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Changes in well-being level of households

in Hanoi and Ho Chi Minh City: Trends and implications

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Abstract

Vietnam has achieved a relatively high economic growth rate during the last three decades. However, the growth is accompanied with many socio-economic issues that hinder improvement in the quality of life of the households. This paper aims at tabulating a practical well-being index to measure changes in the level of well-being of households in Hanoi and Ho Chi Minh City, the two biggest cities in Vietnam. The index was established based on the Theory of Human Needs and the available data about living standards of households in the cities during the 2002-2008 period. It concerns aspects of households' life such as demography, social status, education, health, work, financial status, living accommodations, and consumption. The study showed that the aggregate level of well-being of households in the cities has increased during the period but the trends of the indexes were diverse and unstable. Though increasing is the common trend, there are very few indexes having a continuous increasing trend. Most indexes have increasing trend with down turn(s) in specific year(s) whereas some of them have decreasing trends. Further improvements to increase the quality of databases and the quality of well-being index are necessary.

Keywords: well-being, households, Hanoi, Ho Chi Minh City, Vietnam

1. Introduction

The economy of Vietnam was officially transformed from a "central planned economy" to a "market oriented economy" in 1986 when the nation was in a deep deficit crisis[4]. At that time, the internal production could not fulfil the domestic demand while the population of the country was increasing 2.32% per year. In such a harsh condition, how to increase the production to meet the demand of people is one of the crucial aims of the country. To achieve the target, several socio-environmental factors were neglected and/or sacrificed for economic purposes. Hanoi and Ho Chi Minh City, the two most important urban centres of

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[4] This process is called "*Doi moi*" or "Renovation".

the country, were strongly influenced by this orientation. Despite impressive achievement in economic development, the negative impacts of economic growth in the cities are easy to observe. Socio-environmental problems such as pollution, inequality, high density, traffic congestion, deteriorated infrastructure, decrease of green spaces, etc. are dramatically increasing.

One of the main causes of the problems is the over-evaluation of the important role of economic factors. Since "Doi moi", the increase of economic indicators is considered as the achievement of national progress. Economic growth is a mean to achieve a better life but it is not an aim in itself. The final aim of people is to have a good life, which is more meaningful than just being rich. Without good indexes to measure development, it would be hard for policy makers to identify goals, priorities, steps and the necessary resources for the development goals. However, there are very few studies about quality of life and methods to measure the improvement in quality of life of the households in Vietnam. Therefore, this study focuses on issues such as "Is it possible to measure changes in the well-being level of households by an aggregate index?", "Which are possible indicators to measure changes in the well-being level of households in Hanoi and Ho Chi Minh City?", "How does the well-being level of households in the cities change by time?" and "Is there a gap between economic growth and improvement of well-being level of households in the cities?"

2. Formulating the well-being index of households: Theoretical and technical issues

Theory and data

The study is designed as a data driven study which is based on available time series data to study changes in the well-being level of households. The findings from the relevant theories and empirical studies in the field are compared with the available sources of data to find out potential components of the well-being index of households. Then, the components are assessed and modified so that they can be used to compute the aggregate well-being index (figure 1).
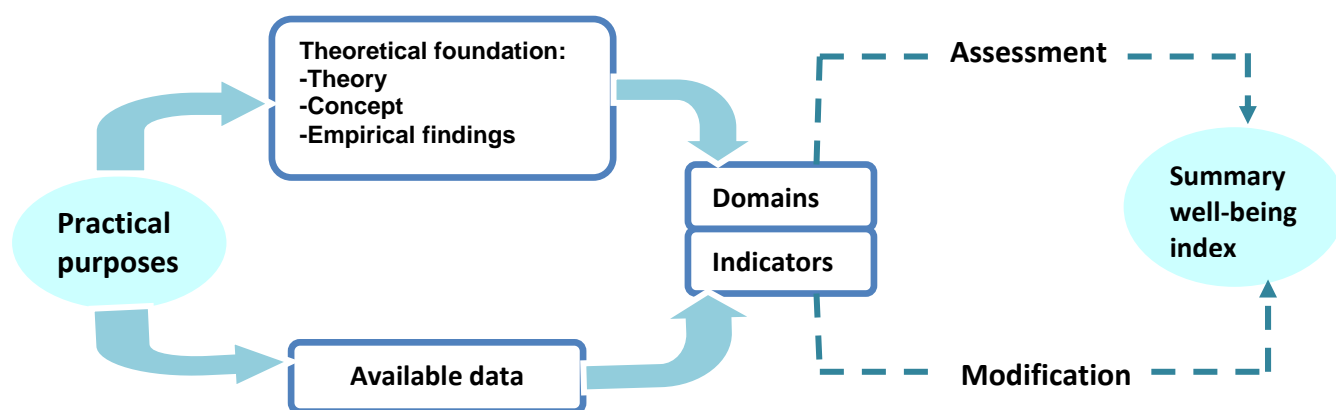
Figure 1: Index construction process

The "Theory of Human Need", developed by Doyal and Gough (1991), proposed that the 'wants' of humans are diverse but the basic needs, which help humans avoiding fundamental disablements and pursuing the good of life, are universal. The factors that satisfy the basic needs of human beings were grouped into eleven categories: adequate nutritional food and water, adequate protective housing, non-hazardous work environment, non-hazardous physical environment, appropriate health care, security in childhood, significant primary relationships, physical security, economic security, safe birth control and child bearing, and basic education.

Dolan, Peasgood and White (2006) have reviewed 153 relevant studies to find out potential indicators of personal well-being and possible influences of the indicators to well-being. Based on the synthetic results of the studies, they have classified possible well-being indicators into seven groups: income, personal characteristics, socially developed characteristics, time using, attitudes and beliefs, relationships, and environment. These findings are coherent with the categories of the "Theory of Human Need". And they are used as guidance for the determination of well-being indicators.

Among the available databases, the Vietnam Household Living Standards Survey (VHLSS) is the most suitable data for the study. Though there are severe limitations[5], the VHLSS is the only available database that possesses detailed and systematic information about aspects of life of households in the whole Vietnam. From 2002, the survey is carried out every two years. This gives room for time-series analyses. The two cities, Hanoi and Ho Chi Minh City (HCMC), were chosen with the aim to study urban well-being and urban poverty which is lower than in rural areas, but less known and sometimes more worrisome. The comparison between both cities is the second aim. Besides changes in socio-economic life of the cities are happening very fast; it makes the observation of changes within a short period of time easier. The descriptive information of the data of the both provinces[6] is illustrated in table 1.

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[5] The main limitation is the sampling method. It excludes 'mobile households', 'floating population' and increases the "cluster effect" of the collected data. Others limitations are the small sample size, the level of representativeness of the database, and sometimes the questions which were asked at the interviews.

[6] The surveyed data does not represent the data for the cities of Hanoi and HCMC, but the data of the whole provinces which include a large portion of rural population.

Table 1: Descriptive characteristics of sampling data

	Hanoi				HCMC			
	2008[7]	2006	2004	2002	2008	2006	2004	2002
Number of surveyed households	240	240	240	740	300	300	300	775
Mean of p-weight	3575.9	3160.3	2763.8	884.1	5088.2	4380.3	3849.0	1345.9

Sources: Author's calculation from VHLSS 2002, 2004, 2006, and 2008

Except on year 2002, the sample sizes of the cities were kept constant at 240 observations in Hanoi and 300 observations in HCMC during the 2004-2008 period. The average sampling weights have increased gradually during the study period due to population increase.

