund (IMF), the statistical office of the European Union (EUROSTAT) and UNCTAD as additional data sources. The trade matrix adjusts or complements source data when considered necessary and fills gaps in the absence of official data through estimates. Thereby, the trade matrix overcomes the problem of insufficient coverage of trade by LDCs and several other developing countries, a main weakness of COMTRADE.

The indicator uses the SITC (Revision 3) commodity classification at the three-digit level, hence  $n=259$ , and all available individual economies as partners, hence currently  $m=234$ .<sup>8</sup> Therefore, export concentration index scores can vary between zero (if a country exports the same amount in value terms of each product to each market) and  $\ln(n \times m) \approx 11.012$  (if a country exports only one product to one market), see also equations (3) and (4) above. While the indicator will be applied by CDP only to countries in

developing regions, we here calculate the index for all United Nations member States, except for Lichtenstein, Monaco and San Marino for which data is not available.

Table A1 in the annex shows the values of the refined export concentration index (see formula (1) above) for all United Nations member States, calculated from 2019-2021 trade data.<sup>9</sup> For analytical purposes, countries are color-coded according to their development status, separating countries into LDCs, other developing countries (ODCs) and developed countries (DVCs). Unsurprisingly, developed countries have the most diversified export patterns, with Italy being the most diversified exporter. However, among the ten most diversified countries, there are also two developing countries, Turkey (rank 2) and China (rank 5). The least diversified countries are typically LDCs, often those that are also landlocked or a small island development state. South Sudan, a landlocked LDC, has the highest concentration index, because in the 2019-2021 period, 88 per cent of its export were of a single product (crude oil) to a single market (China).

Comparing the two components of the refined export concentration index, i.e., the export product concentration index  $T_P$  and the export market concentration index  $T_M$ , shows that they are positively correlated, with a rank correlation of 0.565, in the 2019-2021 period.

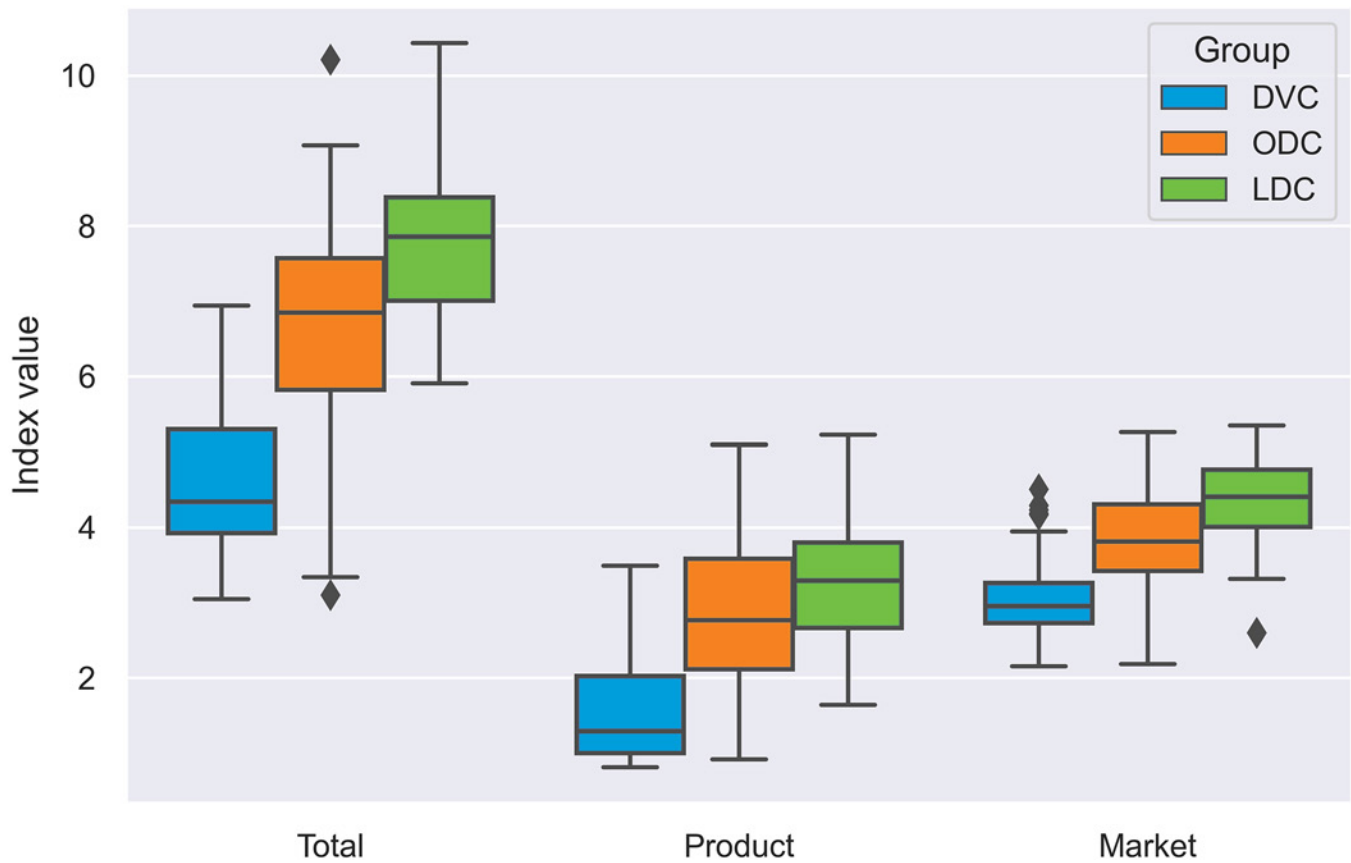
<sup>7</sup> See the data center at <https://unctadstat.unctad.org/>, under international merchandise trade, subfolder trade structure.

