Supplementary Material
Finding a consensus towards global climate justice

August 28, 2024 – Link to most recent version

We estimate the revenues by country from six global taxes: a tax on wealth above $100 million, a small carbon tax, a higher minimum corporate income tax, a financial transaction tax, a tax on maritime fuel and one on aviation fuel. $2.1 trillion would be collected. We further estimate international transfers that could be financed. Namely, we reallocate 1% of each country's GNI to all countries in proportion to their population, and one half of the wealth tax to countries with a per capita GNI lower than twice the world average, in proportion to their distance to this threshold. The combination of these taxes and transfers entail $766 billion in North–South transfers.

Figure 1: International transfers to be financed by new global taxes.

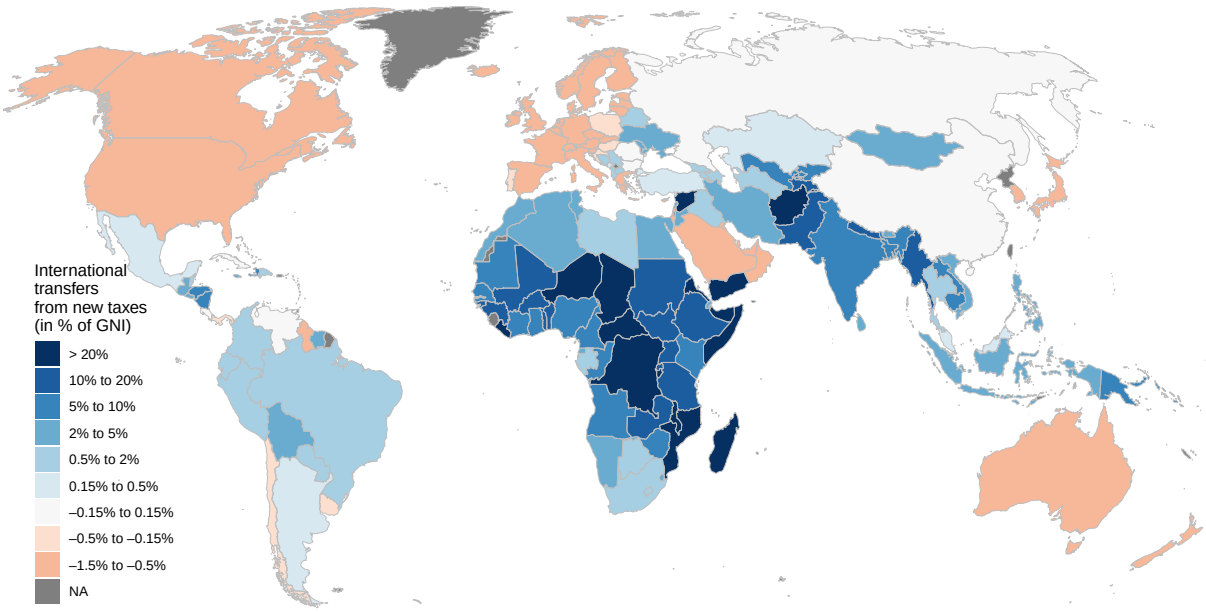

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Table 1: Global taxes: international transfers, budget gain, revenues collected (% of GNI).

