Penn World Tables (PWT)

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Contents

The Penn World Table (PWT)

"For over four decades, the Penn World Table (PWT) has been a standard source of data on real GDP across countries. Making use of prices collected across countries in benchmark years by the International Comparisons Program (ICP), and using these prices to construct purchasing-power-parity (PPP) exchange rates, PWT converts gross domestic product (GDP) at national prices to a common currency— US dollars—making them comparable across countries."[1] The Penn World Table version 9.0 is a database with information on relative levels of income, output, input and productivity, covering 182 countries between 1950 and 2014.[2] The Penn World Table is currently hosted at the Groningen Growth and Development Centre within the Economics Department of the University of Groningen.[3]

Availability

The data is currently available for the years 1950 through 2014 for 182 different countries. Varying series are not reported for all 182 countries. In the Series Available section reported series will be assumed to be reported for all 182 countries unless otherwise indicated. Varying series are also not reported for the full time range of 1950 through 2014. There is no set interval which dictates when the next release of the Penn World Table data will be.

Data Source

The data and metadata is available here: http://www.rug.nl/ggdc/productivity/pwt/

- Certain series in the data are reported in chained PPPs, these PPPs are in millions of 2011 US Dollars.
- Certain series in the data are reported in current PPPs, these PPPs are in millions of 2011 US Dollars.
- Certain series in the data are reported in constant 2011 national prices, these prices are in millions of 2011 US Dollars.

Definitions

Expenditure-side real GDP, at chained PPPs: The expenditure-side of calculating GDP is a method which sums together consumption, investment, government spending, and net exports. Then adjusted for inflation to yield real GDP. Penn World Tables use expenditure-side real GDP in order to compare standards of living across multiple countries and times.[1] This data is shown at 2011 chained purchasing power parity (PPP) rates in millions of US dollars.

Output-side real GDP, at chained PPPs: An expenditure-based real GDP calculation. Penn World Tables use output-side real GDP in order to compare productive capacity across multiple countries and times.[2] This data is shown at 2011 chained purchasing power parity (PPP) rates in millions of US dollars.

Population: In the Penn World Table is reported in millions of people based off World Bank and United Nations sources.[3]

Average Annual Hours Worked per Person Engaged: Average reported annual hours worked per person engaged.

Persons engaged: Defined by the Penn World Tables as persons over the age of 15, who during the reference week worked at least one hour at a job, or were not at work but had a job or business that they were temporarily absent from.[4] Measured by millions of people.

Human Capital Index: Provides an index of human capital per person which is based on average years of schooling and the return to education.[5] Documentation of the Human Capital Index provides the following explanation to the origin of the index, "Following a

common approach in the literature (e.g. Caselli, 2005), PWT version 8 introduced a human capital index based on the average years of schooling from Barro and Lee (BL, 2013) and an assumed rate of return to education, based on Mincer equation estimates around the world."

Real Consumption of households and governments, at current PPPs: The final purchase of goods and services by both individual consumers (households) and governments. This is calculated at current purchasing power parity (PPP) rates based on prices in that period. This value is shown in millions of 2011 US dollars.

Real Domestic Absorption, at current PPPs: A derived value from the sum of real consumption and investment. This is calculated at current purchasing power parity (PPP) rates based on prices in that period. This value is shown in millions of 2011 US dollars.

Expenditure-side real GDP, at current PPPs: The expenditure-side of calculating GDP is a method which sums together consumption, investment, government spending, and net exports. Then adjusted for inflation to yield real GDP. Penn World Tables use expenditure-side real GDP in order to compare standards of living across multiple countries and times.[6] This is calculated at current purchasing power parity (PPP) rates based on prices in that time period. This value is shown in millions of 2011 US dollars.

Output-side real GDP, at current PPPs: An expenditure-based real GDP calculation. Penn World Tables use output-side real GDP in order to compare productive capacity across multiple countries and times.[7] This is calculated at current purchasing power parity (PPP) rates based on prices in that time period. This value is shown in millions of 2011 US dollars.

Capital Stock, at current PPPs: The total worth of plants, equipment and machinery that is used to assist labor in the production process. This is calculated at current purchasing power parity (PPP) rates based on prices in that time period. This value is shown in millions of 2011 US dollars.

