

**“THE EMERGING MIDDLE CLASS IN VIETNAM
TRANSITIONAL ECONOMY:
IDENTIFICATION, MEASUREMENT AND CONSUMPTION
BEHAVIOR RESPECT TO ECONOMIC GROWTH”**

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Abstracts

In developed countries, “the middle class is considered as source of business spirit and creativity-economic units promote economic prosperity, the middle-class supplies all necessary inputs for the development of neoclassical economic- new ideas, accumulation of capital and human capital”¹. However, in developing countries in general and Vietnam in particular, the formation and development of the middle-class, as well as its role in society, economic and politic, have large differences besides similarities². There are many different views about the Vietnamese middle-class. First, there are diverse identifications about the middle-class based on living standard, education level or political role. Besides, there are so many questions about the existence, size, uniformity and the role of the middle-class in the economic and social development. So, this research article hopes to contribute a new point of view about the Vietnamese middle-class today.

¹ Homi Kharas, “The emerging middle class in developing countries”, 01/2010

² Banerjee and Dufflo, “What is middle class about the middle class around the world”, 12/2007

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1. Introduction

The Vietnamese middle class is not a new topic, because it is a theme chosen in both Vietnamese and foreign working papers, for examples “Global economic prospects 2007: managing the next wave of globalization”³; “The middle class in Southeast Asia: diversities, identities, comparison and Vietnam case”⁴; “The Vietnamese middle-class today”⁵, “Legitimatized social stratification and the formation of advanced social strata during renovation and international economic integration in Vietnam today”⁶. However, up till now, there is no quantitative research papers, which has an in-depth view in the role of middle class to the Vietnam economic growth.

The research paper focuses on finding out the role of the middle-class in Vietnam economic growth thanks to its consumption behaviors. Besides, the middle-class is considered and analyzed on our own way.

2. Objectives

The main objective is to examine the role of the middle-class of Vietnam to the economic growth through consumption behavior. Therefore, the question is that “*What is the role of the Vietnamese middle-class’s consumption behaviors to economic growth?*”. In order to respond to that, we put some related questions:

1. How does the consumption expenditure impact the economic growth?
How about the specific condition of Vietnam?
2. What is a concept about the middle class in Vietnam?

³ World Bank, 2007

⁴ Victor T. King, “ The middle class in southeast asia: diversities, identities, comparisons and Vietnam case”, University of Leeds, UK, 12/2008

⁵ Assoc. Prof. Nguyen Thanh Tuan, Vietnamese Academy of Social Sciences.

⁶ Assoc. Prof. Nguyen Dinh Tan, Ho Chi Minh National Academy of Politics-Administration

3. How is the population scale of the Vietnamese middle class in the period of 1992-2015?
4. How is the consumption behavior of the Vietnamese middle class?
5. How does the consumption expenditure of the middle class affect the economic growth in Vietnam?

3. Analysis framework

The Vietnamese middle-class will be approached in term of two angles, including microeconomics and macroeconomics. We use the econometrics model with the production function Cobb-Douglas and the Quadratic Lorenz function with the EVIEW to estimate the population scale of Vietnamese middle class. Then, we use the multi-variant comprehensive statistics, with STATA to analyze the consumption behavior of the middle class. The first step is to build a suitable and clear definition about the Vietnamese middle-class, and then create the theory framework for a whole working paper. Next, we estimate the role of the middle-class to the economy in the macroeconomics angle by estimating population size of the Vietnamese middle class from 1986 to 2015. The microeconomics angle investigates consumption behavior of the middle-class in comparison with the rich and poor in Vietnam. The study ends up by summarizing some research problems, policy implications and opening some in-depth research directions in the future. The appendix will show models and research methods used.

4. Concept of the Vietnamese middle class

In research, the middle-class is defined based on level of personal consumption expenditure. Following this way, personal average consumption expenditure per day (month or year) will determine which class, in society, that person belongs to: the poor, middle or rich.

Using consumption expenditure as a measurement to classify economic classes has been used widely in the world, thanks to its preeminence compared to income criterion and its suitability to Vietnam's conditions. Many economists also conducted researches to explain the relationship between private consumption and the economic growth as well as individual living standard. Irish Fisher built model about "suitable consumer", who is far-seeing and makes decision in different periods: present and future, because there is a tradeoff between present and future consumption. Therefore, consumer will optimize consumption level by choosing tangential intersection between the budget constrain and the highest indifference curve in two periods.

According to I. Fisher's model, Milton Friedman gave a hypothesis about "regular income" to explain individual consumption behavior. Assume that Y is the sum of two factors, including regular income Y^P and temporary income Y^T : $Y = Y^P + Y^T$. Friedman said that consumption depends on regular income first, because consumers use saving and loan to regulate their consumption when they face a temporary change in income. However, using income norm to identify the middle-class has some limitations. It is very hard to measure and determine precisely an average income if someone intends not to disclose income, especially in developing countries as Vietnam, where financial and audit systems are weak. Therefore, "the average consumption expenditure is more reliable than income, because seldom do people mention the fake spending"⁷. In addition, due to an existence of "the non-official economic areas"⁸, income of those people in areas is not counted. Besides, the real income fluctuates over times, yet consumption reflects both stability of

⁷ Institute of Scientific Statistics, "Some statistical methodology issues", 06/2005

⁸ Added value of this area is around 20% of GDP in 2009 (its identification can be found on materials of International Conference "The non-official economic areas in Vietnam", Vietnamese Academy of Social Sciences, 05/2010)

regular income and fluctuation of present income, so it is more reliable than the present income.

