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Quality indices used for the quantity method for estimating PPPs of dwelling services

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Introduction

The so-called "quantity method" for estimating PPPs for dwelling services starts by calculating quantity relatives based on total living space of dwellings or, if not available, total number of rooms in each country. These crude quantity relatives are then multiplied by quality indices to obtain volume relatives. Finally the volume relatives are divided into expenditure relatives to obtain PPPs.

For ICP 2005, the quality index was the geometric mean of the shares of dwellings with electricity, inside water and private toilet. An early TAG agreed that for ICP 2011 it may be possible to improve the quality index by adding a fourth quality indicator – namely the number of persons per room. The number of persons per room is one of the criteria used by the United Nations for measuring housing quality.

The sixth column of Table A shows the numbers of persons per room in 2005 for 14 AP countries. The average for the 14 countries is just under 2.0, with ratios of over 3.0 per room in the poorer countries and under 1.0 in the richer countries. In order for these ratios to be combined with the shares of dwellings with electricity, water, and toilets, the numbers of persons per room need to be converted to an index that is commensurate with these shares. A simple, admittedly arbitrary, way of doing this is suggested below. The quality index is then recalculated using this index as an additional quality component and the original and revised quality indices are shown in Table A and in Chart A.

Note that the information required to include number of persons per room in the quality index is already being collected by the existing "quantity" questionnaire for dwelling services. It can be seen as a way of better exploiting data that countries have already supplied.

Index of the number of persons per room

The index suggested here is a linear conversion from numbers of persons per room to an index going from 0.1 to 0.9. The particular linear conversion suggested here is quite arbitrary but seems to produce plausible results for the 14 AP countries used as an example. These are the assumptions I have made:

- Set the index at 0.50 for 2.0 persons per room. This is one of the UN's criterion for slum/non- slum and, by chance, is also close to the average persons per room for these 14 countries.
- Set the index at 0.10 for 3 or more persons per room (crowded conditions). A lower limit is required since the index must not be zero or negative. The rational for having a cut-off is that 3 persons per room is already unpleasantly overcrowded so that adding more persons only makes things a little worse.
- Set the index at 0.90 for 1 or fewer people per room (spacious accommodation). The rational for having a cut-off is that 1 person per room is already quite spacious and adding more rooms per person is a minimal quality improvement.

With these assumptions, $y = 1.3 – 0.4x$ where y is the index value and x is number of persons per room. (Index values less than 0.10 or greater than 0.90 are set at the 0.10 or 0.90 cut-off points.)

