



Subnational Purchasing Power Parities: Integrating International Comparison Program and Consumer Price Index in Asia¹

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Abstract

The International Comparison Program (ICP) produces quality benchmark purchasing power parities (PPP) for cross-country comparisons of economic activity and relative price levels. The resource-intensiveness of the program as well as inadequate research and utilities of ICP at the national level, however, are some of the major stumbling blocks in mainstreaming ICP to national statistical programs. This paper presents past and current research initiatives in Asia including efforts of national statistical organizations (NSO) to integrate ICP with consumer price index (CPI). It provides updates on subnational PPP work which is critical in creating a more secure platform for future ICP endeavor. The paper further explores the use of subnational PPPs as an alternative approach to measuring income dimension of the regional human development index of the Philippines.

Keywords: subnational PPP, purchasing power parities; deflators; human development index

1. Introduction

The International Comparison Program (ICP) produces quality benchmark purchasing power parities (PPP) for cross-country comparisons of economic activity and relative price levels. It underlines the real importance of compiling national statistics that adheres to scientific principles and international standards and practices. It has been at the forefront of statistical capacity-building efforts of international organizations including the Asian Development Bank (ADB). At the national level, there has been growing recognition on the contribution of ICP in improving operational data procedures which translates to improved price data and implementation of international standards at the country level.

Notwithstanding the gains, the ICP remains as a resource-intensive exercise with significant costs to all parties involved. Although smaller in scale, PPP extrapolations for nonbenchmark years use to fill-in the gap between benchmark years, are also costly and time-consuming. These constraints along with the inadequate research and utilities for ICP at the national level continue to challenge the future of ICP.

This paper presents past and current research initiatives in Asia including efforts of national statistical organizations (NSO) to integrate ICP with CPI. It provides updates on subnational PPP work which is critical in creating a more secure platform for future ICP endeavor. To further increase their utilities, subnational PPPs from the CPI were used to provide alternative approach for measuring the income dimension index of the regional human development index of the Philippines.

2. ICP Research Initiatives in Asia and the Pacific

Since the 2005 ICP benchmark, the ADB has been spearheading the implementation of ICP in Asia and the Pacific. To date, the ADB has approved five major statistical capacity building regional projects and technical assistance that directly supports the compilation of ICP. The success of the two

¹ The views expressed in this paper are those of the authors and do not necessarily reflect the views and policies of the ADB, its Board of Governors, or the World Bank, its Board of Executive Directors, or the governments they represent.



benchmarks and follow-up ICP projects, hinges to a large extent on the full and willing cooperation of national statistical organizations from 23 economies in the region which include: Bangladesh; Bhutan; Brunei Darussalam; Cambodia; the People's Republic of China (PRC); Fiji; Hong Kong, China; India; Indonesia; Islamic Republic of Iran (2005 only); the Lao People's Democratic Republic; Macao, China; Malaysia; the Maldives; Mongolia; Myanmar (2011 only); Nepal; Pakistan; the Philippines; Singapore; Sri Lanka; Taipei, China; Thailand; and Viet Nam. For consistency, Hong Kong, China has been the reference (base) economy for the region since the 2005 ICP round.

To sustain the capacity of national statistical organizations (NSO) on ICP framework and practices, the ADB implemented two follow-up projects after the 2005 benchmark. The 2009 PPP Updating with 21 economies aimed at addressing the issue of extrapolation; improve the operational aspects of the ICP, and minimize costs faced by member economies in collecting ICP price data. It produced the 2009 Asia and the Pacific PPPs for GDP and its aggregates using innovative methods. The Supply and Use project, on the other hand, assisted 18 economies in implementing the 1993 system of national accounts (SNA) recommendation and produced the 51x32 SU Tables for eighteen economies. The SU framework allows for compilation of more reliable, consistent and internationally comparable estimates of GDP. The projects support the production of quality price and national accounts data which were critical in the successful implementation of the 2011 ICP and mainstreaming the ICP at the national level.

With the release of the 2011 PPPs in the region, the ADB identified four major regional ICP research agenda which include: a) Subnational PPP estimation using ICP and CPI data; b) Poverty-Specific PPP (PS-PPP) estimation using the modified version of the 2006 PS-PPP method; c) 2015 PPP Updates; and d) Development in national accounts to ensure better quality and consistent estimates of gross domestic products following the supply and use framework. The overarching goal of the initiatives is mainstreaming ICP at the national level and therefore, the same bottom-up approach and transparency carried out in the past ICP projects will be implemented in the current initiatives.