	Int'l transfers	Budget gain	Wealth Tax(3% >100M)	Financ. Transac. Tax	Carbon Tax (10$/t)	Maritime fuel tax (100$/t)	Aviation fuel tax (300$/t)	Corporate inc. tax (min 21%)
World	0.0	2.0	0.72	0.32	0.33	0.10	0.22	0.28
Afghanistan	47.6	49.8	0.29	0.58	0.88	0.01	0.42	0.00
DRC	24.4	25.2	0.32	0.13	0.10	0.11	0.10	0.00
Sudan	16.8	18.4	0.34	0.40	0.47	0.05	0.32	0.00
Uganda	16.3	17.3	0.34	0.20	0.15	0.01	0.33	0.00
Myanmar	15.8	17.3	0.36	0.51	0.35	0.04	0.25	0.00
Ethiopia	14.7	15.8	0.35	0.14	0.12	0.00	0.45	0.00
Tanzania	13.1	14.2	0.36	0.22	0.20	0.02	0.26	0.00
Pakistan	11.3	12.4	0.02	0.35	0.49	0.04	0.18	0.00
Nigeria	7.8	9.0	0.10	0.24	0.34	0.35	0.09	0.00
Kenya	7.3	8.5	0.39	0.15	0.18	0.02	0.42	0.00
India	6.3	8.7	1.26	0.26	0.61	0.05	0.17	0.01
Bangladesh	5.9	6.4	0.03	0.13	0.17	0.02	0.08	0.00
Morocco	4.1	5.9	0.44	0.23	0.49	0.18	0.46	0.00
Vietnam	3.8	5.0	0.01	0.17	0.50	0.11	0.41	0.00
Egypt	3.5	5.2	0.44	0.29	0.63	0.07	0.20	0.00
Philippines	3.3	4.4	0.28	0.19	0.22	0.03	0.37	0.00
Iran	3.0	6.1	0.45	0.37	1.63	0.39	0.22	0.00
Ukraine	3.0	5.1	0.46	0.21	0.98	0.30	0.19	0.00
Indonesia	2.9	4.4	0.25	0.23	0.45	0.23	0.32	0.04
Algeria	2.5	4.3	0.46	0.26	0.72	0.18	0.14	0.00
Iraq	1.8	5.1	0.47	0.33	1.00	1.34	0.09	0.00
Thailand	1.6	4.0	0.49	0.25	0.61	0.20	0.79	0.00
Colombia	1.6	3.2	0.49	0.20	0.24	0.36	0.30	0.00
South Africa	1.6	5.0	0.33	0.19	1.12	0.53	0.38	0.83
Brazil	0.8	2.9	0.60	0.17	0.29	0.57	0.23	0.24
Turkey	0.5	1.8	0.13	0.24	0.45	0.10	0.37	0.00
Mexico	0.2	1.5	0.59	0.17	0.30	0.05	0.22	0.03
Argentina	0.2	1.6	0.54	0.15	0.35	0.18	0.23	0.01
China	-0.1	1.9	1.06	0.10	0.58	0.05	0.15	0.12
Russia	-0.1	2.1	0.87	0.18	0.79	0.16	0.24	0.00
Poland	-0.2	1.3	0.11	0.16	0.44	0.07	0.10	0.59
Saudi Arabia	-0.6	1.0	0.11	0.15	0.59	0.52	0.25	0.00
Spain	-0.6	0.7	0.24	0.22	0.14	0.06	0.37	0.34
Japan	-0.7	0.6	0.22	0.40	0.23	0.05	0.14	0.28
South Korea	-0.7	0.8	0.31	0.11	0.30	0.16	0.20	0.38
Italy	-0.8	0.3	0.35	0.17	0.13	0.04	0.15	0.22
United Kingdom	-0.8	2.8	0.25	2.36	0.12	0.04	0.28	0.55
Germany	-1.0	0.6	0.50	0.22	0.16	0.06	0.15	0.44
Canada	-1.0	1.2	0.59	0.09	0.27	0.08	0.26	0.92
France	-1.1	0.8	0.80	0.33	0.10	0.02	0.20	0.40
United States	-1.3	0.7	0.90	0.27	0.19	0.03	0.21	0.34

Note: Budget gain denotes the sum of all other columns: international transfer and revenues collected.

Table 2: Comparison of population vs. adult pop. entitlement; carbon balance (% of GNI).