Components of the well-being index

All information of the four VHLSS which might be used to measure the well-being level of households were listed, modified and checked if they could be used as a component of the well-being index. Finally, 29 indicators were selected as components of the summary well-being index and were grouped into seven domains.

Table 2: Components of the well-being index

Indicator	Definition
1. Demographic and social characteristics	
non-single parent	Ratio of non-single parent households (households have father, mother and child/children)
non-single occupant	Ratio of non-single occupant households (households have at least two members)
KT1	Ratio of household members who have a permanent resident permit and live in this dwelling (members who live and register at the same place)
non-poor	Ratio of households which are not classified as poor[8]

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[7] In 2008, the boundaries of Hanoi were extended. Yet, the data of the year 2008 in this study are the data of the old Hanoi.

[8] The ratio of poor households in VHLSS 2008 is the ratio of poor households in 2007 as there is not information about the ratio of poor households in 2008 in the questionnaire.

life improvement	Ratio of households which state that life of household members is currently better than five years before[9]

2. Educational status

schooling status	Ratio of households which state that there is no member from 6 to 18 years old who did not attend school in the last 12 months
literate	Ratio of households which state that there is no member equal to or older than 13 who does not know how to read and write
bachelor or above	Ratio of households which state that there is at least one member having a bachelor degree or above

3. Health and entertainment

healthy	Ratio of household members which have not suffered from any illness or injury in the last 12 months
Insurance	Ratio of household members who have had health insurance or free health care in the last 12 months
non-hospitalized	Ratio of household members who have not used in-patient treatment in the last 12 months
entertainment	Ratio of daily expenses for books, newspapers, magazines and entertainment over living expenditure of household in the last 12 months
non-smoking	Ratio of households that have had no smokers in the last 12 months

4. Work and career

working status	Ratio of households which state that there is no members who could not find a job in the last 12 months
leader	Ratio of households which state that there is at least one member who is a leader in any field in the last 12 months
professional	Ratio of households which state that there is at least one member who has a high or mid-level professional status in any field in the last 12 months
working time	Ratio of households in which the average of time worked by working members was not higher than 56 hours per week in the last 12 months

5. Financial status

excess income	Ratio of excess income over incomes of households (the excess income of the household is income minus living expenditure)
health care coverage	Ratio of households not stating that they could not afford to cover health care expenses for all household members in the last 12 months
Unindebtedness	Ratio of households not having to borrow money or goods or being indebted in the last 12 months

6. Consumption and basic services

non-food expenses	Ratio of non-food expenses over living expenditures of households in the last 12 months (non-food expenses is living expenditure minus expenditures for food and drink)
tap water	Ratio of households having tap water as a main source of drinking and cooking water
non-rental payment	Ratio of non-rental payment expenses in total living expenditures

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[9] The base years of this question are different in VHLSS. Thus, the values of this indicator were adjusted based on the assumption that the percentage of households which state that the life of household members has improved after one year is constant during the mentioned period in the questionnaire.

	of households in the last 12 months (the non-rental payment expenses is living expenditure minus housing rental expense)
7. Ownership and living accommodations	
assets and appliances	Ratio of assets and durable goods that households have in the total of the items listed in the questionnaire
living space	Average living area of household members equal to or larger than 25 m^2
permanent house	Ratio of households which are located in a permanent house
safe toilet	Ratio of households having a safe and protected toilet (flush toilet with septic tanks sewage pipes)
house ownership	Ratio of households that own or partly own the dwelling in which they are living
Internet connection	Ratio of households having an Internet connection

To mitigate the impacts of the "economy of scale", the regional and seasonal differences, and the imprecision of the collected values, the index does not use the absolute value but the relative ratios of the indicators. The year 2002 is chosen as the base year and it is indexed at 100%. The index value is the percentage of the current value of the indicator divided by its base value. However, the Hanoi versus HCMC well-being indexes (Hanoi vs. HCMC well-being indexes) applies a multi-base method. The index value of an indicator in a specific year is the percentage of the value of this indicator of the households in Hanoi divided by the corresponding value in HCMC.

Mean and weight of the index

There are three kinds of means: arithmetic, geometric and harmonic. The arithmetic mean is the most commonly used method to compute aggregate indexes. It is also the most transparent method for index construction (Salzman 2003, Smith et al. 2007). The arithmetic and harmonic means have an important limitation. They are very sensitive to outliers and skewed data, which are common for aggregate indexes in social sciences. Besides, these kinds of means do not qualify for the requirement for self-consistency of an index (Fisher 1987)[10]. The geometric

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[10] The requirement is that the product of an index which follows a forward method and an index that follows a backward method, of the same data set, must be 1.00. Assume that there are two series of data for 5 years as follow: 10, 15, 20, 12, 20 and 50, 90, 80, 100, 60 The arithmetic

mean is the only one which satisfies both requirements (Smith et al., 2007: 372-374). This mean can better capture the performance of the individual dimensions of the aggregate index. It respects the differences and reduces the level of substitutability across dimensions (UNDP 2010). Therefore, it is applied to calculate the well-being index of households.

Since there is no persuasive evidence for an appropriate weighting scheme for the well-being index, equal weight is applied. This technique is more favourable than other weighting schemes as it makes the choice of weight less subjective and minimizes the disagreements among indicators or domains (Hagerty and Land 2004, Salzman 2003, Smith et al. 2007, Decancq and Lugo 2008, Alkire 2010). It is a weighting scheme that has no preference to any component of the aggregate index. A detailed description of the relative weight of components of the index is illustrated in table 3.

mean (AM), geometric mean (GM), and harmonic mean (HM) of these series of data by forward and backward methods are as follows:

	Forward (1st year base)					Backward (5th year base)				
Mean	1st	2nd	3th	4th	5th	5th	4th	3th	2nd	1st
AM	1	1.65	1.8	1.6	1.6	1	1.13	1.17	1.13	0.67
GM	1	1.643	1.79	1.55	1.55	1	1	1.15	1.06	0.65
HM	1	1.636	1.78	1.5	1.5	1	0.88	1.14	1	0.62

Taking the 5th value of the forward index multiplied by the 1st index value of the backward index for the three means, we have the value of AM, GM, and HM: 1.07, 1, and 0.94 respectively. The value of GM always equals to 1.

