AN ASSESSMENT OF MULTIDIMENSIONAL URBAN POVERTY IN VIETNAM CENTRAL CITIES

Nguyen Huu Dung[1], Nguyen Van Cuong[2]
[1]University of Economics Ho Chi Minh City
[2]Graduate program of Vietnam and The Netherlands
Email: nhdung@ueh.edu.vn

ABSTRACT

Cross section data from the Vietnam Household Living Standard Survey 2008 (VHLSS-2008) was used to estimate multidimensional poverty in five urban central cities (Ha Noi, Hai Phong, Da Nang, Ho Chi Minh, and Can Tho) in Viet Nam following the methodology developed by Alkire & Santos (2010). Five dimensions of poverty were considered in the study including education, health, standard of living, economic well-being, and employment labor. The findings show that multidimensional poverty is significantly high in central cities, especially in Ho Chi Minh City. The multidimensional poor suffer from the high deprivation intensity of indicators as type of dwelling, underemployment, housing space, and working time. Moreover, five urban central cities present non-depreciable level of deprivation in electricity. Under-employment deprivation significantly increases its contribution as it receives a higher weight in the estimation. The study highlights the potential application of the methodology for national poverty measurement at multidimensional level as well as a tool for state budget allocation.

Keywords: Multidimensional Poverty Index (MPI), urban poverty, deprivation intensity.

1. Introduction

The poverty problems have been seen different perspectives in every historical period of country and region. Many people in developing countries usually think that developed countries have the availability of enormous economic resources allowing these countries free of being poor. In fact, the poverty is a global issue not only in developing countries but also in developed countries. In the past, the researchers and policymakers usually conducted poverty studies focused on rural areas, especially in Vietnam, to evaluate poverty, inequality, and household living standard by traditional money-metric measure. Recently researchers have recognized that the poor suffer from not only income or expenditure below the poverty line but also other aspects. Hence, many scholars have tried to explore alternative approaches to define the poor into many aspects, not only household living standard but socio-economic position, chronic poverty, deprivations as well. In particular, using of the Multidimensional Poverty Index (MPI) approach is the international measure and analytical tool to define the most vulnerable people, measure deprivations directly and discover the interconnections among severe deprivations that people face at the same time.

Most poverty studies in Vietnam like other developing countries have just concentrated on rural areas, less in urban areas and defined determinants affecting poverty by traditional money-metric measures. In the recent issues of urbanization, the demand of new approach applied to evaluate poverty is really need and requires more attention from

Vietnamese researchers and policymakers. Therefore, this paper implemented to examining the multidimensional urban poverty in five central cities in Viet Nam, including Ha Noi, Hai Phong, Da Nang, Ho Chi Minh and Can Tho, identifying deprivations of the poor, and suggesting recommendation for policymakers in setting appropriate policies for effectively poverty reduction in the coming years.

