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Uses of Purchasing Power Parities to better inform policy making and poverty measurement

Nada Hamadeh¹ and Hanan AbuShanab²

¹ International Comparison Program Global Lead and Senior Statistician (corresponding author)

² Consultant, International Comparison Program Global Unit
World Bank Group

nhamadeh@worldbank.org

Abstract

The paper examines the uses of Purchasing Power Parities (PPPs) to better inform policy making and poverty measurement. PPPs are spatial deflators and currency converters. Using PPPs instead of market exchange rates makes it possible to compare the output of economies and the welfare of their inhabitants in real terms, by controlling for differences in price levels. Using PPPs, economists, policy makers and researchers can measure the relative economic well-being of countries and monitor the progress in poverty reduction efforts. Thus, PPPs offer policy makers a powerful tool for comparative research on economic and social development. Major international organizations and development agencies use PPPs to analyze economic and social conditions within their areas of focus. The United Nations use PPPs in the Sustainable Development Goals indicators and the Human Development Index. The World Bank uses PPPs in determining its international poverty line and global poverty headcount, while the International Monetary Fund uses them in its global and regional growth rates estimates and country quota allocation. The Organization for Economic Cooperation and Development uses PPPs in economic analysis and the European Commission uses them for the allocation of structural and cohesion funds. The data underlying the PPPs is very useful to policy makers for assessing national competitiveness in world trade and for evaluating taxes and subsidies. PPPs are also used for analyzing welfare measures, productivity, consumption patterns, capital formation, health costs and energy efficiency.

Keywords: PPPs, global poverty, competitiveness

1. Introduction

Purchasing power parities (PPPs) are price relatives that show the ratio of prices in national currencies of the same good or service in different countries. They allow for a way to measure and compare the performance of countries around the world. The production of PPPs is undertaken by the International Comparison Program (ICP), a global statistical operation based on a rigorous foundation of economic and statistical theory and solid research that began in the 1960s in the University of Pennsylvania [1]; the ICP is the largest worldwide statistical operation.

In order to compile PPPs, the ICP collects prices and expenditure data for all goods and services that make up the gross domestic product (GDP) including consumer goods and services, government services, and capital goods. Until recently, the ICP rounds have been conducted nearly every six years; the latest ICP round was implemented in 2011 following the successful completion of the 2005 round. Recognizing the needs for more frequent and reliable PPP estimates, the United Nations Statistical Commission (UNSC), at its 47th Session held in 2016, instituted the ICP as a permanent element of the global statistical program, conducted more frequently starting from 2017, and further aligned with regular national statistical programs. [2]

The latest ICP results were published in April 2014 in the report entitled *Purchasing Power Parities and Real Expenditures of World Economies: Summary of Results and Findings of the 2011 International Comparison Program* [3]. The detailed results for ICP 2011 were subsequently released in June 2014 in electronic form. The final report entitled *Purchasing Power Parities and the Real Size of World Economies: A Comprehensive Report of the 2011 International Comparison Program* [4] was published in October 2014 and provided more in-depth analysis. These results provided data on PPPs, expenditure shares of GDP, total and per capita expenditures both in exchange rate terms and PPP terms, and price level indices. This dataset covered 26 expenditures categories for goods and services for 199 participating countries.

The results of the ICP are used by a variety of international institutions, government agencies, academia and research institutions, multinational organizations, and the media. These users employ the PPPs and underlying price and expenditure data for many purposes. PPPs are usually used by international organizations, policy makers and researchers in the analysis of

macroeconomic aggregates across countries. Public and private enterprises use PPPs for competitive analysis of prices, market shares and operational costs across countries.

The purpose of this paper is to provide an overview of the main uses of PPP data. The wide variety of topics that use PPPs is an indication of the importance of producing this data. It also shows the possibilities for many insights for policy makers.

2. International Uses

International organizations are some of the principle users of ICP data. They use PPP data in research and analysis, producing indicators, and institutional purposes. The analysis of macroeconomic indicators, poverty measurement and welfare is core to some of their most prominent publications. International organizations also use PPPs to infer real expenditure data to aggregate real GDP across country groupings. Some also use PPPs for institutional purposes in the allocation of resources to their members.

The United Nations (UN) use PPPs for analysis and measurements in many areas. The Sustainable Development Goals (SDGs), a set of 17 aspirational global goals agreed upon in a UN resolution in 2015, use PPPs for measuring 'Goal 1: End Poverty in all its forms', where the international poverty line is calculated in PPP terms. 'Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all' also uses PPPs for measuring energy intensity; an indicator which computes how much energy is needed to produce one unit of GDP [5]. Moreover, their predecessors, the Millennium Development Goals (MDGs), also used PPPs in the indicators for 'Goal 1: Eradicate extreme poverty and hunger' and 'Goal 7: Ensure environmental sustainability.' [6]

The United Nations Development Programme (UNDP), which produces the annual Human Development Report, utilizes PPPs in the calculation of the Human Development Index (HDI), Inequality-adjusted Human Development Index (IHDI) and the Gender Development Index (GDI). Also, the United Nations Educational, Scientific and Cultural Organization (UNESCO) compares the relative value of funding provided annually for education across countries; this is done using the indicator 'government expenditure per student in PPP term'. The UN Children's Fund also uses PPPs to measure, among many indicators, the number of children living in poverty using international and national poverty lines [7].