Total Factor Productivity (TFP) level, at current PPPs: The portion of output that is not explained by the amount of input used in production. Therefore, it is determined by how efficient the total inputs are used in production.[8] This value is calculated at current purchasing power parity (PPP) rates based on prices in that time period. This value is relative to the US, with the USA equaling 1.

Welfare-relevant TFP levels, at current PPPs: Determined using prices and quantities as viewed by consumers rather than firms. Thus, is found using after-tax wages and rental rates. The results can then be used to find welfare gaps and growth rates across countries.[9] This is calculated at current purchasing power parity (PPP) rates based on prices in that time period. This value is relative to the US, with the USA equaling 1.

Real GDP, at constant 2011 national prices: Reports real GDP at constant 2011 prices and reported in millions of 2011 US dollars.

Real Consumption: The final purchase of goods and services by individual consumers, factoring in inflation to find real income. Set at constant 2011 prices and reported in millions of 2011 US dollars.

Real Domestic Absorption, at constant 2011 national prices: A derived value from the sum of real consumption and investment reported at constant 2011 prices and reported in millions of 2011 US dollars.

Capital Stock, at constant 2011 national prices: The total worth of plants, equipment and machinery that is used to assist labor in the production process. Value is set at constant 2011 prices and reported in millions of 2011 US dollars.

Share of Labor Compensation in real GDP: Reports the total share of labor compensation through wages in calculated real GDP, set at current national prices.

Average Depreciation Rate: Rate by which capital stock loses value over time, relative to previous national average capital stock.

Exchange Rate: A reported national currency divided by the worth of the US dollar at current period in time.

Price Level: The average price of goods and services produced in an economy. This gives a static picture of the price of a good or service at a certain moment in time.

Price level of CCON: Shows the price level of real consumption at current purchasing power parity (PPP) rates based on prices at the time. Rank is relative to the US, with USA output-side real GDP at current PPPs in 2011 equaling 1.

Price level of CDA: Shows the price level of real domestic absorption at current purchasing power parity (PPP) rates based on prices at the time. Rank is relative to the US, with USA output-side real GDP at current PPPs in 2011 equaling 1.

Price level of CGDPo: Shows the price level or output-side real GDP at current purchasing power parity (PPP) rates based on current prices at the time. Rank is relative to the US, with USA output-side real GDP at current PPPs in 2011 equaling 1.

Extrapolate: Defined by Miriam Webster as, **"**to project, extend, or expand (known data or experience) into an area not known or experienced so as to arrive at a usually conjectural knowledge of the unknown area."

Benchmark: Defined by Miriam Webster as, "something that serves as a standard by which others may be measured or judged."

Interpolate: Defined by Miriam Webster as, "to estimate values of (data or function) between two known values."

Outlier: "Country/year information in which relative prices and (sometimes) relative income take on values that are hard to reconcile with ICP benchmark information."[10]

Expenditure Share: Defined by the English Encyclopedia as, "the fraction of expenditure that is spent on a certain good or purpose."

Statistical Capacity Indicator: "Provides an index of the statistical capacity of nation based on a scale of 0-100, with 0=weak statistical capacity and 100=high statistical capacity. Statistical capacity is the ability of countries to meet user needs for good quality statistics, typically those statistics that are considered to be 'official' (ie, those statistics produced by governments as a public good). The measure is sourced from the World Bank."[11]

Capital Formation: Describes the net capital accumulation during an accounting period for a particular country.[12]

Series Available

Identifier Variables

1. Country Code
    1. Using 3-letter ISO country code
2. Country Name
3. Currency Unit
4. Year

Real GDP, employment and population levels

1. Expenditure-side real GDP
    1. At chained PPPs
2. Output-side real GDP
    1. At chained PPPs
3. Population
4. Number of Persons Engaged
    1. 178 countries reporting
5. Average annual hours worked by persons engaged
    1. 70 countries reporting
6. Human Capital Index
    1. Based on years of schooling and returns to education
    2. 145 countries reporting