3. ICP and CPI Integration in Asia: Some Updates

Strengthening CPI price collections

Asia has been making strides since the 2005 ICP benchmark in terms of integrating the ICP in the CPI and other price collection surveys. Most economies reaffirmed their commitment in the 2015 PPP update initiative and support the inclusion of CPI items that are exactly matching the 2011 ICP items in the 2015 regional household core list. Based on 14 responding economies, about 32% of the ICP items priced are exactly matching the priced items in the national CPI. To ensure that enough overlap and reliable PPPs will be estimated from the 2015 PPP Updates, the CPI/ICP lists may be increased from the "first iteration" of the 2011 ICP data using combinatorial approach. The aim is to reduce the burden and cost to countries and ADB; to fully utilize the available data from countries; and further mainstream the ICP in the national statistical work.

At the country level, mainstreaming does not end with the inclusion of ICP list in the CPI but also the adoption of its concepts and practices. Most economies confirmed that they are now instituting the structured product descriptions (SPDs) approach in defining items in their CPI to enable them to conduct across-space analyses. Philippines, Viet Nam and Malaysia have adopted the "core list" approach to improve their subnational PPP estimates and also confirmed the inclusions of ICP regional items in their rebased CPI basket along with other countries in the region like Bangladesh and Hong Kong, China. Cambodia, India and Sri Lanka, expanded their regular CPI geographic coverage to obtain national average CPIs.

Adopting ICP Concepts to Expand CPI Uses

With the knowledge gained from participating in past ICP projects, NSOs are recognizing the importance of capturing both temporal and spatial price movements using their current data system.

Originally intended to capture price movements across time, a number of economies with support from their policy-making bodies and governments are now moving to expanding CPI uses. They acknowledged the need to further enhance the current CPI infrastructure and methods to adhere to the basic ICP principle of comparing “banana with banana” of the same variety, size, source, etc.; to measure price levels across states, provinces or regions. In the June 2015 Regional Meeting in Bangkok, Thailand², representatives from PRC, reported that their Ministry of Human Resource and Social Security needed the subnational PPPs for wage adjustments of their civil servants. Viet Nam went one step further and released their first time series subnational PPP approved by their government in December 2014 to serve as the Standard Cost of Living Index across states. The Philippines, on the other hand, has been regularly compiling subnational PPPs and are moving towards its institutionalization.

The ADB conducted in-country briefing on ICP concepts and methods focusing on subnational PPPs in at least 12 countries since 2009 while full training courses have been conducted in Philippines and Viet Nam. For 2015, most 2011 ICP participating DMCs expressed their support for subnational PPPs with the exception of Pakistan and geographically small economies. In pursuing subnational PPP computation, economies integrated its activities in their national work program and some are hoping to produce reports containing these results. It is recognized that technical assistance and training are crucial in ensuring the success of subnational PPP and in advocating their uses in these countries.

Support to Subnational PPP estimation

The subnational PPP provides information for establishing comparability across time and space at the national level. The idea of calculating subnational PPPs from CPI price information is to maximize the benefits derived from the conduct of CPI price survey without additional price and data collection. The results of such studies will also be useful to international organizations for extrapolating PPPs for nonbenchmark years.

Understanding ICP concepts requires a “paradigm shift” among national statisticians specially those engaged in CPI. The ADB with the World Bank conducted several regional and in-country. Every subnational PPP training in Asia starts with the review of basic ICP concepts, methods and approaches. Emphasis is likewise given to actual data mining from CPI and understanding how best to utilize the CPI in constructing the first subnational PPPs for each country. Hands-on exercises include the use of actual CPI data and group reporting as the culminating activity. To facilitate PPP estimation, the Dikhanov Tool, which is being widely used in Asia for “simplifying” even the most complex index calculations were used in the training. Understanding the concepts before using the Dikhanov tools, give the assurance that the staff will be confident enough to take on the subnational PPP tasks forward after the training. It is important for NSOs to take ownership of the PPP results including the task of explaining the results and their uses to their stakeholders.