	Int'l transfers (population)	Int'l transfers (adult)	Budget gain (population)	Budget gain (adult)	Annualized carbon balance 1850-2024	Annualized carbon balance 1990-2024
Afghanistan	47.6	43.4	49.8	45.6	264.9	166.2
DRC	24.4	21.7	25.2	22.4	139.5	95.2
Sudan	16.8	15.6	18.4	17.2	96.2	65.3
Uganda	16.3	14.6	17.3	15.6	87.0	61.4
Myanmar	15.8	16.2	17.3	17.7	130.2	69.9
Ethiopia	14.7	13.7	15.8	14.8	88.0	58.1
Tanzania	13.1	11.9	14.2	12.9	75.1	52.0
Pakistan	11.3	10.7	12.4	11.8	60.9	39.3
Nigeria	7.8	7.1	9.0	8.2	47.4	30.1
Kenya	7.3	6.9	8.5	8.1	42.3	30.1
India	6.3	6.4	8.7	8.8	43.3	22.7
Bangladesh	5.9	6.0	6.4	6.4	44.5	26.2
Morocco	4.1	4.1	5.9	5.9	30.0	15.2
Vietnam	3.8	4.0	5.0	5.2	27.6	14.0
Egypt	3.5	3.4	5.2	5.1	19.1	10.0
Philippines	3.3	3.3	4.4	4.4	22.5	14.2
Iran	3.0	3.1	6.1	6.2	-6.0	-9.6
Ukraine	3.0	3.2	5.1	5.4	-47.4	-13.9
Indonesia	2.9	2.9	4.4	4.5	20.0	9.9
Algeria	2.5	2.5	4.3	4.3	10.3	3.9
Iraq	1.8	1.7	5.1	4.9	2.5	0.1
Thailand	1.6	1.8	4.0	4.1	10.1	1.9
Colombia	1.6	1.7	3.2	3.3	13.2	7.7
South Africa	1.6	1.6	5.0	5.0	-17.3	-10.3
Brazil	0.8	0.9	2.9	3.0	9.4	4.7
Turkey	0.5	0.5	1.8	1.8	3.6	0.3
Mexico	0.2	0.2	1.5	1.5	1.2	0.5
Argentina	0.2	0.2	1.6	1.6	1.9	0.3
China	-0.1	-0.1	1.9	2.0	3.8	-1.3
Russia	-0.1	-0.1	2.1	2.1	-22.9	-11.5
Poland	-0.2	-0.2	1.3	1.3	-13.7	-5.2
Saudi Arabia	-0.6	-0.6	1.0	1.0	-6.2	-5.6
Spain	-0.6	-0.6	0.7	0.7	-0.5	-1.2
Japan	-0.7	-0.7	0.6	0.6	-3.9	-3.1
South Korea	-0.7	-0.7	0.8	0.8	-2.5	-3.7
Italy	-0.8	-0.8	0.3	0.3	-1.3	-1.5
United Kingdom	-0.8	-0.8	2.8	2.8	-10.5	-1.6
Germany	-1.0	-1.0	0.6	0.6	-9.6	-2.6
Canada	-1.0	-1.0	1.2	1.2	-7.9	-4.3
France	-1.1	-1.1	0.8	0.8	-3.5	-0.7
United States	-1.3	-1.3	0.7	0.7	-9.2	-3.5

Note: Budget gain denotes the country net entitlements, i.e. the revenue it collects plus the net international transfer. International transfers denotes the country net entitlements minus taxes paid in the country. The carbon balance is separated from the tax proposals, it corresponds to the carbon credit or debt over 1850–2024 (or 1990–2024), priced at \$185/tCO_2 and annualized at 3.5%. For example, a country with excess emissions compared to the world average accumulates a carbon debt.

1 Tax on ultra-high wealth

We simulate a 3% tax on all individual wealth in excess of $100 million. For example, with a wealth of $150 million, someone would pay each year a 1% tax on their wealth ($3\% \cdot (150 - 100) = 1.5M$).

The World Inequality Lab offers an online simulator to estimate the revenue collected by a custom wealth tax in each world region. Building on this work, we disaggregate the revenue estimates at the country level. Courtesy of Félix Bajard, we obtained the simulator's underlying data for 50 countries covering 95% of global wealth tax revenue. To impute missing data, we predict the taxable base from a linear regression of the log of taxable base on the log of nominal GDP per capita, weighted by country population.

Following Zucman (2024), we assume 20% of tax evasion. We also conservatively assume that asset prices would decline by 10%. Half of the revenue from the global wealth tax would not be retained domestically but channeled into a fund to finance sustainable development. This fund would return revenues to countries with a per capita GNI below a threshold. We fix this eligibility threshold at twice the world average per capita GNI, or $26,885 per year (in nominal terms). Finally, eligible countries receive a transfer per person proportional to the difference between the threshold and their GNI per capita.