Table 3: Structure and weights of the well-being index

Well-being Index	Demographic and social characteristics (1/7)	non-single parent (1/35)
		non-single occupant (1/35)
		registration (1/35)
		non-poor (1/35)
		Life improvement (1/35)
	Education (1/7)	schooling status (1/21)
		literate (1/21)
		bachelor or above (1/21)
	Health and entertainment (1/7)	healthy (1/35)
		insurance (1/35)
		non-hospitalized (1/35)
		entertainment (1/35)
		non-smoking (1/35)
	Work and career (1/7)	working status (1/28)
		leader (1/28)
		professional (1/28)
		working time (1/28)
	Financial status (1/7)	excess income (1/21)
		health care coverage (1/21)
		Unindebted (1/21)
	Consumption and basic services (1/7)	non-food expenses (1/21)
		tap water (1/21)
		non-rental payment (1/21)
	Ownership and living accommodation (1/7)	assets and appliances (1/42)
		living space (1/42)
		housing (1/42)
		toilet (1/42)
		house ownership (1/42)
		Internet (1/42)

Evaluating the well-being index

Hagerty et al. (2001) have developed fourteen criteria to determine the validity and usefulness of quality indexes to public policy as follows: (i) Having a clear practical purpose; (ii) Helping public policy-makers to develop and assess programs at all levels of aggregation; (iii) Be based on time-series to allow periodic monitoring and control; (iv) The components of the index are reliable, valid and sensitive; (v) Be grounded in well-established theory; (vi) Can either be reported as a single number or be broken down into components; (vii) The domains encompass the totality of life experience; (viii) Each domain encompass a substantial but discrete portion of the quality of life construct; (ix) Each domain have the potential to be measured in both objective and subjective dimensions; (x) Each domain within a generic quality of life instrument must be relevant for most of the people; (xi) The domain that is proposed for the non-generic instrument must contribute a unique variance to the quality of life construction beyond the generic domains for the target group; (xii) The domains must be potentially neutral, positive or negative in contribution to the quality of life construction; (xiii) The domains differ from the dimensions of personality, cognitive processes, and affect in that they cannot be measured objectively; and (xiv) The subjective dimension of each domain has both a cognitive and an affective component.

Applying the mentioned criteria into the actual well-being index of households, it turns out that the index satisfies quite well the standards for policy usefulness and validity. It qualifies criteria (i), (ii), (iii), (v), (vi), (viii), (x), (xi)[11], (xii), and (xiii). The index, however, cannot fully satisfy criteria (iv) and (vii). It covers several important aspects of life but fails to encompass the totality of life experience, especially subjective aspects[12]. Besides, the time series for analysis is short, only 6

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[11] Inter-correlations among domains in our study are quite low, mostly smaller than 0.5. Therefore, the possibility for redundancy is low.

[12] There are very few indexes that fully satisfy this criterion. Amongst the 22 chosen indexes in the study of Hagerty et al., only the American Demographics Index was graded excellent for

years, and the data of the base year, the year 2002, are not complete. The index is unqualified for criteria (ix) and (xiv); the lack of subjective information of well-being domains is also the main limitation of our well-being index. This is also a common limitation of most data driven studies about quality of life, well-being and multidimensional poverty[13].

Another issue of the index is its significance. In this study, our concern is whether changes in the well-being level of households by time are real or if they just happen by chance. The Spearman test is applied to test this hypothesis as it is less sensitive to extreme values than the Pearson test (StataCorp 2009: 1769). The H_0 hypothesis is that the mean of indicators is unchanged by time. If this null hypothesis is rejected or the test is significant, we can conclude that there are real changes in the index values by time. Changes of means of indicators are not caused by sampling chance. This conclusion is reliable at 1%, 5% or 10%, depending on the level of significance of the test (Garson 2009).

3. Well-being dynamics: Trends and disparities

Changes in the well-being level of households in the cities: The Individual index[14]

This part examines the trends and disparities of the individual indexes within domains of well-being of households in the cities[15].

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criterion (vii). Other eight indexes were graded satisfactory while the other 13 indexes were not satisfactory (Hagerty et al. 2001).

[13] Detailed information about criteria and index evaluation can be consulted in Hagerty et al. 2001.

[14] Detail information about values of individual indexes, domain indexes, and the aggregate indexes were illustrated in appendix 1 and 2.

[15] The values of the indicators were illustrated in appendix 1.

The demographic and social characteristics domain

Among the five individual well-being indexes of the domain, the registration index of both cities and the life improvement index[16] of HCMC are significant at 5% level.
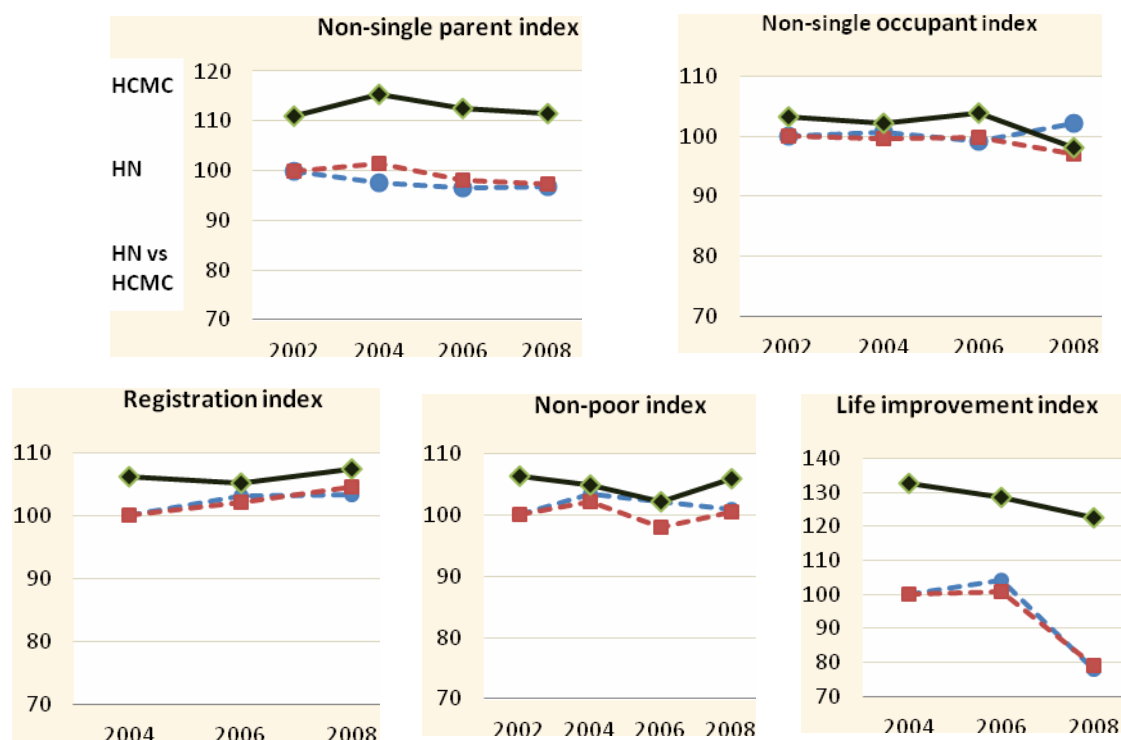
Source: Author's calculation from VHLSS 2002, 2004, 2006, and 2008
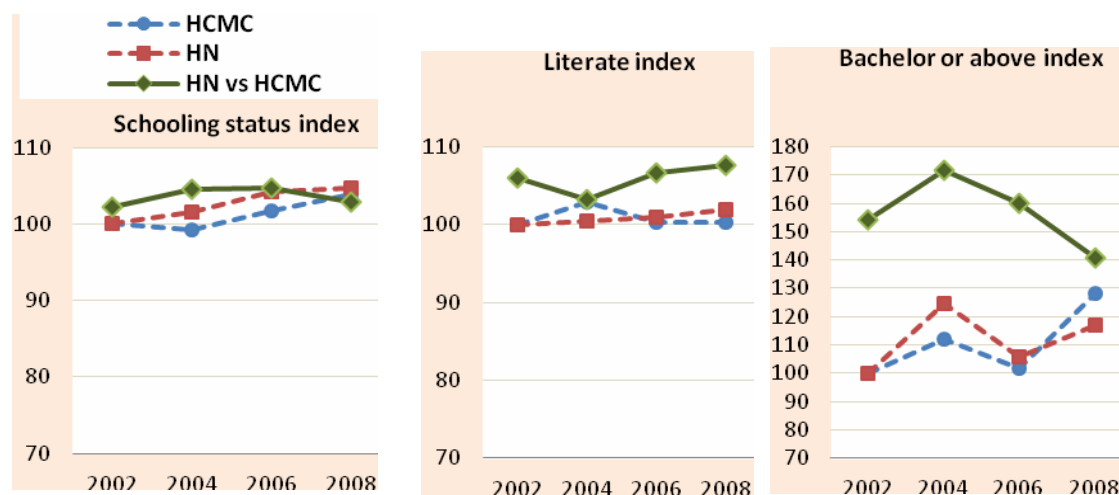
Figure 2: Trends and disparities of indicators of the demographic and social characteristics domain of the households in the cities