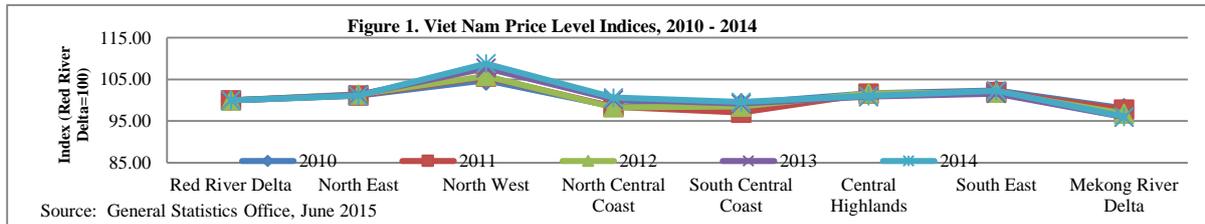
Subnational PPP Updates in the region

To construct subnational PPPs, there are three major considerations: 1) organization of the price and expenditure data for computing subnational PPP; 2) determination of the overlapping items; and 3) subnational aggregation (Dikhanov, Palanyandy, Capilit, 2011)³. The Philippines was the first to construct subnational PPPs in Asia following these simple considerations while Viet Nam was the first to release its results via the Spatial Cost of Living Index.

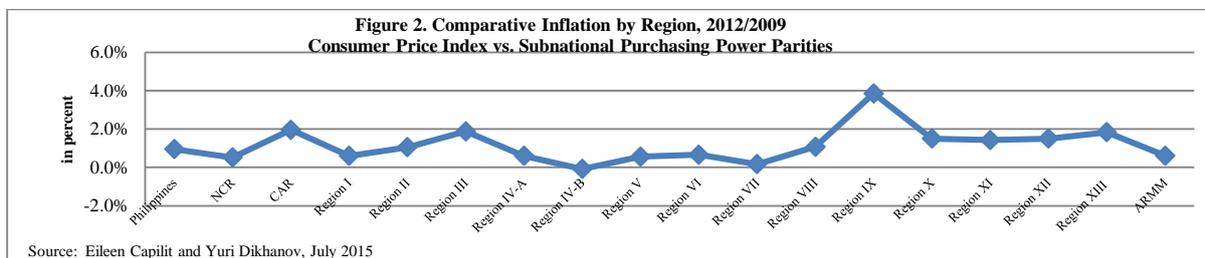
In Viet Nam, it is interesting to note that there is high degree of consistency in price levels across regions and across years (Figure 1). With the exception of South Central Coast and Mekong Delta River, price levels in all other regions are higher than Red River Delta – the base region. North West region has the highest price level which is about 9% above the base region in 2014.

² Presentation materials are available from the ICP Asia CCube at: <http://icpasia.adb.org/>

³ Full description of the subnational PPP estimation methodology is provided in Section VI of ADB Economics Working Paper No. 290.



Updated subnational PPPs for the Philippines showed that temporal behavior of price levels between 2009 and 2012 approximates the official CPI. It further validates the earlier findings (Dikhanov, Palanyandy, and Capilit in 2011) whereby time series from the subnational PPPs are consistently lower than the official estimates both for the national and regional levels by about 1% - 4% with the exception of Region IV B.



For purposes of demonstrating the applicability of ICP concepts in the national context, preliminary subnational PPPs using the 2011 ICP data were presented in the April 2014 and June 2015 regional meetings. Except for geographically small economies (Brunei Darussalam, Fiji Islands, Hong Kong, China; Macau, China; Singapore; and Taipei, China) and those who only provided national average prices (People’s Republic of China and India), subnational PPPs (unweighted) were estimated using the ICP Asia Pacific Software Suite. Concerns were raised regarding the plausibility of the results for two main reasons: the survey reflects annual national average prices to satisfy the ICP requirements; a lot of the ICP shop items are available only in capital cities or urban areas; and thus, subnational PPPs from ICP data may not reflect the real situation across region as compared to using the national or regional CPI baskets. Hence, subnational PPPs from 2011 ICP will have to be adjusted using CPI data before they can be used for comparing intra-country price levels.

4. Subnational PPPs for Human Development Index

With the growing demands for spatial comparison at the national level, it is an opportune time for ICP framework to be mainstreamed at the national level. Subnational PPPs and the ways in which they can be used to improve and/or serve as inputs for estimating regular major economic indicators such as real regional price comparisons; and the real income dimension of the human development indices (HDI), play an important role in advocating and increasing the chances for the overall sustainability of the ICP. This section explores the use of subnational PPPs for increasing across-region comparability of income dimension of HDI.

