Time preference in HCMC

by MEcon. TRƯƠNG ĐĂNG THỤY

Public projects, especially environmental ones, produce costs and benefits at different points of time. This requires a social discount rate in order to make costs and benefits of different points of time comparable. Unfortunately, in an economy like that of Vietnam, where the banking system has yet fully developed, and people have not the habit of depositing their spare money in the banks, interest rate is not a good proxy of social discount rate.

This paper aims at measuring social rate of time preference of people in HCMC and examining factors that might affect the rate. A questionnaire is designed to identify time preference of people. A survey with 250 respondents is done in HCMC, in all districts.

1. Literature

Social rate of time preference is the trade-offs between present and future consumption. It is the rate that makes society indifferent between the two amounts of consumption: one in the present and one in the future. According to Boscolo (1998), the time preference of consumption has two components: pure preference of present over future utility (r), and the expected growth in per capita income that makes a unit of consumption in the future provide less utility than that in present (mg). The latter term is denoted as mg, where g is the expected growth rate of per capita income, and m is the absolute value of the elasticity of marginal utility with respect to consumption.

The social rate of time preference is then defined as:

$$i = r + mg \quad (1)$$

The first component r reflects the fact that, in case $r > 0$, people care more about the present than the future. The second component implies that even when r equals zero, the social rate of time preference could be positive. This is because, when consumption is expected to grow at $g > 0$, which means that people become better off, the utility from one unit of consumption becomes smaller and smaller.

The present value of consumption will be maximized when:

$$W(C_t) = \frac{W(C_{t+1})}{1+i} \quad (2)$$

In other words, consumption levels will be maximized when the present value of consumption of each period are equal.

Equation (2) can be rewritten as:

$$i = \frac{W(C_{t+1}) - W(C_t)}{W(C_t)} \quad (3)$$

Or

$$i = \frac{dW(C_t)}{W(C_t)} \quad (4)$$

People are willing to delay their consumption only if they yield a return for their postponement of consumption. The higher the rate, the more they save. In other words, if the rate is higher, a higher amount of future consumption is required in order to make people indifferent between the two amounts.

2. Analytical framework

This research uses a questionnaire to identify the rate of time preference of individuals. Besides socio-economic characteristics, there are questions about time preference. The rate of time preference is not asked directly, which might result in misleading results for people in Vietnam are not familiar with the term "time preference". Instead, the research tries to identify the time interval that make people indifferent between 16,000,000 VND and 32,000,000 VND.

Provided the time interval that makes people indifferent between the two amounts, the interval of the rate of time preference can be then estimated using equation (4). Individual rate is calculated as the mid-point of the interval.

A survey of 250 individuals is done in Ho Chi Minh City, stratified by population of districts. Households random selection procedure is done to ensure that any household in HCMC has the same chance of being chosen.

3. Results

Table 1: A brief description of the sample

Variable	Mean	Min	Max
Age	35.49565	15	79
Schooling years	12.30942	0	21
Household size	5.33913	1	25
Household income	3,793.478	500	15,000

Table 2: Individual Rate of Time Preference

Rate	Frequency	Percent	Commutation
0.07	10	4.39	4.39
0.095	5	2.19	6.58
0.155	15	6.58	13.16
0.3	20	8.77	21.93
0.5	147	64.47	86.4
0.705	31	13.6	100
Total	228	100	

Questions about your time preferences

Suppose that someone were to offer you a gift of some money. Imagine that the person giving you this gift offered you a choice: you could either have 16,000,000 VND now or you could have 32,000,000 VND in the future. Imagine that there is *no risk of not receiving the 32,000,000 VND in the future*, and that there was no inflation (or deflation) in the economy.

48. Suppose that you could receive 16,000,000 VND now or 32,000,000 VND in 4 years. Which would you choose?

_____ 16,000,000 VND now ⇒ *Go to Question 49*

_____ 32,000,000 VND in 4 years ⇒ *Go to Question 50*

49.Suppose that you could receive 16,000,000 VND now or 32,000,000 VND in 1 year. Which would you choose?

_____ 16,000,000 VND now ⇒ *Finished with questionnaire*

_____ 32,000,000 VND in 1 year ⇒ *Go to Question 50*

50.Suppose that you could receive 16,000,000 VND now or 32,000,000 VND in 2 years. Which would you choose?

_____ 16,000,000 VND now ⇒ *Finished with questionnaire*

_____ 32,000,000 VND in 2 years ⇒ *Go to Question 51*

51.Suppose that you could receive 16,000,000 VND now or 32,000,000 VND in 10 years. Which would you choose?

