DETERMINANTS ON ASPECTS OF WELL-BEING: A TEST OF KASIK BASU HYPOTHESIS AND ITS IMPLICATION ON VIETNAM

By

Nguyen Phuong Tra

THESIS

Submitted to
KDI School of Public Policy and Management
in partial fulfillment of the requirements
for the degree of

MASTER OF PUBLIC POLICY

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ABSTRACT

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The selection of measures for economic development plays an important role for countries to pursue their development goals. Kaushik Basu hypothesized that Per capita income of the poorest 20 percent of the population (Quintile income) should be used in place of Per capita income in evaluating an economy's performance as the former will correlate more strongly with other indicators of well-being, such as greater life expectation and higher literacy, than does the latter. However, the use of this quintile income will have a great effect on distribution issue and impose important constraints on policy. The transfer from the rich to the poor may raise the income of the poor but, if they reduce savings and capital accumulation by the rich, they may in time lead to lower income in the poorer groups. Thus, the adoption of Basu hypothesis should be put in well consideration.

The study performed regression based on a sample of 69 developing countries to empirically test this hypothesis. It found that quintile income in fact does not explain the well-being indicators of life expectancy, infant morality or adult literacy better than per capital income. The hypothesis is not true for all the case but only for middle developing countries. Therefore, policies of other developing countries including Vietnam should focus on social aspect rather than the distribution aspect.

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Especially, I would like to give my special thanks to my parent and Thai Anh whose patient love enabled me to complete this work.

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ABBREVIATES

Variables

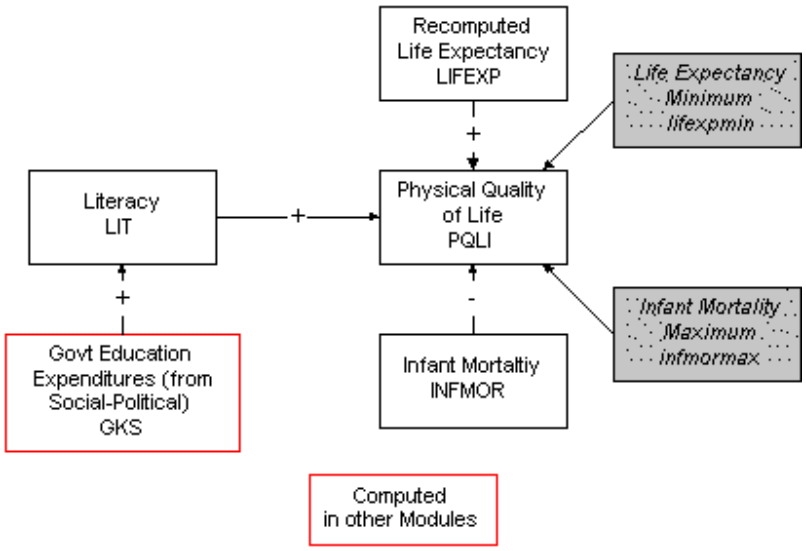
ADULITERACY:	Adult Literacy rate - % of age 15 or above (1998), source UNDP
AIDS:	People living with HIV/AIDS - % of age 15-49 (1997), source UNDP, WB and WHO
CHILDLABOR:	Children in the age of 10-14 as percentage of labor force, source UNDP
CVWAR:	Dummy for civil war, source Levine and Easterly (1997)
EDUEXP:	Public expenditure on education - % of GNP (a certain year of 1995 – 1997), source UNDP
FERRATE:	Total fertility rate per woman (average of survey period 1997 – 2000), source UNDP and WHO
HEAEXP:	Public expenditure on health - % of GNP (1998), source UNDP
INFMORALITY:	Infant morality rate – per 1000 births (1998), source UNDP
LIFEEXPECT:	Life expectancy at birth (1998), source UNDP
PCAPGNP:	GNP per capital calculated by PPP method (1998), source UNDP and WB
POLINS:	Political instability, source formula by Annett (2000) from dataset of Levine and Esterly (1997)
QUINGNP:	GNP per capita of the poorest 20% population, equals

	PCAPGNP multiplied by SHARE and divided by 20
SHARE:	Share of the poorest 20% population in percentage (value for specific period of survey through out countries), source UNDP and WB
SOC:	A dummy variables for countries having socialist system till the end of 1980s, source: Kornai (1992)

Others

CHSs:	Community Health Stations (differ from Central Health Services)
DHOs:	District Health Offices
ICPCs:	Intercommunual Polyclinics
IMF:	International Monetary Fund
MOET:	Ministry of Education and Training
MOH:	Ministry of Health
PQLI:	Physical Quality of Life – developed and publicized as a measure of (physical) quality of life many years ago by The Overseas Development Council. It combines literacy rate, infant mortality rate, and life expectancy, using scales from the lowest to the highest values in the global system. It weights the three scales equally. The literacy rate is, in turn, a function of the per capita spending levels on education, estimated cross-sectionally.

Based on country/region-specific Physical Quality of Life, it is possible to compute world quality of life (WPQLI) and the North-South gap in quality of life (NSPQLI). It is also possible to compute world literacy (WLIT). Source: Nick Van der Lijn (1195).



UNDP: United Nation Development Program

WHO: World Health Organization

WB: World Bank

CHAPTER I: INTRODUCTION

I.1 Purpose of the study

The selection of measures for economic development plays an important role for countries to pursue their development goals. So far, associated with Human Development Index (HDI), Per Capita Income (GNP per capita) is internationally used as measure for economic development. Attempts to give a better tool, Kaushik Basu[1] debated that Per capita income of the poorest 20 percent of the population (Quintile income) should be used in place of Per capita income in evaluating an economy's performance. He argued, "The quintile income was shown to have many attractive properties, among them the fact that it probably correlates more strongly with other indicators of well-being, such as greater life expectation and higher literacy, than does Per Capita income"[2]. To reconfirm a truly better measure for evaluating economic development, this study is an attempt to test the above-mentioned hypothesis of Kaushik Basu. It will answer those questions whether or not Quintile Income will make the well-being variables of life expectancy, infant morality and adult literacy more significant than so does Per Capital Income. Also, it comes to find what important factors affect these variables. After having a framework, it will do a

[1] Kaushik Basu is a Professor of Economics at the Department of Economics, Cornell University. He has held visiting positions at CORE (Louvain-la-Neuve, Belgium), the Institute for Advanced study (Princeton), and the London School of Economics, where he was a Distinguished Visitor in 1993. He also has been a Visiting Professor at Harvard University and Princeton University, a fellow of the Econometric Society and a recipient of the Mahalanobis Memorial Award for contributions to economics.

[2] Kaushik Basu, "On the Goals of Development" in Gerald M.Meier and Josdeph E. Stiglitz (eds), Frontiers of Development Economics, Oxford University Press (2000), pp.61-86

case study clarifying determinants on and applied policies for a better well-being standard in Vietnam.

I.2 Method and strategy of the study

Quantitative analysis is the main method of analysis used in the study. It employs comparative, logical and inferential explanation on various econometrics models. The study is divided in to five chapters. Chapter 1 is an introduction that explains objectives and method of the study as well as a preface on Basu hypothesis. Next, chapter two depends on argument of Basu to perform simple regression equations from a sample of all developing countries having dataset available (69 countries). Per Capita Income and Quintile income are equivalently hold as independent variables to see how they explain other indicators of well being including life expectation, infant morality and adult literacy. The initial empirical result surprisingly appears in an opposition direction to Basu's judgment. Then, chapter three has a closer look at the matter by introducing multiple regression equations. This step is to control other concerning variables in associated with per capita income and quintile income that have effect to well-being indicators. The attempt of doing this job is to identify whether there is or there is not further evidence for Basu's hypothesis. Also, it will be helpful for the analysis of what government policies being important for the human development. Results in this multiple regression again confirm that quintile income does not correlate more significantly with well-being indicators than per capital income, the rest of chapter three builds a debate on Basu hypothesis. After that, chapter four employs findings from previous chapters to conduct a case study in

Vietnam. The first part of this chapter evaluates well being indicators in Vietnam and its comparison to other developing countries. The rest of chapter using findings from previous sections discuss application of government policies on the matter. Finally, chapter five concludes the study.

For doing all testing works, the study collected the latest data from official sources of World Bank (WB), United Nation Development Program (UNDP), and International Monetary Fund (IMF) and also from datasets of Easterly and Levine (1997). Data for doing case study on development in Vietnam is collected from General Statistics Office of Vietnam, Ministry of Education and Training, Ministry of Health, Ministry of Planning and Investment, the World Bank Vietnam Office and the UNDP Vietnam office.

I.3 Basu hypothesis

So far, scholars often use per capita income as a measure of wealth and examined its effects on aspects of well-being. Debraj (1998) examined the relationship between per capital income alone and indicators of well-being. He constructed three regression models consisting of life expectancy, the infant morality rate and the adult literacy rate as dependent variable and per capita income as explanatory variable. A cross section data was collected for 1995. His findings were that the relationship between per capita income and each of well-being indicators was strikingly strong. Empirical figures then expressed the idea that it is a powerful measure to observe the explanation of wealth to well-being indicator. However, Kaushik Basu denied the use of per capita income and recommended quintile income as an alternative. In a

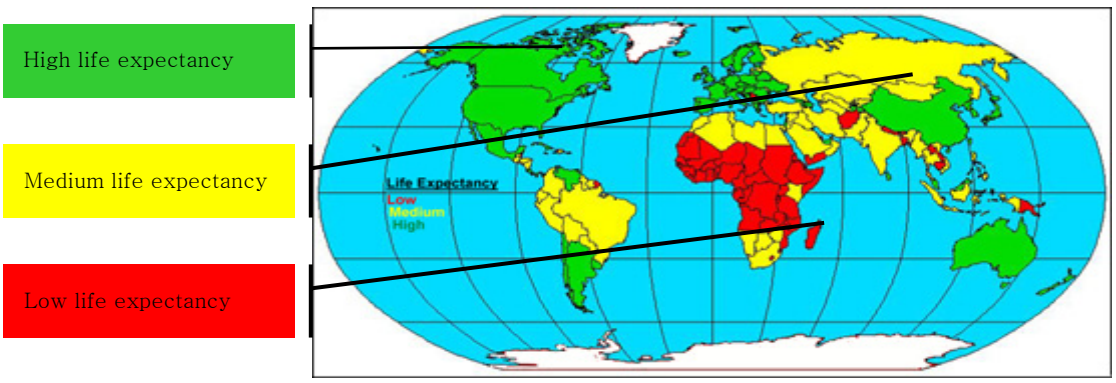
background paper of UNDP's Human Development Report 1996, he wrote "when we evaluate the economic well-being of a nation, we should look at the per capita income of the poorest 20% of the population (quintile income); and we should assess economic progress by looking at the growth rate of per capita income of the poorest 20% (quintile growth)". Essentially, his idea says that in evaluating an economy's state or progress, we should focus primarily on how the poorest people are faring. An advantage of designing policy by focusing attention on the poorest 20 percent is that one cannot totally ignore the effect on people outside this group. If others fare too badly, they will become part of the poorest 20% percent and so will automatically come into focus. For this same reason, raising the quintile growth rate can never mean totally ignoring the overall growth rate of the country. In addition, he believes the move away from per capita income and growth to quintile income and quintile growth will certainly change the ranking of societies quite drastically. Basu (2000) also gave further argument on the matter in a paper named "On the Goals of Development". He insisted that the quintile income be shown to have many attractive properties, among them the fact that it probably correlates more strongly with other indicators of well-being, such as greater life expectancy and higher literacy, than does Per Capita income. In summary, by giving theoretical argument, Basu's hypothesis seems to be interesting but not persuasive enough, as he has not taken empirical study to prove it. The thesis in following steps will continue Basu's work by constructing regression models to empirically test the above - mentioned argument.

CHAPTER II
DETERMINANTS ON ASPECTS OF WELL-BEING: A SIMPLE REGRESSION

II.1 Description of sample data and estimation

This part performs simple regression equations from a cross-section sample of 69 developing countries for 1998 (TEST 1). The binding constraint on the selected countries is its focus on developing world and data availability. It is well proven that well-being indicators of all developed countries were at very high level while those of developing world varied in a wide scale. For instance, the map below shows that developed regions of the world generally reach high level of life expectancy in the range of the mid-80s in age (green section) while developing regions has quite dramatic variation on the matter.

Map II-1: Worldwide Life Expectancy 1998



Among those developing countries, Africa is home to the world's lowest life expectancies with Sierra Leone (37.9 years). Some countries like Saudi Arabia have very high GNP per capita but don't have high life expectancies. Alternatively, there are countries like China, Vietnam, Ghana and Senegal that have low GNP per capita

have reasonably high life expectancies[3]. Serious situation and a great extent of variety made the study narrow its scope on developing world. At the beginning, it intended to collect a sample data of all developing countries under UNDP definition (2000) but the availability of information on share of the poorest 20% was restricted[4]. Therefore, only a sample size of 69 countries was constructed.

Two systems with PCAPGNP and QUINGNP as independent variable in each are introduced to see how they explain other indicators of well-being. To avoid the misleading by price difference through countries, the study chooses Purchasing Power Parity (PPP) method to calculate PCAPGNP[5]. QUINGNP is Per capita GNP of the poorest 20 percent of the population (Quintile income) computed by the following formula:

$$QUINGNP = \frac{per\_capita\_GNP \times share\_of\_the\_poorest\_20\%}{20}$$

The study chooses LIFEXPECT, INFMORALITY and ADULITERACY to present well-being indicators. LIFEXPECT is life expectancy at birth or the average number of years that a person may be expected to live in a country.