2. Theoretical foundation related to Multidimensional Poverty Index (MPI)

The MPI measure is the international approach and is an index of acute multidimensional poverty. It is very easy to calculate, interpret and satisfy many desirable properties. The MPI reveals a different pattern of poverty than income poverty, as it illuminates a different set of deprivations. The MPI has three dimensions as health, education, and standard of living. These dimensions are measured by ten indicators. Each dimension is equally weighted and each indicator within a dimension is equally also weighted (Alkire & Santos, 2010).
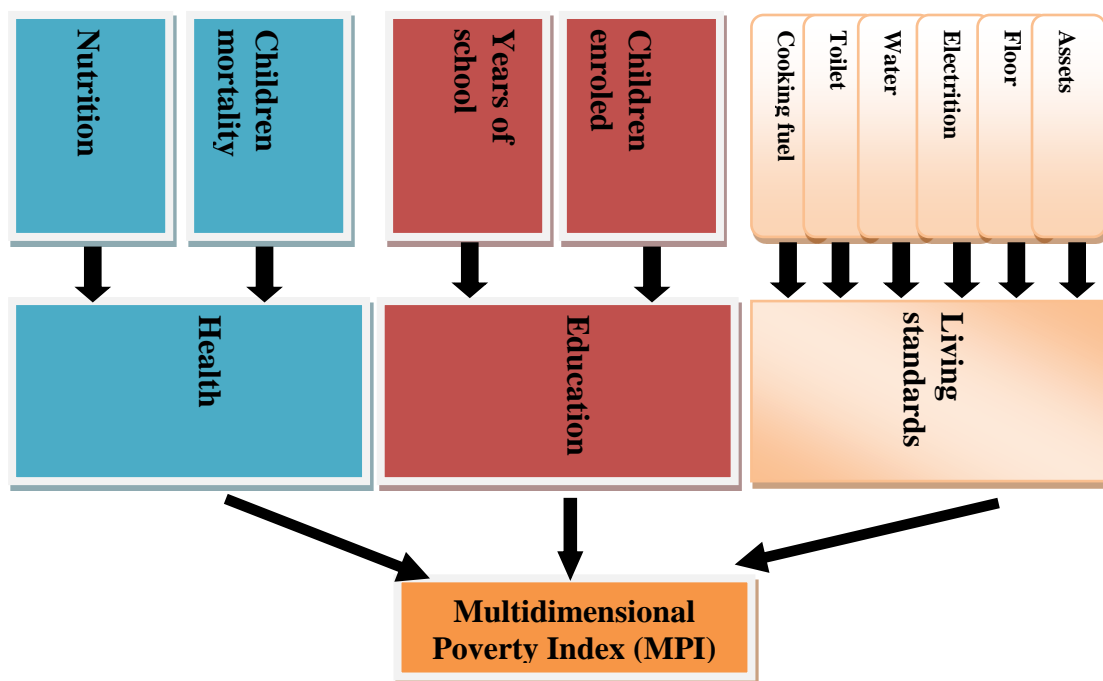

Figure 1. Components of the Multidimensional Poverty Index (MPI)

Source: Adopted from Alkire and Santos (2010)

According to Alkire & Santos (2010) MPI is the product of two measures, namely, the Headcount (H) which is percentage of people who are poor, and the average intensity of deprivation (A) which reflects the proportion of dimensions in which households are deprived. The MPI reveals the combination of deprivations that batter a household at the same time. A household is considered poor if it is deprived at least 30 percent of the weighted indicators.

3. Empirical studies related to dimensions and indicators of poverty

Moser *et al.* (1996) indicated the key urban poverty indicators in urban management and poverty alleviation including incidence of urban poverty, severity or urban poverty, depth of urban poverty (poverty gap), household size, household composition, dependency burden, wage level, formal sector employment, child labor, housing production, floor area per person, permanent dwelling units, unauthorized housing, access to public transport by urban poor, average journey time to work, access to water by urban poor, access to sewerage, average time spent in fetching water, water quality, water quality, water supply reliability, sewage treatment rat,

sewage reliability, access to solid waste collection, access to electricity supply, access to education, access to health service, infant mortality, net enrollment rates in primary and secondary schools, percent of income spent on, infrastructure expenditure ratio, urban female, gender wage equity, gender education differences, gender labor force participation equity, woman owner, and asset ownership by women.

In the assessment of city poverty, Hentschel and Seshagir (2000) has suggested the following groups of indicators: *income poverty indicators* regarding to poverty rate (incidence), poverty gap, poverty severity or extreme poverty rate (incidence) or income inequality measure. *Health and Education Outcome indicators* regarding tounder-five mortality rate, infant mortality rate, maternal mortality rate, life expectancy, malnutrition rate of children, literacy rate, years of schooling. *Access indicators* regarding to water, electricity, sanitation, garbage collection or school and health facility or social programs (nutrition, social assistance) or service satisfaction. *Non-Income Deprivation Indicators* regarding to unemployment, violence, child labor, discrimination.

Baker and Schuler (2004) discussed the approaches to analyze urban poverty including Income or Consumption Measures, Unsatisfied Basic Needs Index, Asset Indicators, Vulnerability, Participatory methods. In India, Mehta (2003) determined chronic poverty at 379 districts level in 15 large states of India via variables as illiteracy, infant mortality, low levels of agricultural productivity and poor infrastructure reflecting persistent deprivation.

In Thailand, Prakongsai (2006) discussed the uncertainty of household income and expenditure data and the difficulties in available data in Thailand to evaluate the living standard, household socio-economic positions by traditional money-metric measure. Then, the research tried to explore the possibility of using household asset index for assessing household poverty.