_____ 16,000,000 VND now ⇒ *Go to Question 52*

_____ 32,000,000 VND in 10 years ⇒ *Finished with questionnaire*

52. Suppose that you could receive 16,000,000 VND now or 32,000,000 VND in 6 years. Which would you choose?

_____ 16,000,000 VND now ⇒ *Finished with questionnaire*

_____ 32,000,000 VND in 6 years ⇒ *Finished with questionnaire*

After cleaning data, there are 228 observation remained. About 52% of the respondents are female. A typical respondent has an age of 35, with 12 years of schooling, living in a family of 5 members, with total household income of VND3.8 million.

The estimated rate of time preference appears to be very high. Many respondents choose 16,000,000 at present. Table 2 presents the results of estimated of individual rate of time preference.

Column 1 of Table 2 presents the estimated rate of time preference. It is calculated from the time interval, or the estimated period that makes people indifferent between VND16 million at present and 32 million in the future. A rate of 0.07 implies a period of 10 years, while the rate 70.5% implies a period of 1.2 years. Column 2 and 3 present the frequency of the rate. Column 4 presents the cumulated frequency.

Most respondents have the rate of 50%, which indicating a time period of 1.7 year. In other words, 65% of the respondents are indifferent between VND16 million at present and 32 million after 1.7 year. Much smaller proportion of observations is distributed to rates other than 50%.

The range of the rate is widespread from 7% to 70%. Average value is 46%, which is also the estimated social rate of time preference. Median value is 50%, approximately equal to the mean. However, the distribution of the rate is left-skewed. Many observations are concentrated on 50%, a value that is higher than the mean.

4. Factors affecting the rate of time preference

There appears to be no association between individual rate of time preference and socio-economic characteristics of respondents.

Household size, age of respondent, gender, years of schooling and household income are included in the regression function. T-test results reject the hy-

Table 3 presents the results of multivariate analysis.

Rate	Coef.	Std. Err.
Household size	-2.78E-03	3.97E-03
Age	0.000254	0.000871
Gender	-0.02262	0.022798
Years of schooling	0.000727	0.003323
Household income	-5.40E-06	4.52E-06
Constant	0.48856	0.05915
No. of obs	221	
F value	0.73	
R-square	0.017	

pothesis that coefficients is different from zero. The F-test for overall significance did not reject the hypothesis that all coefficients are simultaneously different from zero.

5. Concluding remarks

This paper aims at estimating the social rate of time preference of people in Ho Chi Minh City. A survey of 250 respondents is done to estimate individual rate of time preference. Respondents are asked for their time interval that makes them indifferent between VND16 million at present and 32 million in the future. The individual rate of time preference is then derived.

Results from the survey show that the estimated rate of time preference is 46%, which is much higher than the interest rate. This results from the fact that the average period of time that makes people indifferent to VND16 million at present and 32 million in the future is 1.83 years.

With that high rate of time preference, projects that bring about benefits far into the future would not be preferred.

Multivariate analysis shows that there is no association between the rate and socio-economic characteristic of respondents.

The estimated rate of time preference could be criticized because it is a hypothetical situation that faces respondents, and that respondents could behave differently in the real world. To some extent, this opinion is reasonable. The real rate could be lower than the hypothetical rate. However, there is no evidence for this.

Another limitation of this paper is that the rate of time preference could vary by the amount offered. For instance, the reported time interval could be higher (and thus, lower rate of time preference) if the amounts are VND160 and 320 million. This could be true. But recall that social rate of time preference is for discounting costs and benefits of public projects. And public project is implemented for the good of society as a whole, and as a result, the share of benefit/cost of an individual is not that huge amount.■

Selected Readings

Arrow, K.J. and Kurz, M. (1970), *Public Investment, the Rate of Return, and Optimal Fiscal Policy*, Johns Hopkins University Press, Baltimore, MD, U.S.A.

Boardman, A.E., Greenberg, D.H. Vining, A.R. and Weimer, D.L. (1996), *Cost-Benefit Analysis: Concepts and Practice*, Prentice Hall.

Boscolo, M., Vincent, J. R. and Panayotou, T. (1998), *Discounting Costs and Benefits in Carbon Sequestration Projects*, Development Discussion Paper 638, Harvard Institute for International Development

Bradford, D. (1975), "Constraints on Government Expenditures and the Choice of the Discount Rate", *American Economic Review* 60:364-378.

Caplin, A. and Leahy, J. (2001), *The Social Discount Rate*, Institute for Empirical Macroeconomics, Federal Reserve Bank of Minneapolis.

Cropper, M.L. Aydede, S.K. and Portney, P.R. (1992), "Rates of Time Preference for Saving Lives", *American Economic Review*: Papers and Proceedings. 82(2):469-472.

Haveman, R.H. (1969), "The Opportunity Cost of Displaced Private Spending and the Social Discount Rate", *Water Resources Research*, 5(5)

Loewenstein G. and R.H. Thaler. (1989), "Anomalies: Intertemporal Choice", *Journal of Economic Perspectives*. 3(4):181-193.