The registration index has a continuous upward trend whereas the non-single parent index and the life improvement index have a downward trend. The non-poor index has increased during the period but the improvement is trivial. The non-single occupant index of HCMC has improved but the index of Hanoi has worsened.

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[16] The modification of this indicator may partly contribute to the sharp decrease of the life improvement index.

The educational status domain

In comparison with the base values, all individual well-being indexes of the educational domain have increased in the 2002-2008 period but the increasing trends of the indexes are not stable. Besides, only the schooling status index of HCMC is significant at 10% level. This implies that the changes of individual indexes may be not real. However, all the HN vs. HCMC indexes are significant at 1% level which implies that the differences between the cities are reliable at 99% or above.
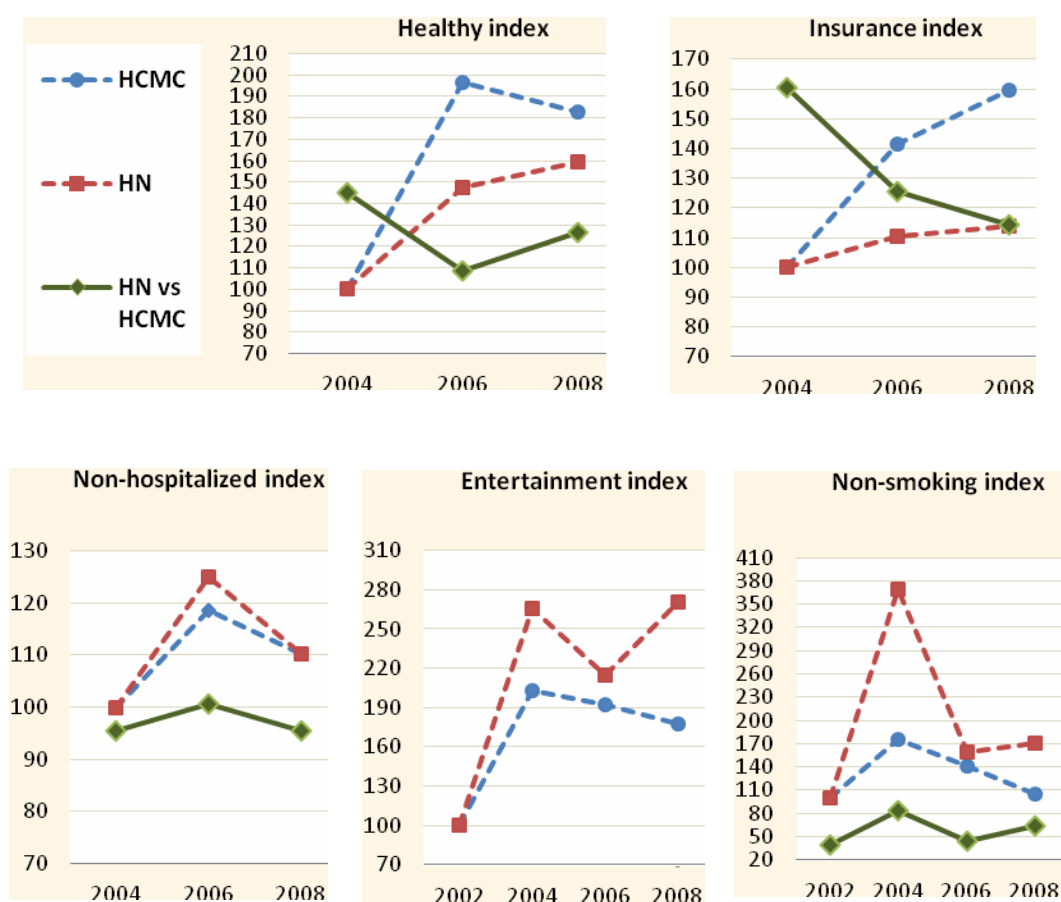

Source: Author's calculation from VHLSS 2002, 2004, 2006, and 2008.

Figure 3: Trends and disparities of the indicators
of the educational index of household in the cities

Comparing the two cities, it is obvious that the educational status of households in Hanoi is better than that of HCMC. The improvement trends of the indexes of households in Hanoi are not only clearer but also more consistent than that of HCMC. Although, there is a convergent tendency of the schooling status index and the bachelor or above index of households in the cities, the disparity of the literate index between the cities tends to increase by time.

The health and entertainment domain

At the difference from other domains, all indexes of health and entertainment domain were significant at 1% level (except the health index of Hanoi which was significant at 10% level). Though values of all indicators which belong to the health and entertainment domain of the households in these cities in the year 2008 are higher than that of the year 2002, the improvement trends of the indexes are diverse. There are several turning points in the study period.

Source: Author's calculation from VHLSS 2002, 2004, 2006, and 2008

Figure 4: Trends and disparities of the indicators

of the health and entertainment index of the household in the cities

The health insurance indexes of both cities have considerably increased due to the advancements in the regulations about health care insurance. The new regulation

allows individuals to have chance to buy a "voluntary health care insurance"[17] and increases the number of agents who can receive free health care from the State.

The entertainment indexes of the cities have increased very fast. However, the sharp increase mainly comes from the fact that the base values of this indicator were very low in the year 2002 (the ratio of expenses for entertainment in the total expenses of households were 0.17% in Hanoi and 0.38% in HCMC). When the government pushed up the "socialization" process of the entertainment activities, it allowed non-government sectors to participate in entertainment activities. The entertainment services have been diversified and became more attractive to the people.

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[17] According to circular 14/2007/TTLT-BYT-BTC about voluntary health care, from 12/2007, individuals can buy health care insurance. This is a considerable improvement in the regulation about health insurance in Vietnam.

The work and career domain

Source: Author's calculation from VHLSS 2002, 2004, 2006, and 2008.