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[3] See figure 2

[4] See figure 1

[5] Purchasing power parity (PPP) is a theory, which states that exchange rates between currencies are in equilibrium when their purchasing power is the same in each of the two countries. This means that the exchange rate between two countries should equal the ratio of the two countries' price level of a fixed basket of goods and services. When a country's domestic price level is increasing (i.e., a country experiences inflation), that country's exchange rate must depreciate in order to return to PPP. The simplest way to calculate purchasing power parity between two countries is to compare the price of a "standard" good that is in fact identical across countries. Thus, the calculation of GNP by PPP method help to eliminate the difference in purchasing power across countries that exchange rate faces.

LIFEEXPECT measures health status of the population and provides a useful indicator or the overall effect of environmental and other risk factors on health, and a basis for monitoring both trends in health and for comparing different countries in terms of their health status. Therefore, the study includes this variable as an important measure of well-being.

INFMORALITY is infant mortality rate per 1000 live births or the death rate of infants under one year of age, per 1000 live births, over a given period of time (1998). Young children, in many ways are the most vulnerable group to adverse effects of environmental health. They are sensitive not only to conditions in their immediate environment after birth, but also to the pre- and post- natal health of their mother, and the quality of the health support services. Information on infant mortality thus provides both a specific indication of the health status of young children, and a more general indicator of the overall quality of health conditions and the effectiveness of health facilities in a country.

ADULITERACY is adult literacy rate or the percentage of age 15 or above can "use printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential"[6]. Literacy is no longer defined merely in terms of a basic threshold of reading ability. As society becomes more complex and low-skill jobs continue to disappear, the concern about adults' ability to use written

[6] This definition of literacy, originally developed for the Young Adult Literacy Assessment of 1985, was later adopted for the National Adult Literacy Survey (1992), used again in the International Adult Literacy Survey (1994) and now worldwide accepted by a number of international organizations (e.g., World Bank, UNESCO, UNDP) as a measure of adult literacy.

information to function in society continues to rise. For the purpose of this indicator, "literacy" is defined as the ability to understand and employ printed information in daily activities at home, at work, and in the community to achieve one's goals and to develop one's knowledge and potential. In recent years, adult literacy has come to be seen as one of the fundamental tools necessary for successful well-being standard of a country and therefore it is included in the study.

It is estimated that both PCAPGNP and QUINGNP will have positive effects on LIFEXPECT and ADULITERACY as well as negative influence on INFMORALITY.

II.2 Model specification

Basu hypothesized quintile income as a better measure should be used in place of per capital income to explain other indicators of well-being. To test this hypothesis, we have to compare significant levels of the independent variables (QUINGNP and PCAPGNP) to see if value on the dependent variable of QUINGNP is more significant than that of PCAPGNP. Hence, the study constructs two systems, each of which is attempting to explain the same dependent variable (LIFEEXPECT, INFMORALITY or ADULITERACY). Only do QUINGNP and PCAPGNP differ across systems.

System I:

LIFEEXPECT = C(1) + C(2)*PCAPGNP <Model I.1>

INFMORALITY = C(1) + C(2)*PCAPGNP <Model I.2>

ADULITERACY = C(1) + C(2)*PCAPGNP <Model I.3>

System II:

LIFEEXPECT = C(1) + C(2)*QUINGNP <Model II.1>

INFMORALITY = C(1) + C(2)*QUINGNP <Model II.2>

ADULITERACY = C(1) + C(2)*QUINGNP <Model II.3>

Note: C(1) and C(2) stand for coefficients and get different values through models.

It is well known that R-square is used to compare two models. R-square has two interpretation: (i) it is the proportion of the total variation in dependent variable that the model explains, and (ii) it is the square of the correlation coefficient between the observed value of dependent variables (the real value of well-being indicators) and the predicted value (values provided by models). The higher its value is, the better the fit. Thus, if Basu's hypothesis is correct, an actual fit good (R-square) that represents percentage of the variation in LIFEEXPECT, INFMORALITY and ADULITERACY explained by QUINGNP should be higher than that by PCAPGNP. Also, the system with QUINGNP as dependent variable (system II) will give coefficiences with higher degree of significance than does the other (system I). In other words, absolute t-values of QUINGNP in model II.1, II.2 and II.3 should be higher than that of PCAPGNP in model I.1, I.2 and I.3.

II.3 Result and interpretation

The test is meaningful as all coefficients significantly appear with appropriate signs. Both QUINGNP and PCAPGNP had positive effects on LIFEEXPECT and ADULTERACY while negatively correlated with INFMORALITY. However, comparative results does support Basu's hypothesis. Except the case in model I.1 and II.1, absolute t-values in model II.2 and II.3 of 8.8 and 5.0, respectively were smaller than its counterparts of 9.3 in model I.2 and 7.7 in model I.3. As a result, R-square in

two models of system II are lower compared to that in system I. QUINGNP explained about 52.7% the variation in INFMORALITY while this number of PCAP was 57.2%. Similarly, 34.2% was percentage that presented variation in ADULTERACY by QUINGNP while 46.2% was that results by PCAPGNP. In summary, this initial findings shows quintile income certainly does not make well-being indicators such as infant morality or adult literacy more significant than per capital income does.

Table 1: Summarized results of TEST 1 - simple regression[7]

	Model I.1	Model II.1	Model I.2	Model II.2	Model I.3	Model II.3
Dependent variable	LIFEEXPECT		INFMORALITY		ADULITERACY	
Independent variable	PCAPGNP	QUINGNP	PCAPGNP	QUINGNP	PCAPGNP	QUINGNP
Constant	50.279	49.348	99.828	101.181	46.643	48.208
Coefficient	0.004	0.015	-0.013	-0.052	0.007	0.026
t-Statistic	8.436	8.770	-9.395	-8.767	7.710	6.022
Adj. R square	0.507	0.527	0.562	0.527	0.462	0.342
S.E of regression	7.825	7.667	25.013	25.986	16.795	18.585

Note: all coefficients statistically signify at 1% level

So far, the study tried to find empirical evidence to support that quintile income should be used in place of per capita income. The reason for this replacement is based on a hypothesis that quintile income correlates with well-being indicators more significantly than per capita income does. Although, initial evidence did not support the hypothesis, this simple comparison of PCAPGNP and QUINGNP alone is misleading because it does not include other factors that significantly have correlations with both well-being indicators and per capita income or quintile income

[7] See figure 3 for more information

itself. From this result we can see PCAPGNP is more significant to well-being indicators than QUINCAP but if we control other variables, the result may appear different. In the next chapter, the study will include in two systems (I and II) more variables. It still keeps PCAPGNP and QUINGNP abreast in systems to see the appearance of what between them making a system more significant. Chapter three, therefore has two purpose:

1. To find further evidence for hypothesis of Kaushik Basu, and
2. To realize determinants on well-being indicators of LIFEEXPECT, INFMORALITY and ADULITERACY

CHAPTER III
DETERMINANTS ON ASPECTS OF WELL-BEING: A MULTIPLE REGRESSION

III.1 Explanation on the selection of controlled variables

In this chapter, system I and II will control several variables that logically have influence on life expectancy, infant morality or adult literacy including government expenditure on education (EDUEXP), the percentage of children 10-14 in labor force (CHILDLABOR), government expenditure on health (HEAEXP), people living with HIV/AIDS (AIDS), fertility rate per woman (FERRATE), Dummy for economic system (SOC), and political instability (POLINS). Those variables appear insignificant will be omitted to find the best model for each of dependent variable. It is for second time noted that PCAPGNP and QUINGNP are still remained in system I and II, respectively.

EDUEXP includes public spending on public education plus subsidies to private education at the primary, secondary and tertiary levels. It includes expenditure at every level of administration – central, regional and local. If governments spend more money on education, it is expected that people will have better access literacy programs.

CHILDLBOR are the shares of children 10-14 active in the labor force[8]. If children have to work for survival, they will have less time for education. For this reason, they

[8] The total labor force comprises people who meet the ILO definition of the economically active population: all people who supply labor for the production of goods and services in an economy

tend to illiterate in the future. This variable is expected to be negative correlated with ADULITERACY.

HEAEXP includes recurrent and capital spending from central and local government budgets, external borrowings and grants (including donations from international agencies and non-governmental organizations) and social health insurance funds. The government spends money with no aim other than improving heath care quality. Thus, it is expected that HEAEXP will have a strong correlation with LIFEEXPECT and INFMORALITY.

HIV/AIDS emerges as one of the most devastating enemy in health and education in Africa and Asia, nowadays. When this disease infects a person, it will change his life very much. His health will be seriously destroyed and his life will be shortened in few months or years. He will tend to loose his hope for the future and then quit his study. Moreover, when a pregnant woman is HIV/AIDS patient, she is likely to get complication in other diseases as well. Her child will have a high probability of death after birth. Therefore, the study considers AIDS as an important variable having effect on all LIFEEXPECT, INFMORALIY and ADULTERACY.

FERRATE is total fertility rate per woman. The study includes this variable because of two reasons. First, in developing countries where most people are very poor, high fertility rate is considered to have great negative effect on life expectancy of women. The second reason is that when mothers give many births in such poor conditions of developing countries, their children will have less chance of survival. Thus,

FERRATE is expected to correlate negatively with LIFEEXPECT and positively with INFMORALITY.

SOC is dummy variable for socialist countries. In many previous studies socialist countries tended to provide better health and education conditions than the others. Horvat (1974) used a specially designed rank analysis for social indicators concerning life, education, and health and compared this ranking on basic welfare with the ranks resulting from per capita GNP figures to see how they correlate with each other. One of his findings was that the social ranking of certain countries on average substantially exceeded their economic ranking, meaning that this group of countries had achieved higher relative basic welfare than was generally the case in other group of countries. His finding followed by a conclusion that economic system had strong affect on basic welfare. Later, Burkett (1985) with a model of the Physical Quality of Life Index (PQLI)[9] as the dependent variable and SOC as one of the explanatory variables in regression equations concluded that socialism appeared to enhance the provision of basic needs. This study includes SOC to see whether or not nowadays it is longer correlated with LIFEEXPECT, INFMORALIY or ADULITERACY.

POLINS is a variable measuring political instability and expected to influence badly to heath and education. It is very hard to define and measure this variable in a way, which can be used for econometric work[10]. The study gets benefit from a study of Annett (2000) to calculate POLINS by the following equation:

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[9] See Abbreviate

[10] Alesina and Perotti (1993) considered there are two approaches for political instability. The first one emphasizes executive instability. It is defined as “propensity to observe government change” and therefore frequently used as variable to control economic and institutional mater. For example,

POLINS = 0.61*WARCV + 0.57*COMPOLT + 0.29*ASSASS + 0.1*GOVTCRIS + 0.07*REVOLS + 0.06*RIOTS + 0.01*COUPS + 0.01*CABCHG + 0.01*CONSTCHG

The study chose this equation to calculate POLINS as its components of instability variables appear to have influence on heath and education. WARCV is dummy for civil war; COMPLT equal 1 for country with genocidal incident involving communal (ethnic) victims or mixed communal and political victims; ASSASS is number of assassinations per thousand population; GOVTCRIS is Major Government Crises:; REVOLS is Revolutions or any illegal or forced change in the top governmental elite; RIOTS is any violent demonstration or clash of more than 100 citizens involving the use of physical force; COUPS is the number of extra constitutional or forced changes in the top government elite and/or its effective control of the nation's power structure in a given year; CABCHG is Major Cabinet Changes or the number of times in a year that a new premier is named and/or 50% of the cabinet posts are occupied by new ministers; CONSTHG is Major Constitutional Changes or the number of basic alternations in a state's constitutional structure[11].

III.2 Model specification

Similar to the previous test, dependent variables of two systems remained the same in multiple regression models. Associated with the appearance of PCAPGNP (in system

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Cukierman, Edwards and Tabellini (1992) adopt this definition of political instability in their work on inflation; so did Alesina (1992) in his work on economic growth. The second one is measured by constructing an index that captures phenomena of social unrest and political violence. To see how instability influence on certain matter of health and education rather than economic or institutional issues, the study adopts this method to compute POLINS.

[11] Source of data from Esterly and Levine (1997), see figure 6 for more information

I) and QUINGNP (in system II) are concern variables mentioned above.

