**APPENDIX to “Democracies Not in Peril” (*PS* 2025)**

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**Data: variables, sources, and descriptive statistics**

The first source of data, following *Democracies in Peril*, is World Bank, *World Development Indicators* (*WDI*). It is available online at <https://databank.worldbank.org/reports.aspx?source=world-development-indicators>.  The 2024 online version is used here. The second source of data for fiscal variables is the Government Revenue Dataset, originally from the International Centre for Tax and Development (ICTD) at the Institute of Development Studies (IDS), Brighton, UK (ICTD 2015), later adopted and updated by UNU-WIDER (2018; the most recent version is now from 2023). Its sources, in turn, include: World Bank, *World Development Indicators* (various years, henceforth *WDI*); IMF, *Government Finance Statistics* (various issues, henceforth *GFS*) and IMF country reports, which include documents with published titles of *Statistical Appendix* or *Statistical Annex*, as well as staff reports included in periodic Article IV consultations or program reviews; OECD *Revenue Statistics*; publications of regional development banks such as the AfDB and UN-ECLAC; and national statistical agency publications. More details on its methods and sources can be found here: <http://www.ictd.ac/ju-download/2-working-papers/12-the-ictd-government-revenue-dataset> and here: <https://www.wider.unu.edu/about/government-revenue-dataset-grd> . The main criterion for choosing central-government or merged data from this set was to maximize the size of the series. Because all equations have unit fixed effects, the difference is not relevant.

The main analyses for this article restrict the data to 1990-2012 and exclude all country members of the OECD as of 1990.

**Variables**

**Goods and services tax revenue** is expressed as a percentage of GDP. In *WDI* the figure for such revenue is expressed as a percent of total revenue, so its conversion involves the *WDI* total revenue figure also. In the ICTD-UNU set it is expressed as a percent of GDP.

**Income tax revenue** in the *WDI* is taxes on income, profits, and capital gains, also in *WDI* as a percentage of total revenue, converted as above. In the ICTD-UNU data this figure adds revenue from the tax on individuals to the non-resource component of the tax on corporations, all as a percent of GDP.

**Trade tax revenue** in the *WDI* and ICTD-UNU sets is revenue from taxes on trade as a percent of GDP, using *WDI* revenue for the former as above.

**Total revenue** is revenue excluding grants as a percentage of GDP in *WDI*; it excludes grants and social contributions in the ICTD-UNU set.

**Polity Dem** is the “Polity2” variable from the Polity V data set (Marshall, Gurr, and Jaggers, 2020). It combines the Polity measures of autocracy and democracy, adding transitional values for error codes in several cases, to facilitate use in time-series analyses. It has a range of -10 to 10 with more democratic governments having higher scores.

**Fuel exports** are from World Bank, *World Development Indicators*, expressed as a percentage of merchandise exports.

**GDP per capita** comes from the Penn World Table 10.01 variable **rgdpe**, which isreal gross domestic product per capita in US dollars (Feenstra, Inklaar, and Timmer, 2015), divided by the population figures from the same source.