Figure 5: Trends and disparities of the indicators

of the work and career index of the households in the cities

The trends of the individual indexes of this domain are diverse and unstable. Among the four indicators, only the professional index has a significant improvement trend. The sharp increase of the leader index of households in HCMC in the 2004-2008 period can be explained by the positive impacts of the Enterprise Law in 2002 and the Revised Enterprise Law in 2006 when the number of enterprises in the city has increased from 23,670 to 58,505[18]. However, the trend of the index of Hanoi is strange.

In comparison with the base year, the values of the working time index of the cities in 2008 have decreased. These decreases imply that the ratio of households in

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[18] Statistical Office of Ho Chi Minh City 2009.

which the average time worked by the working members is higher than 56 hours per week has increased despite the implementation of the decision No. 188/1999/AD-TTg about 40-working hours in November 1999.

The financial status domain

Within the financial status domain, the excess income index and the health care coverage index of HCMC are significant at the 1% level. The unindebtedness index of the households in Hanoi is significant at 5% level while others are insignificant at the 10% level.
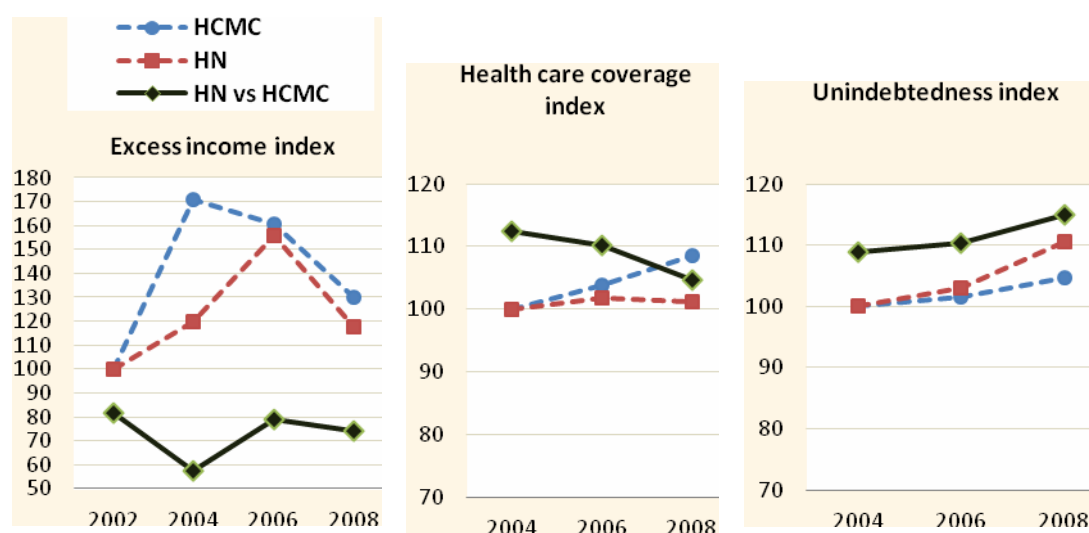
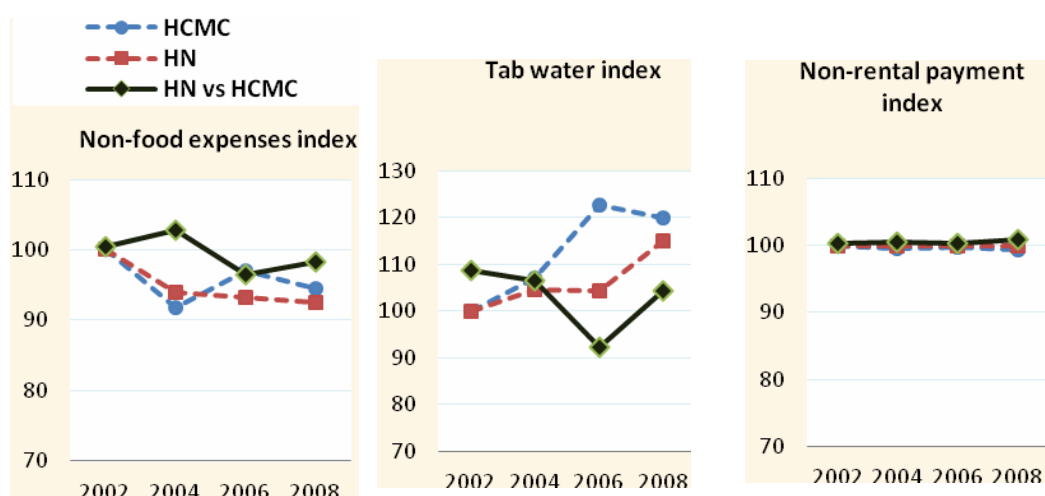*Source:* Author's calculation from VHLSS 2002, 2004, 2006, and 2008

Figure 6: Trends and disparities of the indicators

of the financial status domain of the households in the cities

All the three financial indexes of households in the cities have improved in the 2002-2008 period. However, the values of the excess income index in the year 2008 are much lower than the values of the peak year. The trends imply that the excess income of households have decreased in the recent years. This finding is suitable with the practical economic status of Vietnam over the period. The country is facing many difficulties. The inflation rate of Vietnam has increased from 4% in 2002 to 9.5% in 2004, then to 6.6% in 2006 and soared up to 23% in

2008[19]. The increase of the unindebtedness index of the households shows an improvement in the financial status of the households but it is also a signal that the households are more careful about spending and investment activities.

The consumption and basic services domain

All the individual indexes of the domain are significant at the 99% level of confidence except the non-rental payment index of the households in Hanoi.

Source: Author's calculation from VHLSS 2002, 2004, 2006, and 2008

Figure 7: Trends and disparities of the indicators of the consumption and basic services index of the households in the cities

Both the non-food expenses index and the non-rental payment index of the households in these cities have a downward trend. Because the demand for housing in the cities increases faster than the supply, it is normal that the increase of the house rental is faster than that of the income.

The reducing trends of the non-food expenditure of the households in the cities are strange. Normally, when economy develops, the living standards of households increase and the share of non-food expenses in the total expenditure of the

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[19] Vietnam statistical yearbooks, several years.

households decreases. The main cause of this tendency is the high level of inflation and the difficulties of the economy of Vietnam in those years.