To sum up, the section mentioned above indicates a close relationship between expenditure and income. Consumption can represent either the disposable income (the present income) according to Keynes's theory, or the regular income through a coefficient α based on Milton Friedman's theory. Moreover, consumption ensures accuracy, objectiveness and a more suitable measurement for individual living standard and household.

4.1. Definition

With expenditure level, there are two ways to make a definition: one based on absolute expenditure, and another based on relatively expenditure. For relatively expenditure, a researcher Easterly (2000) defined the middle-class were in 20%-80% of income distribution. Birdsall, Graham and Pettinato (2000) argued that those people are about 0.75 to 1.25 of individual median income of one country. The other way to define (based on absolute expenditure) is to indicate the particular expenditure level with the price in a base year. For example, in a report about the middle-class in developed countries, Homi Kharas (2010) argued that the middle-class are who have daily average expenditure (according to purchasing power parity (PPP) in 2005) ranging from \$10 to \$100. Definition of Banerjee & Dufflo (2007) was built on two absolute measures: Households whose daily expenditure, based on PPP in 2005, is about \$2- \$4 and \$4- \$10, are in the middle-class. In particular, the expenditure per day of the lower middle class is ranging from \$2- \$4, while the upper middle class's is from \$4-\$10.

World Bank(2007) used an absolute level to say that the middle-class as people whose income falls in between annually average income per capita in Brazil and Italy, about \$4,000\$- \$17,000 based on PPP in 2005.

Selecting which approach depends on a target of research theme. As mentioned above, our cares and expectations is to find the response for the middle class's size, consumption behaviors as well as its role to economy from 1986 when Vietnam carried out open market policy up to now. Therefore, absolute expenditure level is more meaningful to evaluate, compare the middle class' changes and contribution as the course of time.

By using the absolute consumption level, we venture our own definition: the Vietnamese middle-class are who have consumption expenditure per day ranging from \$3-10 based on PPP in 2005.

We can classify as below:

	Expenditure per capita per day	Expenditure per capita per year
Lower middle-class	\$3-6	\$1095- 2190
Upper middle class	\$6-10	\$2190- 3650

Usually the middle class can be divided into two subgroups: the lower and the upper middle class. The main difference between 2 groups is the consumption level: the lower middle-class have lower expenditure, which are close to the poor, and the upper have a higher spending level, which is close to the rich. Understanding structure of two subgroups we can have a quite useful conclusion and estimation. In one society, the upper middle class make up a higher proportion, so it indicates that it is a relatively rich society. In this case, the average of the upper and lower bounds, saying \$6, are used to classify to groups.

Assume that the average number of people in each Vietnam family is 4, so the expenditure of a household that belongs to the lower middle class is about \$4,380 - \$8760 per year based on PPP in 2005, and \$8,760-\$14,600 per year for who belongs to the upper.

According to reports about the middle class in Asia and Southeast Asia of Bannerjee & Dufflo, and Ponciano (Note on expanding and deepening the Middle class and engendering Inclusive Growth in the ASEAN), it is obvious to say that our upper bound is relatively close with the definition of Ponciano, Banerjee& Dufflo (\$10), and the lower bound is \$3 closer than World Bank's definition. Besides, according to classification of WB, countries which its annual income per capita is from \$975 to \$11905 based on PPP in 2005 (or \$2.7-\$32.7 per day) belong to the average income countries group. Notice that the definition of World Bank is applicable for the entire world, yet the research of Ponciano is only for Southeast Asia. Thus, applying the lowest bound of the World Bank and the highest of Ponciano ensures that our bounds are suitable to the world and close to the general conditions of area.

4.2. Price factor

The final note is that all absolute approaches are converted to the PPP in the base year. Usually PPP is used for most researches when comparing living standard amongst nations, because it includes the relative price relation in living costs and inflation rate. Therefore, using PPP is more precise and rational than exchange rate, which can distort the real difference in people's spending and income. Due to a complication in calculating PPP and limited time, we used directly PPP estimated, in 2005, by ICP (International Comparison Program).

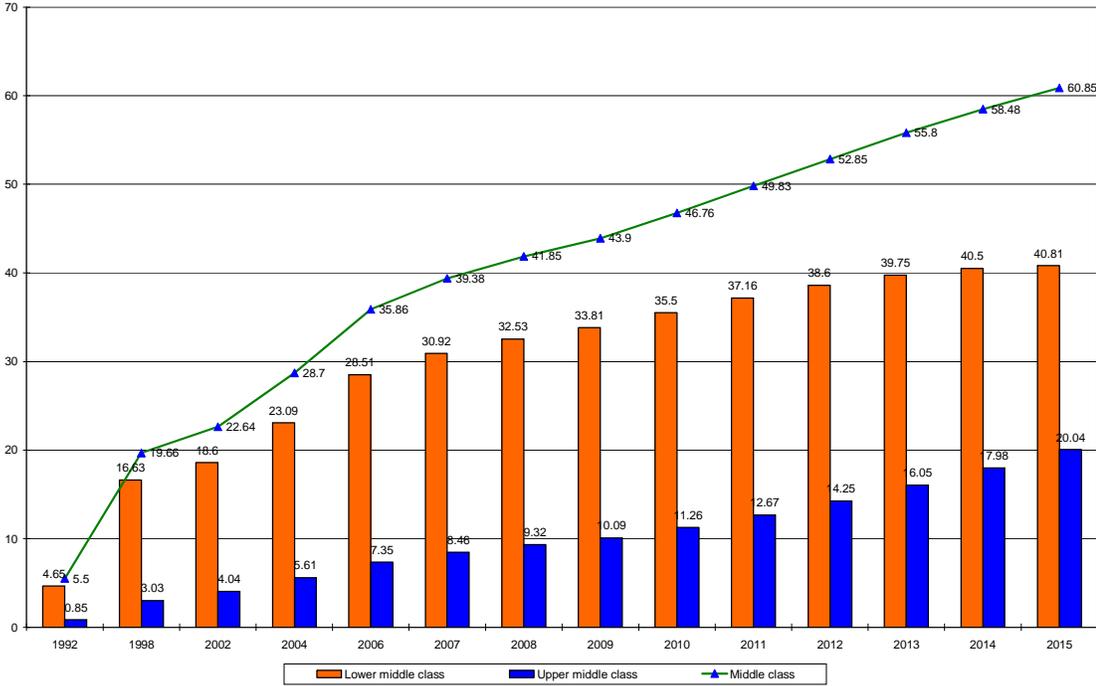
5. Estimate Vietnamese middle class's scale in population in 30-year period, from 1986 to 2015.