System I

LIFEEXPECT = C(1) + C(2)*PCAPGNP + C(3)*HEAEXP + C(4)*AIDS + C(5)*FERRATE + C(6)*SOC + C(7)*POLINS <Model I.4>

INFMORALITY = C(1) + C(2)*PCAPGNP + C(3)*HEAEXP + C(4)*FERRATE + C(5)*AIDS + C(6)*SOC + C(7)*POLINS <Model I.5>

ADULITERACY = C(1) + C(2)*PCAPGNP + C(3)*EDUEXP + C(4)*CHILDLABOR + C(5)*AIDS + C(6)*SOC + C(7)*POLINS <Model I.6>

System II

LIFEEXPECT = C(1) + C(2)*QUINGNP + C(3)*HEAEXP + C(4)*AIDS + C(5)*FERRATE + C(6)*SOC + C(7)*POLINS <Model II.4>

INFMORALITY = C(1) + C(2)*QUINGNP + C(3)*HEAEXP + C(4)*FERRATE + C(5)*AIDS + C(6)*SOC + C(7)*POLINS <Model II.5>

ADULITERACY = C(1) + C(2)*QUINGNP + C(3)*EDUEXP + C(4)*CHILDLABOR + C(5)*AIDS + C(6)*SOC + C(7)*POLINS <Model II.6>

Note: C(1-7) stand for coefficients and get different values through models

III.3 Facts and Findings

The study controlled concerning variables and came up with TEST 2 results. It is unexpected that both SOC and POLINS were not realizable enough to explain LIFEEXPECT, INFMORALITY or ADULITERACY in all models of two systems. Also, EDUEXP were surprisingly not statically correlated with ADULITERACY in both model I.9 and II.9. Absolute t-values of SOC, POLINS and EDUEXP

constantly occurred under 1.0 making the acceptance of them insignificant at even 10% type I error. Another interesting finding was that AIDS were unacceptable variable in model I.9 and II.9 as it had a meaningless positive correlation with ADULITERACY. Moreover, the appearance of these variables in models made other variables less significant. Therefore, SOC, POLINS, EDUEXP and AIDS (in model I.6 and II.6) leaded TEST 2 to incorrect results.

Table 2a: Summarized results of TEST 2 – multiple regression[12]

Model I.4 Dependent variable: LIFEEXPECT		**Model II.4** Dependent variable: LIFEEXPECT	
Independent variable	Coefficient & t-value	Independent variable	Coefficient & t-value
Constant term	71.592 (19.234)*	Constant term	70.843 (16.635)*
PCAPGNP	0.001 (2.581)**	QUINGNP	0.004 (2.284)**
HEAEXP	1.282 (2.318)**	HEAEXP	1.723 (3.275)*
AIDS	-0.652 (-5.210)*	AIDS	-0.589 (-4.615)*
FERRATE	-3.438 (-5.471)*	FERRATE	-3.462 (-5.226)*
SOC	0.266 (0.144)****	SOC	-0.398 (-0.218)****
POLINS	-1.889 (-0.717)****	POLINS	-1.574 (-0.593)****
Adj. R-square	0.787	Adj. R-square	0.801
S.E. of regression	5.146	S.E. of regression	5.201

Note: (*) – significant level at 1%, (**) – significant level at 5%, (***) significant level at 10%, (****) – insignificant level

Table 2b: Summarized results of TEST 2 – multiple regression (continued)

[12] See figure 4 for more information

Model I.5 Dependent variable: INFMORALITY		**Model II.5** Dependent variable: INFMORALITY	
Independent variable	Coefficient & t-value	Independent variable	Coefficient & t-value
Constant term	32.923	Constant term	31.348
	(2.287)**		(1.863)***
PCAPGNP	-0.005	QUINGNP	-0.017
	(-3.148)*		(-2.348)**
HEAEXP	-3.627	HEAEXP	-5.736
	(-1.696)***		(-2.761)*
FERRATE	11.978	FERRATE	12.794
	(4.927)*		(4.889)*
AIDS	1.012	AIDS	0.749
	(2.093)**		(1.484)****
SOC	-5.325	SOC	-1.752
	(-0.742)****		(0.243)****
POLINS	0.881	POLINS	-0.991
	(0.086)****		(-0.925)****
Adj. R-square	0.723	Adj. R-square	0.705
S.E. of regression	19.903	S.E. of regression	20.542

Note: (*) – significant level at 1%, (**) – significant level at 5%, (***) significant level at 10%, (****) – insignificant level

Table 2c: Summarized results of TEST 2 – multiple regression (continued)

Model I.6 Dependent variable: ADULITERACY		**Model II.6** Dependent variable: ADULITERACY	
Independent variable	Coefficient & t-value	Independent variable	Coefficient & t-value
Constant term	63.841	Constant term	69.474
	(8.596)*		(8.756)*
PCAPGNP	0.004	QUINGNP	0.001
	(3.383)*		(2.210)**
EDUEXP	0.373	EDUEXP	0.462
	(0.491)****		(0.581)****
CHILDLABOR	-0.668	CHILDLABOR	-0.848
	(-3.699)*		(-4.541)*
AIDS	0.687	AIDS	0.838
	(1.826)***		(2.086)**
SOC	-1.333	SOC	-4.442
	(-0.239)****		(-0.779)****

POLINS	-1.969 (-0.247)****	POLINS	-0.434 (-0.052)****
Adj. R-square	0.543	Adj. R-square	0.498
S.E. of regression	15.479	S.E. of regression	16.221

Note: (*) – significant level at 1%, (**) – significant level at 5%, (***) significant level at 10%, (****) – insignificant level

In following step, the study dropped all the consistently insignificant variables (SOC, POLINS, EDUEXP and AIDS – in model I.9 and II.9) and got results of TEST 3. Then, it did a F-test to check if the dropped variables are jointly significant or not. It hypothesized the Null that all dropped variables are not jointly significant (equal to zero) and the Alternative that at least one among them is different from zero. The null hypothesis is rejected if F-statistic > $F^*_{k-m,n-k}(0.05)$. F-statistic is computed by the following formula[13]:

$$F_{statistic} = \frac{(ESS_R - ESS_U) \times DF_U}{ESS_U \times (DF_R - DF_U)}$$

The strategy of doing F-test is to compare each model in TEST 2 with its respective in TEST 3. Because of the fact that model I.7, I.8 and I.9 are restricted models of I.4, I.5 and I.6, respectively, F-statistic of each couple are as follows:

$$F_{LIFEEXPECT\_PCAPGNP} = \frac{(1655-1641)\times 62}{1641\times 2} = 0.264 \qquad \text{(Compare model I.4 and I.7)}$$

$$F_{INFMORALITY-PCAPGNP} = \frac{(24781-24560)\times 62}{24560\times 2} = 0.279 \qquad \text{(Compare model I.5 and I.8)}$$

$$F_{ADULITERACY\_PCAPGNP} = \frac{(15801-14855)\times 62}{14855\times 4} = 0.987 \qquad \text{(Compare model I.6 and I.9)}$$

[13] Models in TEST 2 are unrestricted models (U) while those in TEST 3 are restricted models (R). ESS is Error Sum of Square or sum squared resid. Degree of freedom equals to number of observation (n) minus number of independent variable (k) in TEST 2 and (m) in TEST 3. Detail data are provided in figure 4 and 5.

Similarly, as II.7, II.8 and II.9 are restricted models of II.4, II.5 and II.6, we have:

$$F_{LIFEEXPECT\_QUINGNP} = \frac{(1687-1676)\times 62}{1676\times 2} = 0.203 \qquad \text{(Compare model II.4 and II.7)}$$

$$F_{INFMORALITY\_QUINGNP} = \frac{(26191-26162)\times 62}{26162\times 2} = 0.034 \qquad \text{(Compare model II.5 and II.8)}$$

$$F_{ADULITERACY\_QUINGNP} = \frac{(17785-16313)\times 62}{16313\times 4} = 1.397 \qquad \text{(Compare model II.6 and II.9)}$$

As $3.07 < F^*(2,62) < 3.15$ so all $F_{LIFEEXPECT\_PCAPGNP}$ (of 0.264), $F_{LIFEEXPECT\_QUINGNP}$ (of 0.203), $F_{INFMORALITY\_PCAPGNP}$ (of 0.279), $F_{INFMORALITY\_QUINGNP}$ (of 0.034) are smaller than $F^*_{2,62}(0.05)$. In the same way, since $2.45 < F^*(4,62) < 2.53$ so both $F_{ADULITERACY\_PCAPGNP}$ (of 0.987) and $F_{ADULITERACY\_QUINGNP}$ (of 1.397) are smaller than $F^*_{4,62}(0.05)$. Consequently, it is not safe to significantly reject the null hypothesis or C(6) and C(7) in all models of TEST 2 are equal to zero at the significant level of 5%. It means that models of TEST 2 are not good because they included the variables that do not affect the models. Also, the omission of that variables has improved the precision of the remaining coefficients by making some of them more significant compared to the previous model. In addition, models of TEST 3 after adjusting SOC, POLINS, EDUEXP and AIDS were meaningful with all coefficients having appropriate signs. Therefore, models in TEST 3 are better than models in TEST 2. The study will adopt results in TEST 3 for its final conclusion.

Table 3a: Summarized results of TEST 3 – Adjusted multiple regression[14]

Model I.7 Dependent variable: LIFEEXPECT		**Model II.7** Dependent variable: LIFEEXPECT	
Independent variable	Coefficient & t-value	Independent variable	Coefficient & t-value
Constant term	71.691 (20.006)*	Constant term	70.604 (16.996)*
PCAPGNP	0.001 (2.603)*	QUINGNP	0.004 (2.332)**
HEAEXP	1.345 (2.497)**	HEAEXP	1.756 (3.400)*
AIDS	-0.662 (-5.459)*	AIDS	-0.604 (-4.876)
FERRATE	-3.479 (--5.670)*	FERRATE	-3.469 (-5.321)*
Adj. R-square	0.792	Adj. R-square	0.788
S.E. of regression	5.086	S.E. of regression	5.135

Note: (*) – significant level at 1%, (**) – significant level at 5%, (***) significant level at 10%

Table 3b: Summarized results of TEST 3 – Adjusted multiple regression (continued)

Model I.8 Dependent variable: INFMORALITY		**Model II.8** Dependent variable: INFMORALITY	
Independent variable	Coefficient & t-value	Independent variable	Coefficient & t-value
Constant term	30.528 (2.205)**	Constant term	30.672 (1.874)***
PCAPGNP	-0.005 (-3.115)*	QUINGNP	-0.017 (-2.395)**
HEAEXP	-3.799 (-1.824)***	HEAEXP	-5.719 (-2.811)*
AIDS	0.973 (2.072)**	AIDS	0.731 (1.796)*
FERRATE	12.250 (5.161)*	FERRATE	12.828 (4.995)*
Adj. R-square	0.729	Adj. R-square	0.714
S.E. of regression	19.678	S.E. of regression	20.229

Note: (*) – significant level at 1%, (**) – significant level at 5%, (***) significant level at 10%,

[14] See figure 5 for more information

Table 3c: Summarized results of TEST 3 – Adjusted multiple regression

(continued)

Model I.9 Dependent variable: ADULITERACY		**Model II.9** Dependent variable: ADULITERACY	
Independent variable	Coefficient & t-value	Independent variable	Coefficient & t-value
Constant term	66.123 (10.609)*	Constant term	73.961 (11.020)*
PCAPGNP	0.004 (3.567)*	QUINGNP	0.010 (1.985)***
CHILDLABOR	-0.626 (-3.596)	CHILDLABOR	-0.182 (-4.458)*
Adj. R-square	0.543	Adj. R-square	0.486
S.E. of regression	15.473	S.E. of regression	16.416

Note: (*) – significant level at 1%, (**) – significant level at 5%, (***) significant level at 10%

Findings

Not as expected, TEST 3 gives a consistent outcome that R-square of all models in system II are smaller than that in system I. Model II.7 explained 78% variation in LIFEEXPECT while 79% is the number explained by I.7. Likewise, R-square in model II.8 and II.9 are 71% and 48% as compared to 73% and 54% in I.8 and I.9, respectively. In addition, absolute t-values for coefficients of QUINGNP are all smaller than those of PCAPGNP (2.3 in II.7 and 2.6 in I.7; -2.4 in II.8 and –3.1 in I.8; 1.9 in II.9 and 3.9 in I.9). These results again disallow the idea of Basu that quintile income is a better measure than per capita income in explaining well-being indicators.

Another important result of the study is the finding of determinants on health and education indicators. For LIFEEXPECT and INFMORALIY, FERATE and AIDS statistically have great negative effect despite a positive contribution of HEAEXP. Despite the fact that government expenditure should improve education quality,

EDUEXP does not correlate significantly with ADULITERACY. The result raises a question of inefficiency in the use of government expenditure on this sector. Meanwhile, CHILABOR significantly makes ADULITERACY worse. Moreover, not like the cases when Horvat (1974), Burkett (1986) or Annett (2000) found that economic system or political instability did stimulus well-being indicators, SOC and POLINS are insignificant in explaining LIFEEXPECT, INFMORALITY and ADULITERCY in developing countries.

III.4 More discussion on Basu hypothesis

If PCAPGNP explains average level of wealth, QUINGNP consists of two explanations: level of wealth of 20% poorest and distribution of wealth. Basu believes that the inclusion of distribution matter or equality will make QUINGNP correlate stronger with well-being indicators than so does PCAPGNP (average level of wealth alone). However, as we have seen from above, this is not the case. It is because QUINGNP while considering the distribution of wealth; ignore the wealth level of the rest of 80% of the population. In addition, if countries do not have a serious problem in distribution, the inclusion of this matter is useless.

The following example will make the point clearer. All observed developing countries are divided into three groups according to per capita income. Therefore, in each group level of wealth among countries is rather similar but distribution among them is variant. Relationship between QUINGNP and ADULITERACY (the cases are similar with LIFEEXPECT and INFMORALITY) is drawn within each group to see the net explanation of distribution on well-being indicators. Diagrams say that distribution

matter only correlates with regards to well-being indicators in middle developing countries. For extremely poor or advance developing countries, distribution matter and well-being indicators are neither positively nor negatively correlated.

