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# Issues on the Official Poverty Estimation Methodology in the Philippines: Comparability of Estimates across Space and over Time

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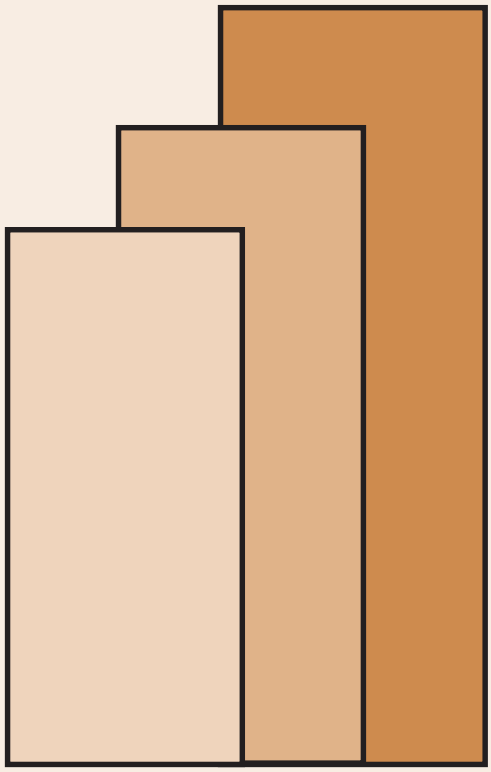
# Issues on the Official Poverty Estimation Methodology in the Philippines: Comparability of Estimates across Space and over Time

*Lisa Grace S. Bernales*

**DISCUSSION PAPER SERIES NO. 2009-17**



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# Issues on the Official Poverty Estimation Methodology in the Philippines: Comparability of Estimates across Space and Over Time[1]

Lisa Grace S. Bersales, PhD[2]

Abstract

In the effort to effectively monitor the progress or draw backs in the fight against poverty to formulate more effective poverty reduction programs, the issue on comparability of the official poverty estimates through space and time has been raised. The official estimates are said to be inconsistent across regions because these are based on poverty lines that vary across regions in the country. The differences are due to the use of different menus in calculating the food thresholds for the different regions. The menus are designed to reflect the regional variations in the food consumption patterns of Filipino families. On the other hand, the incomparability of estimates across time has been a hurdle in effectively monitoring progress made over longer period of time. This problem stems from using a changing ratio of food expenditures to total basic expenditures (FE/TBE ratio), an indirect way of estimating the poverty threshold. The ratio changes because the data being used changes each time there is a new FIES dataset. In this paper, Bersales discussed the validity of the current methods, laid out several options and the corresponding merits and/or disadvantages and made several recommendations for future improvement of the current methodology.

Key words: poverty, FE/TBE ratio, reference menu, test of revealed preferences

[1] This paper is part of a bigger report for the UNDP-funded project titled "Comprehensive Documentation and Analysis of the Official Poverty Estimation Methodology of the Philippines" implemented by PIDS in cooperation with the National Economic and Development Authority (NEDA) and the Technical Committee on Poverty Statistics (TCPOVSTAT).

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# Issues on the Official Poverty Estimation Methodology: Comparability of Estimates Across Space and Over Time[1]

Lisa Grace S. Bersales, PhD.
U.P. School of Statistics

## 1. Introduction

In December 2000, the NSCB Executive Board approved the resolution that provided for the computation of subsistence and poverty thresholds on an annual basis. Official poverty statistics were then available at the national and regional levels with urban-rural disaggregation. There was demand and need, however, for more disaggregated poverty statistics for designing more effective poverty alleviation programs and interventions. Thus, the NSCB undertook a project[2] with the main objective of coming up with a methodology for the estimation of poverty statistics at the provincial level. In February 2002, the NSCB Executive Board initially approved a methodology for estimating provincial poverty statistics; in November 2002, it instructed the NSCB Technical Staff to undertake a phased revision of the provincial poverty estimation methodology so as not to depart largely from the existing official estimates; and, in January 2003, it approved the methodology for the computation of provincial poverty statistics. The first set of official poverty statistics at the provincial level was released in January 2003. These were poverty statistics for the years 1997 and 2000. The existing regional menus (urban/rural) were used for the provinces using provincial prices and a changing Food Expenditure/Total Basic Expenditure or FE/TBE ratio.

Preliminary poverty estimates for 2003 were released in January 2005 with only the regional and national levels were initially released. Provincial poverty estimates were computed but were found to exhibit large fluctuations in poverty incidence for some provinces; thus, the

[1] This paper is part of a bigger report for the UNDP-funded project titled "Comprehensive Documentation and Analysis of the Official Poverty Estimation Methodology of the Philippines" implemented by PIDS in cooperation with the National Economic and Development Authority (NEDA) and the Technical Committee on Poverty Statistics (TCPOVSTAT).