5.1. Estimation Method

We used simple regression model, as well as Eview software, to estimate Lorenz quadratic function (according to Villasenor and Arnold 1984, 1989) for the period, from 1992 to 2009, in data profile in households' living

standard survey conducted by Vietnam General Statistic Office. Assume that GDP per capita, through years, grows along with real GDP, so we estimate real GDP growth to get GDP per capita. Afterwards, an expenditure level, a factor to distinguish the middle class from the rich and poor, is used to evaluate middle class's scale in population.

5.2. The estimation outcome

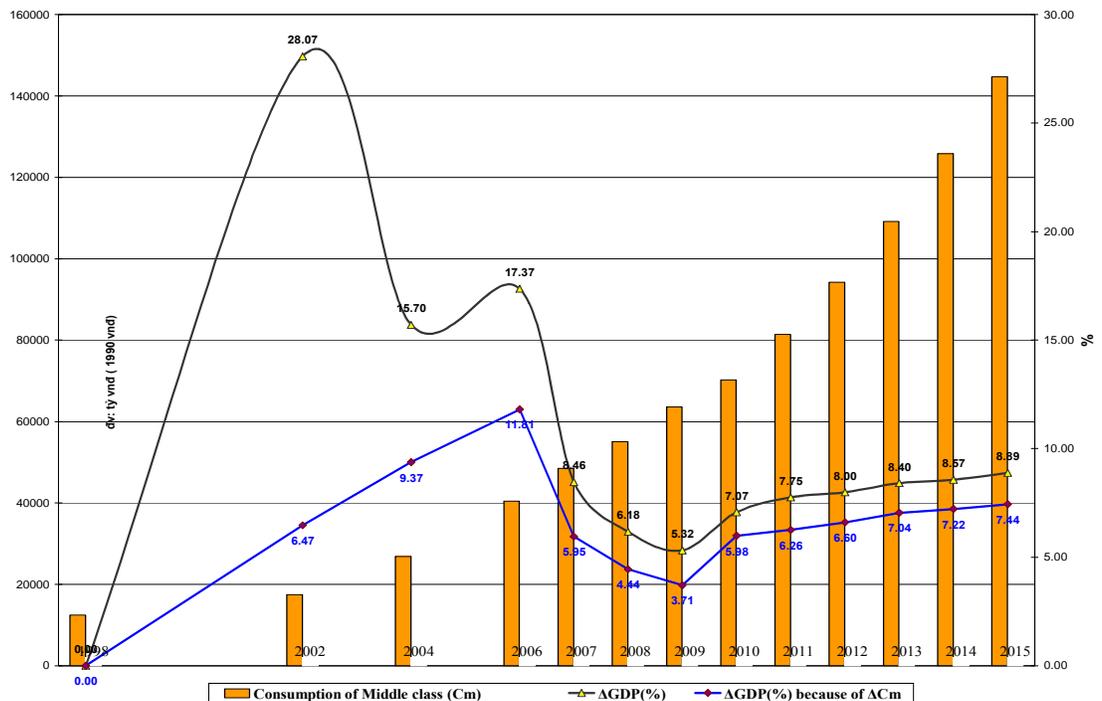


5.3. Identify population scale of the Vietnamese middle class within period from 1986 - 2015.

The evaluated outcome indicates the rise in population size of the Vietnamese middle class: the middle class's size increases gradually, making up 5.5% of population in 1992 to around 44% in 2009, and up to 60% in 2015. In addition, it shows the substantial change in people's living standard. It is because the higher percentage of the middle class is, the wealthier society is. It means the poor have enough food; even can satisfy their needs in a higher

level, and people who have the normal life become wealthier. Besides, the higher proportion of the middle class decreases gaps of income between the rich and poor. The upper middle class get a strong and stable growth, and shorten the distance in scale with the lower one. In the other words, the living standard of both the poor and the middle class increases gradually, and are closer to the rich's. Thanks to that, the middle class are a society's so-called pressure-pushing valve.

However, there are disadvantages in the middle class's size and structure. In structure, the lower middle class account for a larger proportion compared to the upper. This group includes who get rid of poverty, yet can relapse into misery due to economic fluctuations. Therefore, it is possible to witness the decline of the middle class if the proportion of the lower is still on the high level. We see, however, the optimistic signals from the evaluated outcomes in 2010-2015 phase, which express the decline in proportion of the lower middle class, and the increase of the upper, accounting for 1/3 Vietnamese population in 2015 in comparison with 1/4 in 2009. Besides, economic growth plays important role in expansion of the middle class's size through the impacts of an increase in income and then in average consumption (if saving and consumption rate stay the same). It implies that size of the middle class will be affected if witnessing the decline of economic growth (in years 2002 to 2007, the middle class's scale increased thanks to the high economic growth, but a year later, 2008, witnessed the decline due to recession in Vietnam).