Figure 6: The case in extremely poor countries

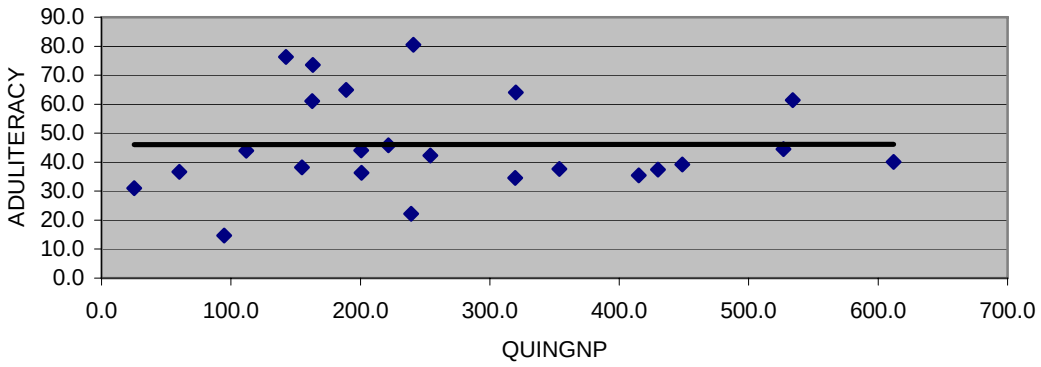


Figure 7: The case in middle developing countries

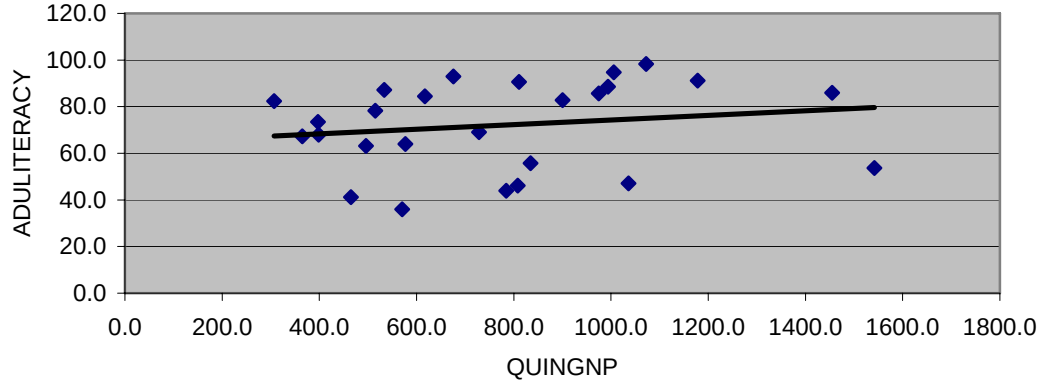
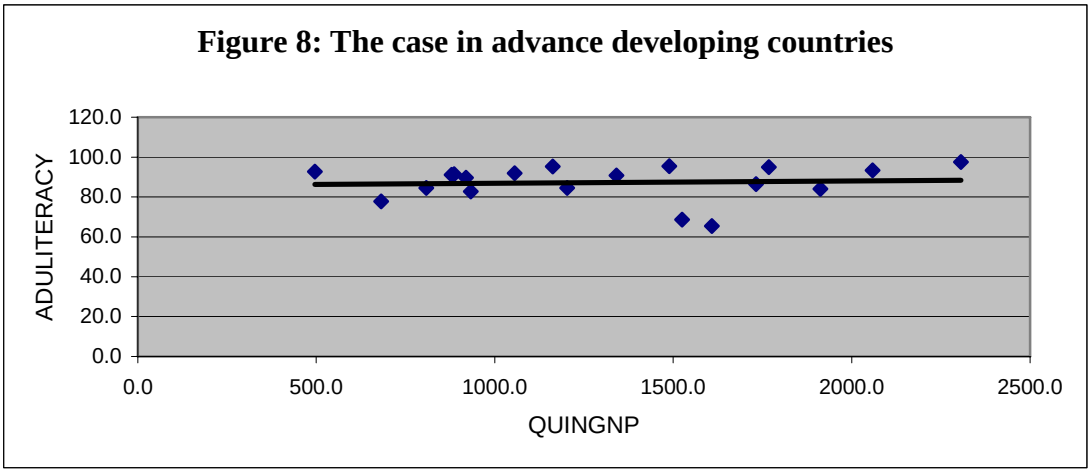


Figure 8: The case in advance developing countries



It is concluded that the use of QUINGNP in place of PCAPGNP should be considered carefully. QUINGNP does not reveal advantage in all countries but only some of them where distribution matter is significantly variant. "The fact of income linkages is crucial for any analysis of distributional problems since they impose important constraints on policy. The transfer from the rich to the poor may raise the income of the poor but, if they reduce savings and capital accumulation by the rich, they may in time lead to lower income in the poorer groups".[15] For those extremely poor or advanced developing countries, government should focus on economic and social rather than distribution policies.

[15] Gerald M.Meier, (1976)

CHAPTER IV
AN APPLICATION TO WELL-BEING POLICIES IN VIETNAM

IV.1 Well-being situation in Vietnam – a comparative overview

It is worthy to restate that the study continues restricting LIFEEXPECT, INFMORALITY and ADULITERACY as indicators referring well-being situation in Vietnam. PCAPGNP, not QUINGNP, is used as a measure of economic development.

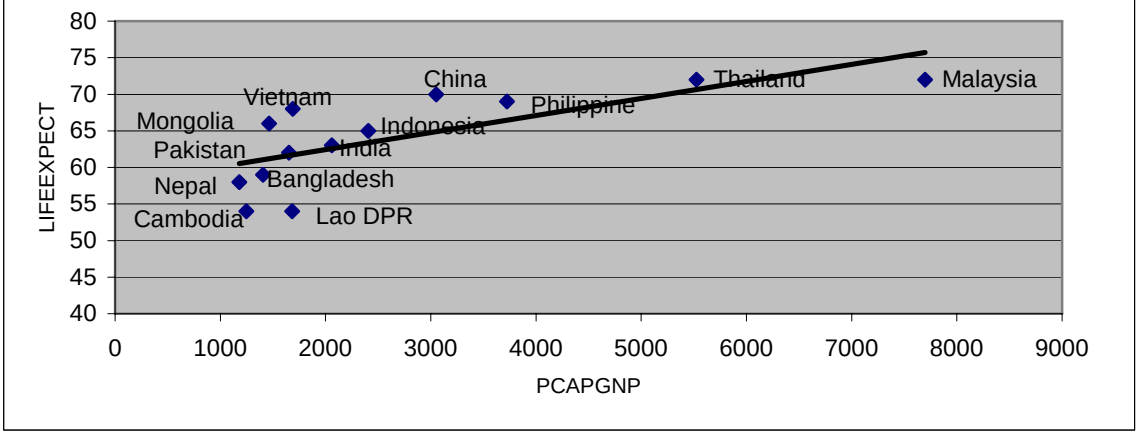
Well-being as a means of promoting national development is not new in the country. From the founding of the Democratic Republic of Vietnam (now the Socialist Republic of Vietnam) in 1945, the government of Vietnam has placed a high priority on this sector. President Ho Chi Minh considered hunger and illiteracy as enemies that threatened the nation's survival and development. Throughout the years of war and stage later on, the state has heavily emphasized access to basic education and basic health care in social and development policies to improve standard of well-being. Health condition of the people has improved. In 1960, life expectancy at birth was only 45 years for female and 42 years for male (1984 World Development Report). 19 years later, life expectancy at birth increased to 69 years for female and 65 years for male (1989 Population Census). Education also enjoyed the same progress. In the year of independence, majority of the population did not know how to read and write simple Vietnamese. After four decades, adult literacy stands at over 90 percent and gender difference are small compared to many countries. Primary school enrolment is nearly universal, drop-out rates have declined to less than 10 per 100 students at all levels, and the percentage of students repeating grades is below 5 percent at all levels. It can be said that Vietnam was economically backward but

socially advanced.

To understand more the contemporary well-being situation in Vietnam, it is constructive to compare outcome in Vietnam with those of its regional neighboring countries. Figures below show LIFEEXPECT, INFMORALITY and ADULITERACY in Vietnam and other countries in the region, relative to PCAPGNP. The points in the graphs represent the actual life expectancy at births, infant morality rate or adult literacy rate and the actual per capita income. The diagonal line shows the relationships between PCAPGNP and LIFEEXPECT, INFMORALITY or ADULITERACY for the region as a whole. The vertical distance between each country point and the diagonal line shows the departure from this overall regional relationship. Points above or below the line indicate that the countries is doing better or worse (for LIFEEXPECT and ADULITERACY) and vice versus (for INFMORALITY) than the regional average.

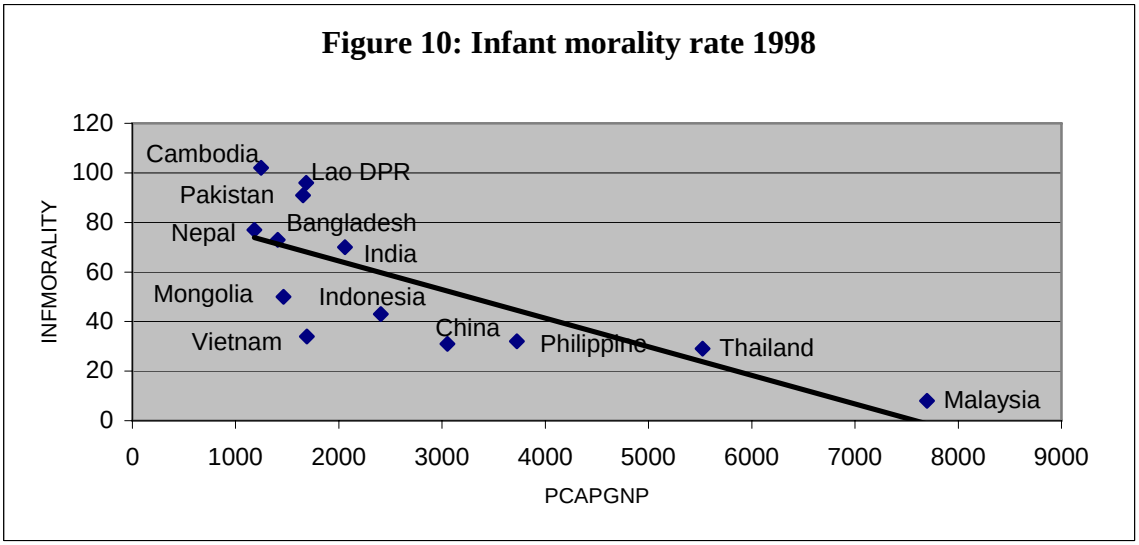
In 1998, LIFEEXPECT of Vietnam was 68 years well above the rate of about 60 years that would be expected if Vietnam were performing at her regional average. It was nearly one decade longer than Bangladesh's and above two wealthier countries of India and Indonesia. Countries like Thailand and Malaysia had 3.3 and 4.6 times higher per capita income but about the same LIFEEXPECT to Vietnam.

Figure 9: Life expectancy at births 1998



In comparison to other Asian, Vietnam was extremely poor but enjoyed relatively low mortality levels. Its GNP of less than US$2000 (PPP) per capita was comparable to Cambodia's and Bangladesh's, one-half of China's and Indonesia's, one-third of Thailand's. However, Vietnam's average infant morality of 34 years was one-third of Cambodia's, one-half of Bangladesh and approached the same level of three wealthier countries.

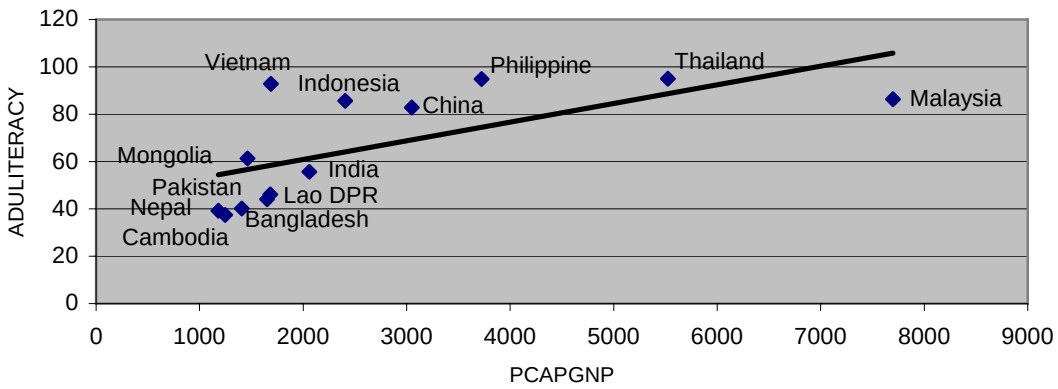
Figure 10: Infant morality rate 1998



Nevertheless, the most amazing achievement has been seen in ADULITERACY. It

was well far above the expected rate of 60% by regression. The actual number of 93% adult literacy was higher than triple income countries like Malaysia (86%) and Thailand (95%) as well as wealthier nations like the Philippine (95%), Indonesia (86%), and China (83%). It made a long distance of about one third population to literacy rate of other comparable income countries in the region like India, Bangladesh, Pakistan, Mongolia, Cambodia and Lao DPR.