[2] *Development of an Integrated Poverty Monitoring and Indicator System Project* from 1999 to 2001 , one of the modules of the umbrella project *Strengthening Institutional Mechanisms for the Convergence of Poverty Alleviation Efforts, Phase I* spearheaded by the National Anti-Poverty Commission (NAPC) with funding assistance from the United Nations Development Programme (UNDP).

delay in the release of provincial estimates. The release of 2006 poverty statistics also encountered such a problem with the ratio FE/TBE identified as a possible reason.

The first release of provincial poverty statistics in January 2003 gave rise to a number of issues on the official poverty estimation methodology. Among these is the question of incomparability of the statistics across provinces due to the use of varying menus. Another comparability issue surfaced as official statistics were generated triennially during FIES years. In this case, a source was identified as the FE/TBE ratio.

## 2. Comparability of Provincial Poverty Estimates Across Space

To address the issue of comparability across space, the use of a national menu instead of provincial/regional menus was suggested. Virola and Encarnacion (2003),[3] however, presented evidences that the use of a national menu or regional menus would not produce a threshold that would equal or approximate the minimum income needed to satisfy the nutritional requirements, and therefore, would lead to invalid food thresholds and incorrect measures of poverty incidence. They showed that the use of a national menu for all the provinces or regions would lead to the following distortions: 1) Food items used in determining the food threshold would not necessarily be low cost; some home-grown commodities in a particular province could be cheaper than the ones identified in the national menu but would still satisfy the minimum nutritional requirements; and 2) Food items in the national menu would not necessarily be locally available in a province/region; given the geographical structure of the country, commodities available in one region/island group might not be available in others. The same conclusion holds if a regional menu is used for all the provinces in that region. Virola and Encarnacion (2003) also showed that if a provincial menu was used for each province, the food bundle/menu was constructed to consist of food items satisfying the following criteria: (1) local availability and commonness of consumption, (2)nutritional value as prescribed by the Food and Nutrition Research Institute (FNRI) , (3) low cost, (4) acceptable visualization.

[3] Virola, Romulo A. and Jessamyn O. Encarnacion 2003. *Official Provincial Poverty Statistics in the Philippines and the Issue of Comparability Across Space.* NSCB Technical Papers No. 2003-10.

**The Reference Menus**

A national reference menu was formulated based on the typical meal pattern of households in the 2003 National Nutrition Survey. The menu reflects the consumption pattern consistently recorded in past national nutrition surveys of FNRI. It includes breakfast, lunch, supper and a snack. Food items in the menu are distributed in all food groups in the Philippine Food Guide Pyramid prescribed by FNRI. Tentative provincial menus were then constructed based on the tentative reference menu. The quantities/weights of the food items in the reference menu were determined based on usual consumption patterns of Filipino households including those belonging to the 2nd income quintile. The list of specific types of food item frequently consumed by the reference households and cheapest in the province were identified. The reference menus when consumed according to the recommended amounts are designed to meet 100% energy and protein requirement, and at least 80% for other major nutrients.

The final reference menus were a result of consultation with a group of regional and national representatives on 16 June 2006, held at the Bayview Park Hotel, Manila. A total of 72 participants attended the workshop: 14 Regional Nutrition Program Coordinators of the National Nutrition Council, 14 NEDA regional representatives, and 18 from national government agencies, apart from 18 from NSCB and its consultant and 8 from NGOs and other agencies . Suggestions and comments of the participants consisted of those on: (1) the applicability of the national reference menu for food threshold estimation; (2) the soundness of the procedures adopted for coming up with the national reference menu and provincial menus; and (3) the validity of the proposed provincial menus in terms of the availability of the food items in the provinces, their acceptability and commonness of consumption, and potential for being least cost. The following table presents the national reference menu that

already incorporates the comments and suggestions of the participants in the consultative workshop:

**Table 1. National Reference Menu[1]**

| Reference Menu | Food Item | Indicative weight (in gms)[1] |
|---|---|---|
| **Breakfast** | | |
| Scrambled egg | Itlog, manok, buo | 48 *(wt. of 1 med sized egg)* |
| Coffee with milk | Instant coffee | 1 |
| | Gatas, pulbos, filled, instant | 5 |
| Boiled rice/corn | | |
| **Lunch** | | |
| [Boiled/sautéed/ginataang] monggo with malunggay and dried dilis | Munggo, buto, berde, tuyo | 35 |
| | Malungay | 25-35 |
| | Dried dilis | 20-30 |
| [Banana] | Latundan/Lakatan | 65 *(wt of 1 med-sized lakatan)* |
| Boiled rice | | |
| **Supper** | | |
| Fried [fish]/boiled pork | Bangus/galunggong/tulingan/ matambaka/tilapia/sapsap/tambakol/flying fish/aloy/ | 50 -55 *(wt of a med-sized fish)* |
| | Baboy, liempo | 50 |
| [Vegetable] dish | [Kangkong/kamote tops/saluyot/ alugbati/pechay/sayote leaves] | 85-100 *(wt of 1- 1 1/4 hh cup of all other veg, raw wt )* |
| Boiled rice | | |
| **Snack** | | |
| Bread or boiled [saba/rootcrop] | Pan de sal or cassava/kamote/ saba | 30 *(med sized pan de sal)*/ 120-190 *(kamote/cassava)*/ 150-200 *(saba)* |
| | Bigas, puti | 360 *(raw wt)* |
| | Mais, durog, puti | 210 |
| | Langis, niyog | 15 |
| | Asukal, pula | 10 |
| | Kakang gata | 5 |
| | Asin, magaspang | 7 |
| | Bawang | 2 |
| | Sibuyas | 5 |
| | Luya | 5 |