<sup>8</sup> Partners include not only United Nations member States, but also most other areas included in the United Nations Standard Country or Area Codes for Statistical Use, see the UNCTAD website for details.

<sup>9</sup> It should be acknowledged that the 2019-2021 period includes the COVID-19 pandemic that disrupted global trade flows. However, export concentration is quite stable over time. The correlation coefficient between the 2019-2021 and the pre-COVID 2016-2018 period is very high, with a correlation coefficient of 0.988. It would be worthwhile to further explore the impact of COVID-19 on export concentration in future research.

Figure 1

Total export concentration, export product concentration and export market concentration indices by country group, 2019-2021



Source: Own calculation, based on UNCTAD trade matrix, accessed 25 May 2023.

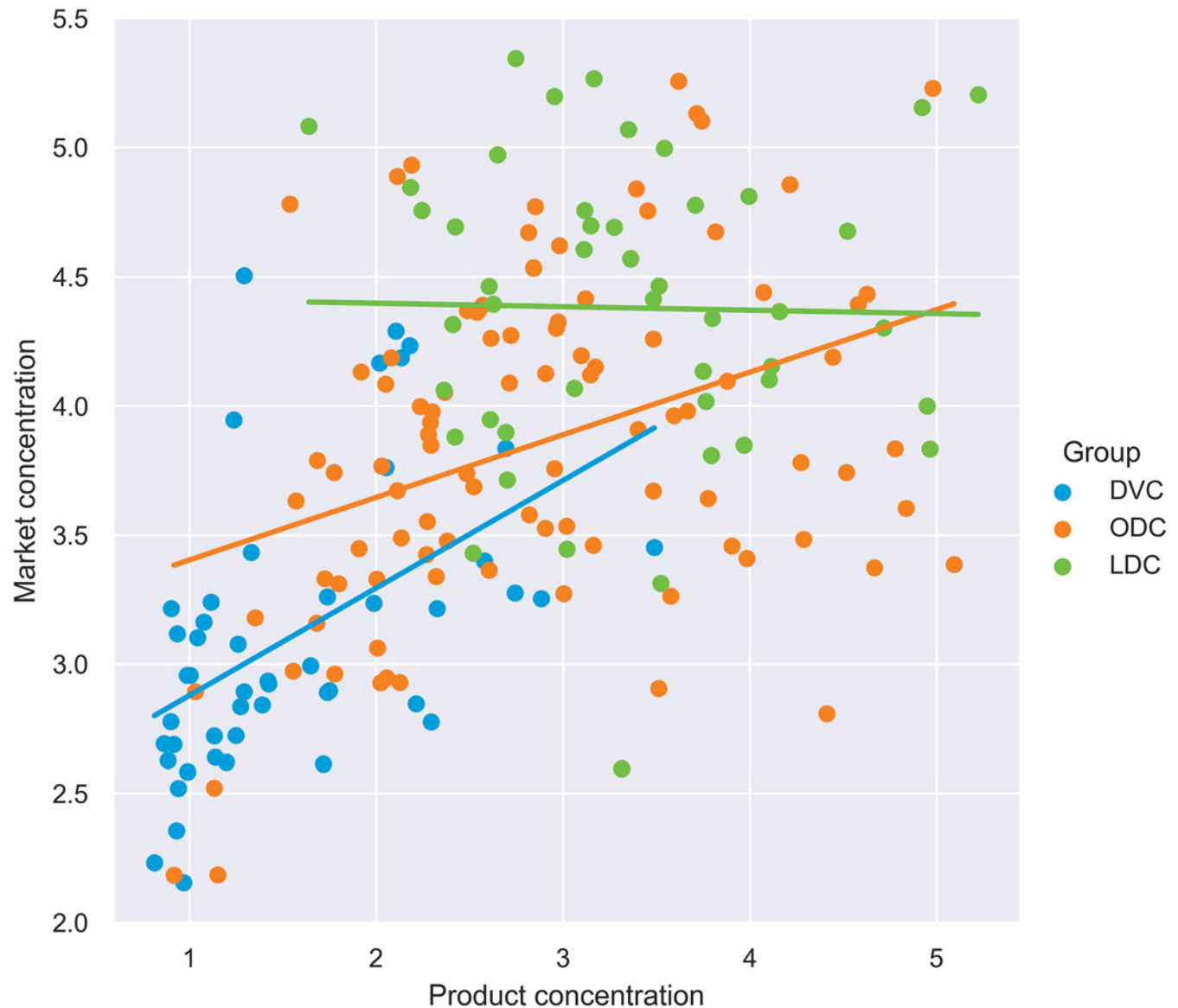
Figure 1 uses boxplots to illustrate the differences between country groups regarding their overall export concentration, export product concentration and export market concentration. Overall, developed countries are the most and LDCs the least diversified countries according to all three measures. In all three groups, export product concentration varies more than export market concentration. The range of values is largest for other developing countries, which is not only very diverse but also comprises the most countries of the three groups considered here.