Figure 11: Adult Literacy rate 1998



IV.2 Well-being service and Inherent problems

2.1 Health sector

Description of health service system

Viet Nam's commitment to providing access to basic health services is long-standing. A major initiative was launched in the early 1950's to construct a network of community health stations intended to provide basic primary and preventive health services to Viet Nam's large rural population. This movement took strong hold in the

north, but because of the partition of the country, the south lagged behind. Efforts to extend this network to southern communities were undertaken immediately after reunification in 1975. By 1998 nearly 99 per cent (9,806 out of 9,929) of all communes in the country had a community health station. An additional 926 rural communities had inter-communal polyclinics, the second tier in Viet Nam's five-tiered public health system. The five tiers of the health system consist of the following[16]:

Community Health Stations (CHSs): These facilities are the first point of access to health services in Viet Nam. CHSs provide basic preventive and curative health services. Many preventive and public health programs organized at higher levels in the system use CHSs as the focal point for their operations. Much of the financing needed for this level of service are met by user fees and other locally raised resources, although in recent years the government has provided increasing assistance, especially to poor communities, through special programs.

Intercommunal Polyclinics (ICPCs): These facilities, the first referral point for CHSs, were intended to provide backup services to between three and six CHSs. However, their numbers have been declining in recent years. Many now serve up to 10 CHSs. ICPCs effectiveness with respect to their original intended purpose has been questioned, and policy options are being weighed to determine their fate. District health authorities manage ICPCs.

District Health Services: District health offices (DHOs), district hospitals (DHs), and

[16] For a more detailed description of the health sector, refer to "Situation Analysis of Women and Children in Viet Nam" (Ha Noi: UNICEF, 1994).

preventive medicine brigades (PMBs) make up this level of service. DHOs serve public health surveillance and program management functions, being intermediary between province and central levels, and the communal level. By the end of 1998 there were 564 DHs, one in each district in the country, providing both basic and specialized health services. District health centers also provide outpatient services, often on the same premises as DHs. PMBs manage and implement public and preventive health programs and services such as childhood immunizations (Expanded Program for Immunizations), childhood diarrhoeal disease programs, malaria control, and others. District health services are financed through allocations from Provincial Health Bureaus to the district MOF branch, using resources from the state budget.

Provincial Health Services: Provincial Health Bureaus oversee health service operations at district and community levels. Provinces also operate preventive medicine stations, local production of medical supplies, training schools for lower-level health workers (assistant physicians, nurses, midwives, and secondary physicians), and provincial hospitals. By the end of 1998 there were 293 general and speciality provincial hospitals, mostly serving residents of the towns and cities where they are located.

Central Health Services: The MOH and its services and facilities make up the top level of Viet Nam's health system. The MOH provides policy and technical direction to the entire system. It also operates medical and pharmacist training schools, production facilities for drugs and medical equipment, and specialized hospitals and institutes that provide mostly tertiary health care services. Finally, the MOH operates

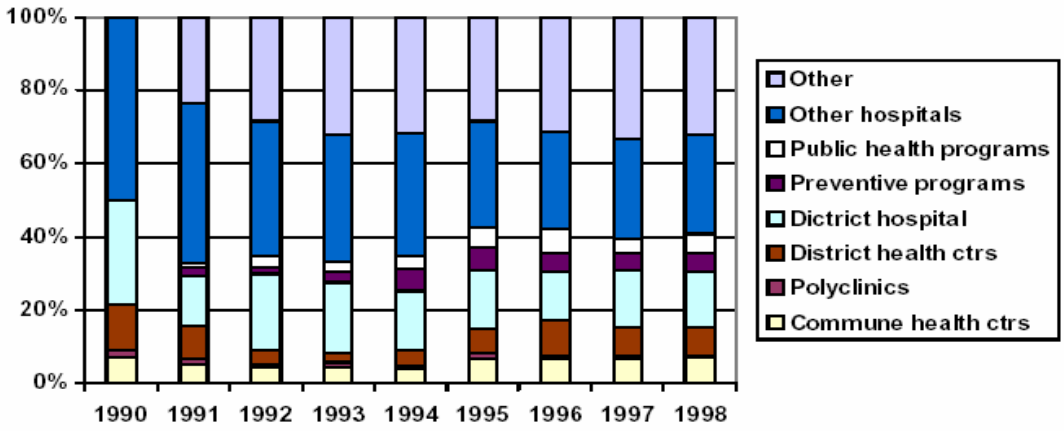
the Institute for Hygiene and Epidemiology and the Institute for Nutrition. Other state agencies also operate health services for specific populations, such as the Ministry of Defense. In addition to these functional service delivery levels, the MOH operates a number of vertical preventive and public health programs. Preventive programs include childhood immunizations, postnatal care, family planning and HIV prevention. Public health programs include malaria control, tuberculosis control, leprosy, maternal and child health and provision of essential drugs and materials.

Inherent problems

Inequality in resource distribution:

Spending for health services heavily favors the better off. This is true at the district hospital as well as the province and specialty-hospital levels (the three last tiers). The richest 20 per cent of the population captures 56 per cent of state spending at the tertiary hospital level, compared to only 2 per cent for the poorest 20 per cent of the population. Figure 9 shows information in more detail.

Figure 12: Distribution of Health Sector Expenditures by Level and Program



Source: Vietnam Statistical Year Book 2000

Between 1991 and 1994, the proportion of health sector resources spent for CHSs declined from 5.3 to 3.6 percent. By 1998, the proportion had increased to 6.8 percent. The decline in the early 1990's may be accounted for by the effects of restructuring of state and community-financing systems, which left CHSs with insufficient resources to adequately serve community-level health care needs. Recognition of this in the mid-1990's led to greater national attention to the problems of CHSs and allocation of additional resources to them, especially in poor communities. ICPCs have historically received a small proportion of health sector financial resources. In 1990, only 1.4 per cent of state health sector spending occurred at this level and by 1997, it had declined to 0.8 per cent. Further declines in proportional allocations to ICPCs are expected in the next several years.

Among basic health service components, the highest proportion of resources is allocated to district level health services. In each year from 1991 to 1997, between 20 and 23 per cent of state health sector resources were spent on district health centers and hospitals, a proportion that has changed little over time. Meanwhile, allocations to vertical preventive and public health programs have increased from 3.2 per cent in 1991 to 8.6 per cent in 1997. The 1998 state budget calls for this to increase further to 10.7 per cent.

Although the proportion of state health sector spending allocated to higher levels (other than basic) in the system declined between 1991 and 1997, 60 per cent is still spent on these non-basic services. Hospitals above the district level (including provincial general and specialized hospitals, and tertiary hospitals operated by the

MOH) consumed nearly 44 per cent of state health sector resources in 1991. Commensurate with increased financing allocations to basic health services and programs, this percentage declined to 27.5 per cent by 1997. A slightly further decline (less than one per cent) is projected in the 1998 budget. It should be noted that a large portion of state spending in the health sector placed in the “other” category is not well defined. In 1991 this portion was 23.5 per cent of health sector spending; in 1997 it had risen to 33 per cent.

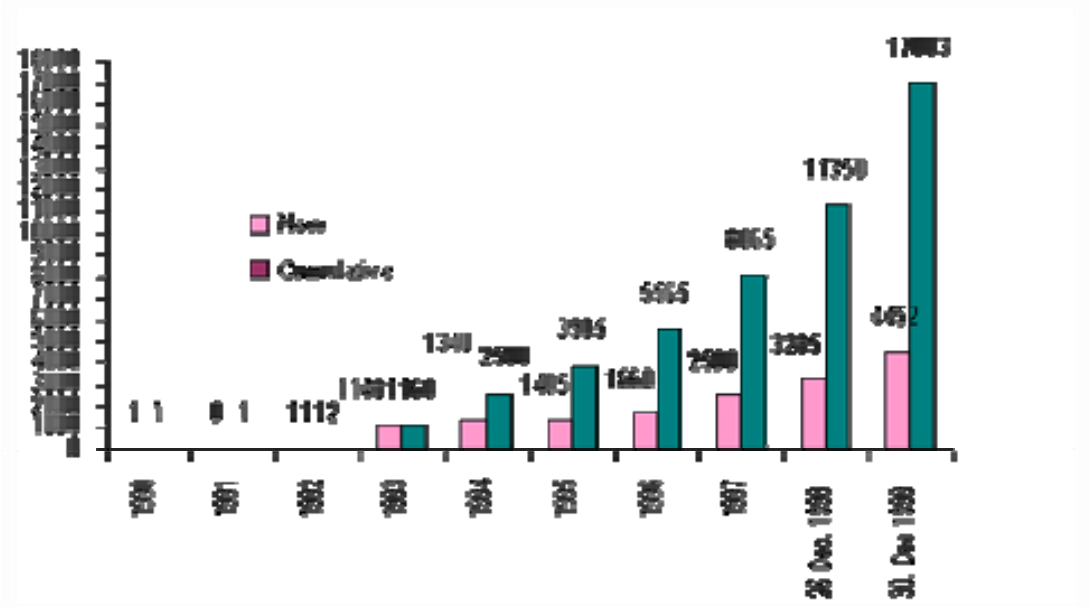
HIV/AIDS threat

Throughout the 1980s, Viet Nam remained untouched by the exploding AIDS epidemic in Thailand and other south-east Asian countries. The first case in 1990 alerted government authorities that HIV had arrived. Between 1996 and 1997, the number of new cases had doubled and the prevalence of HIV had spread from the South to 59 of Viet Nam's 61 provinces. As of December 1998, cumulatively 11,350 people were infected with HIV and 1,224 had developed full-blown AIDS. The real number is believed to be much higher. By the year 2000, there were about 130,000-160,000 HIV cases in Viet Nam with nearly 23,000 people suffering from AIDS and up to 24,000 AIDS-related deaths.

There are multiple reasons for the spread of HIV in Viet Nam. Injecting drug users have been the hardest hit, comprising 65% of reported HIV infections. Inconsistent condom use has spread the disease amongst commercial sex workers and the rising numbers of Sexually Transmitted Diseases (STDs) have intensified the epidemic. Unprotected sex and drug use amongst teenagers are on the rise, indicating that Viet

Nam's adolescents are engaging in greater high-risk behavior than they once did. Many hospitals are reporting an increase in teen abortions, and heroin use in schools has been reported in many provinces as busy drug smuggling routes have increased the supply of available narcotics

Figure 13: Trend in number of people infected by HIV/AIDS



Source: MOH

2.2 Education sector

Description of education service system

Institutionally, the education sector is becoming more diverse. Government policy encourages the establishment of private sector educational institutions. Within the public educational system, there are six levels:

- Pre-school education consists of nursery schools and kindergarten. Attendance is optional at this level.
- Primary school is compulsory and consists of five years of education.

- Four years of lower secondary school follows primary school.
- Three years of upper secondary school follows lower secondary school. There are three general levels of vocational and technical education.
- Vocational training programs, generally short, are open to students who complete primary or lower secondary education and who are not likely to proceed further in the formal education system. Secondary vocational education programs last three to four years and are also open to students who leave primary and lower secondary school. Professional secondary education lasts two to four years and students completing upper secondary school may attend these programs.
- Tertiary educational institutions in Viet Nam include colleges and universities.

The Ministry of Education and Training (MOET) is the primary government institution responsible for education[17]. The World Bank reports that more than 24 other ministries and government agencies also operate educational institutions and programs[18]. These institutions and programs are generally related to the mandate of the administering agency and are generally vocational or technical in nature.

Inherent problems

Although, Vietnam's education makes strong impression compared with even higher

[17] A recent structural change was made and responsibility for vocational training has been shifted from MOET to the Ministry of Labour, Invalids, and Social Affairs.

[18] For greater detail on the history and structure of Viet Nam's educational sector, refer to "Viet Nam Education Financing Sector Study" (The World Bank, 1996).

income countries in term of literacy coverage, however, there are observed weakness in education and training system which clouds the effectiveness of this indicator.

Education quality:

Many Vietnamese including teachers, students' parents and Government's officials expressed their worries towards the quality of education system. The Central Party Executive Committee described this system as "weak and backward". For example, the school time of primary pupils is considerably lower than the world's average level. The main reason is short school year and school day because of insufficiency of schools and teachers. Besides that, quality and quantity of teachers also must also be taken into consideration. Currently, a large number of teachers are not qualified enough, working with short teaching time and low salary. The issues of training, salary improvement and more required working time of teachers are actual ones. Furthermore, quality of education at tertiary level is also questionable. Professional knowledge was not very much respected. Take economics courses for instance, theory teaching is low quality as compared with international standard and Vietnamese managers do not pay attention on modern management theories. Lectures focus on diffusion of knowledge rather than teaching the way of thinking and creative abilities.

Education Equality:

According to World Bank report on hunger and poverty, only 68% children of the lowest income group goes to schools while the rate of the highest income group is 86%. Policy on increment of children enrollment form poor families in primary schools includes facility upgrading, training quality improvement and higher budget

expenditure for primary education. The expenditure of the State for a primary pupil is low and thought officially the tuition is free; family has to pay about 45% of total primary education expenses in various forms of contribution. The State's average expenditure for a high school student is 13 times higher than that for a primary pupil. The situation is quite different in other East Asia economies where required only basic tuition fee at their very first stage of development. The tuition fee is low at primary education and gradually increases at higher levels. The tuition fee is considered correlatively to income level.