1 - Based on the range of usual intakes of households who consume these items, with consideration of households in the 2nd income quintile and all households regardless of income class

Source: Final Report of *Improvement of the Provincial Poverty Estimation Methodology*

**Preparation of the Provincial Menus**

The Final Report of the project Improvement of the Provincial Poverty Estimation Methodology documents the issues that NSCB addressed regarding its provincial menu. The following issues were:

1. On the consistency and comparability of provincial poverty lines across space and time

*An important condition for valid poverty threshold is consistency and comparability of poverty lines to be able to compare across regions or areas and over time. This assumes that derived poverty lines indicate comparable levels of "welfare" across space and time*[4]*. In 2004, the NSCB Technical Staff re-evaluated 79 provincial and NCR menus, which were initially validated by Dr. Regina Pedro of FNRI. The test of revealed preferences was piloted on 17 provincial menus and the results were presented during the 2004 International Conference on Official Poverty Statistics (ICOPS). These menus, however, used the 1989 RDA since the 2002 Recommended Energy and Nutrient Intake (RENI)8 which replaced the 1989 Recommended Dietary Allowance (RDA)9, has only recently been released. Likewise, the 1995 Census of Population was used since the 2000 Census of Population and Housing results were not yet available at that time. Thus, the menus were reviewed/revised and the menus for the remaining provinces were completed using the 2002 RENI and 2000 population census.*[5]

**2.** On the nutritional requirements of each province

*In order to arrive at the average nutritional requirement of the population upon which the nutritional adequacy of the proposed menus was to be based, a comparison was made on the average nutritional requirement of the Philippine population (based on the 2000 NSO population census) between the 2002 Recommended Energy and Nutrient Intake (RENI) and the 1989 Recommended Dietary Allowance (RDA). The comparison showed significant*

[4] NSCB Poverty Project Staff. *Deriving Consistent Provincial Poverty Lines for the Philippines*. October 2004.
[5] p. 7, Final Report of *Improvement of the Provincial Poverty Estimation Methodology(2006)*

*differences between them particularly with respect to calcium and niacin. Thus the 2002 RENI was used in formulating and assessing the nutritional adequacy of provincial menus. The population structure of the 2000 population census was likewise used instead of that of the 1995 census, the former being the most recent.*[6]

**3.** On the energy and nutrient adequacy of the provincial menus

*The current official methodology uses the criteria of 100% adequacy for calories and protein and 80% for the major vitamins and minerals in assessing the nutritional adequacy of the provincial menus. While other countries are using 100% adequacy only for calories and protein as the threshold without using any specific cut-off for vitamins and minerals, it was felt that using this criterion alone is inadequate. Using only calories and protein in assessing nutritional adequacy of a diet for purposes of poverty estimation would assume that when the requirements for calories and protein are satisfied, the requirements for most of the other nutrients are satisfied as well. This may be true provided that a reasonably adequate dietary pattern in the form of an "ideal" food basket is followed, based either on FNRI 2003 NNS, diet diversity score, or DDP. Otherwise, there will be a need to specify a cut -off for vitamins and minerals. The results of using the two methods in formulating reference menus showed significant inadequacies in several of the nutrients when there is no cut-off for vitamins and minerals. Thus, the criteria of 100% adequacy for calories and protein and 80% for the major vitamins and minerals was used in assessing the nutritional content of the provincial menus against the recommended energy and nutrient intake for the province. The availability and commonness of consumption of food items were obtained from the food consumption pattern generated from the 2003 NNS of FNRI. The nutritional value of the food items were sourced from the 1997 Food Composition Table and compared with the provincial RENI and assessed for adequacy using the criteria of 100% adequacy for energy and protein and 80%*

[6] p. 15, Final Report of *Improvement of the Provincial Poverty Estimation Methodology(2006)*

*adequacy for the major vitamins and minerals. Cost was based on the 2000 price data of the National Statistics Office (NSO) and the Bureau of Agriculture Statistics (BAS). Visualization was judged from the combination of food items in the menu compared to customary diets of Filipinos. With the nutritional requirements determined for each province and the criteria for energy and nutrient adequacy and for selecting food items as set above, tentative provincial menus were formulated based on the customary diet of Filipinos and using food items that are available and commonly consumed. The menus were then evaluated based on their cost, and acceptable visualization.*[7]

Table 2 below shows the summary of the provincial menus that resulted after the consultative workshop. It should be noted that all the menus satisfy the nutritional adequacy criteria of at least 100% of the requirement for calories and protein and at least 80% for the major vitamins and minerals. Another important note on the provincial menus is that the menu items were priced based on the latest price data from the NSO and BAS and subjected to the Test of Revealed Preferences.