The heterogeneity across countries is evident in figure 2, which shows the decomposition of export concentration into product and market concentration (based on 2019-2021 data) for all three country groups as a scatter plot, with group-specific linear regression lines added. While overall both components are positively correlated, these correlations are markedly different across country groups. Notably, for LDCs export product and export market concentration appear even uncorrelated.<sup>10</sup> The lack of correlation between product and market concentration for LDCs further

<sup>10</sup> The correlation coefficient is -.019 and hence insignificantly different from zero at any sensible significance level. The correlation coefficients for developed countries and other developing countries are 0.491 and 0.369, respectively, and hence positive even at very stringent significance levels.

Figure 2

Export product concentration and export market concentration, 2019-2021



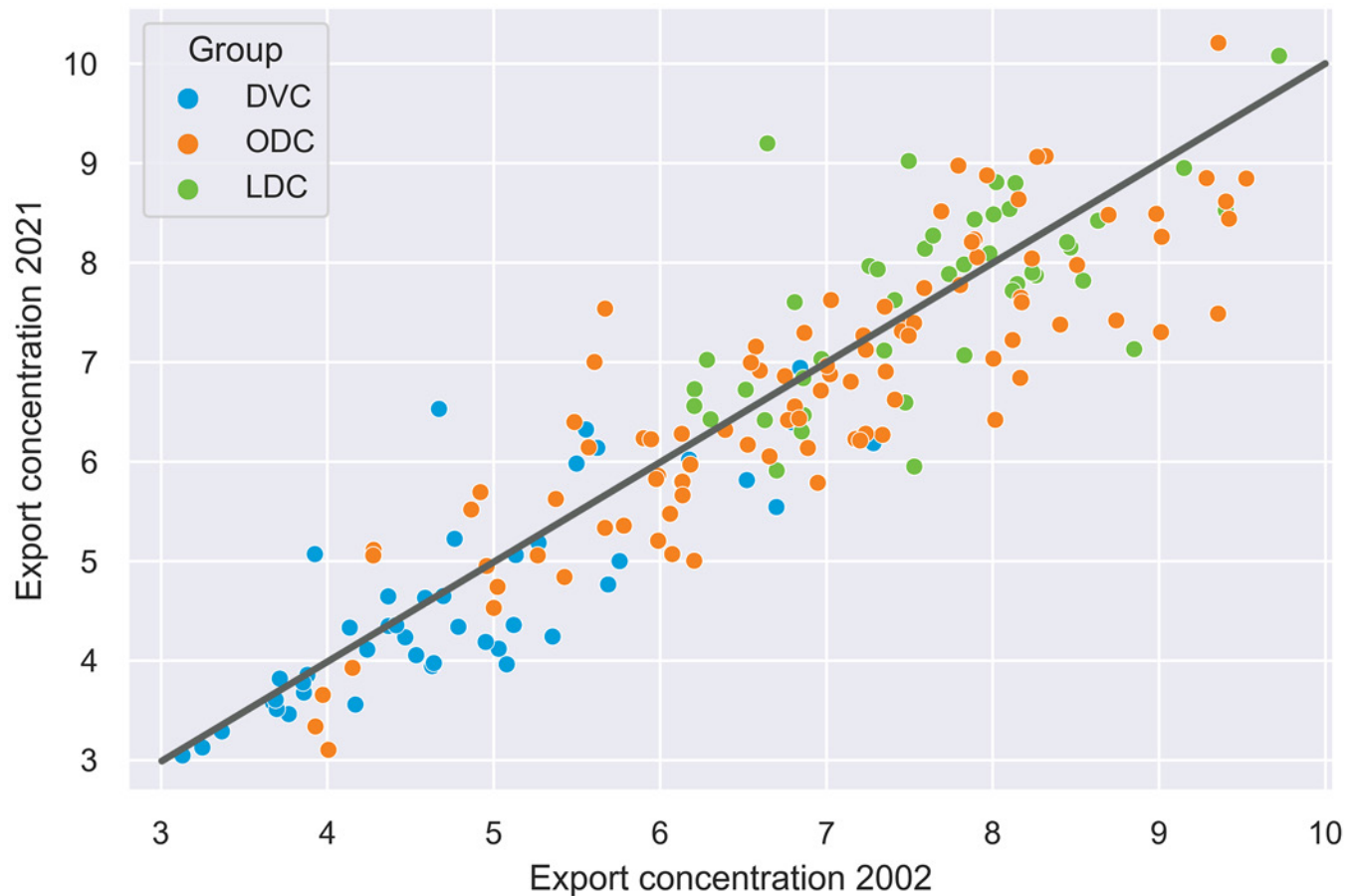
Source: Own calculation, based on UNCTAD trade matrix, accessed 25 May 2023.