IV.3 Policy implications

3.1 Health Sector

Reallocation of intra-sector expenditure:

The above analysis shows that the government did not pay much attention on basic preventive and curative health services (CHSs, ICPCs, and DHOs). Lack of investment left these first aid services in very poor condition. Survey among local health officials and providers at these tiers presents a picture of scarcity in doctors, drugs and other clinical supplies[19]. Consequently, these inadequate services exacerbate health condition of patients and add burden to provincial and central hospitals. It is very usual that if you go to any hospital in Hanoi, you will see every bed is occupied. More often, two women in childbed share a sickbed in C hospital or Tu Du hospital (two largest hospitals on gynecology in the North and the South, respectively). Surveys from MOH say that about 34% serious patients in central

[19] Presentation documents at the "Basic Social Service Study Workshop", Hanoi, August 23-24,1999

hospitals would not be in that condition if they were well taken care at the initial stage. If the government spends more money on CHSs, ICPCs or DHOs, health status of the people will certainly be improved; patients with normal diseases can be treated at these tiers. This solution will automatically reduce the burden for provincial and central hospital and therefore ease demand for government spending on these high level tiers.

Participation of private sector

In health, about 80 per cent of all health spending is private and about one-half of all services are supplied by private providers. Examination of the pattern of spending could help to reorient state spending toward basic health services. As mentioned above, 28 percent of current state health spending supports urban hospitals and specialty facilities, whereas only 8 per cent supports community health stations and polyclinics. There has been little change during the 1990s in the percentage allocated to these community-based primary health care centers. If some services provided at urban and speciality hospitals can be shifted either to private sources (such as actuarially sound insurance), the saved resources can be used to decrease the costs to users of primary health care facilities, particularly in rural communities. Formulating an explicit and appropriate segmentation of public and private roles in the health care sector is one area with high potential to increase the proportion of total spending allocated to basic social services.

Strengthen human capacity of basic health stations:

The government should provide incentives to attract graduate doctors coming back

their hometowns. The type of incentives may be not only salary or welfare but also working condition or educational opportunities. Another possible solution to strengthen capacity of basic health stations is to apply “service responsibility” nationwide. Doctors and qualified nurses are extremely rare in communities and district health stations while very much abundant in central hospitals. It may be a good idea if the government set a regulation that requires all doctors who get salary from state budget to have one or two months work at basic health stations once in their 5 years career. This requirement has many advantages. First, it makes doctors not to stick in their positions but have a chance to understand more practical cases. Second, doctors who come to basic health stations will certainly enhance human resource at these places by providing their medical service as well as upgrading local physicians and doctors.

Control of HIV/AIDS and other social diseases

The previous test in chapter III found that FERRATE and HIV/AIDS both contributed a very significant damage to LIFEEXPECT and INFMORALITY of developing countries. In Vietnam, FERRATE is not a serious problem (the third lowest in Asia). It indicates that resources and efforts allocated to population and family planning have been well used. It became a nature to the people on keeping low fertility rate. Increasing allocations to those programs and services may not be required to continue the improving trends in health status; However, HIV/ADIS as mentioned above is really a growing problem. Clearly, it is worth noting to focus on this area.

However, as prostitutes and drug users are unlawful citizens, efforts to reach them

with education and information about HIV/AIDS is extremely difficult. In addition, Needle exchange and condom distribution have been particularly sensitive topics. Therefore, the government should create an appropriate legal and policy framework to decrease discrimination and stigma, to promote a safe environment for people affected and infected by HIV/AIDS. In addition, primary prevention should be put on high priority of the government policies. The government should ensure the availability of essential resources (clean needle exchange, condoms, disposable syringes, etc.) to people vulnerable to HIV/AIDS. This is very cost-effective. People practising high-risk behaviours are likely to become infected with HIV and transmit it to others. Effective interventions must empower them to adopt safe practices.

3.2 Education Sector

Results from TEST 3 shows that the large amount of education expenditure did not certainly make ADULITERACY standing at high rate. Therefore, what to focus is not try to raise the amount of government expenditure on education but try to use it efficiently.

Cost Recovery and reallocation resource

In education, the World Bank has estimated that nearly 50 percent of primary education costs are covered through cost recovery and about 60 per cent for secondary education. However, since less than 20 percent of tertiary costs are paid for in this way, there may be some scope for increased cost recovery here and then intra-sectoral transfers of savings to basic education. As mentioned above, in other Asian countries and elsewhere in the world, students at higher levels pay proportionally more of their

costs than students at basic levels. Yet in Viet Nam, the reverse is true.

Reallocation of resource to basic level will enhance both education quality and equality. First, there will be resource to improve primary school teachers' salaries as well as primary school facilities. The sufficient amount of spending will improve the chances that the new spending will have a positive impact on education quality and effectiveness. For instance, if teachers get appropriate salaries that meet their living requirement, they do not have to spend time on doing other part-time jobs (the fact is that 70% primary school teachers have to do part-time jobs[20]). When a new spending on retraining or improving teaching quality comes, these teachers will certainly get use of it more efficiently. Second, primary pupils will have to pay less and therefore increase their chance towards higher education. Easing the way for children to participate in early education stage will narrow down inequality gap in education.

Subsidies on text books and teaching materials

According to MOET, current allocations for textbooks and teaching aids meet only about 20 percent of need. This means that the remaining 80 per cent is coming either out of people's income or, for the poorest, perhaps not being met at all. How can a lecture be qualified if learner cannot effort to read at least its textbook (reference material is a luxury). Subsidies from the government are therefore very necessary.

Application of modern education method

A very important issue is to shift from an education system that was constructed for centrally planned economy to a system that can adapt better to market economy. The

[20] Report on Education situation 2000, MOET

custom of imposing knowledge from above to pupils/students rather than educating them their ways of thinking and creativity should be changed. In most classes from primary school to universities, people see the same pictures that teachers read textbooks and pupils/student take notes (note learning). In examinations, learners have to learn by heart a mountain of knowledge to answer questions. Practical field trips or case studies are something unusual. All these traditions should be changed. Attention must be paid to make changes in teaching programs focusing on development of better skills in academic knowledge as well as creative and problem solving abilities.

CHAPTER V: CONCLUSION

The study starts with a hypothesis of Kasik Basu that quintile income should be used in place of per capita income. Next, a simple as well as a multiple regression tests with a sample of 69 developing countries are performed to test the hypothesis. There are three important findings from testing works as follows:

1. Quintile income whether stand alone or controlled together with other explanatory variables does not appear to correlate more significantly with well-being indicators. Kaushik Basu hypothesis should not be applied in all countries but in those having serious problem of income distribution.

2. PCAPGNP, HEAEXP, AIDS, and FERATE are significant determinants on LIFEEXPECT and INFMORALITY. ADUEXP surprisingly does not correlate significantly with ADULITERACY in developing countries. It expresses an ideal that many developing countries do not efficiently spend money on education. PCAGNP and CHILABOR are however important determinants on ADULITERACY.

3. Not like previous studies, SOC and POLINS are no longer important determinants on well-being indicators.

However, it is noted that the tests may face errors due to the restraint and accuracy of its sample. The study finds following limitation when accessing data:

1. The accurate of data even through very official sources are not highly

insurable. GNP per capita of several countries was based on estimate of regression or the latest International Comparison Programme benchmark estimates.

2. Within countries, literacy levels are affected by both the quality and quantity of the population's formal education, as well as their participation in informal learning activities throughout their lives. Therefore, the numbers of people who are considered as literate are difficult to measure.

3. Reliable estimate of child labor are hard to obtain. In many countries child labor is officially presumed not to exist and so is not included in surveys or in official data.

4. POLINS are hard to defined. Then its construction is relatively acceptable.

In the end, with the findings of determinants on well-being indicators, the study recommends policies that the government should focus on to improve health and education standard in Vietnam.

Health sectors

1. The first approach is on HEAEXP. The government should reallocate resource to basic health care rather than heavily invest in central hospitals. The improvement of health condition in basic health stations will not only enhance health condition but also release burden in high level services. Another solution is to increase the participation of private sector in sharing the cost of health service. With this competition, the quality of health service will be certainly enhanced.

2. Regulation to strengthen human resource intra-sector is also worth considerable. The government may require doctors those work in central hospitals with State-budget salary to go to basic health stations to provide medical service for certain period of time.

3. Although TEST 3 shows that FERRATE is an important enemy to health status, it is not a serious problem in Vietnam. It indicates that resources and efforts allocated to population and family planning have been well used. Therefore, it is not necessary to increase attention on this matter.

4. HIV/AIDS is now really a raising trouble in Vietnam. Empirical result proved that this is a dangerous enemy to well-being indicators in developing countries. To prevent this century disease, the government should create an appropriate legal and policy framework to decrease discrimination and stigma, to promote a protecting environment for people affected and infected by HIV/AIDS, to ensure the availability of essential resources (clean needle exchange, condoms, auto-disable syringes, ect) to people vulnerable to HIV/AIDS. Also, it should focus attention on primary prevention to cut down the spread out of HIV/AIDS.

Education Sector

1. The study finds that it is not necessary to increase ADUEXP but spending it efficiently is more important. The first concern is Cost Recovery and reallocation resource. Primary students in Vietnam have to pay more than higher educated students while the cost recovery rate in primary education is

about 3 times higher than tertiary education. This structure of spending exacerbates both quality and equality of education. Reallocation of resource to basic level education will help to solve these problems. In addition, subsidies from the government on textbooks and teaching aids should be a high priority.

2. Application of modern education method is urgently required. The government should shift education system from one that was constructed for centrally planned economy to a system that can adapt better to market condition.

Figure 1: Information Availability for share of the poorest 20% population of all developing countries

No.	Countries	Information availability
1	Algeria	yes
2	Angola	no
3	Antigua and Barbuda	yes
4	Argentina	no
5	Bahamas	no
6	Bangladesh	yes
7	Barbados	no
8	Belize	no
9	Benin	no
10	Bhrain	no
11	Bhutan	no
12	Bolivia	yes
13	Botswana	no
14	Brazil	yes
15	Brunei Darussalam	no
16	Bukina Faso	yes
17	Burundi	yes
18	Cambodia	yes
19	Cameroon	no
20	Cape Verde	no
21	Central Afican Rep.	yes
22	Chad	no
23	Chile	yes
24	China	yes
25	Co^te d'lvoire	yes
26	Columbia	yes
27	Comoros	no
28	Congo	no
29	Congo, Dem. Rep. Of the	no
30	Costa Rica	yes
31	Cuba	no
32	Cyprus	no
33	Djibouti	no
34	Domincan Republic	yes
35	Dominica	no
36	Ecuador	yes
37	Egypt	yes
38	El Salvador	yes
39	Equatorial Guinea	no
40	Eritrea	no
41	Ethiopia	yes
42	Fiji	no
43	Gabon	no
44	Gambia	yes
45	Gana	yes
46	Grenada	no
47	Guatemala	yes
48	Guinea	yes
49	Guinea-Bissau	yes
50	Guyana	yes
51	Haiti	no
52	Honduras	yes
53	India	yes
54	Indonesia	yes
55	Iran, Islamic Rep. Of	no
56	Iraq	no
57	Jamaica	yes
58	Jordan	yes
59	Kenya	yes
60	Kuwait	no

61	Lao People's Dem. Rep.	yes	92	Saint Lucia	no
62	Lebanon	no	93	Saint Vincent and the Grenadines	no
63	Lesotho	yes	94	Samoa	no
64	Libyan Arab Jamahiriya	no	95	Sao Tome and principle	no
65	Madagascar	yes	96	Saudi Arabia	no
66	Malawi	no	97	Senegal	yes
67	Malaysia	yes	98	Seychelles	no
68	Maldives	no	99	Sierra Leone	yes
69	Mali	yes	100	Singapore	no
70	Mauritania	yes	101	Solomon Islands	no
71	Mauritius	no	102	South Africa	yes
72	Mexico	yes	103	Sri Lanka	yes
73	Mongolia	yes	104	Sudan	no
74	Morocco	yes	105	Suriname	no
75	Mozambique	yes	106	Swaziland	yes
76	Myanmar	no	107	Syrian Arab Rep.	no
77	Namibia	no	108	Tanzania, U. Rep. Of	yes
78	Nepal	yes	109	Thailand	yes
79	Nicaragua	yes	110	Togo	no
80	Niger	yes	111	Trinidad and Tobago	yes
81	Nigeria	yes	112	Tunisia	yes
82	Onam	no	113	Turkey	yes
83	Pakistan	yes	114	Uganda	yes
84	Panama	yes	115	United Arab Emirates	no
85	Papua New Guinea	yes	116	Uruguay	yes
86	Paraguay	yes	117	Vanuatu	yes
87	Peru	yes	118	Venezuela	yes
88	Philippines	yes	119	Vietnam	yes
89	Qatar	no	120	Yemen	yes
90	Rwanda	yes	121	Zambia	yes
91	Saint Kitts and Nevis	no	122	Zimbabwe	yes

Source: Having scanned resources from Human Development Report 1999, 2000, 2001 (UN), World Development Indicators 2000 (WB) and Government Financial Budget Survey 1999 (IMF)