Wagle (2008) has given some indicators of poverty dimensions including economic well-being, capability, and three social

inclusion (sub)dimensions unable to be directly observed. These dimensions were measured by using a set of observable indicators.

Santos and Ura (2008) estimated multidimensional poverty in Bhutanby using 2007 Bhutan Living Standard Survey data. There are five dimensions used for both rural and urban areas as income, education, room availability, access to electricity and access to drinking water, and two additional dimensions used for only rural area as access to road and land ownership.

According to Asselin and Vu (2009), there were five dimensions to analyze dynamic poverty in Vietnam, namely health, employment, education, labor, and housing (environment).

4. Research methodology
4.1. Poverty measurement

The study applied both absolute and relative poverty measurements for the comparison and discussion of the estimated results.

Absolute poverty measure by Head-count

The head-count measure is the most popular and simplest measure to calculate the percentage of the population whose incomes or expenditures are below poverty line.

$$P_0 = \frac{1}{N} \sum_{i=1}^{N} I(y_i \leq z) = \frac{N_0}{N}$$

Where:

P_0 is head-count ratio

N_0 is people below the poverty line

N is people in the total population or total households

$I(y_i \leq z)$ is indicator function which is equal one when y_i less than z and is equal zero when y_i more than z. So if the expenditure (y_i) is less then poverty line (z) when $I(y_i \leq z)$ is equal one and the household is defined poor.

The head-count ratio is a simple formula and easy to calculate. However, it doesn't point out magnitude, severity, and depth of poverty. The "poverty head count ratio" is computed by identifying the proportion of the population that is poor.
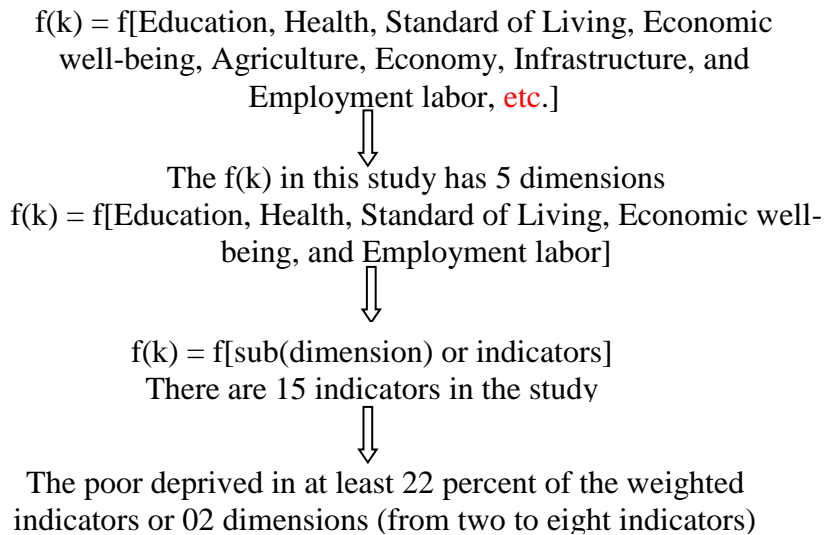
Relative measurement by MPI

The Multidimensional Poverty Index (MPI) measure of Alkire and Santos (2010) is the newer alternative measure that created to calculate multiple deprivations and their overlap. The MPI formula can be written in general form as MPI = H x A, where H is percentage of people who are MPI poor (incidence of poverty), and A is average intensity of MPI poverty across the poor (%).

4.2. Analytical framework

Based on these above theoretical foundation, empirical studies and the MPI formula from Alkire and Santos (2010), the general multidimensional function in the study is f(k), where k is the total dimensions. The f(k) is as following:

f(k) = f[Education, Health, Standard of Living, Economic well-being, Agriculture, Economy, Infrastructure, and Employment labor, etc.]