[7] p. 16, Final Report of *Improvement of the Provincial Poverty Estimation Methodology(2006)*

**Table 2. Summary of Provincial Menus Following the National Reference Menu***

| Region | Province/City | Banana | Fish | Green Leafy Vegetables | Snack |
|---|---|---|---|---|---|
| NCR** | | Latundan | Tilapia | Camote tops | pandesal |
| | | | | | |
| Region I | Ilocos Norte | Latundan | Tilapia | Saluyot | pandesal |
| | Ilocos Sur | Latundan | Tulingan | Saluyot | pandesal |
| | La Union | Latundan | Tulingan | Camote tops | pandesal |
| | Pangasinan | Latundan | Tulingan | Camote tops | saba |
| | | | | | |
| CAR | Abra | Latundan | Galunggong | Kangkong | saba |
| | Benguet | Latundan | Galunggong | Pechay | Camote |
| | Mt. Province | Latundan | Boiled Pork | Camote tops | Camote |
| | Kalinga | Latundan | Galunggong | Kangkong | saba |
| | Apayao | Latundan | Galunggong | Kangkong | saba |
| | Ifugao | Latundan | Galunggong | Pechay | pandesal |
| | | | | | |
| Region II | Batanes | Latundan | Flying fish | Camote tops | camote |
| | Cagayan | Lakatan | Galunggong | Kangkong | pandesal |
| | Isabela | Lakatan | Galunggong | Kangkong | camote |
| | Nueva Vizcaya | Latundan | Galunggong | Kangkong | camote |
| | Quirino | Latundan | Galunggong | Kangkong | camote |
| | | | | | |
| Region III | Bataan | Lakatan | Tilapia | Cam ote tops | camote |
| | Bulacan | Latundan | Galunggong | Kangkong | saba |
| | Pampanga | Latundan | Tilapia | Kangkong | saba |
| | Nueva Ecija | Latundan | Tilapia | Camote tops | saba |
| | Tarlac | Latundan | Galunggong | Kangkong | saba |
| | Zambales | Lakatan | Galunggong | Kangkong | pandesal |
| | Aurora | Latundan | Tambakol | Kangkong | saba |
| | | | | | |
| Region IVA | Batangas | Latundan | Tulingan | Camote tops | saba |

**Table 2 contn.**

| Region | Province/City | Banana | Fish | Green Leafy Vegetables | Snack |
|---|---|---|---|---|---|
| Region VIII | Eastern Samar | Lakatan | Sapsap | Camote tops | pandesal |
| | Leyte | Latundan | Sapsap | Kangkong | pandesal |
| | Biliran | Latundan | Galunggong | Kangkong | saba |
| | Northern Samar | Latundan | Sapsap | Camote tops | pandesal |
| | Southern Leyte | Latundan | Sapsap | Camote tops | saba |
| | Western Samar | Latundan | Sapsap | Kangkong | pandesal |
| | | | | | |
| Region IX | Zamboanga del Norte | Latundan | Galunggong | Kangkong | saba |
| | Zamboanga del Sur | Lakatan | Galunggong | Kangkong | Pandesal |
| | Zambo Sibugay | Lakatan | Galunggong | Kangkong | Pandesal |
| | | | | | |
| Region X | Bukidnon | Latundan | Tulingan | Alugbati | saba |
| | Camiguin | Latundan | Tulingan | Camote tops | pandesal |
| | Misamis Oriental | Latundan | Tulingan | Camote tops | pandesal |
| | Misamis Occidental | Latundan | Galunggong | Camote tops | saba |
| | Lanao del Norte | Latundan | Galunggong | Alugbati | saba |
| | | | | | |
| Region XI | Davao del Norte | Latundan | Tulingan | Kangkong | pandesal |
| | Davao del Sur | Latundan | Tulingan | Alugbati | saba |
| | Davao Oriental | Lakatan | Tulingan | Alugbati | pandesal |
| | Compostela | Latundan | Tulingan | Kangkong | pandesal |
| | | | | | |
| Region XII | North Cotabato | Lakatan | Tilapia | Camote tops | pandesal |
| | Sultan Kudarat | Lakatan | Tilapia | Camote tops | pandesal |
| | South Cotabato | Lakatan | Tulingan | Kangkong | pandesal |
| | Saranggani | Lakatan | Tulingan | Kangkong | cassava |
| | | | | | |
| CARAGA | Agusan de Norte | Latundan | Tulingan | Camote tops | saba |
| | Agusan del Sur | Latundan | Tulingan | Kangkong | saba |
| | Surigao del Norte | Latundan | Tulingan | Camote tops | Cassava |
| | Surigao del Sur | Latundan | Tulingan | Camote tops | saba |
| ARMM | Basilan | Latundan | Galunggong | Kangkong | saba |
| | Lanao del Sur | Lakatan | Galunggong | Kangkong | pandesal |
| | Maguindanao | Latundan | Galunggong | Kangkong | pandesal |
| | Sulu | Lakatan | Galunggong | Camote tops | cassava |
| | Tawi-Tawi | Latundan | Tulingan | Camote tops | cassava |