underscores the benefits of combining these two dimensions of vulnerabilities resulting from export concentration into a single indicator. A measure of export product concentration does not contain information on export market concentration. Further inspection reveals that some oil exporting LDCs such as Angola or Chad combine very high product concentration with average (for an LDC) market concentration. Hence, while these countries are very vulnerable to external demand shocks affecting global

oil markets (as well as to domestic sector-specific supply shocks), adding export market concentration only moderately increases their overall export concentration. Nevertheless, they are among the most vulnerable countries, with the 177th (Chad) and 180th (Angola) highest export concentration index values, out of 190 countries. Bangladesh has an export product concentration that is medium for an LDC due to the dominance of garment exports, but its export market concentration is low for an LDC

Figure 3

Export concentration, 2000-2002 and 2019-2021



Source: Own calculation, based on UNCTAD trade matrix, accessed 25 May 2023.

as Bangladesh serves a wide range of markets.<sup>11</sup> However, LDCs such as Djibouti or Nepal are far more vulnerable to shocks affecting their main markets than to product-specific shocks. While both countries export a relatively large basket of goods, most of the goods are exported to their dominant markets, i.e., Ethiopia in case of Djibouti and India in case of Nepal. Hence, while product concentration contributes relatively little to their overall export concentration index, market concentration is a significant risk factor.

Figure 3 plots export concentration in the 2019-2021 period against the 2000-2002 period to show progress over time.<sup>12</sup> Generally, export concentration index values are relatively stable over time, demonstrating that diversification is a medium- to long-term process and often difficult to achieve. While developed and other developing countries saw on average a slight decline in export concentration, LDCs on average a slight increase. Worryingly, this could indicate that LDCs as a group are falling further behind other

<sup>11</sup> It should be acknowledged, though, that in international trade statistics each member of the European Union, which is collectively the largest markets for Bangladesh garments, is regarded as a separate market.

<sup>12</sup> It should be noted that the number of countries has slightly increased since the year 2000 due to the independence of Timor-Leste, Montenegro, and South Sudan, and the dissolution of the Netherlands Antilles during this period. Impacts of this increase in countries varies depending on actual export patterns but are very marginal in all cases.

countries in economic diversification. However, further work would be needed to analyse the group- and country-specific trends in export concentration.

The figure also reveals that there is also substantial heterogeneity within each group. Among LDCs, Burkina Faso experienced the largest increase and Cambodia and Central African Republic the largest declines in export concentration. It should be emphasized that a change in export concentration can be associated both with a trade expansion and with a trade decline. Burkina Faso, for example, observed over the twenty-year period a rapid increase in exports, both in absolute terms and relative to world trade average. As this was driven primarily by a single commodity, gold, the export boom also increased vulnerability by increasing concentration both in terms of products (as gold dominates exports even more than the previously

largest product, i.e., cotton) and markets (as most gold is exported to Switzerland, and to a lesser amount, India). Central African Republic, however, experienced a decline in exports as the exports of its leading product in the early 2000s, diamonds, declined. Cambodia exemplifies how expanding trade can be associated with increased diversification. Both product and market concentration declined since the 2000s. Export growth since the early 2000s was primarily driven by increasing the range of low-technology manufacturing products and by serving a wider set of markets for these products. It should be noted that Cambodia's export concentration slightly increased since 2019. The rapid growth in exports of natural rubber, cashew nuts and gold increased overall export product concentration. Therefore, unlike during 2013-2019, it is no longer the most diversified LDC, though it remains the second most, only slightly behind Bangladesh.