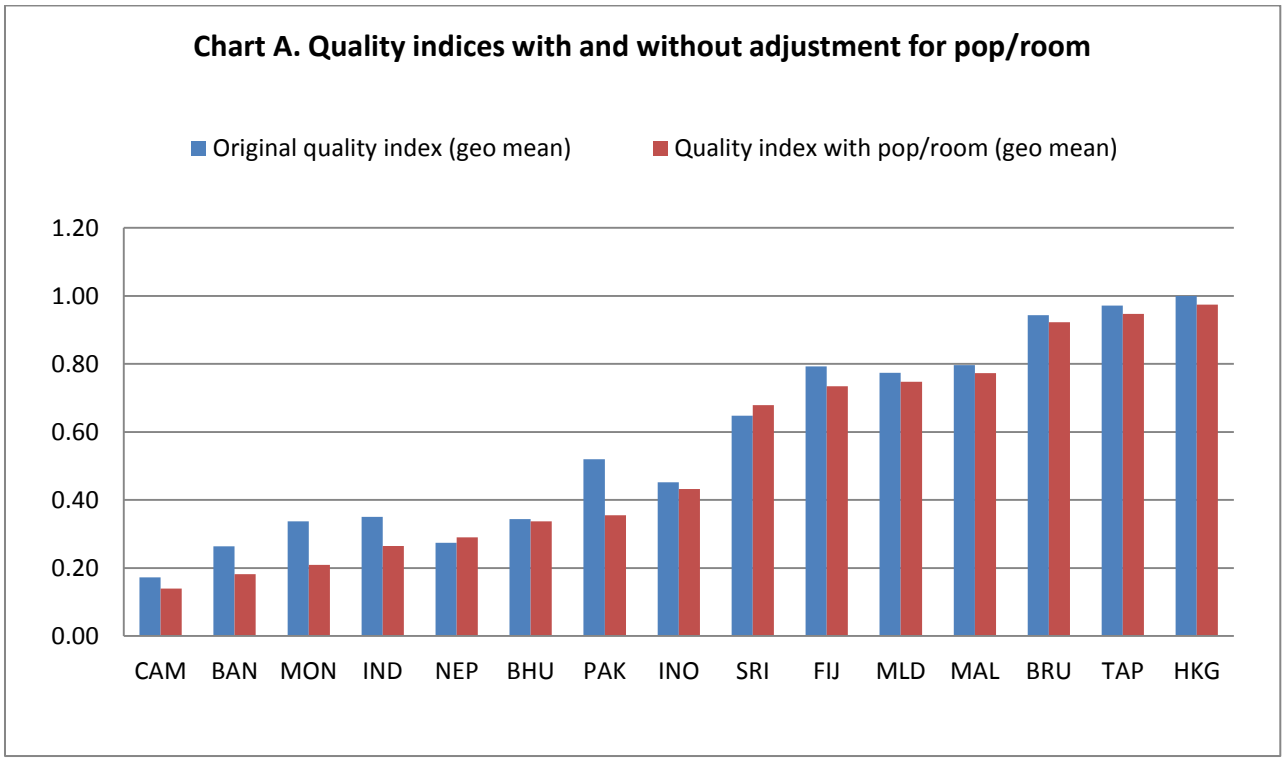
Results

Table A below shows the conversion from numbers per room to the index values. The final column shows the quality index that now covers all four quality indicators – electricity, water, toilet and numbers of persons per room.

Table A. Calculation of original quality index and revised index including persons per room Fourteen AP countries using 2005 data

	Share of dwellings with :			Original quality index (geo mean of cols 2,3 & 4)	Pop/room	Index (*y=1,3-0,4x*)	Index with upper and lower bounds	Quality index with pop/room (geo mean of cols (2,3,4 & 8)
	Electricity	Water	Private toilet					
1	2	3	4	5	6	7	8	9
CAM	0,23	0,10	0,22	0,17	3,88	-0,25	0,10	0,14
BAN	0,44	0,08	0,55	0,26	3,00	0,10	0,10	0,18
MON	0,66	0,24	0,24	0,34	3,02	0,09	0,10	0,21
IND	0,56	0,21	0,37	0,35	2,80	0,18	0,18	0,26
NEP	0,37	0,14	0,39	0,27	2,09	0,46	0,46	0,29
BHU	0,60	0,23	0,30	0,34	1,87	0,55	0,55	0,34
PAK	0,84	0,31	0,54	0,52	2,79	0,18	0,18	0,36
INO	0,85	0,18	0,60	0,45	1,46	0,72	0,72	0,43
SRI	0,63	0,54	0,80	0,65	1,34	0,76	0,76	0,68
FIJ	0,80	0,63	0,99	0,79	1,78	0,59	0,59	0,73
MLD	0,85	0,74	0,73	0,77	1,40	0,74	0,74	0,75
MAL	0,82	0,74	0,83	0,80	1,43	0,73	0,73	0,77
BRU	0,93	0,98	0,91	0,94	1,11	0,86	0,86	0,92
TAP	0,99	0,92	1,00	0,97	0,64	1,04	0,90	0,95
HKG	1,00	1,00	1,00	1,00	0,90	0,94	0,90	0,97

Chart A compares the original quality indices for the 14 countries (blue bars) and the quality index including the number of persons per room (red bars). The inclusion of numbers of persons per room improves the relative positions of Nepal, Bhutan and Maldives and puts Pakistan, India, Bangladesh and Mongolia somewhat lower in the rankings.



Questions

1. Assuming that the quantity approach is going to be used in at least some regions, should the number of persons per room be used as an additional quality variable?

2. Is the kind of linear conversion suggested here suitable? Any better ideas?