There is a remarkable increase in the middle class’s consumption volume. During 4-year period, from 2002 to 2006, the consumption volume increased 1.5 times after 2 years. A 2007-2010 phase witnesses the decline in net inventory of consumption due to the world economic crisis, which results in a slowdown in GDP growth as well as in living standard ameliorating rate. Years later, however, the consumption volume increases again. There are two reasons for that. The first is nearly 5 million Vietnamese people adhere to the middle class, and leads to the increase in expenditure volume years later. The second is that average consumption will increase again, because the economic growth becomes stable after recession.

More importantly, the middle class play an important role in the economic growth through the increase in consumption volume. In a 4-year phase, from 1998 to 2002, GDP increased by 28.08% in which only 6% was of the middle class; but in 2008, the middle class had a major contribution (4.44% out of 6.18%) in the GDP growth. (Note that in 2008, private

consumption led to a 6.08% increase in GDP, while GDP growth was 6.18%; and the middle class made up 43% of the population).

During the period from 2010 to 2015, we can see the magnitude of the middle class in economic growth through consumption. It is because the economic growth turned back to 8%, which is equal to the level before the recession, leading to an increase in the number of people getting rid of poverty, joining the middle class, as well as average consumption.

6. Consumption behavior of the middle class in comparison with the rich and poor in Vietnam.

In the macroeconomic scope, the role of the middle class is indicated by the expansion of population in size as well as the considerable growth in consumption volume. In the below section, we will analyze the consumption behavior of the Vietnam middle class to identify the signals they send to the market through consumption in goods and Vietnam specialties.

6.1. Analysis method.

Data is taken from the Vietnam Living Standards Survey (VLSV) conducted by the Viet Nam General Statistics Office in 1998, 2002 and 2004.

In research, we use a general statistics method as well as STATA statistics software. Methods and the detailed calculation are presented more clearly in the appendix.

The total expenditure of individuals below will be divided into six main groups: food (eating, drinking); health care, education, housing, electricity, water, sanitation; durable goods and for apparel, travel, entertainment. In sum, they are approximately 100% of the total expenditure of individuals and households.

Meanwhile, the individuals are divided in four expenditure groups: the poor, lower middle class, upper middle class and the rich. They also divided according to living area: urban or rural. Statistics results of the average personal expenditure by region and expenditure help us to describe and compare the characteristics of the consumer groups, especially the middle class.

6.2. *The middle class consumer*

6.2.1. *Food spending*

Spending on food is an important spending item of individuals and households in Vietnam. Although the percentage of expenditures for food falls recently, it still remains high. In 1998, the percentage of food spending per capita in Vietnam is up to 54.06% - accounting for over half of total individual expenditure. By 2002, this percentage has decreased but made up more than 50%; in 2004, however, it tumbles to 47.18%.

The rate of expenditure for food is high, because Vietnam is a developing country. Food is still so important to meet the needs of the people's lives.

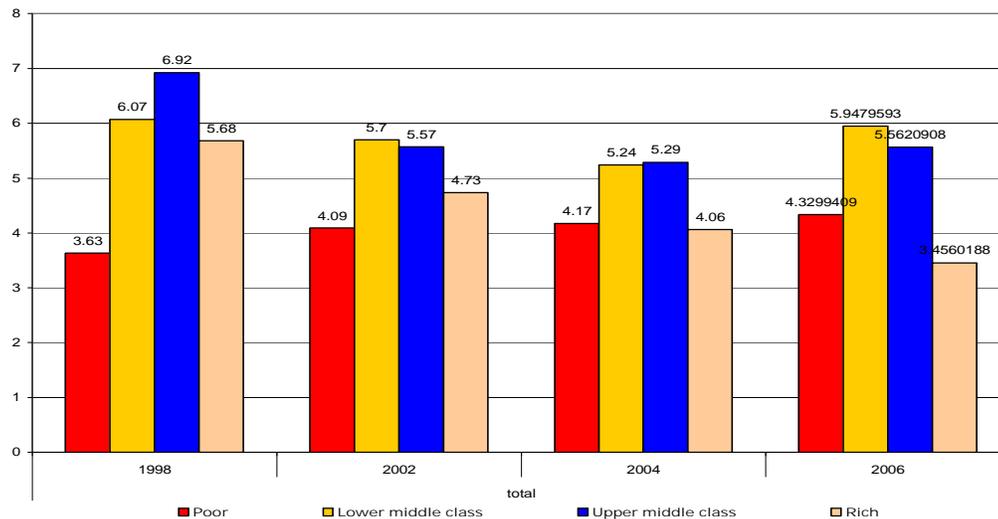
Based on the expenditure group, the results show that the poor have a largest spending on food. Their food spending in 1998 reached over 60% of total expenditure. Meanwhile, this rate for the middle class and the rich much more lower, 38.18% and 31.82% (1998) relatively. Moreover, spending on food continued declining years after. By 2004, spending on food of the rich group fall to one quarter (25.44%) while the poor still have pay more than half of their spending (52.77%). As observed more than hundred years ago by Engel (1895), the share of the budget spent on food falls along with increases in the standard of living. So it is positive to say that the Vietnam living standard has been improved.

People in urban areas spend less on food than in the rural. For example in 2002, the lower middle-class group in urban areas spent 38.33% their budget on food while that percentage in rural areas is 42.21%.

Compared with the proportion of expenditure of other developing countries (Indonesia, Pakistan), the Vietnam middle class has a relatively small spending proportion on food. The study of Banerjee & Dufflo (2007) points out that middle class in Indonesia and Pakistan must spent 50.7 to 66.6% of budget for food during the same period. Overall, in developing countries, a high rate of spending on food will have an adverse effect on other needs such as healthcare, education and other necessary demands...