* Not shown are the food items common to all the province: scrambled eggs, coffee with milk, and boiled monggo with malunggay and dried dilis; food items in red are changes made from the orginal menu.
** For NCR, sauteed monggo is used.
*** For the Bicol provinces, gata is used for cooking vegetables.
**** For Iloilo, Guimaras, Negros Occidental and Zamboanga del Sur, gata is used for monggo instead of boiling.

Source: Final Report of *Improvement of the Provincial Poverty Estimation Methodology*

## 2. The question of comparability of estimates across space

Dr. Martin Ravallion in the Forum on Poverty Lines on 3 December 2003 suggested two tests to validate the provincial poverty estimation methodology. The first is the test of revealed preferences to check the consistency of the menus used in the estimation of the food thresholds. The second is the application of rank correlation test to check the robustness of the poverty estimates based on their rankings.

The Final Report of the project to improve the provincial poverty estimation methodology in 2006 documented the test of revealed preferences. Castro, Addawe, and Agtarap(2007) also presented the findings. Ravallion and Lokshin (2003) provide a more detailed discussion as well as the underlying economic theory behind the utility consistency of poverty lines.

The theory of revealed preferences states that the preferences of consumers is revealed by their actual behavior in purchasing goods and services and poverty results because of non-fulfillment of basic references. Consumer preferences as revealed by the consumers' choices provide information for the derivation of the levels of wellbeing and poverty. Attachment 1 gives a brief discussion of the procedure based on revealed preferences that may be used to assess consistency of poverty lines.

Results for initially-proposed provincial menus across the 79 provinces and NCR for urban and rural areas, respectively, indicated that, initially, for both urban and rural areas,9 out of 80 menus passed the consistency test or registered zero failed test, namely Ilocos Sur, Cavite, Antique, Negros Oriental, Western Samar, Bukidnon, Davao del Sur, Mountain Province and Sulu. Consequently, adjustments to the menus were made to address the results. The more practical and straightforward way to pass the test is by re-designing the original menus of those provinces for which consistency is rejected. "Re-designing" involves either of the following: (a) adjustment only of the weights but not the composition of the food items in the menu, and at the same time still satisfying the nutritional standard and making sure that the adjusted weights are still within reasonable/acceptable range; and (b) revision of the composition of the food items in the menu.

**a) Minor adjustments in the weights of food items of the original menu**

The original menus were revised so that the revised menus satisfy the nutritional requirements. The revisions done were mainly adjustments of weights in the original menus such that they are within acceptable range which is the range between the national food consumption pattern and food consumption pattern of the 2nd economic quintile. The weights of more nutritious food items were increased and the weights of less nutritious and costlier food items were decreased. On the other hand, standard weights for eggs, coffee, milk, rice, mongo, malunggay, banana, bread, cooking oil, salt and brown sugar were maintained. The overall cost of the menu was lowered such that it became cheaper than the menu/s of the province/s for which it failed the test.

**b) Revision in the composition of food items in the menu**

For provincial menus where mere adjustments in the weights were not successful, the menus were was changed by substituting certain food items with those that are either frequently consumed or at least available in the province. Validation of availability of a food item in the province was done by checking the presence of its price data in the province or its inclusion in the CPI market basket of NSO. Data on frequent consumption was obtained from the 2003 Food Consumption Survey of the FNRI.

Food thresholds based on the revised menus indicated that 76 out of 80 revised menus for urban areas passed the consistency test. The five menus that failed the test were those of Camarines Norte (1), South Cotabato (2), Basilan (1), and Lanao del Sur (1). None of the Qij's however of these five failed tests fell below 0.9800. In fact, lowest Qij was 0.9862. Besides the Qij's being very close to 1, the menus of the four provinces were acceptable for the following reasons:

| Menu | Reason for acceptability |
|---|---|
| Camarines Norte | Difference of only P5 with the cheapest menu (Ilocos Sur menu); Ilocos Sur menu has no coconut milk |
| South Cotabato | Difference of only P2 with the cheapest menus (Surigao del Norte and Tawi-tawi) |
| Basilan | Lost only to Cebu menu which has rice-corn mix |
| Lanao del Sur | Difference of only P29 with the cheapest menu (Romblon); Romblon menu was not adopted since matangbaka is not in the CPI market basket of Lanao del Sur, and hence, may not be widely available in the province |

Source: p. 127, Final Report of *Improvement of the Provincial Poverty Estimation Methodology*