## 4. Extension: import and overall trade concentration indices

Recent shocks such as the COVID-19 pandemic and the war in Ukraine have also reemphasized the interest in import diversification as means to reduce vulnerability to external shocks. Denoting imports of product  $k$  from market  $j$  as  $Y_{kj}$  we can define an import concentration measure in the same way as export concentration, i.e.,

$$V = \frac{1}{n \times m} \sum_{k=1}^n \sum_{j=1}^m \left( \frac{Y_{kj}}{\varphi} \ln \left( \frac{Y_{kj}}{\varphi} \right) \right), \text{ with } \varphi = \frac{1}{n \times m} \sum_{k=1}^n \sum_{j=1}^m Y_{kj} \quad (5)$$

Figure 4 shows export and import concentration in the 2019-2021 period as scatter plot. Export and import concentration are positively correlated, with an overall correlation coefficient of 0.66.

Developed countries have, in general, the least concentrated import structure and LDCs the most concentrated. This underscores that both exports and imports contribute to the overall heightened vulnerabilities of developing countries, particularly LDCs. However, it also shows that export concentration contributes more to overall trade concentration than import concentration, again particularly for LDCs.

It is also possible to construct a trade concentration index covering both exports and

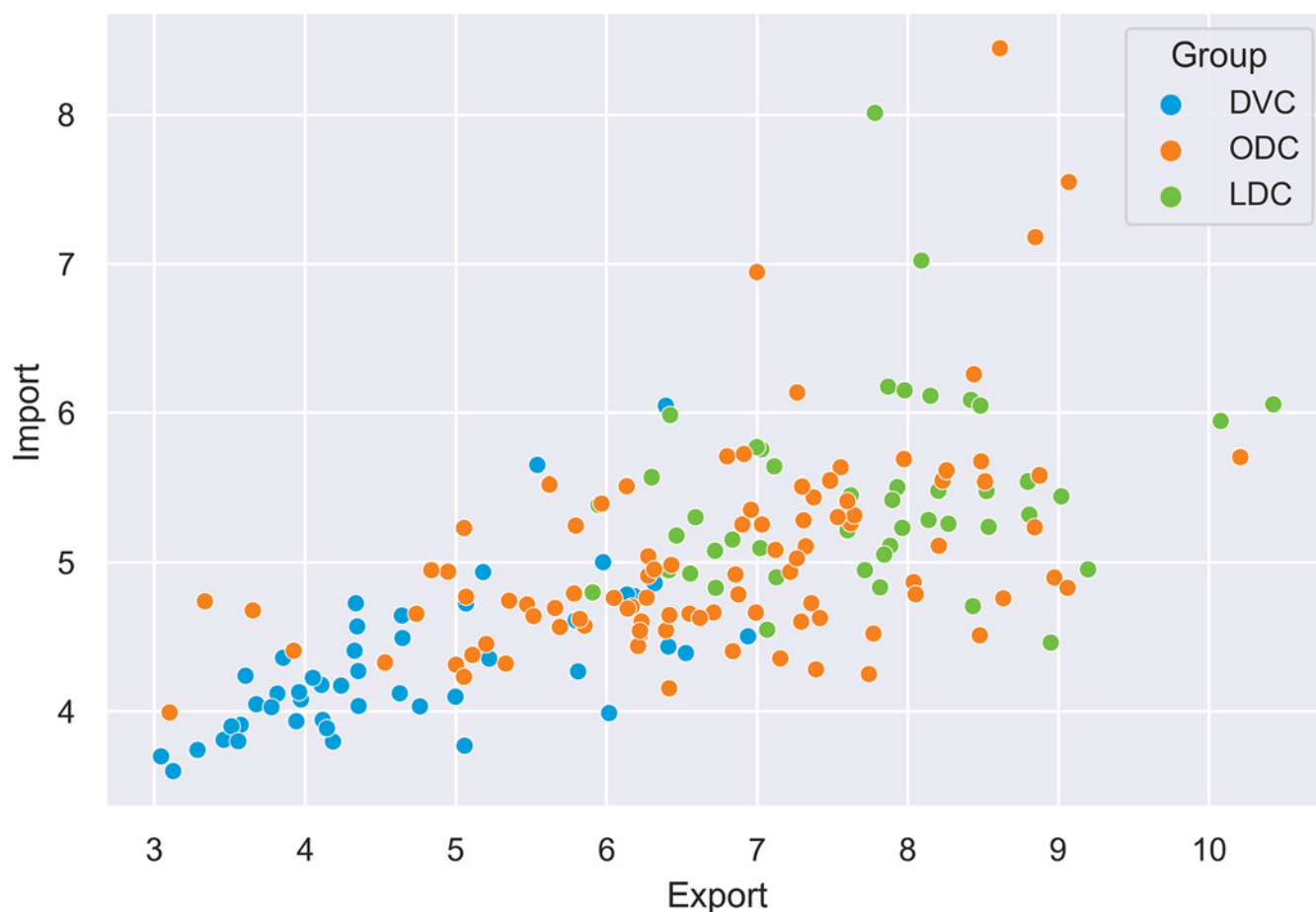
imports by using each product/market/flow triple as separate flow. Such an index might be of interest in case both export and import concentration are relevant but there is space for only one single indicator on trade concentration. Due to the decomposability property of the Theil index, denoting total exports of a country as  $X$  and total imports as  $Y$ , such measure  $W$  can be written as

$$W = \left( \frac{X}{X+Y} \times T \right) + \left( \frac{Y}{X+Y} \times V \right) + \left( \frac{X}{X+Y} \ln \left( \frac{X}{X+Y} \right) + \frac{Y}{X+Y} \ln \left( \frac{Y}{X+Y} \right) + \ln 2 \right) \quad (6)$$