**Capital-account openness** is the normalized Chinn-Ito index (Chinn and Ito 2006), dated to 2023.

**Log Population** is the log(10) of total population from *WDI*.

**Table A.1. Same as Table 1, but with a time trend variable rather than year dummies.**

Consumption tax and income tax revenues as %GDP, WDI 2024 data, on trade tax revenue and Polity V democracy (Marshall, Gurr, and Jaggers 2020 “Polity 2”) after the *DiP* baseline model (*DiP* Table A.1, Eqs. 3 and 4). Log GDP per capita, fuel exports, and capital account openness (normalized Chinn-Ito index) as controls. OLS PCSE. No 1990 OECD, 1990-2012. All equations include unit dummies and a temporal trend variable.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) |
|  | Goods & Services tax rev | Goods & Services tax rev | Income tax revenues | Income tax revenues |
| Log10 GDP per | 0.735 | 0.768 | 5.616\*\*\* | 6.401\*\*\* |
| capita t-1 | (0.925) | (0.936) | (0.946) | (1.060) |
|  |  |  |  |  |
| Fuel exports | -0.002 | -0.002 | 0.018\*\*\* | 0.017\*\* |
| t-1 | (0.004) | (0.004) | (0.005) | (0.005) |
|  |  |  |  |  |
| Capital account | 0.377 | 0.377 | See note | -0.159 |
| openness, t-1 | (0.222) | (0.221) | below | (0.198) |
|  |  |  |  |  |
| **Trade tax rev** | -0.083 | -0.098 | 0.023 | -0.066 |
| **%GDP, t-1** | (0.043) | (0.067) | (0.029) | (0.044) |
|  |  |  |  |  |
| **Polity dem** | 0.001 | -0.003 | -0.017 | -0.020 |
| **t-1** | (0.017) | (0.020) | (0.011) | (0.014) |
|  |  |  |  |  |
| **Trade tax rev \*** |  | 0.002 |  | **0.013\*\*** |
| **Polity dem, t-1** |  | (0.007) |  | **(0.005)** |
|  |  |  |  |  |
| Observations | 1047 | 1047 | 1090 | 1053 |
| Units | 92 | 92 | 92 | 91 |
| Average#yrs | 11.4 | 11.4 | 11.8 | 11.6 |
| ChiSquared | 209316 | 429911 | 20690.2 | 55668 |
| Degrees of Frdm | 86 | 87 | 84 | 84 |
| Rsquared | 0.862 | 0.862 | 0.874 | 0.887 |

Standard errors in parentheses

\* *p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001

Equation 1, 99 coefficients; Equation 3, 96 coefficients

*Note:* The capital-account openness variable was omitted from Equation 3 because its inclusion produced a matrix that was not positive and definite.

**Table A.2. Same as Table 2, but with a time trend variable rather than year dummies.**

Consumption tax and income tax revenues as %GDP, ICTD 2018 fiscal data, on trade tax revenue and Polity V democracy (Marshall, Gurr, and Jaggers 2020 “Polity 2”) after the *DiP* baseline model (*DiP* Table A.1, Eqs. 3 and 4). Log GDP per capita (Penn World Table), fuel exports, and capital account openness (normalized Chinn-Ito index) as controls. OLS PCSE. No 1990 OECD, 1990-2012. All equations include unit dummies and a temporal trend variable.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) |
|  | Goods & Svcs tax rev | Goods & Svcs tax rev | Income tax revenues | Income tax revenues |
| Log10 GDP | -1.285\* | -1.293\* | 3.507\*\* | 3.508\*\* |
| per capita t-1 | (0.569) | (0.566) | (1.260) | (1.234) |
|  |  |  |  |  |
| Fuel exports | -0.001 | -0.001 | -0.000 | -0.001 |
| t-1 | (0.003) | (0.003) | (0.007) | (0.007) |
|  |  |  |  |  |
| Cap account | 0.237 | 0.235 | -0.245 | -0.237 |
| openness, t-1 | (0.174) | (0.174) | (0.233) | (0.234) |
|  |  |  |  |  |
| **Trade tax rev** | **-0.075\*\*\*** | -0.068 | 0.027 | 0.044 |
| **%GDP, t-1** | **(0.022)** | (0.044) | (0.024) | (0.060) |
|  |  |  |  |  |
| **Polity dem** | 0.015 | 0.017 | -0.002 | 0.004 |
| **t-1** | (0.012) | (0.017) | (0.014) | (0.021) |
|  |  |  |  |  |
| **Trade tax rev\*** |  | -0.001 |  | -0.003 |
| **Polity dem, t-1** |  | (0.005) |  | (0.007) |
|  |  |  |  |  |
| Obsvns | 1626 | 1626 | 1048 | 1048 |
| Units | 111 | 111 | 86 | 86 |
| Avg#yrs | 14.6 | 14.6 | 12.2 | 12.2 |
| ChiSq | 32244 | 3884866 | 103187 | 697250 |
| DF | 109 | 110 | 84 | 84 |
| Rsq | 0.930 | 0.930 | 0.850 | 0.851 |