The World Bank is one of the main users of PPP data, most notably in its *World Development Indicators* [8] and *Poverty and Shared Prosperity* report [9]. Important indicators are calculated in PPP terms, such as the size of economy expressed as GNI and GNI per capita estimates in international dollars. The international poverty line of \$1.90/day is also converted to local currency units using PPPs. Other indicators, such as shared prosperity, health systems, energy dependency, efficiency and carbon dioxide emissions and price levels, are all expressed in PPP terms.

Other international organizations use PPPs for economic analysis and some use it for administrative purposes. The International Monetary Fund (IMF) uses PPPs for analysis in the World Economic Outlook (WEO), notably to weigh estimations of output and growth of composite groups of economies. The IMF also uses PPPs in its Quota subscription allocation - a measure of the financial obligation to the IMF, access limit, share of SDRs, and voting power of a member country - calculated as a weighted average of GDP (market exchange rates and PPPs), openness, variability and international reserves [10].

The European commission is another organization which uses PPPs for administrative purposes. The allocation of the Structural Fund, targeting investment for growth and jobs, is influenced by the PPP-deflated intra-economy regional GDP per capita. Moreover, the Cohesion Fund is allocated based on GNI per capita measured in PPPs [11]. The Organization for Economic Cooperation and Development (OECD) uses PPPs extensively in policy analysis to compare cross-country macroeconomic aggregates. PPPs are also used to aggregate the real GDP and its components for the OECD; economic indicators such as growth are estimated using PPP-based GDP weighted by country shares [12].

3. Policy Making Uses

PPPs provide policy makers many insights in a wide variety of topics that involve national, bilateral, regional and global cross-country comparisons. These policy analysis use PPPs to compare the sizes of economies, the components of GDP and productivity by creating volume measures. The underlying prices of PPPs can also be used by policy makers to compare price structures, levels and competitiveness.

a. Comparisons of economies

Real GDP comparisons are the basis for a true understanding of the relationships between economies and the impact of major events on the world economy. The ICP is the leading global exercise to compare the relative sizes of economies, overall productivity and price levels by producing PPP figures. These important indicators provide policy makers with means to understand growth rate differentials and the contributing factors to such differences. This is especially handy in cases of regional comparisons which are of great importance to policy makers, as they illuminate valuable information on the relative size and structure of the economy. Using PPPs to calculate GDP per capita and household consumption (HHC) per capita is also an important tool for evaluating standards of living and relative material wellbeing.

Moreover, PPPs are employed to determine cost of living differentials across countries. This is used to decide PPP-adjusted cost-of-living allowances across countries to meet the needs of multinational corporations, major nongovernmental organizations and international development agencies. Cost of living differentials provide valuable information for policy makers because of their implications for national aid eligibility and poverty count, as well as important indications regarding wage pressure and competitiveness in different regions. The variations in cost of living have important effects on the economic well-being of the population, an important indication for policy makers.

b. Poverty, inequality and social welfare measurements

Global poverty measurements rely heavily on PPPs; in order to establish an international poverty line, purchasing power must be equal across economies. With the announcement of the global goal of ending extreme poverty by 2030, the continuous production of PPP data is increasingly important for updating global poverty measures and monitoring SDG progress. These measurements will help guide development policy focus at the local, national and regional levels, improve identification of the poor using a common threshold across countries, and indicate viability of global poverty goals.

Simultaneously, the rising income inequality has become a major concern in recent years. PPPs are one of the methods used to convert the incomes in different countries to a common measure. The comparisons of international inequality and its trend is

important for improving growth models as well as forecasting the future allocation of global income. Repercussions for poverty reduction programs, the environment and international relations are closely linked to inequality [13]. Thus, the information that PPPs provide on this topic have important implications for social and political stability, migration flows and geopolitical impacts.

When discussing poverty and inequality one must keep in mind the effects of food consumption on these phenomena. PPPs are used to compare these effects as well as the effects of hunger, income and price elasticities in the food categories across countries. Food prices are linked to global demand and could affect food aid in many parts of the globe. Poverty and inequality rates are also affected by food consumption, which sheds great importance on the collection of food price data and close monitoring of variation across countries. It is also critical to consider the costs of increasing hunger and its implications on growth, development and overall well-being in economies.