Current price GDP, capital and TFP

1. Real consumption of households and government
    1. At current PPPs
2. Real domestic absorption
    1. Sum of real consumption and investment, at current PPPs
3. Expenditure-side real GDP
    1. At current PPPs
4. Output-side real GDP
    1. At current PPPs
5. Capital stock
    1. At current PPPs
    2. 180 countries reporting
6. TFP level
    1. At current PPPs

2. 113 countries reporting
7. Welfare relevant TFP level
    1. At current PPPs
    2. 113 countries reporting

National accounts-based variables

1. Real GDP
    1. At constant 2011 national prices
2. Real consumption
    1. At constant 2011 national prices
3. Real domestic absorption
    1. At constant 2011 national prices
4. Capital stock
    1. At constant 2011 national prices
    2. 180 countries reporting
5. TFP level
    1. At constant 2011 national prices
    2. 116 countries reporting
6. Welfare relevant TFP level
    1. At constant 2011 national prices
    2. 116 countries reporting
7. Share of labor compensation in GDP
    1. At current national prices
    2. 133 countries reporting
8. Average depreciation of capital stock
    1. 180 countries reporting

Exchange rates and GDP price levels

1. Exchange rate
    1. Quotient of national currency divided by the US dollar (market+estimated)
2. Price level of real consumption of households and government
    1. Quotient of PPP divided by exchange rate, price level of USA in 2011 =1
3. Price level of real domestic absorption
    1. Quotient of PPP divided by exchange rate, price level of USA in 2011=1
4. Price level of output-side real GDP
    1. Quotient of PPP divided by exchange rate, price level of USA in 2011=1

Data information variables

1. Relative price data for consumption, investment and government
   1. Extrapolated=0, Benchmark=1, Interpolated=2
2. Relative price data for exports and imports
   1. Extrapolated=0, Benchmark=1, Interpolated=2
3. Exchange rate
   1. Market-based=0, Estimated=1
4. Observation of price level of expenditure-side or output-side GDP
   1. Not an outlier=0, Outlier=1
5. Correlation between expenditure shares of the country and the US
   1. Benchmark observations only
6. Statistical capacity indicator
   1. Sourced from the World Bank, only for developing countries
   2. 131 countries reporting

Shares in output-side real GDP at current PPPs

1. Share of household consumption
   1. At current PPPs
2. Share of gross capital formation
   1. At current PPPs
3. Share of government consumption
   1. At current PPPs
4. Share of merchandise exports
   1. At current PPPs
5. Share of merchandise imports
   1. At current PPPs
6. Share of residual trade and GDP statistical discrepancy
   1. At current PPPs

Price levels, expenditures categories and capital

1. Price level of household consumption
   1. Price level of US in 2011=1
2. Price level of capital formation
   1. Price level of US in 2011=1
3. Price level of government consumption
   1. Price level of US in 2011=1
4. Price level of exports
   1. Price level of US in 2011=1

5. Price level of imports
    1. Price level of US in 2011=1
6. Price level of the capital stock
    1. Price level of US in 2011=1

Series pulled for the EconDash

Series pulled from the Penn World Tables include all series with the exception of Country Code, Country Name, Currency Unit, and Year. Fourty-two series were pulled in total from the raw Penn World Tables data.

Instructions for pulling PWT data

1. Go to http://www.rug.nl/ggdc/productivity/pwt/.
2. Click on the Excel button under the "Download" header.
3. This will automatically download the excel sheet containing all of the Penn World Tables data to your computer.
4. You will then be able to reference the sheet through your computers download folder.

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[1] Feenstra, Robert C., Robert Inklaar and Marcel P. Timmer (2015), "The Next Generation of the Penn World Table" American Economic Review, 105(10), 3150-3182, available for download at www.ggdc.net/pwt

[2] See [1]

[3] See [2]

[4] See http://data-planet.libguides.com/PennWorldTables

[5] Ibid.

[6] Ibid.

[7] Ibid.

[8] Comin. 2006. "Total Factor Productivity."

[9] Bascu, Pascali. 2012. "Productivity and the Welfare of Nations."

[10] See http://www.rug.nl/ggdc/docs/user_guide_to_pwt90_data_files.pdf

[11] See http://data-planet.libguides.com/PennWorldTables

[12] See http://www.investopedia.com/terms/c/capital-formation.asp