Standard errors in parentheses

\* *p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001

Equation 1, 119 coefficients; Equation 3, 117 coefficients

**Table A.3. Same as Table 3, but with a time trend variable rather than year dummies.**

Consumption tax and income tax revenues as %GDP, WDI 2024 data, on trade tax revenue and Polity V democracy (Marshall, Gurr, and Jaggers 2020 “Polity 2”) after the *DiP* baseline model (*DiP* Table A.1, Eqs. 3 and 4), adjusted on the basis of information criteria (Tables A.4a, A.4b). Log GDP per capita, fuel exports, and capital account openness (normalized Chinn-Ito index) as controls. OLS PCSE. No members of the OECD as of 1990, years 1990-2012. All equations include unit dummies and a time trend variable.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) |
|  | Goods & Svcs tax rev | Goods & Svcs tax rev | Income tax revenues | Income tax revenues |
| Log10 GDP | -1.482 | -1.456 | 6.951\*\*\* | 7.237\*\*\* |
| per capita t-1 | (0.917) | (0.920) | (1.084) | (1.120) |
|  |  |  |  |  |
| Log10populatn | -11.001\*\*\* | -11.069\*\*\* | 3.475\* | 2.961\* |
| t-1 | (2.150) | (2.150) | (1.456) | (1.491) |
|  |  |  |  |  |
| Fuel exports |  |  | 0.015\*\* | 0.015\*\* |
| t-1 |  |  | (0.005) | (0.005) |
|  |  |  |  |  |
| Cap account | 0.537\*\* | 0.540\*\* | -0.181 | -0.171 |
| openness, t-1 | (0.200) | (0.200) | (0.195) | (0.198) |
|  |  |  |  |  |
| **Trade tax rev** | **-0.075\*** | -0.096 | 0.023 | -0.060 |
| **%GDP, t-1** | **(0.033)** | (0.060) | (0.028) | (0.044) |
|  |  |  |  |  |
| **Polity dem** | -0.013 | -0.019 | 0.005 | -0.019 |
| **t-1** | (0.015) | (0.017) | (0.011) | (0.014) |
|  |  |  |  |  |
| **Trade tax rev\*** |  | 0.003 |  | **0.012\*** |
| **Polity dem, t-1** |  | (0.006) |  | **(0.005)** |
|  |  |  |  |  |
| Obsvns | 1249 | 1249 | 1050 | 1050 |
| Units | 95 | 95 | 90 | 90 |
| Avg#yrs | 13.1 | 13.1 | 11.7 | 11.7 |
| ChiSq | 26734 | 58625 | 22533 | 50653 |
| DF | 89 | 90 | 83 | 84 |
| Rsq | 0.838 | 0.837 | 0.872 | 0.879 |