Figure 2: Data set of the study

COUNTRIES	LIFEEXPECT	ADULITERACY	INFMORALITY	PCAPGNP	SHARE	QUINGNP	AIDS	FERRATE	HEAPCAP	HEAEXP	EDUEXP	CHILDLABOR	CVWAR	DEMOC	SOC	POLINS
Algeria	71.0	65.5	25.0	4595.0	7.0	1608.3	0.1	3.8	**217.0**	3.3	5.1	1.0	1	6	0	0
Bangladesh	59.0	40.1	73.0	1407.0	8.7	612.0	0.0	3.1	51.0	1.6	2.2	29.0	0	3	0	5E-07
Bolivia	62.0	84.4	60.0	2205.0	5.6	617.4	0.1	4.4	150.0	1.1	4.9	13.0	0	7	0	0.38
Brazil	67.0	84.5	33.0	6464.0	2.5	808.0	0.0	2.3	453.0	3.4	5.1	15.0	1	4	0	0.06
Bukina Faso	44.7	22.2	109.0	870.0	5.5	239.3	7.2	6.6	36.0	**0.5**	1.4	47.0	0	6	0	0.12
Burundi	42.0	45.8	118.0	561.0	7.9	221.6	8.3	6.3	21.0	0.6	4.0	49.0	1	7	0	0.63
Cambodia	54.0	37.4	102.0	1246.0	6.9	429.9	2.4	4.6	90.0	0.6	2.9	24.0	0	7	1	0.07
Central Afican Rep.	44.0	44.0	114.0	1118.0	2.0	111.8	10.8	4.9	33.0	**1.2**	1.6	23.0	0	7	0	0.02
Chile	75.0	95.4	10.0	8507.0	3.5	1488.7	0.2	2.4	511.0	2.4	3.6	0.0	1	6	0	0.06
China	70.0	82.8	31.0	3051.0	5.9	900.0	0.1	1.8	**142.0**	2.0	2.3	9.0	1	6	1	0.06
Co^te d'Ivoire	46.0	44.5	88.0	1484.0	7.1	526.8	10.1	5.1	62.0	1.4	5.0	19.0	0	6	0	0
Columbia	70.0	91.2	23.0	5861.0	3.0	879.2	0.4	2.8	553.0	4.9	4.1	6.0	1	2	0	0.08
Costa Rica	77.0	95.3	13.0	5812.0	4.0	1162.4	0.6	2.8	509.0	6.9	5.4	5.0	0	1	0	0
Domincan Republic	71.0	82.8	40.0	4337.0	4.3	932.5	1.9	2.8	246.0	1.6	2.3	14.0	1	2	0	0.02
Ecuador	70.0	90.6	32.0	3003.0	5.4	810.8	0.3	3.1	115.0	2.5	3.5	5.0	0	2	0	0
Egypt	67.0	53.7	49.0	3146.0	9.8	1541.5	0.0	3.4	**124.0**	1.8	4.8	10.0	0	5	0	0.03
El Salvador	69.0	77.8	31.0	4008.0	3.4	681.4	0.6	3.2	298.0	2.6	2.5	14.0	1	6	0	0.4804
Ethiopia	43.0	36.3	107.0	566.0	7.1	200.9	9.3	6.3	25.0	1.7	4.0	42.0	1	7	1	0.63

Gambia	47.4	34.6	64.0	1453.0	4.4	319.7	2.2	5.2	56.0	**1.2**	3.4	35.0	0	2	0	0
Gana	60.0	69.1	65.0	1735.0	8.4	728.7	2.4	5.2	85.0	1.8	4.2	13.0	1	2	0	0.08
Guatemala	64.0	67.3	42.0	3474.0	2.1	364.8	0.5	4.9	155.0	1.5	1.7	15.0	1	5	0	0.6903
Guinea	46.9	36.0	124.0	1782.0	6.4	570.2	2.1	5.5	68.0	**0.8**	1.8	32.0	0	7	0	0
Guinea-Bissau	44.0	36.7	128.0	573.0	2.1	60.2	2.3	5.8	**30.0**	1.2	1.9	37.0	0	6	0	0.11
Guyana	64.8	98.3	58.0	3403.0	6.3	1071.9	2.1	2.3	186.0	**1.4**	**5.0**	25.0	0	4	0	0.0902
Honduras	69.0	73.4	36.0	2338.0	3.4	397.5	1.5	4.3	210.0	2.7	3.6	8.0	0	4	0	0.02
India	63.0	55.7	70.0	2060.0	8.1	834.3	0.8	3.1	**73.0**	0.6	3.2	13.0	1	2	0	0.92
Indonesia	65.0	85.7	43.0	2407.0	8.1	974.8	0.1	2.6	44.0	0.6	1.4	9.0	1	5	0	0.69
Jamaica	75.0	86.0	21.0	3344.0	8.7	1454.6	1.0	2.5	202.0	2.3	7.4	0.0	1	2	0	0.26
Jordan	71.0	88.6	27.0	2615.0	7.6	993.7	0.0	4.9	**215.0**	3.7	6.8	0.0	0	6	0	0.02
Kenya	51.0	80.5	76.0	964.0	5.0	241.0	11.6	4.5	79.0	2.2	6.5	40.0	0	5	0	0.02
Lao People's Dem. Rep.	54.0	46.1	96.0	1683.0	9.6	807.8	0.0	5.8	35.0	1.2	2.1	26.0	0	7	1	0
Lesotho	55.0	82.4	93.0	2194.0	2.8	307.2	8.4	4.8	**60.0**	3.7	8.4	21.0	0	5	0	3E-05
Madagascar	58.0	64.9	92.0	741.0	5.1	189.0	0.1	5.4	16.0	1.1	1.9	35.0	0	6	0	0
Malaysia	72.0	86.4	8.0	7699.0	4.5	1732.3	0.6	3.2	189.0	1.3	4.9	3.0	0	3	0	0
Mali	50.0	38.2	117.0	673.0	4.6	154.8	1.7	6.6	30.0	2.0	2.2	52.0	0	7	0	0.15
Mauritania	54.0	41.2	90.0	1500.0	6.2	465.0	0.5	5.5	74.0	1.8	5.1	23.0	0	7	0	0.1
Mexico	72.0	90.8	30.0	7450.0	3.6	1341.0	0.4	2.8	**369.0**	2.8	4.9	6.0	0	3	0	6E-07
Mongolia	66.0	61.4	50.0	1463.0	7.3	534.0	0.0	2.6	**68.0**	4.3	5.7	2.0	0	7	1	0
Morocco	67.0	47.1	49.0	3188.0	6.5	1036.1	0.0	3.1	**140.0**	1.3	5.0	3.0	0	4	0	0
Mozambique	43.8	42.3	129.0	782.0	6.5	254.2	14.2	6.3	28.0	**1.2**	3.5	33.0	1	7	1	0.15
Nepal	58.0	39.2	77.0	1181.0	7.6	448.8	0.2	4.5	66.0	1.3	3.2	43.0	0	3	0	0.09

Nicaragua	68.0	67.9	36.0	1896.0	4.2	398.2	0.2	4.4	266.0	4.4	3.9	13.0	0	5	1	0.18
Niger	46.0	14.7	118.0	729.0	2.6	94.8	1.5	6.8	20.0	1.3	2.3	44.0	0	7	0	0.02
Nigeria	53.0	61.1	76.0	740.0	4.4	162.8	4.1	5.2	23.0	0.2	0.7	25.0	1	2	0	0.08
Pakistan	62.0	44.0	91.0	1652.0	9.5	784.7	0.1	5.0	71.0	0.9	2.7	16.0	1	7	0	0.08
Panama	74.0	91.4	21.0	4925.0	3.6	886.5	0.6	2.6	410.0	6.0	5.1	3.0	0	4	0	0
Papua New Guinea	58.3	63.2	79.0	2205.0	4.5	496.1	0.2	4.6	75.0	**1.0**	19.5	18.0	0	2	0	0.02
Paraguay	70.0	92.8	24.0	4312.0	2.3	495.9	0.1	4.2	233.0	2.6	4.0	7.0	0	5	0	0
Peru	69.0	89.7	40.0	4180.0	4.4	919.6	0.6	3.0	278.0	2.2	2.9	2.0	1	2	0	0.09
Philippines	69.0	94.8	32.0	3725.0	5.4	1005.8	0.1	3.6	136.0	1.7	3.4	6.0	1	5	0	0.06
Rwanda	40.6	64.0	105.0	660.0	9.7	320.1	12.8	6.2	34.0	**0.1**	3.3	41.0	1	6	0	0.07
Senegal	52.0	35.5	69.0	1297.0	6.4	415.0	1.8	5.6	61.0	2.6	3.7	29.0	0	4	0	0
Sierra Leone	37.9	31.0	182.0	458.0	1.1	25.2	3.2	6.1	27.0	**1.4**	1.0	15.0	0	5	0	0
South Africa	63.0	84.6	51.0	8296.0	2.9	1202.9	12.9	3.3	623.0	3.2	7.9	0.0	0	5	0	0.92
Sri Lanka	73.0	91.1	16.0	2945.0	8.0	1178.0	0.1	2.1	95.0	1.4	3.4	2.0	1	2	0	0.06
Swaziland	60.7	78.3	64.0	3816.0	2.7	515.2	18.5	4.7	148.0	**1.6**	5.0	0.0	0	5	0	0
Tanzania, U. Rep. Of	69.0	73.6	91.0	480.0	6.8	163.2	9.4	5.5	15.0	**1.8**	3.4	38.0	0	6	0	0.02
Thailand	72.0	95.0	29.0	5524.0	6.4	1767.7	2.2	1.7	349.0	1.7	4.8	14.0	0	3	0	0.14
Trinidad and Tobago	74.0	93.4	16.0	7485.0	5.5	2058.4	0.9	1.7	300.0	**3.5**	3.3	0.0	0	2	0	0
Tunisia	72.0	68.7	28.0	5169.0	5.9	1524.9	0.0	2.6	287.0	3.0	7.7	0.0	0	6	0	0.02
Turkey	69.0	84.0	38.0	6594.0	5.8	1912.3	0.0	2.5	**377.0**	2.9	2.2	9.0	1	5	0	0.73
Uganda	42.0	37.7	101.0	1072.0	6.6	353.8	9.5	7.1	65.0	1.8	2.6	44.0	1	5	0	0.85
Uruguay	74.0	97.6	16.0	8541.0	5.4	2306.1	0.2	2.4	823.0	1.9	3.3	1.0	0	5	0	0

Vanuatu	67.7	64.0	38.0	3120.0	3.7	577.2	0.2	4.3	**230.0**	**0.5**	**4.8**	20.0	0	3	0	0.03
Venezuela	73.0	92.0	21.0	5706.0	3.7	1055.6	0.7	3.0	248.0	3.0	5.2	0.0	0	1	0	0
Vietnam	68.0	92.9	34.0	1689.0	8.0	675.6	0.2	2.6	81.0	0.4	3.0	7.0	0	7	1	0.01
Yemen	56.0	44.1	82.0	658.0	6.1	200.7	0.0	7.6	**38.0**	2.1	7.0	19.0	1	2	1	0.08
Zambia	43.0	76.3	114.0	678.0	4.2	142.4	19.1	5.6	52.0	2.3	2.2	16.0	0	5	0	0.09
Zimbabwe	43.5	87.2	59.0	2669.0	4.0	533.8	25.8	3.8	**191.0**	**0.8**	**7.5**	28.0	1	3	1	0.27

Source: Human Development Report 1999, 2000 (UN), World Development Indicators 2000 (WB) and Government Financial Budget Survey 1999 (IMF), Easter and Levine (1997)

Figure 3: TEST 1 - Simple regression results (Chapter 1)

MODEL I.1

Dependent Variable: LIFEEXPECT

Method: Least Squares

Date: 01/18/02 Time: 03:48

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	50.27914	1.559012	32.25064	0.0000
PCAPGNP	0.003541	0.000420	8.435651	0.0000

R-squared	0.515056	Mean dependent var	60.75797
Adjusted R-squared	0.507818	S.D. dependent var	11.15399
S.E. of regression	7.825163	Akaike info criterion	6.981123
Sum squared resid	4102.623	Schwarz criterion	7.045880
Log likelihood	-238.8488	F-statistic	71.16021
Durbin-Watson stat	1.525861	Prob(F-statistic)	0.000000

MODEL II.1

Dependent Variable: LIFEEXPECT

Method: Least Squares

Date: 01/25/02 Time: 01:53

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	49.34778	1.595155	30.93605	0.0000
QUINGNP	0.015369	0.001752	8.770347	0.0000

R-squared	0.534460	Mean dependent var	60.75797
Adjusted R-squared	0.527512	S.D. dependent var	11.15399
S.E. of regression	7.667006	Akaike info criterion	6.940287
Sum squared resid	3938.460	Schwarz criterion	7.005043
Log likelihood	-237.4399	F-statistic	76.91899
Durbin-Watson stat	1.640464	Prob(F-statistic)	0.000000

Figure 3: TEST 1 - Simple regression results (Chapter 1) – continued

MODEL I.2

Dependent Variable: INFMORALITY

Method: Least Squares

Date: 01/18/02 Time: 03:50

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	99.82763	4.983445	20.03185	0.0000
PCAPGNP	-0.012608	0.001342	-9.395130	0.0000

R-squared	0.568489	Mean dependent var	62.52174
Adjusted R-squared	0.562049	S.D. dependent var	37.79730
S.E. of regression	25.01345	Akaike info criterion	9.305261
Sum squared resid	41920.06	Schwarz criterion	9.370018
Log likelihood	-319.0315	F-statistic	88.26846
Durbin-Watson stat	1.758610	Prob(F-statistic)	0.000000