On the other hand, 61 out of 80 revised menus for rural areas passed the consistency test. The test was passed for 6,209 out of 6,241 possible pairwise comparisons. The 32 failed tests however have Qij's greater than 0.98, except for the use of Cebu menu for Basilan that resulted in an index of 0.9652 which is still greater than 0.95.[8]

In conclusion, the results from the Final report of the Improvement of the Provincial Poverty Estimation Methodology showed the consistency of majority of the revised provincial menus through the test of revealed preferences. Although overall consistency was initially rejected, with only 9 provinces passing the initial test, revision of the menus by either adjusting the weights of the original menu or by changing the composition of the food items, greatly improved the consistency of the provincial menus. With the menus passing the test of revealed preferences, it is assured that the formulated provincial menus are comparable and consistent and can therefore be used to estimate absolute poverty estimates in the country.[9]

Castro, Addawe and Agtarap(2007) assessed provincial menus of the eight provinces namely, Bulacan, Capiz, Cebu, Negros Oriental, Siquijor, Easterm Samar, Zamboanga del Sur, and Bukidnon,that registered higher food poverty thresholds than the official estimates,

[8] p. 127, Final Report of *Improvement of the Provincial Poverty Estimation Methodology(2006)*
[9] p.173, Final Report of *Improvement of the Provincial Poverty Estimation Methodology(2006)*

as reported in the *Improvement of the Provincial Poverty Estimation Methodology*. They presented proposed provincial menus that tested consistent across provinces as the menus passed the test of revealed preferences.

The revised provincial menus were presented to the Technical Committee on Poverty Statistics (TC-PovStat), a multi-sectoral representation consisting of noted experts in the area of poverty statistics coming from the academe, producers and users of poverty statistics from both government and non-government organizations. The TCPovStat , in general, approved the results but recommended their adoption together with other improvements on the official poverty estimation methodology.[10]

### 3. Comparability of Poverty Estimates Across Time

The issue of comparability of poverty estimates, both national and provincial, across time is a concern that has gained increasing recognition as updated estimates are added to the time series of poverty estimates. Research to look into this issue has focused on the indirect estimation of the poverty threshold using the FE/TBE ratio:

$$Povertythreshold = \frac{Foodthreshold}{\left(FE/TBE\right)}$$

where FE = actual food expenditure of families within the +/-ten percentile of the food threshold

TBE = total basic expenditure of families within the +/- ten percentile of the food threshold. TBE is an aggregate of expenditures on food; clothing and footwear; fuel; light and water; housing maintenance and other minor repairs; rental or occupied dwelling units; medical care; education; transportation and communications; non-durable furnishing; household operations and personal care and effects.

In the current methodology, FE/TBE based on the data for the year of computation of poverty statistics( i.e., changing FE/TBE ratio). Questions of comparability across time have focused on the use of changing FE/TBE.

Domingo, Encarnacion, and Balamban(2002), using 2000 data, studied alternative approaches to FE/TBE ratio estimation including computing for different percentile bands for the non-food component of the poverty threshold to come up with a more appropriate estimation of the FE/TBE ratio. Computational exercises on the use of a constant and

[10] p. 26, Castro, Addawe,and Agtarap(2007)

changing (national-provincial) FE/TBE ratios were also done to study the probable overestimation of poverty thresholds in the use of changing FE/TBE ratios as applied on the official methodology. Lastly, exercise on the computation of poverty incidence using national FE/TBE was also done and compared with the official poverty statistics, which uses provincial FE/TBE ratios. The following findings were enumerated:

1. *Although use of different percentile bands generated different provincial poverty incidences, rankings of the provinces did not show large differences across the different approaches.*

   *The use of the conditional percentile band would have lessen the possibility of overestimating poverty incidence since it ensures equal width of bands around the food threshold, which would result for provinces with subsistence incidence less than 10 not to be biased upwards. However, the use of such band will mean that different approaches will be applied to the different provinces depending on the subsistence incidence. Thus, it can be argued that this approach will make the poverty threshold not comparable across space.*

2. *The use of a constant FE/TBE ratio resulted to lower poverty incidence and thresholds compared to the official estimates, which used changing FE/TBE ratios. This empirically confirms the use of a constant FE/TBE ratio underestimates the poverty threshold/incidence since it assumes the same rate of increase in prices for both food and non-food commodities.*

   *Thus, it is recommended that the use of a changing FE/TBE ratio be retained. However, the use of a changing FE/TBE ratio needs to be studied further as this is believed to be overestimating poverty thresholds/incidence.*

3. *The use of a national FE/TBE in some cases may lead to an overestimation/underestimation of the poverty incidence depending on how far is the standard of living in a province to the determined national standard.*