⇩

The f(k) in this study has 5 dimensions
f(k) = f[Education, Health, Standard of Living, Economic well-being, and Employment labor]

⇩

f(k) = f[sub(dimension) or indicators]
There are 15 indicators in the study

⇩

The poor deprived in at least 22 percent of the weighted indicators or 02 dimensions (from two to eight indicators)

The study examines five dimensions of poverty including education, health, standard of living, economic well-being, employment labor and excluding other dimensions such as agriculture, infrastructure, etc. due to the availability of information in VHLSS and in urban cities. The following fifteens indicators in five dimensions are used to calculate the MPI poor in five urban central cities. Each dimension is equally weighted and each indicator within the dimension is also equally weighted. The intent of determination of weight is like the original standard to evaluate how each dimension and indicator affect to multidimensional poverty and intensity of indicators affect to MPI poor.
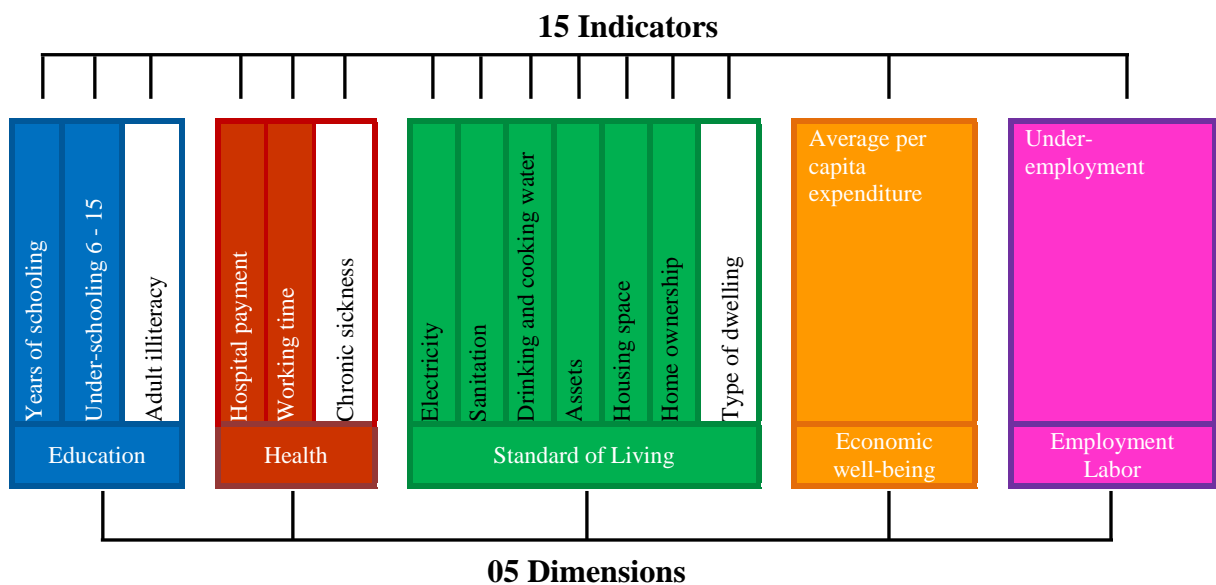

15 Indicators

Years of schooling | Under-schooling 6 - 15 | Adult illiteracy — **Education**

Hospital payment | Working time | Chronic sickness — **Health**

Electricity | Sanitation | Drinking and cooking water | Assets | Housing space | Home ownership | Type of dwelling — **Standard of Living**

Average per capita expenditure — **Economic well-being**

Under-employment — **Employment Labor**

05 Dimensions

Figure 2. Diagram of dimensions and indicators of the MPI

The multidimensional poverty in this study has five dimensions, so k = 5 and 1/k or 20.00% is weight of each dimension. As the result, the five dimensions as education, health, standard of living, economic well-being, and employment labor have equally weight by 1/5.

The weight of indicators into dimensions is also equal and presented in below table. For instance, weight of standard of living dimension is 1/5 and has seven indicators. Therefore, denominator of indicators in standard of living dimension is 5*7 = 35, so the seven indicators have equal weight by 1/35 or 2.86%.