MODEL II.2

Dependent Variable: INFMORALITY

Method: Least Squares

Date: 01/25/02 Time: 01:52

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	101.1806	5.406517	18.71457	0.0000
QUINGNP	-0.052070	0.005939	-8.767156	0.0000

R-squared	0.534279	Mean dependent var	62.52174
Adjusted R-squared	0.527328	S.D. dependent var	37.79730
S.E. of regression	25.98607	Akaike info criterion	9.381555
Sum squared resid	45243.48	Schwarz criterion	9.446312
Log likelihood	-321.6637	F-statistic	76.86302
Durbin-Watson stat	2.069867	Prob(F-statistic)	0.000000

Figure 3: TEST 1 - Simple regression results (Chapter 1) – continued

MODEL I.3

Dependent Variable: ADULITERACY

Method: Least Squares

Date: 01/18/02 Time: 03:56

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	46.64324	3.346014	13.93994	0.0000
PCAPGNP	0.006947	0.000901	7.710489	0.0000

R-squared	0.470153	Mean dependent var	67.20000
Adjusted R-squared	0.462245	S.D. dependent var	22.90232
S.E. of regression	16.79468	Akaike info criterion	8.508558
Sum squared resid	18898.10	Schwarz criterion	8.573315
Log likelihood	-291.5453	F-statistic	59.45164
Durbin-Watson stat	1.680281	Prob(F-statistic)	0.000000

MODEL II.3

Dependent Variable: ADULITERACY

Method: Least Squares

Date: 01/25/02 Time: 01:51

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	48.20846	3.866602	12.46791	0.0000
QUINGNP	0.025580	0.004248	6.022232	0.0000

R-squared	0.351198	Mean dependent var	67.20000
Adjusted R-squared	0.341515	S.D. dependent var	22.90232
S.E. of regression	18.58457	Akaike info criterion	8.711098
Sum squared resid	23140.88	Schwarz criterion	8.775854
Log likelihood	-298.5329	F-statistic	36.26728
Durbin-Watson stat	1.805056	Prob(F-statistic)	0.000000

Figure 4: TEST 2 - Multi regression results (Chapter 2)

MODEL I.4

Dependent Variable: LIFEEXPECT

Method: Least Squares

Date: 01/25/02 Time: 01:35

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	71.59244	3.722135	19.23424	0.0000
PCAPGNP	0.001146	0.000444	2.580647	0.0122
HEAEXP	1.281675	0.552821	2.318427	0.0237
AIDS	-0.651666	0.125072	-5.210317	0.0000
FERRATE	-3.438202	0.628463	-5.470808	0.0000
SOC	0.266458	1.854434	0.143687	0.8862
POLINS	-1.889246	2.636365	-0.716610	0.4763

R-squared	0.805949	Mean dependent var	60.75797
Adjusted R-squared	0.787170	S.D. dependent var	11.15399
S.E. of regression	5.145729	Akaike info criterion	6.210137
Sum squared resid	1641.668	Schwarz criterion	6.436786
Log likelihood	-207.2497	F-statistic	42.91729
Durbin-Watson stat	1.445288	Prob(F-statistic)	0.000000

MODEL II.4

Dependent Variable: LIFEEXPECT

Method: Least Squares

Date: 01/25/02 Time: 01:32

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	70.84264	4.258616	16.63513	0.0000
QUINGNP	0.004311	0.001887	2.284564	0.0258
HEAEXP	1.723065	0.526052	3.275466	0.0017
AIDS	-0.589509	0.127725	-4.615444	0.0000
FERRATE	-3.462052	0.662530	-5.225500	0.0000
SOC	-0.398169	1.823966	-0.218299	0.8279
POLINS	-1.573500	2.653461	-0.592999	0.5553

R-squared	0.801791	Mean dependent var	60.75797
Adjusted R-squared	0.782609	S.D. dependent var	11.15399
S.E. of regression	5.200573	Akaike info criterion	6.231341
Sum squared resid	1676.849	Schwarz criterion	6.457990
Log likelihood	-207.9813	F-statistic	41.80008
Durbin-Watson stat	1.576563	Prob(F-statistic)	0.000000

Figure 4: TEST 2 - Multi regression results (Chapter 2) – continued

MODEL I.5

Dependent Variable: INFMORALITY

Method: Least Squares

Date: 01/25/02 Time: 01:38

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	32.92339	14.39700	2.286822	0.0256
PCAPGNP	-0.005410	0.001718	-3.148211	0.0025
HEAEXP	-3.626068	2.138281	-1.695786	0.0949
FERRATE	11.97798	2.430860	4.927467	0.0000
AIDS	1.012483	0.483772	2.092892	0.0405
SOC	-5.325080	7.172845	-0.742394	0.4607
POLINS	0.880669	10.19731	0.086363	0.9315

R-squared	0.747178	Mean dependent var	62.52174
Adjusted R-squared	0.722711	S.D. dependent var	37.79730
S.E. of regression	19.90338	Akaike info criterion	8.915583
Sum squared resid	24560.97	Schwarz criterion	9.142231
Log likelihood	-300.5876	F-statistic	30.53862
Durbin-Watson stat	1.813748	Prob(F-statistic)	0.000000

MODEL II.5

Dependent Variable: INFMORALITY

Method: Least Squares

Date: 01/25/02 Time: 01:38

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	31.34794	16.82142	1.863573	0.0671
QUINGNP	-0.017494	0.007454	-2.347067	0.0221
HEAEXP	-5.736213	2.077891	-2.760594	0.0076
FERRATE	12.79439	2.616977	4.888997	0.0000
AIDS	0.748695	0.504511	1.484000	0.1429
SOC	-1.752466	7.204615	-0.243242	0.8086
POLINS	-0.991183	10.48110	-0.094569	0.9250

R-squared	0.730690	Mean dependent var	62.52174
Adjusted R-squared	0.704628	S.D. dependent var	37.79730
S.E. of regression	20.54212	Akaike info criterion	8.978759
Sum squared resid	26162.68	Schwarz criterion	9.205407
Log likelihood	-302.7672	F-statistic	28.03638
Durbin-Watson stat	1.992581	Prob(F-statistic)	0.000000

Figure 4: TEST 2 - Multi regression results (Chapter 2) – continued

MODEL I.6

Dependent Variable: ADULITERACY

Method: Least Squares

Date: 01/19/02 Time: 18:43

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	63.84059	7.426516	8.596304	0.0000
PCAPGNP	0.004103	0.001213	3.383386	0.0012
EDUEXP	0.372789	0.759547	0.490805	0.6253
CHILDLABOR	-0.688177	0.186019	-3.699493	0.0005
AIDS	0.685616	0.375469	1.826026	0.0727
SOC	-1.333124	5.577936	-0.238999	0.8119
POLINS	-1.968841	7.960396	-0.247330	0.8055

R-squared	0.583492	Mean dependent var	67.20000
Adjusted R-squared	0.543184	S.D. dependent var	22.90232
S.E. of regression	15.47925	Akaike info criterion	8.412804
Sum squared resid	14855.65	Schwarz criterion	8.639453
Log likelihood	-283.2418	F-statistic	14.47609
Durbin-Watson stat	1.960392	Prob(F-statistic)	0.000000

MODEL II.6

Dependent Variable: ADULITERACY

Method: Least Squares

Date: 01/25/02 Time: 01:39

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	69.47465	7.934433	8.756095	0.0000
QUINGNP	0.011697	0.005292	2.210104	0.0308
EDUEXP	0.462086	0.795092	0.581172	0.5632
CHILDLABOR	-0.848314	0.186807	-4.541136	0.0000
AIDS	0.838556	0.401955	2.086193	0.0411
SOC	-4.441934	5.696831	-0.779720	0.4385
POLINS	-0.434152	8.327037	-0.052138	0.9586

R-squared	0.542624	Mean dependent var	67.20000
Adjusted R-squared	0.498361	S.D. dependent var	22.90232
S.E. of regression	16.22090	Akaike info criterion	8.506404
Sum squared resid	16313.29	Schwarz criterion	8.733053
Log likelihood	-286.4710	F-statistic	12.25929
Durbin-Watson stat	2.028486	Prob(F-statistic)	0.000000

Figure 5: TEST 3 – Adjusted multi regression results (Chapter 2)

MODEL I.7

Dependent Variable: LIFEEXPECT

Method: Least Squares

Date: 01/19/02 Time: 18:50

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	71.61059	3.579394	20.00634	0.0000
PCAPGNP	0.001089	0.000418	2.602598	0.0115
HEAEXP	1.344824	0.538479	2.497448	0.0151
AIDS	-0.662357	0.121333	-5.459013	0.0000
FERRATE	-3.478569	0.613519	-5.669860	0.0000

R-squared	0.804288	Mean dependent var	60.75797
Adjusted R-squared	0.792056	S.D. dependent var	11.15399
S.E. of regression	5.086324	Akaike info criterion	6.160692
Sum squared resid	1655.724	Schwarz criterion	6.322584
Log likelihood	-207.5439	F-statistic	65.75262
Durbin-Watson stat	1.416518	Prob(F-statistic)	0.000000

MODEL II.7

Dependent Variable: LIFEEXPECT

Method: Least Squares

Date: 01/25/02 Time: 01:44

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	70.60378	4.154014	16.99652	0.0000
QUINGNP	0.004269	0.001831	2.331555	0.0229
HEAEXP	1.755739	0.516393	3.400007	0.0012
AIDS	-0.604303	0.123928	-4.876234	0.0000
FERRATE	-3.468855	0.651925	-5.320939	0.0000

R-squared	0.800518	Mean dependent var	60.75797
Adjusted R-squared	0.788051	S.D. dependent var	11.15399
S.E. of regression	5.135073	Akaike info criterion	6.179769
Sum squared resid	1687.614	Schwarz criterion	6.341661
Log likelihood	-208.2020	F-statistic	64.20779
Durbin-Watson stat	1.522053	Prob(F-statistic)	0.000000

Figure 5: TEST 3 – Adjusted multiple regression results (Chapter 2) – continued

MODEL I.8

Dependent Variable: INFMORALITY

Method: Least Squares

Date: 01/19/02 Time: 18:51

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	30.52813	13.84774	2.204557	0.0311
PCAPGNP	-0.005040	0.001618	-3.114885	0.0028
HEAEXP	-3.799900	2.083236	-1.824037	0.0728
FERRATE	12.24979	2.373546	5.160966	0.0000
AIDS	0.972534	0.469404	2.071847	0.0423

R-squared	0.744908	Mean dependent var	62.52174
Adjusted R-squared	0.728965	S.D. dependent var	37.79730
S.E. of regression	19.67766	Akaike info criterion	8.866549
Sum squared resid	24781.46	Schwarz criterion	9.028441
Log likelihood	-300.8959	F-statistic	46.72251
Durbin-Watson stat	1.814917	Prob(F-statistic)	0.000000

MODEL II.8

Dependent Variable: INFMORALITY

Method: Least Squares

Date: 01/25/02 Time: 01:46

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	30.67176	16.36478	1.874254	0.0655
QUINGNP	-0.017274	0.007213	-2.394813	0.0196
HEAEXP	-5.719072	2.034334	-2.811274	0.0065
FERRATE	12.82883	2.568266	4.995134	0.0000
AIDS	0.730182	0.488217	1.795611	0.1397

R-squared	0.730395	Mean dependent var	62.52174
Adjusted R-squared	0.713545	S.D. dependent var	37.79730
S.E. of regression	20.22967	Akaike info criterion	8.921882
Sum squared resid	26191.33	Schwarz criterion	9.083774
Log likelihood	-302.8049	F-statistic	43.34619
Durbin-Watson stat	1.994851	Prob(F-statistic)	0.000000

Figure 5: TEST 3 – Adjusted multiple regression results (Chapter 2) – continued

MODEL I.9

Dependent Variable: ADULITERACY

Method: Least Squares

Date: 01/20/00 Time: 02:06

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	66.12232	6.232570	10.60916	0.0000
PCAPGNP	0.004095	0.001148	3.566633	0.0007
CHILDLABOR	-0.626406	0.174192	-3.596060	0.0006

R-squared	0.556960	Mean dependent var	67.20000
Adjusted R-squared	0.543534	S.D. dependent var	22.90232
S.E. of regression	15.47332	Akaike info criterion	8.358616
Sum squared resid	15801.96	Schwarz criterion	8.455751
Log likelihood	-285.3723	F-statistic	41.48534
Durbin-Watson stat	1.818833	Prob(F-statistic)	0.000000

MODEL II.9

Dependent Variable: ADULITERACY

Method: Least Squares

Date: 01/25/02 Time: 01:48

Sample: 1 69

Included observations: 69

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	73.96123	6.711126	11.02069	0.0000
QUINGNP	0.010137	0.005107	1.985014	0.0513
CHILDLABOR	-0.810706	0.181863	-4.457776	0.0000

R-squared	0.501339	Mean dependent var	67.20000
Adjusted R-squared	0.486228	S.D. dependent var	22.90232
S.E. of regression	16.41590	Akaike info criterion	8.476883
Sum squared resid	17785.80	Schwarz criterion	8.574018
Log likelihood	-289.4525	F-statistic	33.17719
Durbin-Watson stat	1.907750	Prob(F-statistic)	0.000000

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