6.2.2. Education

Expenditure on education accounts for a relatively small share of total expenditures per capita of the country. Its overall proportion is fairly stable and does not change much over the years: 4.41% (1998), 4.49% (2002) and 4.53% (2004). Being different from food categories, the proportion of expenditure for education depends ambiguously (up or down) on the standard of living.



It is because urban residents have more advantages and opportunities than the rural in approaching education services such as learning in foreign language or informatics classes, taking vocational education or in-service courses and so on. In addition, big cities and urban areas are centers of university and vocational training centers.

A very interesting thing discovered when comparing the average rate of education expenditure of each group. Needless to surprise, the poor's education spending still is the lowest; however, the highest expenditure on education is not from the rich, but the middle class. It is easy to see that the education spending, of the middle class, over the average expenditure per capita is higher than the rich's in years. These proportions of the lower and upper middle class are quite similar, usually fluctuate around 5-6%.

In general, education spending in Vietnam is relatively high compared to other countries. According to author Vuong Nguyen Viet, a statistics expert in the United Nations, Vietnamese expenditure on education makes up 8.5% of GDP, which is even higher than in America (7.2%) and the world's average level (4.5%)⁹.

During 12 years (from 1998 to 2010), state investment in education have increased from 13% to 20% of the total state expenditure; and it affirms that Vietnam is one of countries which spend most on education in the world.

In summary, it can be seen that Vietnam's middle class have a characteristic, which reflects a social tendency is an emphasis on education investment. The poor and rich classes also have this feature, yet it is not as obvious as in the middle class. This is a positive signal for us, because the

⁹ <http://www.visco.edu.vn/?c=40&t=410>

most important thing in current society is knowledge, so investment in education and human resources is judicious way.

However, remember that every coin has two faces. Besides the issue of spending levels for education, we need to care about the efficiency. A high yet inefficient spending level is a huge waste of social resources. Situations of Vietnam education show that efficiency level is not high, especially in undergraduate education, and even in higher studies. "Achievement disease", "Cheating in examinations", "brain drain"... those problems are still a hard puzzle for Vietnam education.

6.2.3. Health care spending

Similarly with education consumption, a proportion of the health care expenditure in the average expenditure, of a whole country, per capital is not large. In a whole country in 2004, the average percentage of health expenditure is 5.65%, in the urban sector is 4.85% and rural areas is 5.91%. The proportion of health spending in rural areas is higher than in urban areas in all years. In 1998, the proportion of medical expenses of a poor person in rural area over the total expenditure was 5.38%, and increased by nearly 15% to 20.17% when their spending reached the bound of the rich, while in rural areas, the poor's spending proportion just increased by 0.8% to 4.4%.

The reason is that in the countryside, health care services, insurance and the government's health care policy have been improved recently. Therefore, people in rural areas have more opportunities to enjoy health services like others in urban areas. Moreover, according to statistics in the medical and health care of the VLSS, it also illustrates that rural people have the higher incidence of infectious or occupational diseases caused by poor working conditions and polluted environment than urban residents.

The tendency of medical spending of middle class is quite clear. They spent a highest budget for health and medical care in comparison with the poor and rich classes (in 2002, 2004). Moreover, these rates continue to go up. For example, in 1998, the percentage of health care spending of middle-class group was just 3.61%, but in 2004 this increased 1.89 times to 6.84%.

The average expenditure for health care services of our whole country illustrates that Vietnamese spent about 5.24% to 5.65% of their budget on health care. This is fairly high compared to the world, for example, Japanese spent only 2.581% in 2007, French 3.601%, and British 2.992% (*source: <http://www.oecd.org>*).

In fact, the public health care is still weak and Vietnamese government's subsidy is small. According to the World Bank, Vietnamese have to pay 80% of the total medical costs. Government subsidies reach only 20%, and quality of healthcare services is too low: in 2000, there were only 250,000 beds in all hospitals in the whole country; an average is 8.14 beds per 1000 inhabitants. It is a really low rate in Asia.

However an increase in the proportion of health expenditure of people, especially the middle class, is a good signal of better living standards.

6.2.4. The expenses for electricity, water, sanitation services, house-rent

The expenditure on electricity, water, sanitation and house –rent give us a reasonable explanation for changes in Vietnamese living standards. First, in 1998, the expenditure rate was relatively low, especially in rural areas, making up only 5.47% of total expenditure, 13.13% in urban areas, and the average of the whole country reached 7.68%. However, only six years later, in 2004, this percentage increased around 2.24 times in rural areas (12.29%) and 1.97 times in urban areas (26.21%), the rate of the whole country also doubled, reaching 15.7%. A fast increase in expenditure rate gives us a positive signal in the life

quality. It is because clearly, electricity and water which are two basic criteria to assess quality of human life and development of the United Nations.

As a conventional logic, it is needless to surprise when the spending on electricity, water, sanitation and rent is proportional to the positive change in living standards. The figures in 2004 show that the rich spent 36.29% (of total expenditure), which is three times higher than the poor (12.53%), on these items. The similarity happened to the middle class, but there is a difference between the upper and lower. The spending level of the upper is closer to the rich's, and the lower's level is nearly the poor's. We see the uptrend in both classes' expenditure on those items, but with slow speed.

6.2.5. Durable goods spending

Durable goods are items to meet the needs of people for many years and often have a high value such as: motorbikes, automobiles, television, air conditioner, and refrigerator....The more spending in these items, the higher level of household life.