The ownership and living accommodation domain

All the individual indexes of this domain are significant at the 99% level of confidence and have increasing trends.
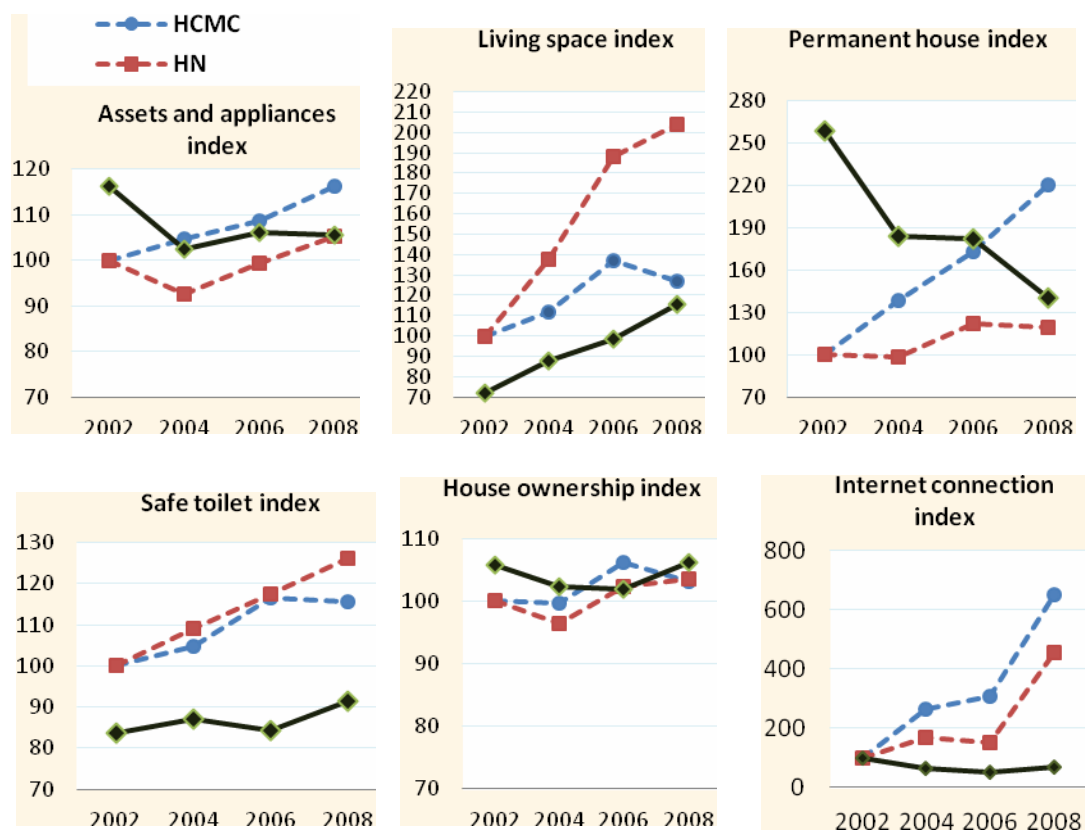
Source: Author's calculation from VHLSS 2002, 2004, 2006, and 2008

Figure 8: Trends and disparities of the indicators of the ownership and living accommodation index of the households in the cities

The index which has the highest growth rate is the Internet connection. Within six years from 2002 to 2008, the index values of the cities have increased by more than 350%. Overall, the households in HCMC have a higher improvement rate of the assets and appliances index, the permanent house index, and the Internet

connection index. However, the households in Hanoi have a higher improvement rate of the living space index, and the safe toilet index.

Changes in the well-being level of households in the cities: The domain and aggregate indexes[20]

Changes in the well-being level of households in Hanoi

The aggregate well-being index of households in Hanoi has increased by 11.6% during the period but the trends of the domain indexes are diverse. Thus, the improvement in the well-being level of households is neither high nor stable. The only domain which has increased consecutively during the six years is the ownership and living accommodation (57.4%). The values of the other five indexes have also increased but at a moderate level: health and entertainment (6.1%), financial status (9.6%), educational status (7.7%), work and career, and consumption and basic services (2%), whereas, the value of the demographic and social characteristics index has decreased by 6.5% during the period. The results remind that the structure and relations within households are sensitive to the changes in socio-economic conditions.

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[20] The values of the domains and the aggregate indexes are illustrated in appendix 2.
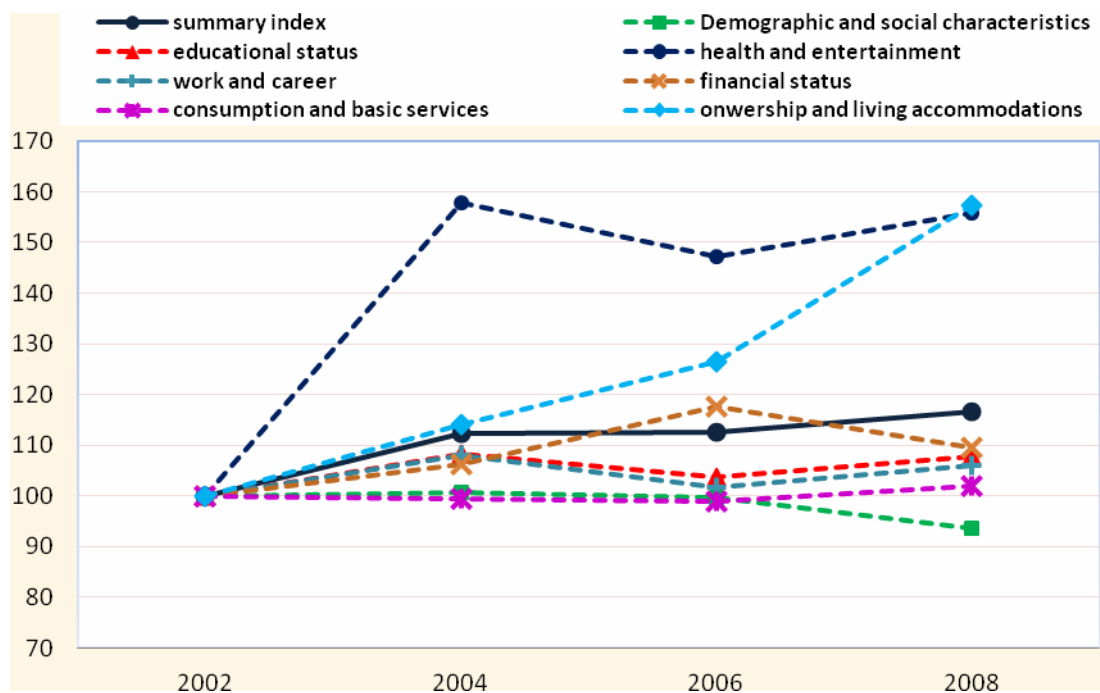
Source: Author's calculation from VHLSS 2002, 2004, 2006 and 2008