Table 1. Dimensions, indicators, cutoffs and weights of the MPI

Dimension	Indicator	Deprived if…(cutoffs)	Relative weight
Education	Years of schooling: Number of schooling years of household members	No household member has completed five years of schooling	1/15 or 6.67%
	Under-schooling 6 – 15: A child 6 – 15 years old is not attending school.	At the household level, at least one child is not going to school	1/15 0r 6.67%
	Adult illiteracy A person with 15 years or more who cannot read, write and do the simple calculation is illiterate.	At the household level, at least one adult member is illiterate	1/15 or 6.67%
Health	Hospital payment: Household's status having money to pay hospital fees or not	Household member cannot pay hospital fees in any times	1/15 or 6.67%
	Working time: Working hours of household head in a day	Household member has working time of main job more than 8 hours per day	1/15 or 6.67%
	Chronic sickness: Sickness status of household member	To be sick for at least one month out of a year or at least one household member is chronically sick	1/15 or 6.67%
Standard of Living	Electricity: Whether the household has electricity	the household has no electricity	1/35 or 2.86%
	Sanitation: Whether the household has improved toilet	Household does not has an improved toilet or if their toilet is shared or toilet directly over the water	1/35 or 2.86%
	Drinking and cooking water: The household using one of following water: rain-water, river water, lake water, well water, pond water, bottle drinking water	The household using one of water as rain-water, river water, lake water, pond water	1/35 or 2.86%
	Assets (owned by household):	The household does not own	1/35 or

	color television, wire telephone, cell phone, computer, refrigerator, car or motorbike	more than one of: color television, wire telephone, cell phone, computer, refrigerator, car or motorbike	2.86%
	Housing space: The housing space per capita (m^2)	The housing space per capita less than the average housing space per person was 10 square meter	1/35 or 2.86%
	Home ownership: Whether the household owns any house	Household doesn't own any house	1/35 or 2.86%
	Type of dwelling: Types of house as permanent, temporary, semi-permanent and other	Household members live in temporary or semi-permanent house	1/35 or 2.86%
Economic well-being	Average per capita expenditure The average expenditure of household	The average expenditure is lower than poverty line	1/5 or 20%
Employment Labor	Underemployment: A worker considered as underemployment if he has missed a job for 3 month or more in the last year	At the household level, at least one main worker is underemployment	1/5 or 20%

4.3. Data

Data for the study comes from Vietnamese Household Living Standard Survey (VHLSS 2008) of General Statistical Office (GSO). The survey collects much information regarding: demographic and household characteristics with age, gender, ethnic, income, expenditure, education, health care, employment status, assets, housing, credit, sanitation in both rural and urban areas. VHLSS 2008 contains 45,945 households from 3,063 wards with 9,189 household's samples for assessing and analysis of income and expenditure. In this study, only 555 households in urban central cities including Ha Noi, Hai Phong, Da Nang, Ho Chi Minh, Can Tho are extracted and used in the analysis.

Both income and expenditure can theoretically use to measure poverty. In this study, the average expenditure was applied since among the reasons, households are usually willing to truthfully declare their expenditure than their income, particularly when dealing with government enumerators. Moreover, expenditure can be viewed as realized welfare, whereas income is viewed as measure of potential welfare (Sahn and Stifel, 2003). The expenditure contains spending on education, health care, consumption expenditure into anniversary or Tet (new year), durable using goods (car, color television, computer, fax machine, etc), housing, electricity and water, waste, and the value of nominal consumption normalized to obtain real consumption.

5. Results and discussion

5.1. The head-count poverty ratio in money-metric measure

$$P_0 = \frac{1}{N} \sum_{i=1}^{N} I(y_i \leq z) = \frac{N_0}{N} = \frac{2}{555} = 0.36\%$$

Based on the study data set (n=555), the average expenditure of those households in each city was used to compare with private poverty line in order to determine the poor people. As the result, there were only two households ($N_0 = 2$) having the average expenditure below the poverty line. Therefore, the poverty head count ratio in money-metric

measure is 0.36% by average expenditure.

5.2. The poverty ratio by Head count (H) in MPI measure

Head count H

$$= \frac{\text{The Multidimensional Urban Poor}}{\text{Total Survey Urban Households}}$$

$$= \frac{91}{555} = 16.40\%$$

The result of MPI measure through fifteen indicators to define the MPI poor showed that 91 households become MPI poor and named the multidimensional urban poor. Those MPI poor are deprived at least 22 percent of the weighted indicators. Therefore, poverty head count H in MPI measure is 16.40% by multidimensional poverty index in five central cities in urban region.