   *Also, a national poverty threshold tends to get the average living standard across all provinces, which means that this standard of living may be higher or lower for some provinces. Thus, it is necessary that provincial level characteristics be reflected in the poverty threshold since standard of living may vary a lot across provinces. Therefore, the use of a national FE/TBE may not be appropriate to estimate poverty incidence. To further show the distribution of regions and provinces with possible overestimation/underestimation, the table is shown below:*

| ***If a national FE/TBE ratio is used*** | ***Regions*** | | ***Provinces*** | |
|---|---|---|---|---|
| | ***Urban*** | ***Rural*** | ***Urban*** | ***Rural*** |
| ***1. FE/TBE $_{natl}$ < FE/TBE $_{official}$ (Possible overestimation)*** | *1* | *10* | *23* | *51* |
| ***2. FE/TBE $_{natl}$ > FE/TBE $_{official}$ (Possible underestimation)*** | *15* | *5* | *58* | *26* |
| ***TOTAL*** | ***16*** | ***15*** | ***81*** | ***77*** |

   *However, it should also be noted that for the 2000 FIES, some of the provinces have very small sample sizes resulting to very few number of families included in the 10 percentile band.*[11]

Computation of the 2006 poverty estimates yielded results which again questioned the changing FE/TBE ratio. Some recommendations from the Dr. Arsenio M. Balisacan to the Technical Committee on Poverty Statistics are : smoothen the FE/TBE series (1985-2006) or use the FE/TBE in 2003. In the latter case, he argues that *the standard of living implied by the poverty line for 2006 is roughly the same as that for 2003. Anchoring the poverty line to the current FE/TBE ratio makes the poverty line systematically vary with the mean incomes of*

[11] pp. 52-53, Domingo, Encarnacion, and Balamban(2002).

*the poor. For example, if economic growth benefits everyone, including the poor, the FE/TBE ratio of the poor falls (Engel effect: an "empirical regularity"), causing the poverty line to rise. Conversely, if economic contraction hits everyone across income groups, the FE/TBE rises, hence poverty line falls. Clearly, in this case, the poverty measure understates the progress in (absolute) poverty reduction whenever there is a broadly based growth and overstates it whenever real incomes contract across income groups. Put differently, the poverty lines are not fixed in terms of living standard, making comparison of poverty estimates over time problematic. Such estimates may also potentially mislead policy choices vis-a-vis poverty reduction.*[12]

Another suggestion for comparability through time as documented in by the secretariat of the Technical Committee on Poverty Statistics is the use of real average income and expenditure by deflating income data using CPI, and if possible, CPI for the bottom 30 percent of families..

## 4. Recommendations

The following are recommendations to ensure comparability of poverty statistics across provinces:

a) Implement the use of the revised provincial menus that resulted from the test of revealed preferences.
b) Use a cost of living index to transform income data into data assuming standard of living of a particular province or region ( NCR is suggested)

[12] Communication of Dr. Arsenio M. Balisacan to the Technical Committee on Poverty Statistics, February 10, 2008.

The following are recommendations to ensure comparability of poverty statistics through time:

a) Use CPI to deflate income data

b) Study further the underestimation of poverty statistics using a constant FE/TBE and their overestimation using changing FE/TBE and suggest another method which corrects under- and over-estimation. Two possibilities are: the use of model-based estimate for FE/TBE or simply combination of the changing FE/TBE and constant FE/TBE, a form of smoothing as suggested by Dr. Balisacan.

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**Attachment 1**[13].

To illustrate how to decide whether a set of poverty lines is utility consistent, we take two provinces, say, A and B, each of which has a poverty line, which is the cost in that province

[13] pp.79 – 80, Final Report of *Improvement of the Provincial Poverty Estimation Methodology(2006)*

of pre-specified bundles of goods specific to each province. Assuming identical preferences in the two provinces, a straightforward revealed preference test is applied. This requires that the poverty line for A is no greater than the cost in province A of B's bundle, for otherwise the bundle in B is more affordable when A was chosen, implying that B should have been the preferred bundle. Similarly, the province B poverty line cannot be greater than the cost in that province of the bundle for A.

To outline the test formally, let $q_i = (q_1, q_2, \ldots, q_m)$ be the m-vector giving the poverty bundle for province $i = 1, 2, \ldots, m$ and $p_i$ be the corresponding vector of prices. The poverty line in province $i$ may then be denoted as $z_i = p_i q_i$, while the cost of $j$'s bundle using $i$'s prices is denoted by $p_i q_j$. We define the $n \times n$ quantity-index matrix $\boldsymbol{Q}$ by:

$$Q_{ij} = \frac{p_i q_j}{p_i q_i}$$

The $\boldsymbol{Q}$ matrix is used to compare the poverty bundles across provinces; the higher $Q_{ij}$ is, the higher the value of the poverty bundle for province $j$ when judged by its cost in province $i$. The quantity index ranks poverty bundles across provinces conditional on the price relatives. So the key testable implication of consistent poverty lines across the full set of preferences is that none of the elements of the $\boldsymbol{Q}$ matrix should be below unity. If consistency is rejected, the original bundles can be re-designed to pass the test.