Figure 9: Changes in the well-being level of households in Hanoi

Changes in the well-being level of households in Ho Chi Minh City

Figure 10 illustrates the changes of the domain indexes and the summary well-being index of households in HCMC by time. Overall, most domain indexes of the households in HCMC have the same trends with the corresponding domains of the households in Hanoi. However, the levels of changes and improvement of the indexes of households are higher in HCMC. The summary well-being index of households in HCMC has increased by 21.1% during the period. The other domains, also have upward trends with down turn(s) in specific year(s). Whereas, the demographic and social characteristics has decreased by 4.2%.
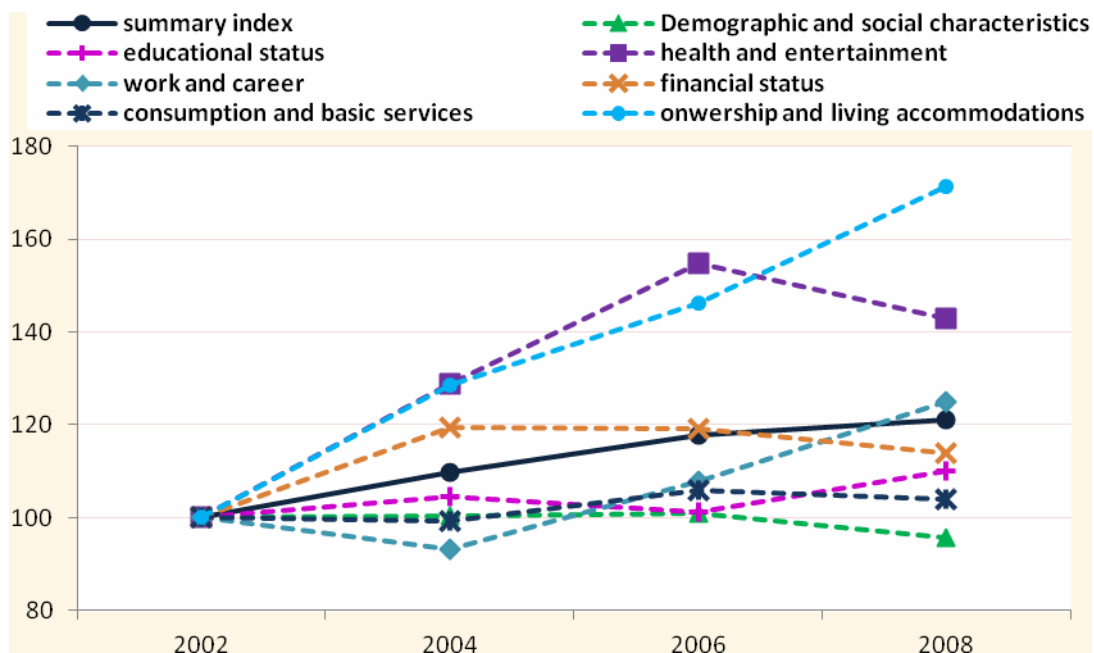
Source: Author's calculation from VHLSS 2002, 2004, 2006 and 2008.

Figure 10: Changes in the well-being level of households in Ho Chi Minh City

Disparities in the well-being level of households in Hanoi and Ho Chi Minh City

Generally, the households in Hanoi have a higher level of well-being than in HCMC. All values of the Hanoi vs. HCMC summary index stay above the 100% line during the study period. However, the disparities between the cities fluctuate highly and none of the domains is significant at the 10% level.
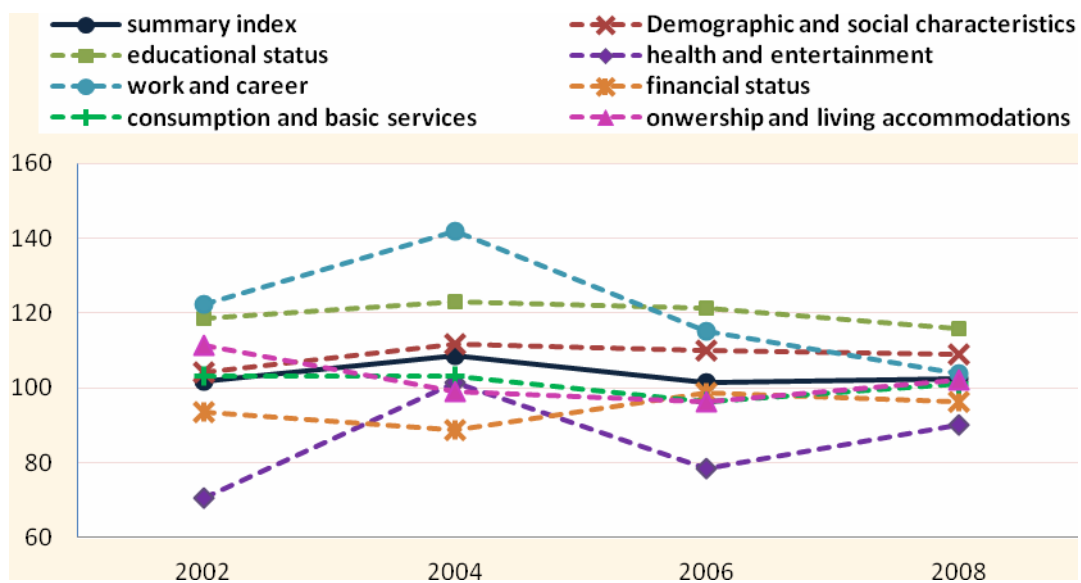
Source: Author's calculation from VHLSS 2002, 2004, 2006, and 2008

Figure 11: Disparities in the well-being level of the households

in Hanoi and Ho Chi Minh City

In detail, the households in Hanoi have a higher level in educational status, demographic and social characteristics, work and career, ownership and living accommodation, and consumption and basic services. The households in HCMC, however, have a higher level of financial status and health and entertainment domains.

4. Well-being dynamics: Findings and implications

Main results

Despite limitations of the data, the findings provided an overview about changes in the level of well-being as well as disparities in the well-being level of the households in the cities. Overall, the level of well-being of the households has increased during the 2002-2008 period. However, the trends of the individual and domain indexes of the households are diverse. Some indexes have gradually increased; many indexes have increased with down turn(s) while some have decreased.

There is a common belief in developing countries, which is also popular in Vietnam, that there is a close relation between economic development and quality of life of the people. However, the findings show that this relation is not strong. The average improvements rate of the aggregate well-being index of households in Hanoi is about 2%/year and the corresponding ratio of HCMC is about 3,5%/year during the 2002-2008 period, much lower than the average growth rate of the cities[21] . Besides, the economic growth rates of the cities were high and stable during the period but the increase of the well-being indexes was slow and unstable.

This study is one of the very first efforts which aim at exploring changes in the well-being level of households in the cities. There are various limitations. However, the findings show that it is possible to monitor changes in the life of households based on the available data. Development is a very complicated process, thus having efficient tools to measure the progress toward the goals is useful. It would help development agents identify priorities and monitor development progress.

Limitations and further studies

Although the VHLSS are a good source of data for social studies about living standards of households, they were not carried out to measure the level of well-being of the households. This is the reason why we had to apply the lowest standards of the "Theory of Human Need" to measure the level of well-being of households in Hanoi and Ho Chi Minh City. Therefore, the well-being index in this study, can only measure the very basic needs of the people. It could not take into account the subjective opinions of the households about their life as well as the non-basic needs of humans, such as the need for the autonomy and self-development, though they are important aspects of human well-being.

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[21] The economic growth rates of Hanoi in 2005, 2006, 2007 and 2008 were 10.8%, 11.2%, 11.2% and 10.9% respectively. The corresponding rates of HCMC were 12.2%, 12.1%, 12.6% and 10.7% (Statistical yearbooks of Vietnam, several years).

Besides, It is worth to remind that the findings of the study must be interpreted with cautiousness due to the limitations of available data: small sample size, high cluster effect, short time series, and sometimes inconsistent data... Moreover, there are very few data about subjective aspects of households' life in the database which hinders the measurement of subjective aspects of the well-being of households. These facts highlight the need for further improvement of the database.

The biggest challenge, however, is to select suitable indicators for the well-being index and to collect reliable data for the measurement. The selected indicators must properly represent the level of well-being of the people and can be easily collected. They must be general enough to cover important aspects of life but be also simple enough for practical applications and understandable by most of the population. An ideal well-being index must contain both objective and subjective aspects of households' life. Further studies which help to clarify the notion and establish a reliable well-being index would be very useful for the society.