5.3. Poverty comparison between money-metric and MPI measure

The analysis shows that the urban poverty ratio in MPI measure by multidimensional level (16.40%) higher than poverty ratio in money-metric measure by average expenditure (0.36%) and those MPI poor suffer from average deprivation 26.83% of indicators (Figure 3). The money-metric measure is simple and easy way to define the expenditure or income poor. However, this measure makes policymakers underestimated urban poverty level and not subsidize timely. On the contrary, MPI measure will make the policymakers look at poverty deeply at multidimensional level and give the subsidiary policy timely.
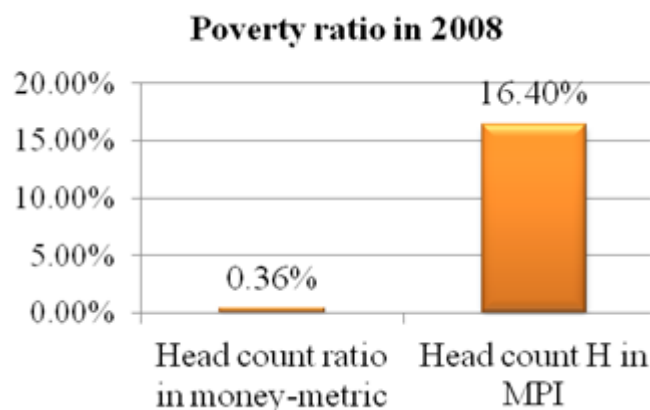

Figure 3. Poverty ratio by money-metric and MPI measure

Moreover, MPI measure reveals the MPI poor at many different aspects or indicators (Figure 4). The first top five indicators affect mostly to MPI poor including type of dwelling (25.22%), underemployment (21.94%), housing space (16.52%), working time (14.63%), and adult illiteracy (5.67%). Besides the bottom five indicators affect less to MPI poor including average expenditure (0.25%), cooking and drinking water (1.01%), under-schooling 6 – 15 (1.26%), sanitation (1.51%), and years of schooling (1.89%). Especially the observed households in urban central cities are not the electricity grid poor. Moreover, the figures also show that 99.75% of the

households in urban central cities have average expenditure above the official poverty line in comparison to those poverty lines issued by Department of Labor, Invalids and Social Affairs in five central cities, and up to 98.74% of the child 6 – 15 years old are attending school. It may have significant effects to poverty alleviation in central city. The more children are attending school the more opportunities they have to get the good job in future and support their family to reduce poverty. However, the child 6 – 15 years old in urban central cities remains 1.26% that is not attending school.
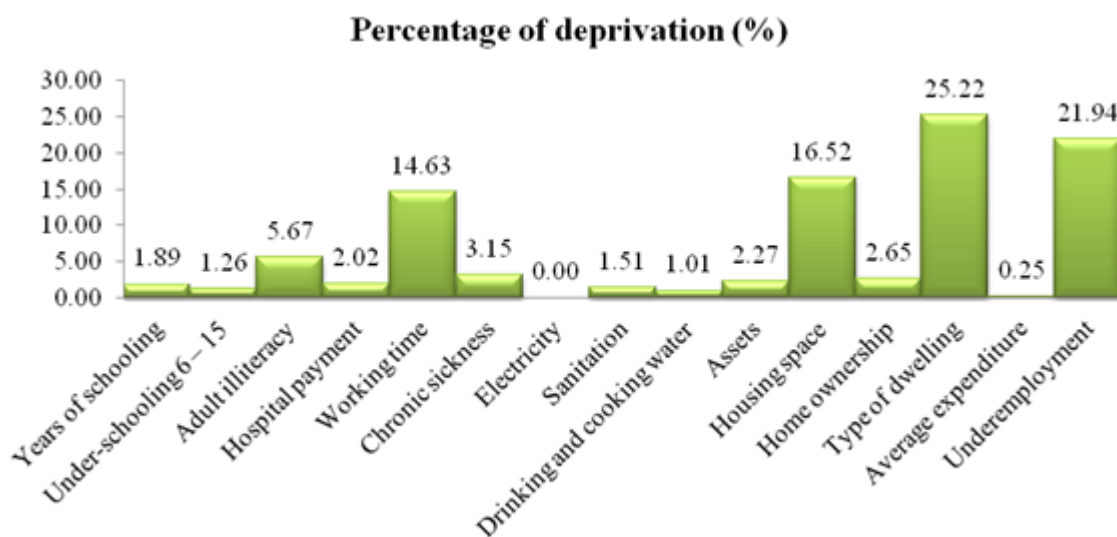
Figure 4. Percentage of deprivation by indicator in urban central cities