The HDI is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living. It estimated as the geometric mean of normalized indices for each of the three dimensions (<http://hdr.undp.org/en/content/human-development-index-hdi>). The Philippines is one of the first few countries to publish their National Human Development Report (HDR) in 1992 (UNDP, 1998). Improvements in HDI methodology have been implemented in the country to improve the way in which regions and/or provinces’ well-being are assessed. In the 2012-2013 Philippine HDR, real per capita income was derived by deflating the nominal income per capita with the regional CPI and

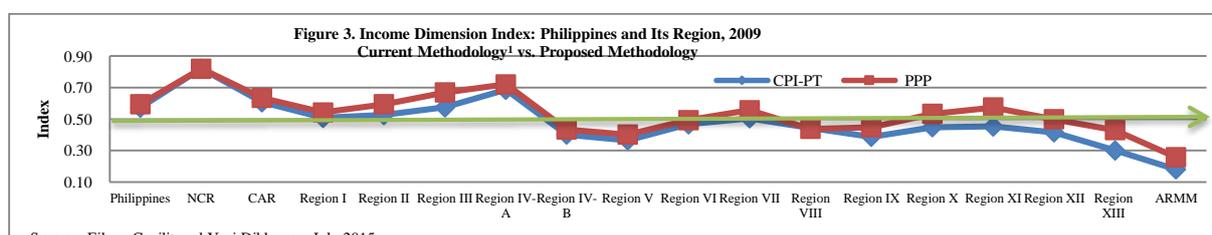
further adjusted with the annual poverty threshold of the National Capital Region to increase comparability across space.

Since the CPI basically measures the changes in average prices of a fixed basket of goods and services purchased by household over time (temporal), it is indeed necessary to find a more suitable deflator to account for comparability across space. Using annual per capita threshold of NCR, however, assumes other regions have the same basket of goods and services. Such is not the case in the Philippines. To enhance the current method, and for a more globally consistent approach in deflating nominal per capita income, we use the results from the subnational PPPs estimated from the CPI. Only overlapping items which are priced by at least two regions were included in the calculation of the PPPs with the NCR as the base region. Table 1 shows a comparison of the current and the author's proposed comparative indicators and approaches in measuring income dimension of the HDI.

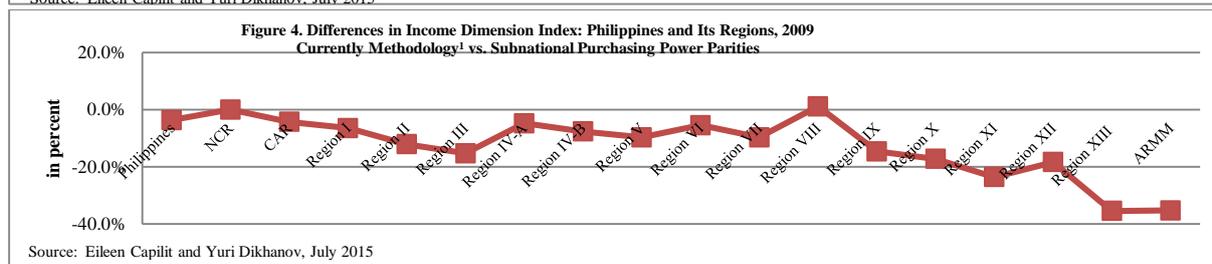
Table 1. Estimating Income Dimensions of Human Development Index Indicators Used Across Methods

Dimension Index	Global Indicator/s	Current Methodology ¹	Proposed Methodology
Income	Gross national income per capita (in purchasing power parity \$)	Data Source: Family Income and Expenditure Survey; Annual Per Capita Threshold and Consumer Price Index (CPI); PSA	Data Source: Family Income and Expenditure Survey and CPI; PSA
	For country comparison	Approach/Method:	Approach/Method: same as global
		Real Per Capita Income (in 2009 National Capital Region Pesos)	Real Per Capita Income (2009 National Capital Region = 100)
		Nominal per capita income deflated by regional CPI (temporal) and adjusted by the ratio of the 2009 poverty thresholds with NCR as base.	Nominal per capita income deflated by subnational purchasing power parities with 2009 NCR as base
	Goalposts: Philippine Human Development Report (PHDR) 2012-2013	Goalposts: Philippine Human Development Report (PHDR) 2012-2013	