According to Ravallion and Lokshin (2003), some relaxation of the test criterion is warranted to account for errors. There is no way of calculating standard errors for the Q matrix since there is no explicit sampling or parameter estimation involved. The best thing to do is to test sensitivity to relaxing the test criterion, say, 0.95. If the test is passed using the relaxed criterion, then consistency may be accepted.

A summary statistic for the value of the poverty line of each province is given by the mean quantity index calculated by taking the simple average across rows for each column of the $\boldsymbol{Q}$ matrix. This index is written as:

$$\overline{Q}_j = \sum_{i=1}^{n} Q_{ij} / n$$

Finding that $Q_j > Q_k$ means that poverty bundle $j$ dominates $k$ at least partially (for some price relatives in $P$), though not necessarily fully.

A matrix of Laspeyres quantity indices is constructed:

| Prices | Bundle | | | | | |
|---|---|---|---|---|---|---|
| | Area 1 | Area 2 | ... | Area $j$ | ... | Area $n$ |
| Area 1 | $Q_{11}$ | $Q_{12}$ | ... | $Q_{1j}$ | ... | $Q_{1n}$ |
| Area 2 | $Q_{21}$ | $Q_{22}$ | ... | $Q_{2j}$ | ... | $Q_{2n}$ |
| . | . | . | ... | . | ... | . |
| . | . | . | ... | . | ... | . |
| . | . | . | ... | . | ... | . |
| Area $i$ | $Q_{i1}$ | $Q_{i2}$ | ... | $Q_{ij}$ | ... | $Q_{in}$ |
| . | . | . | ... | . | ... | . |
| . | . | . | ... | . | ... | . |
| . | . | . | ... | . | ... | . |
| Area $n$ | $Q_{n1}$ | $Q_{n2}$ | ... | $Q_{nj}$ | ... | $Q_{nn}$ |
| $\overline{Q}_j$ | $\overline{Q}_1$ | $\overline{Q}_2$ | ... | $\overline{Q}_j$ | ... | $\overline{Q}_n$ |

for which the following **necessary condition for consistency of poverty lines across the full set of preferences is validated:**

None of the elements of the *Q* matrix should be below unity, *i.e.*,
$Q_{ij} \geq 1$ for all *i*'s and *j*'s

To illustrate the test of revealed preferences, it was applied to the provincial food thresholds as estimated from the application of the proposed provincial menus in the Final Report of Improvement of Provincial Poverty Estimation methodology. Tables 2 and 3 illustrate the matrix of urban food thresholds and quantity indices for selected provinces. As can be leaned from Table 2, there are provinces having cheaper or more affordable menus than Bulacan and Capiz, when priced in these two areas, as shown by provinces with lower food thresholds. Results of consistency test for the two provinces are summarized in Table 3, which shows that there are 42 and 35 provinces, respectively, having indices lower than 1, thus failing the test of revealed preference. In contrast, the initial menu for Negros Oriental, on the other hand, passed the consistency test as indicated by its zero failed test.

Table 2. Food thresholds for selected provinces in URBAN areas, 2000

| PRICE | MENU | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Bulacan | Capiz | Negros Oriental | Ilocos Sur | | | Surigao Del Norte | Surigao Del Sur |
| Bulacan | 9,467 | 9,864 | 9,301 | 9,682 | ..... | ..... | 8,912 | 9,152 |
| Capiz | 8,115 | 8,428 | 8,627 | 7,796 | ..... | ..... | 8,433 | 8,735 |
| Negros Oriental | 7,253 | 7,685 | 6,943 | 7,509 | ..... | ..... | 7,045 | 7,120 |

Table 3. Matrix of Laspeyres quantity indices for selected provinces in URBAN areas, 2000

| PRICE | No. of Failed Tests (no. of provinces test fails) | MENU | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Bulacan | Capiz | Negros Oriental | Ilocos Sur | | Surigao Del Norte | Surigao Del Sur |
| Bulacan | 42 | 1.0000 | 1.0420 | 0.9825 | 1.0227 | .... | 0.9414 | 0.9667 |
| Capiz | 35 | 0.9628 | 1.0000 | 1.0236 | 0.9250 | .... | 1.0006 | 1.0364 |
| Negros Oriental | 0 | 1.0447 | 1.1070 | 1.0000 | 1.0816 | .... | 1.0147 | 1.0256 |

Consistency of food thresholds across the full set of preferences (prices) is rejected for both urban and rural areas as indicated by the presence of indices that are greater than one, $Qij < 1$ for some ($i$, $j$)'s. For urban areas, only 9 out of 80 menus passed the consistency test or registered zero failed test, namely Ilocos Sur, Cavite, Antique, Negros Oriental, Western Samar, Bukidnon, Davao del Sur, Mountain Province and Sulu. Provincial menus that passed the consistency test for the urban areas are also the menus that passed the consistency test in the rural areas, with the addition of Northern Samar and Surigao del Sur. [14]

[14] pp. 7-8 , Castro, Addawe and Agtarap(2007), Assessing Poverty Lines by Revealed Preference