Hence, the combined trade concentration measure is the weighted sum (with the shares of exports and imports in total trade as weights) of the export and import concentration indices as defined in equations (1) and (5), plus a measure for any imbalance between exports and imports. The weighted sum of export and import concentration corresponds to the ‘within’ component of a Theil decomposition, whereas the imbalance term corresponds to the ‘between’ component. However, in this case the ‘between’

Figure 4

# Export and import concentration, 2019-2021



Source: Own calculation, based on UNCTAD trade matrix, accessed 25 May 2023.

component is much smaller than the (within) export and import concentration measures. It can range between 0 (in case exports equal imports) and (in a case a country has either no merchandise exports or no imports).

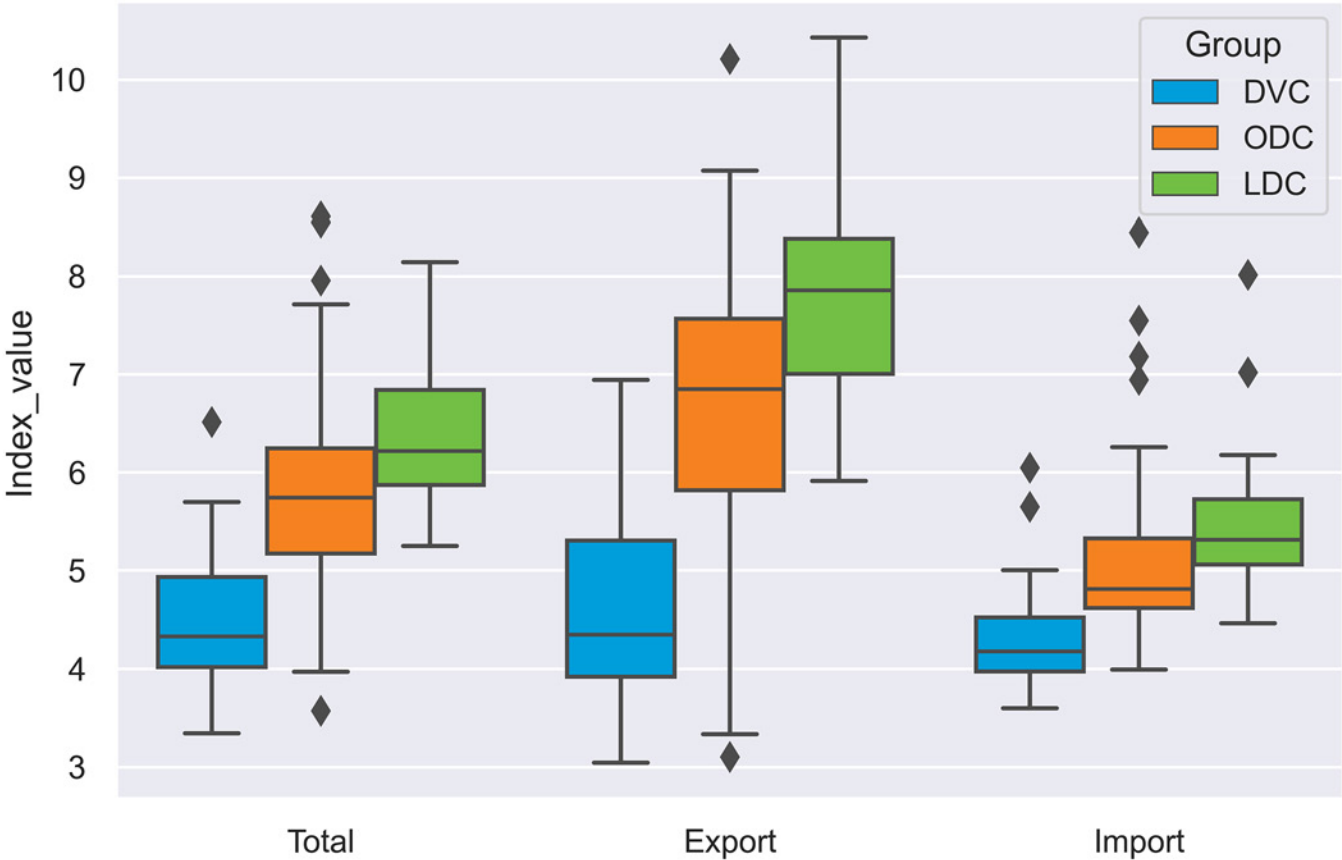
Figure 5 shows the distribution of such overall trade concentration measure  $W$  alongside the distribution of export concentration  $T$  and import

concentration  $V$  by country groups. The figure confirms that developed countries have the most diversified trade patterns, and LDCs the most concentrated patterns. The figure also reveals that the differences between country groups are far less pronounced for import than export concentration. Hence, total trade concentration is also more compressed than export concentration.