From figure 3 one can observe that applying the proposed method reduces the number of regions falling in the “low” category (index less than 0.50) in 2009 to 7 from 10. The income dimension indices for Regions X, XI and XII moved up to 0.53, 0.57 and 0.50, respectively. Differences in income dimension presented in Figure 4 indicates that the current methodology for estimating the income dimension of the HDI in the Philippines are underestimated for the regions in Southern Philippines with CARAGA and ARMM being underestimated by about 35%. Income dimension indices for these regions were 0.43 and 0.26, respectively when subnational PPPs are used to deflate nominal income per capita to real.



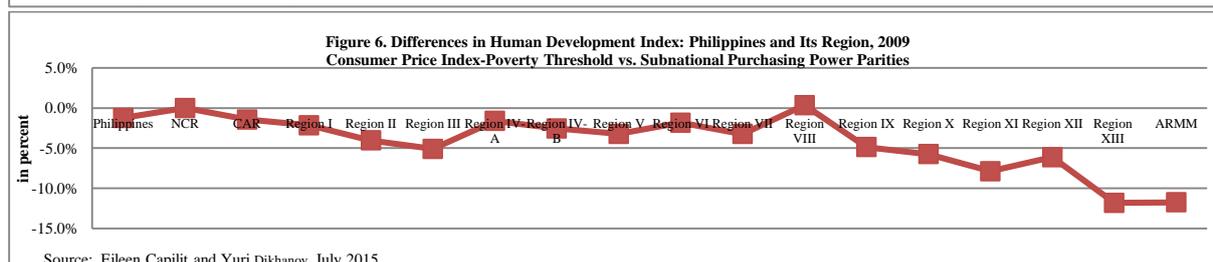
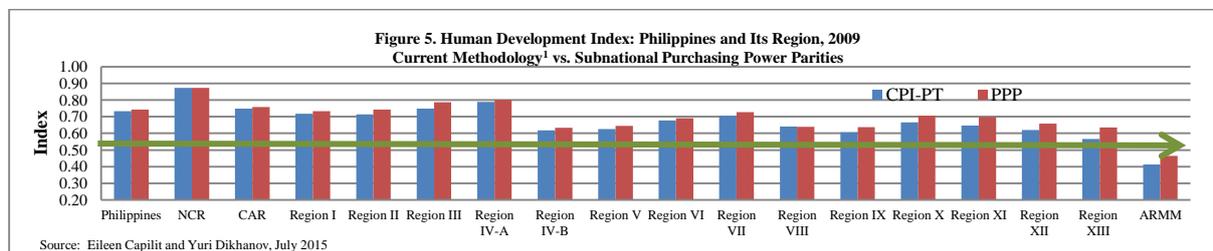
Source: Eileen Capilit and Yuri Dikhanov, July 2015



Source: Eileen Capilit and Yuri Dikhanov, July 2015

^{1/} Follows the 2009 methodology for computing the subnational Human Development Index for the Philippines as explained in the Philippine Statistical Authority's website: <http://www.nscb.gov.ph/hdi/TechnicalNotes.asp>

Figure 5 shows that ARMM still falls into “low” category of HDI whether one uses the current or proposed methodology. Except for Region XIII, HDIs for all other regions are underestimated in the current income methodology by about 4.3% when compared to the proposed method.



^{1/} Follows the 2009 methodology for computing the subnational Human Development Index for the Philippines as explained in the Philippine Statistical Authority's website: <http://www.nscb.gov.ph/hdi/TechnicalNotes.asp>

5. Conclusions

There is a compelling need to find ways to better integrate the ICP methods and practices at the national level. The current study shows that Asia has been making strides in integrating ICP and CPI. Research initiatives implemented in the region such as the 2015 PPP Updating; and inclusion of ICP items in the CPI baskets following the same SPDs. Recognition of the importance of using the ICP concepts and methods for estimating subnational PPPs for downstream analyses of price levels and policy-relevant national indicators such as the HDI, are critical in securing the platform future ICP work. The study further reveals that using subnational PPPs will better capture difference in income dimensions of HDIs across regions in the Philippines which is currently underestimated by about 4.3% in the current methodology. It is worthwhile to replicate the proposed use of subnational PPP for income dimension index of HDI at the provincial level.

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