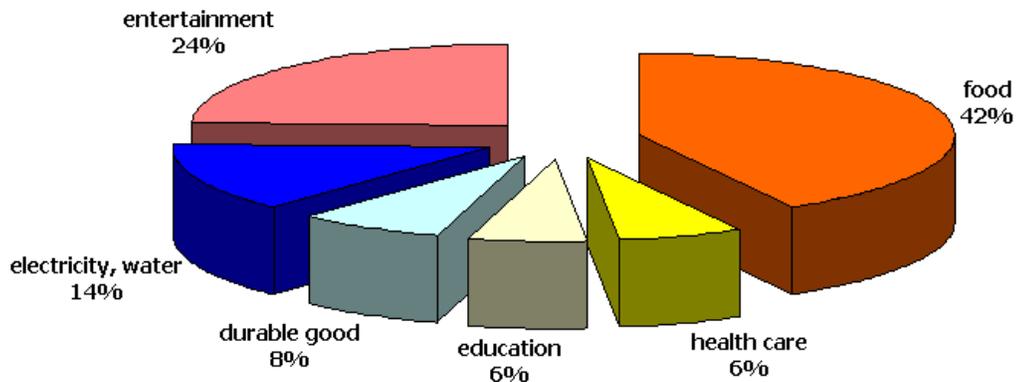
According to two statistical sample models in 1998 and 2004, a proportion of total expenditure for those declined. In 1998 the average expenditure proportion of a whole country was 9.19%, and only 5.07% in 2004. From our point of view, due to its great value, they have must spent large amount of money to purchase, yet thanks to long-time use, spending on those items declined years later. In this case, there is no difference between the rural and urban areas.

In addition, the spending proportion on durable goods is proportional to the standard of living. The middle class pays for this item also constitutes a large proportion. In 2004, the middle class's durable goods spending ratio (7.29%) was higher than the rich (6.78%).

6.2.6. *Spending on clothing, travel, entertainment*

Expenditures for apparel, travel, entertainment, culture constitute a large proportion in the total spending. In 2004, the average expenditure percentage, of the whole country, for these items accounted for 21.91%. We also found that spending levels are relatively similar between the urban and rural. In 2004, the middle class's spending ratio was the highest, but in 2002 it was lower than the rich's. Nonetheless, we can see there is a slight increase.

6.3. *Assessment of the consumption class.*



According to the figures mentioned above, we can give to some conclusions about the middle class and their consumption behaviors:

First, the Vietnamese middle class tend to decrease their spending proportion on items such as food, and increase expenditure on health care services, education, pure water, electricity, expenses of rent, clothing expenses, travel and entertainment.

Secondly, the middle class attach special important to investment in education and health, and compared to the rich and poor, their expenditure ratio is the highest.

Thirdly, the urban middle class have a positive consumption tendency than the rural because of higher spending proportion on education, food, clothing, housing and entertainment.

Three conclusions partly bring a whole picture of the middle class' roles in a consumption society. They seem to pursuit better lives by spending more on health care, children's education, electricity, clean water and so on.

With the images are sketched so, the middle class deserves to be recognized as an advanced class capable of stimulating and dynamic development and raise living standards for society overall.

After combining with the results estimated of the size and contribution of the middle class through the private consumption component in nation demand, we can offer a general comment on the role of middle class in the economy. Vietnam middle class as a whole look, have a positive consumption trends, along with a large potential for future growth in size as well as contribution to GDP. That is the essential feature creates a dynamic class, serves as a driving force for economic growth and improved society living standards.

With those sketched pictures, the middle class are deserved to be recognized as the progressive class, which can stimulate society in developing and raising average living standard.

7. Conclusion

According to the size evaluating outcomes and roles of the middle class through private consumption; we can have a conclusion related to the importance of the middle class in economy. The Vietnamese middle class in general contribute a positive expenditure tendency in growth potential in scale

as well as GDP in the future. Those are critical points of an active class, which have a motive power in economic growth and society's better living standard.

7.1. Research findings.

The concept about the Vietnamese middle class is constructed base on average consumption expenditure per day. That level (\$3-\$10) is suitable for the case of Vietnam as well as the World Bank's standards and conclusions in many working papers about middle class in Asia.

We measure the population size of the middle class within 1992 to 2009 period and estimate for the next 15 years, from 2010 to 2015 by using the quadric Lorenz and the Cobb-Douglas production function. The result indicates that the middle class made up more than 40% population in 2009 compared to 5% in 1992. This figure can be even larger and reach to 60% in 2015. Through private consumption, we can see obviously the important role of the middle class in GDP growth thanks to its high consumption rate and stable expenditure density in GDP.

Besides, the middle class's consumption behavior implies that 65% of aggregate expenditure is for others demand than food, and that figure will decrease in the course of time. It also shows that proportion of expenditure in health, education of the middle class is higher than the rich and poor's. That is a difference of the Vietnamese middle class.

7.2. Policy implication to Governmental Agencies and enterprises.

Government need reinforce the Vietnamese middle class by the effective assistance and policies. First of all, government need to concentrate on increasing the middle class's population size by stabilizing the real GDP growth, annual income allocation, and raising the density of private income in GDP through the macroeconomic policies. Besides, authorities should make a

consideration in orienting the middle class's consumption behaviors in order to strengthen domestic production.

Enterprises should acknowledge the demand (quantity of goods and services demanded) and its structure indicated by the consumption behaviors, concentrate on the middle class's favorite products and services in domestic markets. Besides, from our points of view, they also should think about a strategic reform such as cutting down costs by reformatting the business system and using local resources. Besides, diversifying brand name by producing products that are suitable with either each kind of market or living standard should be taken into account. This way might ensure the loyalty of consumers even when their spending is in higher level.