Figure 5

Total trade, export and import concentration, 2019-2021



Source: Own calculation, based on UNCTAD trade matrix, accessed 25 May 2023.



# 5. Conclusion and future work

The refined export concentration index recently adopted by CDP within its EVI covers both concentration in exported products as well as in export markets. Therefore, it better aligns CDP's measurement of export concentration as impediment to sustainable development with its policy recommendation to LDCs and their development and trading partners. This short paper revealed that LDCs' exports are more concentrated than other developing countries' and developed countries' exports. Hence, the refined index better reflects a key characteristic of LDCs: Due to their narrow export baskets, they are vulnerable to shocks affecting specific product markets as well as to shocks affecting to shocks affecting specific importing countries. The paper also highlighted important heterogeneities among LDCs and other country groups.

In future work, the refined export concentration index could be utilized for more in-depth analysis of export concentration by further harnessing its decomposability property. For

example, the overall export concentration index could be broken down by broader product categories, performing appropriate multi-level decompositions of the Theil index.<sup>13</sup> This would allow to explore whether a reduction in export concentration is due to diversification within broad categories (such as natural resource or low-skill manufacturing) or associated with structural transformation towards sectors producing products that require higher skilled labour. Moreover, deeper analytical work could also further explore the relationship between export concentration and other trade-related vulnerabilities such as volatility of export earnings. Finally, it would be very beneficial to further expand the index to cover both goods and services exports. However, such work would require overcoming both empirical barriers caused by the limited availability of services exports broken down by appropriate sub-category and trading partner, and conceptual barriers, caused by different and at least partially incompatible classifications for merchandise and services trade.

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<sup>13</sup> For an application of such decompositions in the analysis of income inequality, see for example Hoffmeister (2009).

# References

- Cadot, Olivier, Céline Carrè, and Vanessa Strauss-Kahn (2011). Export diversification: What's behind the hump? *The Review of Economics and Statistics*, 93 (2), pp. 590-605.
- Committee for Development Planning Working Group (1970). Special measures to be taken in favour of the least developed among developing countries. Report of a Working Group of the Committee for Development Planning. *Economic and Social Council, E/AC.54/L.36*.
- Committee for Development Policy and United Nations Department of Economic and Social Affairs (2021). *Handbook on the least developed country category: Inclusion, graduation and special support measures. Fourth edition*. United Nations publication, Sales No. E.18.II.A.1.
- Hausman, Ricardo, Jason Hwang and Dani Rodrik. What you export matters. *Journal of Economic Growth*, 12, pp. 1-25.
- Hoffmeister, Onno (2009). The spatial structure of income inequality in the enlarged EU. *The Review of Income and Wealth*, (55), pp. 101-127.
- Hummels, David, and Peter J. Klenow (2005). The Variety and Quality of a Nation's Exports. *American Economic Review*, 95 (3), pp. 704-723.
- Melitz, Marc (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica*, 71 (6), pp. 1695-1725.
- Theil, Henri (1972). *Statistical Decomposition Analysis*. Amsterdam: North Holland.
- United Nations Conference on Trade and Development (2021). *The least developed countries in the post-COVID world: Learning from 50 years of experience. The Least Developed Country Report 2021*. Geneva: United Nations.

## Annex

## Export concentration index T, 2019-2021 average

RANK	COUNTRY	T
1	Italy	3.045
2	Turkey	3.102
3	Germany	3.125
4	France	3.287
5	China	3.336
6	Spain	3.461
7	Netherlands	3.512
8	Poland	3.557
9	Denmark	3.574
10	United States of America	3.605
11	India	3.653
12	Austria	3.677
13	Sweden	3.778
14	United Kingdom	3.817
15	Belgium	3.855
16	Thailand	3.925
17	Bulgaria	3.943
18	Lithuania	3.961
19	Hungary	3.973
20	Portugal	4.053
21	Czechia	4.109
22	Croatia	4.118
23	Serbia	4.146
24	Romania	4.186
25	Finland	4.232
26	Latvia	4.240
27	Greece	4.329
28	Luxembourg	4.338
29	Japan	4.346
30	Slovenia	4.354
31	Estonia	4.356
32	Egypt	4.528
33	Indonesia	4.531
34	Ukraine	4.629
35	Republic of Korea	4.643
36	Slovakia	4.647
37	Malaysia	4.740
38	Bosnia and Herzegovina	4.763
39	Viet Nam	4.839
40	Singapore	4.949
41	Israel	4.999
42	United Arab Emirates	5.002
43	South Africa	5.056
44	Pakistan	5.056
45	Russian Federation	5.060
46	Sri Lanka	5.069
47	Switzerland, Liechtenstein	5.069
48	Brazil	5.111
49	Belarus	5.182
50	Tunisia	5.203
51	New Zealand	5.222
52	Morocco	5.333
53	Kenya	5.355
54	Guatemala	5.474
55	Lebanon	5.517
56	Malta	5.542
57	Panama	5.623
58	Philippines	5.660
59	Argentina	5.692
60	Mauritius	5.786
61	Canada	5.797
62	Barbados	5.797
63	Moldova, Republic of	5.813
64	Costa Rica	5.824