The result of GSO also show that the poverty rate in urban and rural region reduced year by year, from 35.60% in 2002 to 18.70% in 2008 in rural region. In particularly, poverty rate in urban region in entire country is so low and decreased from 6.60% in 2002 to 3.30% in 2008 (Figure5).
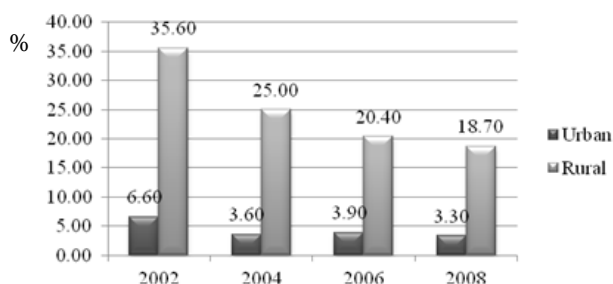

Figure 5. General poverty rate by urban and rural region

The analytic results by MPI measure, money-metric measure, and GSO from VHLSS 2008 give differently urban poverty rates with 16.40%, 0.36%, and 3.3% respectively. The GSO's result of the general poverty rate for entire country in urban region is still lower than multidimensional poverty rate. Normally, the urban poverty rate in other regions outside of urban central cities is higher than central city. The MPI result in this study would make researchers and policymakers having to look back the previous result and think about poverty in Viet Nam under multidimensional level.

5.4. Comparison of urban poverty ratio in five central cities by MPI measure

The comparison of urban poverty ratio in five central cities shows that the multidimensional poverty level is significantly high and different from five urban central cities. Figures in Table 2 show that Ho Chi Minh and Can Tho City are two of the cities having the highest urban MPI poor with 22.50% and 21.43% respectively. Those MPI poor suffer from average deprivation intensity 27.37% of indicators in Ho Chi Minh and 26.35% of indicators in Can Tho. On the contrary, the MPI poor is at the lowest level in Hai Phong City. However, the MPI poor in Hai Phong suffer from average deprivation intensity at the highest level with 28.19%.

Table 2. The Head count H, average intensity of MPI poverty

City	H (%)	A (%)	MPI (%)
Ha Noi	10.32	24.69	2.55
Hai Phong	8.33	28.19	2.35
Da Nang	11.49	26.76	3.08
Ho Chi Minh	22.50	27.37	6.16
Can Tho	21.43	26.35	5.65

Findings also show that multidimensional poor households in urban Ha Noi, Hai Phong, Da Nang, Ho Chi Minh, and Can Tho City deprived in many different indicators. The five indicators significantly

affecting to MPI poor households in Ha Noi City are underemployment, housing space, working time, type of dwelling, and chronic sickness respective to 40.80%, 21.60%, 19.20%, 6.40%, and 4.00%.

The five indicators significantly affecting to MPI poor households in Hai Phong City are type of dwelling, housing space, underemployment, working time, chronic sickness are respective to 23.75%, 21.25%, 18.75%, 18.75%, 5.00%.

The five indicators significantly affecting to MPI poor households in Da Nang City are type of dwelling, working time, housing space, underemployment, chronic sickness or adult illiteracy are respective to 36.96%, 16.67%, 13.04%, 9.42%, 5.80%.

The five indicators significantly affecting to MPI poor households in Ho Chi Minh City are underemployment, type of dwelling, housing space, working time, adult illiteracy are respective to 24.10%, 23.82%, 17.17%, 13.57%, 7.76%.

The five indicators significantly affecting to MPI poor households in Can Tho City are type of dwelling, sanitation, underemployment, housing space, drinking and cooking water are respective to 40.45%, 10.11%, 8.99%, 7.87%, 7.87%.

The four indicators affecting significantly to MPI poor households in five central cities in urban region are underemployment, type of dwelling, housing space, and working time.

6. Conclusion and policy implication
6.1. Conclusion

The study has examined the poor households in five urban central cities including Ha Noi, Hai Phong, Da Nang, Ho Chi Minh, and Can Tho City in Vietnam at the multidimensional level by five dimensions and fifteen indicators. The following main conclusions come from the MPI analysis.