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Appendix 1: Changes and disparities of the individual well-being indexes of the households in the cities

Index	HCMC					Hanoi					Hanoi versus HCMC				
	2002	2004	2006	2008	Corr.	2002	2004	2006	2008	Corr.	2002[1]	2004	2006	2008	Corr.
Demographic and social characteristics															
non-single parent	100	97.50	96.60	96.86	-0.02	100	101.46	97.95	97.42	-0.01	110.91	115.42	112.46	111.56	-0.12***
non-single occupant	100	100.64	99.14	102.18	0.01	100	99.60	99.85	97.13	-0.01	103.23	102.16	103.97	98.13	-0.04**
registration	na	100	103.11	103.38	0.07**	na	100	102.07	104.66	0.07*	100	106.15	105.08	107.46	-0.10***
non-poor	100	103.53	102.22	101.00	-0.04	100	102.08	98.09	100.49	-0.03	106.46	104.98	102.15	105.93	-0.09***
life improvement	na	100	104.17	77.96	0.06*	na	100	100.87	71.86	0.01	100	132.75	128.54	122.38	-0.25***
Educational status															
schooling status	100	99.29	101.75	103.90	0.04*	100	101.57	104.24	104.68	0.04	102.20	104.54	104.69	102.97	-0.07***
literate	100	102.99	100.25	100.32	0.01	100	100.42	100.93	101.95	0.04	105.97	103.33	106.69	107.68	-0.08***
bachelor or above	100	112.07	101.91	128.38	0.03	100	124.69	105.69	116.94	0.03	154.30	171.68	160.03	140.56	-0.12***
Health and entertainment															
health	na	100	196.62	182.47	0.23***	na	100	147.18	159.17	0.21*	100	145.20	108.70	126.66	-0.12***
insurance	na	100	141.38	159.77	0.26***	na	100	110.50	113.71	0.11***	100	160.52	125.46	114.25	-0.20***
non-hospitalized	na	100	118.52	110.26	-0.13***	na	100	124.90	110.19	-0.18***	100	95.57	100.71	95.51	0.06**
entertainment	100	202.62	191.76	177.25	0.15***	100	266.14	214.54	271.03	0.22***	43.6	57.30	48.81	66.70	0.14***
non-smoking	100	174.79	141.17	104.93	0.07***	100	368.55	158.45	170.18	0.08***	39.7	83.80	44.61	64.46	0.16***
Work and career															
working status	100	94.79	96.93	101.16	-0.02	100	99.33	98.43	100.61	-0.02	101.42	106.28	102.99	100.88	-0.07***
leader	100	77.66	102.38	173.58	0.04	100	104.08	93.14	94.91	-0.01	131.68	176.48	119.80	72.00	-0.02
professional	100	112.63	146.26	144.54	0.07***	100	127.64	113.39	140.16	0.09***	151.89	172.14	117.76	147.30	-0.10***
working hours	100	90.77	93.46	96.06	-0.05**	100	102.90	102.63	94.57	-0.01	110.24	124.98	121.05	108.53	-0.13***
Financial status															
excess income	100	170.74	160.71	130.14	-0.14***	100	120.03	155.58	117.80	-0.01	81.61	57.37	79.01	73.87	0.19***
health care coverage	na	100	103.82	108.64	0.11***	na	100	101.75	101.16	0.02	100	112.49	110.24	104.74	-0.13***
unindebtedness	na	100	101.56	104.62	0.05	na	100	103.00	110.56	0.09**	100	108.77	110.31	114.94	-0.10***
Consumption and basic services															
non-food expenses	100	91.80	97.00	94.57	-0.15***	100	93.88	93.14	92.53	-0.10***	100.43	102.71	96.43	98.27	0.03*
tab water	100	107.03	122.75	119.93	0.12***	100	104.70	104.19	114.95	0.09***	108.82	106.45	92.37	104.30	-0.01
non-rental payment	100	99.65	99.79	99.31	0.11***	100	99.97	99.92	99.88	0.02	100.27	100.59	100.40	100.84	-0.09***

Ownership and living accommodation

assets and appliances	100	104.77	108.63	116.12	0.13***	100	92.50	99.28	105.35	0.12***	116.16	102.56	106.16	105.38	-0.10***
living space	100	112.03	137.00	126.59	0.07***	100	137.33	187.93	204.13	0.17***	71.77	87.97	98.45	115.73	0.04***
permanent house	100	138.67	172.94	219.92	0.24***	100	98.58	121.70	119.38	0.16***	258.71	183.91	182.07	140.44	-0.30***
safe toilet	100	104.85	116.44	115.70	0.20***	100	108.97	117.38	126.15	0.20***	83.76	87.04	84.43	91.32	0.18***
house ownership	100	99.63	106.25	103.23	0.10***	100	96.39	102.40	103.61	0.07***	105.70	102.27	101.87	106.10	-0.07***
Internet connection	100	264.81	308.03	652.67	0.23***	100	168.78	150.08	453.32	0.17***	99.32	63.30	48.39	68.99	0.07***

[2] This replacement helps to minimize the fluctuation of the Hanoi vs. HCMC aggregate indexes.

Corr. Represent the Spearman's rank correlation coefficients of The Spearman tests. A (-) sign implies a downward trend of the index and vice versa, a (+) sign implies an upward trend of the index.

Sig. represent the significant level of the correlation. *, **, and *** imply that The Spearman tests are significant at 10%, 5%, and 1% level.

Source: Author's calculation from VHLSS 2002, 2004, 2006 and 2008

Appendix 2: Trends and differences of the aggregate well-being indexes of the households in the cities

Index	HCMC					Hanoi					Hanoi versus HCMC (Hanoi vs. HCMC)				
	2002	2004	2006	2008	Corr.	2002	2004	2006	2008	Corr.	2002	2004	2006	2008	Corr.
Summary index	**100**	**109.77**	**117.87**	**121.14**	**1.00*****	**100**	**112.23**	**112.48**	**116.60**	**1.00*****	**101.89**	**108.67**	**101.43**	**102.31**	**0.16**
Demographic & social characteristics	100	100.32	101.01	95.77	1.00***	100	100.62	99.75	93.52	0.00	104.04	111.77	110.04	108.81	0.49
Educational status	100	104.65	101.30	110.19	0.80	100	108.34	103.60	107.66	0.40	118.67	122.86	121.36	115.94	[-0.05]
Health & entertainment	100	128.78	154.90	142.99	0.80	100	157.88	147.18	155.87	0.40**	70.44	101.35	78.55	90.11	[-0.38]
Work & career	100	93.14	107.92	124.95	0.80	100	107.95	101.63	106.07	0.40	122.29	141.73	115.16	103.80	[-0.05]
Financial status	100	119.52	119.22	113.94	0.20	100	106.27	117.70	109.63	0.80	93.45	88.87	98.68	96.17	0.38
Consumption & basic services	100	99.30	105.91	104.04	0.60	100	99.42	98.98	102.04	0.20	103.10	103.22	96.35	101.11	0.38
Ownership & living accommodations	100	128.50	146.31	171.22	1.00***	100	114.22	126.49	157.41	1.00***	111.26	98.89	96.19	102.28	0.27

Corr. Represent the Spearman's rank correlation coefficient of Spearman test. (-) sign implies a downward trend of the index and vice versa.

Sig. represent the significant level of the correlation. *, **, and *** imply that The Spearman tests are significant at 10%, 5%, and 1% level.

Source: Author's calculation from VHLSS 2002, 2004, 2006 and 2008