RANK	COUNTRY	T
65	Colombia	5.856
66	Bangladesh	5.909
67	Cambodia	5.949
68	Bahrain	5.969
69	Ireland	5.979
70	Norway	6.019
71	El Salvador	6.051
72	Fiji	6.135
73	Cyprus	6.137
74	Uruguay	6.142
75	Georgia	6.168
76	Albania	6.184
77	Iran (Islamic Republic of)	6.210
78	Peru	6.223
79	Cuba	6.226
80	Jordan	6.234
81	Dominican Republic	6.268
82	Cote d'Ivoire	6.278
83	Honduras	6.278
84	Myanmar	6.301
85	Mexico	6.318
86	North Macedonia	6.321
87	Andorra	6.395
88	Chile	6.396
89	Montenegro	6.412
90	Madagascar	6.415
91	Saudi Arabia	6.417
92	Oman	6.419
93	Togo	6.424
94	Trinidad and Tobago	6.432
95	Ethiopia	6.466
96	Australia	6.528
97	Ecuador	6.552
98	Tanzania, United Republic of	6.557
99	Mozambique	6.592
100	Kazakhstan	6.621
101	Cameroon	6.712
102	Djibouti	6.721
103	Senegal	6.726
104	Namibia	6.802
105	Malawi	6.837
106	Qatar	6.840
107	Nicaragua	6.858
108	Armenia	6.877
109	Belize	6.903
110	Eswatini	6.913
111	Iceland	6.941
112	Grenada	6.960
113	Uzbekistan	6.993
114	Timor-Leste	6.999
115	Dem. People's Rep. of Korea	7.000
116	Uganda	7.021
117	Nepal	7.029
118	Paraguay	7.033
119	Sierra Leone	7.068
120	Lao People's Dem. Rep.	7.115
121	Syrian Arab Republic	7.122
122	Central African Republic	7.129
123	Ghana	7.155
124	Nigeria	7.221
125	Papua New Guinea	7.265
126	Bahamas	7.267
127	Bolivia (Plurinational State of)	7.293
128	Tonga	7.300

RANK	COUNTRY	T
129	Jamaica	7.309
130	Dominica	7.324
131	Algeria	7.361
132	Saint Kitts and Nevis	7.376
133	Kuwait	7.392
134	Gabon	7.418
135	Samoa	7.486
136	Zimbabwe	7.536
137	Guyana	7.556
138	Tajikistan	7.600
139	Zambia	7.602
140	Gambia	7.622
141	Kyrgyzstan	7.623
142	Seychelles	7.646
143	Rwanda	7.716
144	Venezuela (Bolivarian Rep. of)	7.743
145	Azerbaijan	7.773
146	Liberia	7.783
147	Congo, Dem. Rep. of the	7.817
148	Sudan	7.844
149	Lesotho	7.871
150	Mauritania	7.884
151	Yemen	7.899
152	Benin	7.932
153	Afghanistan	7.965
154	Brunei Darussalam	7.975
155	Sao Tome and Principe	7.980
156	Libya	8.040
157	Maldives	8.054
158	Tuvalu	8.091
159	Burundi	8.139
160	Bhutan	8.152
161	Comoros	8.204
162	Saint Vincent and the Grenadines	8.207
163	Cabo Verde	8.232
164	Equatorial Guinea	8.258
165	Guinea	8.271
166	Haiti	8.420
167	Eritrea	8.433
168	Botswana	8.440
169	Iraq	8.479
170	Somalia	8.483
171	Antigua and Barbuda	8.489
172	Vanuatu	8.514
173	Kiribati	8.524
174	Niger	8.538
175	Marshall Islands	8.613
176	Congo	8.635
177	Chad	8.798
178	Solomon Islands	8.807
179	Palau	8.843
180	Saint Lucia	8.848
181	Mongolia	8.876
182	Angola	8.950
183	Suriname	8.974
184	Mali	9.020
185	Turkmenistan	9.062
186	Nauru	9.070
187	Burkina Faso	9.197
188	Guinea-Bissau	10.078
189	Micronesia (Federated States of)	10.208
190	South Sudan	10.427