2 Financial Transactions Tax

Pekanov & Schratzenstaller (2019) estimate the revenues from a Financial Transactions Tax (FTT). Following the proposal by the European Commission (2011), they use a rate of 0.1% of bonds and stocks and a rate of 0.01% on derivatives. We use their baseline scenario, which assumes evasion rates of 15% on bonds and stocks and 70% on derivatives, together with an elasticity of trading volumes of -1.[1]

Pekanov & Schratzenstaller (2019) provide estimates at the global level and for 18 high-income countries. We allocate the global revenue that does not originate from these 18 countries to remaining countries, in proportion to their GDP. 22% of world revenues would be collected in these remaining countries, with a revenue amounting to 0.1% of their GDP (vs. 0.56% of GDP for the 18 high-income countries).

3 Carbon price

We model simulate the international transfers a $\$100/tCO_2$ carbon price applied to all non-LULUCF CO_2 emissions. At the global level, and neglecting behavioral responses, 0.33% of the world nominal GDP would be collected.

[1] The formula is: $\text{Revenue} = \text{tax rate} \cdot \text{volume} \cdot \text{evasion} \cdot (1 + \text{tax rate}/\text{transaction cost})^{\text{elasticity}}$.

4 Maritime fuel levy

We simulate the revenues of a \$100/tCO$_2$ levy on maritime fuel. The emissions from shipping by country are given by the simple average between the minimum and maximum estimates of Dequiedt et al. (2024), who graciously provided the data.

5 Aviation fuel levy

Using data from Graver et al. (2018),[2] we estimate the revenues from a tax on all flights (domestic and international). Due to complex climate effects such as contrails, aviation the global warming potential of aviation (GWP*$_{100}$) is 3 times the warming caused by its CO$_2$ emissions (Lee et al. 2021). To fully account for all effects on global warming, the carbon levy on aviation should be multiplied by that factor. Therefore, we simulate a \$300/tCO$_2$ tax on aviation fuel, comparable to the \$100/tCO$_2$ tax on maritime fuel. We use the 2018 data without adjusting for the expected increase in air traffic, and without adjusting for the decrease in traffic that would follow the tax.[3]

6 Higher minimum corporate income tax

We estimate extra revenue by country if the internationally agreed minimum rate on corporate income tax was raised from 15% to 21%, with no carve-out. We use data from the tax deficit simulator from the EU Tax Observatory. These estimates are available for 45 countries (from OECD and the G20). We impute missing data only for three high-income countries (Iceland, Israel, New Zealand) and conservatively assume no extra revenue for other (developing) countries with missing data.