Standard errors in parentheses

\* *p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001

Equation 1, 96 coefficients; Equation 3, 91 coefficients

**Table A.4a and A.4b. Model specification, using AIC and BIC statistics**

**Of revenue from taxes on goods and services (a), *WDI***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|  | Revenue from TGS | Revenue from TGS | Revenue from TGS | Revenue from TGS | Revenue from TGS | Revenue from TGS | Revenue from TGS | Revenue from TGS |
| logGDP/cap | 2.221\* |  |  |  |  |  |  |  |
| t-1 | (1.034) |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Fuel exports |  |  | -0.001 |  |  |  |  |  |
| t-1 |  |  | (0.013) |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Cap account |  |  |  |  | 0.885\* |  |  |  |
| openness, t-1 |  |  |  |  | (0.430) |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Log populatn |  |  |  |  |  |  | 3.593\* |  |
|  |  |  |  |  |  |  | (1.434) |  |
|  |  |  |  |  |  |  |  |  |
| Trade tax rev/ | -0.103 | -0.166 | -0.321\*\* | -0.321\*\* | -0.245\*\* | -0.298\*\* | -0.175 | -0.259\*\* |
| GDP, t-1 | (0.079) | (0.086) | (0.099) | (0.098) | (0.082) | (0.092) | (0.099) | (0.096) |
|  |  |  |  |  |  |  |  |  |
| Polity democ | 0.055 | 0.101\* | -0.038 | -0.037 | -0.003 | 0.008 | -0.043 | 0.010 |
| t-1 | (0.055) | (0.050) | (0.065) | (0.065) | (0.051) | (0.051) | (0.062) | (0.059) |
| Observations | 1851 | 1851 | 1864 | 1864 | 2138 | 2138 | 2224 | 2224 |
| Units | 108 | 108 | 106 | 106 | 104 | 104 | 107 | 107 |
| Rsq | 0.061 | 0.029 | 0.057 | 0.057 | 0.080 | 0.062 | 0.073 | 0.046 |
| AIC | **5944** | 6005 | 6358 | **6357** | **7271** | 7310 | **7687** | 7749 |
| BIC | **5961** | 6016 | 6375 | **6368** | **7288** | 7321 | **7704** | 7761 |

**On income tax revenue (4.b.), *WDI***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|  | Income tax revenue | Income tax revenue | Income tax revenue | Income tax revenue | Income tax revenue | Income tax revenue | Income tax revenue | Income tax revenue |
| logGDP/cap | 2.891\*\* |  |  |  |  |  |  |  |
| t-1 | (0.888) |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Fuel exports |  |  | 0.031 |  |  |  |  |  |
| t-1 |  |  | (0.018) |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Cap account |  |  |  |  | 0.692 |  |  |  |
| openness, t-1 |  |  |  |  | (0.414) |  |  |  |
|  |  |  |  |  |  |  |  |  |
| Log populatn |  |  |  |  |  |  | 1.599 |  |
|  |  |  |  |  |  |  | (1.641) |  |
|  |  |  |  |  |  |  |  |  |
| Trade tax rev/ | 0.098 | 0.019 | -0.090 | -0.078 | -0.022 | -0.064 | -0.009 | -0.046 |
| GDP, t-1 | (0.055) | (0.061) | (0.064) | (0.061) | (0.059) | (0.054) | (0.056) | (0.054) |
|  |  |  |  |  |  |  |  |  |
| Polity democ | -0.000 | 0.060 | 0.027 | 0.013 | 0.044 | 0.053 | 0.028 | 0.052 |
| t-1 | (0.087) | (0.086) | (0.081) | (0.096) | (0.084) | (0.086) | (0.077) | (0.079) |
| Obsvns | 1864 | 1864 | 1870 | 1870 | 2148 | 2148 | 2237 | 2237 |
| Units | 107 | 107 | 105 | 105 | 103 | 103 | 106 | 106 |
| Rsq | 0.065 | 0.004 | 0.036 | 0.004 | 0.018 | 0.008 | 0.012 | 0.006 |
| AIC | **5778** | 5894 | **6523** | 6582 | **7501** | 7521 | **7839** | 7850 |
| BIC | **5794** | 5905 | **6540** | 6593 | **7518** | 7533 | **7856** | 7861 |