Firstly, the poverty rate from MPI measure is significantly higher than money-metric measure. In particular, the top four indicators affect mostly to the MPI poor in urban central cities including type of dwelling, underemployment, housing space, and working time. Besides the bottom five

indicators affect less to MPI poor including average expenditure, cooking and drinking water, under schooling 6 – 15, sanitation, and years of schooling. Especially the survey households in urban central cities are not electricity grid poor.

Secondly, Ho Chi Minh and Can Tho City have the highest urban MPI poor with 22.50% and 21.43% respectively. Those MPI poor suffer from average deprivation intensity 27.37% of indicators in Ho Chi Minh and 26.35% of indicators in Can Tho. The MPI poor are lowest level in Hai Phong City (8.30%) and those MPI poor suffer from average deprivation intensity at the highest level (28.19%).

Finally, the poverty rate estimated by multidimensional level in urban central cities is significantly higher than the GSO's result in entire urban region in Vietnam. In particular, there are the big gap in poverty ratio between each city by MPI result and GSO result. Moreover, the MPI poor suffer from deprivation of many indicators at the same time and the level of deprivation is quite different from each indicator as type of dwelling (22.25%), electricity (0.00%).

6.2. Policy implications

In Viet Nam, many studies and policymakers mostly concerned the economic aspect of poverty. However, the poverty line does not really provide adequate meanings to maintain a basic life of household, especially in the modern life nowadays. Thus, poverty and quality of life require an assessment at multidimensional level.

The analysis of MPI based on sub sample (n = 555) from VHLSS 2008 in five urban central cities indicate some important policy implications in order to reduce poverty. The findings show that MPI poverty rates are at high level in urban central cities. Indicators affecting mostly to MPI poor are type of dwelling, underemployment, housing space, education, sanitation, drinking and cooking water, and working time. The new findings assist the policymaker looked fully back poverty in urban central cities at multidimensional level. The following recommendations are drawn from the findings:

Firstly, type of dwelling has significant effect to MPI poor in five urban central cities. In particular, Can Tho City had 40.45% of households using the semi-permanent and temporary house. The policymakers should find the appropriate way to subsidy to those poor households in order to improve type of dwelling and support those households having the permanent houses. For instance, the government might think to let the poor households accessing to low-interest loan, depending on each specific situation.

Secondly, quality of life of households will improve significantly through income. However, the MPI result showed that underemployment is so high in urban central cities causing an increase of the poor households in these cities. The following solutions should be reviewed by policymakers in central city (1) set up the employment introduction meeting and invite the workers, companies that share conditions to employ the workers; (2) usually train the labor skill for workers with free fee in industrial zones in order to attract the corporate; (3) establish the practical exercise for student; (4) take more investigation why the survey households in urban cities having high underemployment rate and allocate the subsidy timely and effectively.

Thirdly, another of new finding in MPI analysis that many observed households in Can Tho using the toilet directly over the water. The bad sanitation will make the disease easily to outbreak and shed the disease from regions to regions. Therefore, government agencies in Can Tho should look at sanitation at the major priority to increase the quality of life and give the suitable solutions. It can be done via low-interest loan to the poor households to build toilet or organizing the volunteer campaign team to canvass the rich households supporting to the poor.

Fourthly, the resource of drinking and cooking water has the important effect to human being health. In the MPI result, majority of survey households receive the clean water. However, Can Tho City remained many households using rain-water and river water. These households need the subsidy timely from government agencies because of not only improving living standard but also preventing sickness for them.

Finally, one of the important strategies to alleviate poverty is improvement of the educational system at all levels and assistance of households escaping poverty by increasing educational level. In facts, the MPI analysis discovered that the under-schooling of child 6 – 15 years old in Can Tho and Ho Chi Minh City also have high rates with 4.76% and 2.92% respectively, and higher than those of other central cities. This could be a big barrier in the economic development of those households in Can Tho and Ho Chi Minh City. The government agencies in Can Tho and Ho Chi Minh City should pay more attention in educational indicator in urban areas. The feasible solutions are to check what the real reason that make educational poverty rate is high in survey areas and then allocate resources more effective.

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