7 Carbon balance

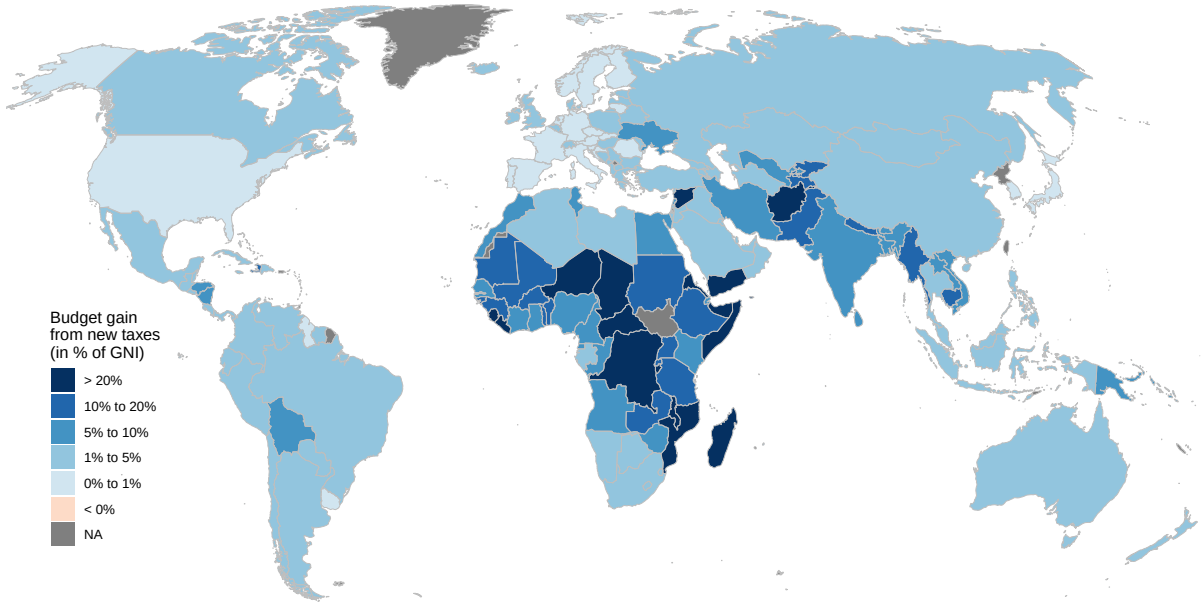
On top of the proposed new taxes, we compute historical responsibilites for climate change. We define a carbon balance as the sum of a country's excess emissions compared to the world average, each year between 1850 and 2024, priced at $p = \$185/\text{tCO}_2$ (which corresponds to the social cost of carbon according to Rennert et al. 2022). In Table 2, we report the carbon balance annualized at a risk-adjusted discount rate of $r = 3.5\%$. Denoting e_t^c the emissions of country c in year t, and π_t^c its share of the world population at t, its annualized carbon balance over nominal GNI, B_c, is: $B_c = r \cdot p \cdot \sum_{t=1850}^{2024} e_t^c - \pi_t^c \cdot \sum_c e_t^c / \text{GNI}_c^{2023}$. Our computations are based on historical CO$_2$ emissions excluding LULUCF sector (Gütschow et al. 2021).

[2] We use the data unadjusted for tourism.

[3] More generally, we do not adjust for inflation or changes in volumes throughout this technical note. Figures are only provided to get ballpark estimates and cannot be very precise.

Our figures are fully reproducible from our data and code, openly availably on github.com/bixiou/global_tax_attitudes/code_global/new_taxes.R.

Figure 2: Net gain for state budgets from new taxes and international transfers (revenue plus net transfer).



Bibliography

V. Dequiedt, A.-A. De Ubeda, & É. Mien. Navigating international taxation: The effects of a carbon levy on shipping. 2024. Link. 5

B. Graver, K. Zhang, & D. Rutherford. CO2 emissions from commercial aviation, 2018. 2018. 5

J. Gütschow, M. L. Jeffery, A. Günther, & M. Meinshausen. Country-resolved combined emission and socio-economic pathways based on the Representative Concentration Pathway (RCP) and Shared Socio-Economic Pathway (SSP) scenarios. *Earth System Science Data*, 2021. Link. 5

D. S. Lee, D. W. Fahey, A. Skowron, M. R. Allen, U. Burkhardt, Q. Chen, S. J. Doherty, S. Freeman, P. M. Forster, J. Fuglestvedt, A. Gettelman, R. R. De León, L. L. Lim, M. T. Lund, R. J. Millar, B. Owen, J. E. Penner, G. Pitari, M. J. Prather, R. Sausen, & L. J. Wilcox. The contribution of global aviation to anthropogenic climate forcing for 2000 to 2018. *Atmospheric Environment*, 2021. Link. 5

A. Pekanov & M. Schratzenstaller. A Global Financial Transaction Tax - Theory, Practice and Potential Revenues, 2019. Link. 4

K. Rennert, F. Errickson, B. C. Prest, L. Rennels, R. G. Newell, W. Pizer, C. Kingdon, J. Wingenroth, R. Cooke, B. Parthum, D. Smith, K. Cromar, D. Diaz, F. C. Moore, U. K. Müller, R. J. Plevin, A. E. Raftery, H. Ševčíková, H. Sheets, J. H. Stock, T. Tan, M. Watson, T. E. Wong, & D. Anthoff. Comprehensive evidence implies a higher social cost of CO2. *Nature*, 2022. Link. 5

G. Zucman. A blueprint for a coordinated minimum effective taxation standard for ultra-high-net-worth individuals. 2024. 4