**Table A.5.** Consumption tax and income tax revenues as %GDP, ICTD 2018 data, on trade tax revenue and Polity, after *DiP* baseline model (*DiP* Table A.1, Eqs. 3 and 4). Log GDP (Penn World Table) per capita, log population (*WDI*), fuel exports (*WDI*) and capital account openness (normalized Chinn-Ito index) as controls. No 1990 OECD, 1990-2012. OLS FE Stata **xtregar**. No temporal trend variable.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) |
|  | Goods & Svcs tax rev | Goods & Svcs tax rev | Income tax revenues | Income tax revenues |
| Log10 GDP | 0.989\* | 0.989\* | 4.003\*\*\* | 3.987\*\*\* |
| per capita t-1 | (0.401) | (0.402) | (0.639) | (0.638) |
|  |  |  |  |  |
| Log10populatn | 0.525\* | 0.524\* | -1.259\*\*\* | -1.258\*\*\* |
| t-1 | (0.248) | (0.248) | (0.341) | (0.340) |
|  |  |  |  |  |
| Fuel exports |  |  | -0.006 | -0.006 |
| t-1 |  |  | (0.006) | (0.006) |
|  |  |  |  |  |
| Cap account |  |  | 0.203 | 0.201 |
| openness, t-1 |  |  | (0.291) | (0.291) |
|  |  |  |  |  |
| **Trade tax rev** | -0.028 | -0.027 | -0.004 | 0.018 |
| **%GDP, t-1** | (0.020) | (0.024) | (0.028) | (0.047) |
|  |  |  |  |  |
| **Polity dem** | 0.004 | 0.004 | -0.003 | 0.005 |
| **t-1** | (0.010) | (0.012) | (0.018) | (0.023) |
|  |  |  |  |  |
| **Trade tax rev\*** |  | -0.000 |  | -0.003 |
| **Polity dem, t-1** |  | (0.002) |  | (0.006) |
| Obsvns | 2164 | 2164 | 962 | 962 |
| Units | 120 | 120 | 83 | 83 |
| Avg#yrs | 18.0 | 18.0 | 11.6 | 11.6 |
| Fstat | 14.5 | 11.6 | 13.3 | 11.5 |
| ResidDF | 2040 | 2039 | 873 | 872 |
| AdjRsq | -0.031 | -0.032 | -0.009 | -0.009 |

Standard errors in parentheses

\* *p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001

Equation 1, 11 coefficients; Equation 3, 6 coefficients

**Table A.6. Descriptive statistics of variables**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variable | | Observations | Mean | Standard  deviation | Minimum | Maximum |
|  |  | |  |  |  |  |
| Revenue from taxes on goods and services, as a percent of GDP, *WDI* | 3,559 | | 5.183 | 2.841 | 0.00001 | 17.069 |
| Revenue from taxes on goods and services, as a percent of GDP, ICTD-UNU | 4,330 | | 7.345 | 4.208 | 0 | 22.083 |
| Revenue from taxes on income, profits, and capital gains, as percent of GDP, *WDI* | 3,572 | | 4.295 | 3.395 | -0.124 | 25.734 |
| Revenue from taxes on individuals + non-resource income of firms, ICTD-UNU | 3,023 | | 6.897 | 5.173 | 0 | 27.859 |
| Revenue from taxes on international trade and transactions, *WDI* | 3,206 | | 1.534 | 2.067 | -1.358 | 24.551 |
| Revenue from taxes on international trade and transactions, ICTD-UNU | 4,389 | | 2.239 | 2.993 | -1.569 | 36.116 |
| Total revenue (w/o grants), *WDI* | 3,635 | | 25.142 | 10.716 | 2.47e-11 | 91.182 |
| Polity democracy (polity2) | 6,941 | | 1.554 | 7.313 | -10 | 10 |
| Fuel exports as percent of merchandise exports, *WDI* | 5,166 | | 18.030 | 29.632 | 0 | 359.26 |
| Log(10) of GDP per capita, *WDI* | 4,519 | | 4.013 | 0.534 | 2.708 | 5.163 |
| Log(10) of GDP per capita, Penn World Table | 7,021 | | 3.775 | 0.539 | 2.348 | 5.407 |
| Capital-account openness, normalized | 6,539 | | 0.456 | 0.364 | 0 | 1 |
| Log(10) of population, *WDI* | 7,021 | | 6.918 | 0.725 | 5.039 | 9.149 |
|  |  | |  |  |  |  |