7.3. Some suggestion for in-depth research in the future.

Besides consumption behavior, we can see the role of the middle class apparently through the behavior in saving or investing. Therefore, research in those behaviors gives us the deeper understanding about how important the middle class is in society.

There are also so many unanswered questions about factors, which help us identify the middle class's income, and a relation between the Vietnamese middle class and enterprises, or even their behaviors. If we can respond those questions, we will have an overall understanding about the middle class's roles in not only economy but also culture and society. Finally, we will have an overview about "The face of the Vietnamese middle class".

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APPENDIX

The model to estimate the population scale of Vietnamese middle class in period from 1986 – 2010.

Lorenz curve shows the relationship between cumulative frequency percentage of population and cumulative frequency ratio of consumer expenditure:

$$L = L(p, \pi) \quad (1)$$

In which:

L is the cumulative frequency percentage of the population according the cumulative frequency rate of consumption; π is a vector of estimated parameters (a, b, c) of the Lorenz curve.

P is a function of the average spending rate with the Z constrain (or the ratio μ / z) and vector parameters (a, b, c) of the Lorenz curve.

$$P = P(\mu / z, \pi) \quad (2)$$

Index Hz (headcount index)

Hz shows percentage of the population whose consumption expenditure is under Z; Hz is derived from function (2) above. Hz is used to measure the absolute living standards of people whose consumption expenditure is lower than z.

$$Hz = \int_0^z f(x)dx \quad (3)$$

In which:

x is household's consumption expenditure; f(x) is a function of percentage of population whose consumption expenditure is x, z is the constrain.

Hz index is calculated based on the relation between the Lorenz curve and the distribution function (P is a function of x regarding the true essence is the distribution function)

$$L'(p; \pi) = z / \mu \quad (4)$$

L'(p, π) is a slope of the Lorenz curve. Value estimates in the limit z:

$$L'(H, z) = z / \mu \quad (5)$$

Solving the above function, we obtain Hz: the formula No (6):

$$Hz = \frac{-1}{2m} \left(n + r(b + 2z/\mu) * [(b + 2z/\mu)^2 - m]^{1/2} \right) I$$

n which:

$$e = -(a + b + c + 1); m = b^2 - 4a; n = 2be - 4c; r = (n^2 - 4me^2)^{1/2};$$

μ is the monthly consumption expenditure per capita.

The parameters (a, b, c) are estimated from the following regression model:

$$L(1-L) = a(P^2 - L) + bL(P-1) + c(PL) \quad (7)$$

(P is the cumulative frequency ratio of population; L is a cumulative frequency rate of spending)

From the formula of (3), to calculate the percentage of the population in middle class (Z₁; Z₃), in which the upper middle class ranges in (Z₁; Z₂) and the lower-middle class ranges in (Z₂; Z₃).

We use the following formula:

Middle class = Upper middle class + Lower middle class

$$P_{z3 - z1} = (H_{z3} - H_{z2}) + (H_{z2} - H_{z1}) \quad (8)$$

$$\begin{aligned} \int_{z1}^{z3} f(x)dx &= \int_0^{z3} f(x)dx - \int_0^{z1} f(x)dx \\ &= \left[\int_0^{z3} f(x)dx - \int_0^{z2} f(x)dx \right] + \left[\int_0^{z2} f(x)dx - \int_0^{z1} f(x)dx \right] \end{aligned}$$

Database

The data about the average consumption expenditure is taken from the Vietnamese Living Standard Survey conducted by the General Statistics Office Vietnam in 1992, 1996, 2000, 2002, 2004, 2006. Also from the VLSS data, we classify consumption expenditure (based on population) into 20 classes incremental (binary decimal position), to get the P and L ratio, and then calculate the parameters a, b, c in the formula of (7) above. Due to lack of data in 2006, the ratio P, L is taken from a Povlcanet database of the World Bank.

In addition, data about exchange rates are taken from the Asian Development Bank ADB. The conversion ratio purchasing power parity is taken from the International Comparison Program of the World Bank. Finally, the figures about changes in GDP growth of Vietnam from 1986 to 2008, according to price comparison in 1990, are taken from United Nation's Database.

Population size of the middle class in Vietnam in period from 1986 to 2006.

We estimate the population scale of middle class, based on the above method, by following steps below. We only mention a calculation process for 2002. The others are calculated on the same way.

Step 1: *Prepare database to estimate the Lorenz function.*

P	L
0.0500050000	0.0135129880
0.1000100000	0.0312570560
0.1500150000	0.0515220690
0.2000200000	0.0740152000
0.2500250000	0.0986236560
0.3000300000	0.1252947000
0.3500350000	0.1539806000
0.4000400000	0.1846564000
0.4500450000	0.2176106000
0.5000499000	0.2529413000
0.5500550000	0.2909278000
0.6001600000	0.3321562000
0.6500650000	0.3769890000
0.7000700000	0.4263793000
0.7501751000	0.4813528000
0.8001801000	0.5431783000
0.8501851000	0.6140628000
0.9000901000	0.6991392000
0.9500951000	0.8103647000
1.0000000000	0.9999999000

P is the cumulative proportion of the population, corresponding to L, which is the cumulative rate of spending, is calculated based on data in the Vietnam living standard survey in 2002, and the World Bank's database.