Two of the main topics studied when determining well-being and social progress in a country are health and education. PPPs are mainly used to compare the cost and expenditure on these sectors across countries. This has major policy implications as sustained economic growth is closely linked to education. Moreover, education and health have direct influence on the levels of poverty and inequality which ties again to the PPPs' role in measurement and comparisons of these indicators. As policy makers consider the health care system, they must study the effects of high cost of health care on the well-being of the population. Comparing the costs of health care in a region or with other similar countries provides clarity and helps policy makers make informed decisions in regards to the health care system.

c. Other measurements

Indicators of economic growth such as competitiveness, productivity, trade and investments benefit greatly from the insights that PPP data provide government agencies and policy makers.

Comparing competitiveness and efficiency of production systems across countries produces valuable policy considerations. Research finds that weaknesses in certain aspects of an industry, such as products for intermediate use, affect the competitiveness in all industries [14]. With deepening globalization, such information is indispensable for policy makers. PPPs also infer sectoral productivity differences across countries, which help in illuminating

the sources of price competitiveness in industries across countries. Moreover, the cross country comparisons can reveal industry efficiency that are important drivers of competitiveness in an economy.

Cross-country price data comparison reveals an interesting feature; the positive correlation between levels of development and the price of services relative to tradable goods [15]. In development and trade policy setting, such information is essential. Inferring the impacts of free trade, economic resources and non-tariff measures on economic structure is of utmost importance for policy makers. Trade policy has many influences on an economy and the well-being of its population, thus the insights provided by prices and PPPs are instrumental in understanding many important aspects such as barriers to international trade, distortions to the price of tradable capital goods as a barrier to development, and income differences and prices of tradable goods. PPPs are often used to examine the role of trade barriers on the relative price gap between rich and poor countries.

Moreover, multinational corporations increasingly use PPPs for evaluating cross-country investment cost such as unit labor and material costs, project viability, market size and asset allocation, as well as assessing industry growth potential and associated investment risks. This gives both governments and the private sector a measure of competitiveness, information on possible barriers to attracting foreign investments, which possibly has a major impact on job creation and employment in a country.

PPPs can also be used for environmental policy and energy measurements. Energy efficiency of an economy is usually measured by energy intensity, which is the number of energy units needed to generate one unit of GDP. PPPs are used to compare energy intensity as it relates energy consumption to the real level of economic activity [16]. Both the UN General Assembly and the G20 use PPPs in measuring their energy efficiency indicators. Improvements in energy efficiency bring social, economic and environmental benefits. Measuring this important indicator helps countries address costs, availability of energy and gauge the environmental impact of energy use. This has great benefits for improving efficiency, health, industrial productivity and product performance, which assist in wealth creation and social development.

4. Limitations to the use of PPP data

Although PPPs are the best tool to compare the size and price levels of economies, it is important to be aware of the limitations of these statistical concepts. Since PPPs are constructed statistically, they are associated with error margins, which mainly depend on the strength and reliability of the country price data, expenditure weights and the degree of representativeness of the priced goods and services within a country. Users should use caution when interpreting the price level comparisons between countries. The price level indicators are relative to a chosen reference country in the comparison. The reference country has a price level of 100, a value below 100 of the compared economies means a lower general price level and a value above 100 means a higher price level. At the level of GDP, the price levels indicate how well the general price level in a country is reflected by its exchange rate as it relates to the general price level in the reference country. Here a value below 100 is an indication that the country's exchange rate overstates the general price level, while a value over 100 indicates that the exchange rate understates the general price level. However, this analysis does not give any inferences to whether the currency is overvalued or undervalued in a country [17].

In summary, PPPs are statistical tools which are designed to be used primarily for spatial volume comparisons of GDP, GDP per capita, GDP per hour worked, and the component expenditures of GDP as well as price levels at the level of GDP. PPPs should be used with caution in the analysis of price convergence or changes over time of prices or volumes at the GDP level. PPP data is not intended for strict ranking of countries without accounting for error margins, nor for computing national growth rates, gauging overvaluation or undervaluation of currencies, or measuring the international comparisons of monetary flows, such as foreign direct investment, development assistance, or trade flows. It is also important to note, that the comparisons of similar economies is more precise than comparisons which involve countries with fundamentally different economic structures [17].

5. Conclusion

The uses of PPPs continue to grow since the inception of the ICP in the 1960s. They are valuable measures when making cross-country comparisons of GDP and its components, and international organizations have been using PPPs extensively in a wide array of indicators. PPPs also have a variety of uses for policy making;

however, policy makers have not realized the full value of PPPs in their economic analysis and policy making. As the ICP becomes a permanent program, which produces reliable PPP time series, more efforts need to be dedicated for advocacy and reaching out to policy makers across countries to inform them on the importance of PPPs and their value for analyzing and designing national economic policies.

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