Step 2: Estimate regression model No 7 to obtain the coefficients a , b , c (except the pair $(P,L) = (1,1)$ in final row).

$$L(1-L) = a(P^2 - L) + bL(P - 1) + c(P - L) \quad (7)$$

We obtain the below outcomes by using Eview software:

Dependent Variable: L*(1-L)
 Method: Least Squares
 Date: 04/10/10 Time: 13:53
 Sample: 1 19
 Included observations: 19

Variable	Coefficient	Std. Error	t-Statistic	Prob.
P^2-L	0.698202	0.014990	46.57821	0.0000
L*(P-1)	-0.695993	0.067219	-10.35417	0.0000
P-L	0.412244	0.033053	12.47225	0.0000
R-squared	0.999492	Mean dependent var		0.158206
Adjusted R-squared	0.999428	S.D. dependent var		0.078719
S.E. of regression	0.001882	Akaike info criterion		-9.568878
Sum squared resid	5.67E-05	Schwarz criterion		-9.419756
Log likelihood	93.90434	Durbin-Watson stat		0.266941

The rewritten Lorenz function is:

$$L(1-L) = 0.698202.(P^2 - L) - 0.695993L(P-1) + 0.412244(P-L)$$

The coefficient R^2 and adjusted R^2 are significant, and they are sufficient evidence to support a suitability of the model. The results also satisfy the Lorenz function models' assessment.

Table of examination

Conditions	Lorenz function
$L(0;\pi) = 0$	$e < 0$
$L(1;\pi) = 1$	$a+c \geq 1$
$L'(0+;\pi) \geq 0$	$c \geq 0$
$L''(p;\pi) \geq 0; c \text{ in } (0; 1)$	$m < 0 \text{ or } 0 < m < -(n^2/(4e^2)), n \geq 0$

Step 3: Determine the limited level of spending Z , the average consumption expenditure μ .

Data about the average consumption expenditure are taken from the results of the Vietnam living standard survey in 2002. The limits Z_1, Z_2, Z_3 are mentioned in concept of Vietnamese middle class.

Step 4: Estimated results of the population size of the Vietnamese middle class in 2002.

Using these steps for years 1992, 1998, 2004, 2006, we get estimated results of the population size of Vietnamese middle class.

Target	Lower middle class		Upper middle class		Middle class	
	Percentage of total population	Population	Percentage of total population	Population	Percentage of total population	Population
1992	1.47	1,018,260	0.24	169,156	1.72	1,187,416
1998	5.32	4,128,357	0.82	639,978	6.14	4,768,334
2002	6.90	5,582,507	1.18	954,962	8.08	6,537,470
2004	9.45	7,842,933	1.69	1,400,770	11.13	9,243,703
2006	12.3	10,508,385	2.16	1,844,344	14.51	12,352,730

Estimate population size of the middle class in Vietnam, the period from 2007 to 2015.

The assumptions in this section are:

1. Data about labor force in Vietnam during the period 2010 - 2015 are taken from International Labour Organization in accordance with the economically active population
2. Personal average consumption increases along with the real GDP growth per capita in the period 2010 to 2015. This also implies that the proportion of consumption in GDP also remains constant during this period.
3. Lorenz curve is unchanged during period of 2010-2015, it means that the unequal distribution of income stays the same, and income is distributed automatically.

Estimating methodology.

To estimate the population size of Vietnam's middle class, firstly we forecast real GDP and real GDP per capita in the period 2010 to 2015. Then, we estimate the growth rate of real GDP per capita through years. Assume that changes in consumption expenditure are along with the growth rates of real GDP per capita, we have data on consumption expenditure per capita over the years from 2007 to 2015 by multiplying the average consumption expenditure in 2006 with the growth rate of real GDP per capita. The third assumption is that the Lorenz curve is unchanged over time from 2006 to 2015, we have the parameters a , b , c of the Lorenz curve for years in 2007 – 2015 period, (it means the parameters a , b , c in 2006 are assumed to remain until 2015). Thus, the size of Vietnamese middle class from 2007 to 2015 would be estimated through the formula (6) and (8).

Predicting real GDP 1990VND in a period from 2010 to 2015.

Database:

We collect and found database under the following headings:

Data on capital investment from 1986 to 2009.

Real GDP growth rates and real GDP from 1986 to 2009.

The total amount of capital stock (K_0) were calculated by the formula below, based on the method of Caselli and Feyrer (2007).

$$K_0 = I_0 / (\delta + g) \quad (9)$$

In which:

I_0 is an initial investment in the base year (1990)

δ is the depreciation rate of the economy. Here, the group use $\delta = 0.05$, which is usually used for Vietnam in research of Le Dang Doanh and his partners (2002) and in some working papers.

g is the average growth rate of real GDP in 20 years after the base year (the period from 1986 to 2006).

Then, the capital stock of economy in the following years is calculated by the formula:

$$K_t = K_{t-1}(1 - \delta) + I_{t-1}$$

The production function.

After building database, we forecast GDP at constant price in 1990 during a period from 2010 to 2015, based on a Cobb-Douglas production function and the elastic coefficient of the capital stock K (1/3):

$$Y = TFP \times K^{1/3} \times L^{2/3}$$

We use an iterative method to estimate GDP based on estimation about labor, the capital stock and total factor productivity for each successive year.

With the labor force L : we use data from the International Labour Organization, predict the economically active population for 2010-2015. The assumed unemployment rate is 5% in a period from 2010 to 2015.

The capital stock from 1986 to 2009 is predicted based on data in the first step; the capital from 2010 to 2015 is estimated by multiplying the GDP in the previous year by the long-term investment index i_{86-06} .

$$K_t = K_{t-1}(1 - \delta) + I_{86-06} Y_{t-1}$$

We use the total factor productivity (TFP) to estimate TFPs for next years:

$$TFP_t = TFP_{t-1} \times 1.02$$

The assumed long term growth rate of technological advances is 2%.

The estimated results of real GDP estimated from 2010 – 2015

