Original Article

Investigate Social Discount Rate for Selective Countries

Vida Varharmi

Department of Economic, Shahid Beheshti University , Iran

ARTICLE INFO	ABSTRACT
	For correct allocation resources to social projects, to survey the distribution of welfare is so important. Therefore in this paper, I investigate "e" as social discount rate. If we estimate "e" correctly, then recourse allocation between countries will be so well and all of countries in world will reach to economic growth. In this paper, I use from a tax method and estimate social discount rate for selective countries such as India and China. **Keywords:** Social Welfare, Social Discount Rate.

INTRODUCTION

"e" is social discount rate, which is used in welfare economic. Social discount rate is so important in source allocation analysis. Gardiner and Cowell (1999) surveyed weights of welfare allocation and estimate "e" for different countries. "e" can be used as rate of time preference. Hotelling (1931) revealed that for fair resource allocation price of social pure should have a linear relation with social discount rate. Therefore "e" limit marginal social welfare when income to increase. In this paper, model is introduces in section 2, estimation results in section3 and conclusion in section 4.

Model
In many studies, three methods are introduced for estimation of "e":
1- Direct method.
2- Behavioral method.
3- Social Values, which is used from tax policies.

In behavioral method, we use from models of survey of household consumption behavioral and in this method "e" is consumption elasticity of substitution. Blurdell *et al*., (1993)

estimated "e" for different countries and used from time series data of consumption income and interest rate. They concluded that "e" did not have relation with income.

Frisch (1932), Fisher (1927) and Fellner (1967) used from FFF model for investigate "e", which is:

$$e = \frac{1 - wy}{P} \qquad (1)$$

In (1) equation, "w" is share of commodity expenditure in household budget, "y" is income elasticity of demand and "P" is price elasticity of demand.
But in behavioral method "e" is introduced as:

$$e = \frac{by}{P} \qquad (2)$$

Which, "y" is income elasticity of demand, P is price elasticity of demand and "b" is marginal prefer to consumption and:

$$b = 1 - b' \qquad (3)$$

Which b' is marginal prefer to saving and $b = 1 - wy$. Evans and France (2004) estimated "e" with AIDS model for England nearly 1.25.

In social values method, "e" is estimated with tax policies which Stern (1977) used from this method. Assume that income tax method is as:

$$u(y) - u(y - T(y)) = k \qquad (4)$$

If utility function has same elasticities, then we have,

$$u(y) = \frac{y^{1-e} - 1}{1 - e} \qquad (5)$$

In (5) equation, "y" is income and T(y) is total tax income. Therefore with respect to (4) and (5) equations, we have:

$$\frac{y^{1-e} - 1}{1 - e} - \frac{[y - T(y)]^{1-e} - 1}{1 - e} = k \qquad (6)$$

With rewriting equation (6), we have:

$$y^{-e} - [y - T(y)]^{-e}(1 - t) = 0 \qquad (7)$$

In (8) equation, "t" is marginal income tax rate, "y" is income and "T(y)" is total tax income. Therefore, with respect to (7), we have:

$$e = \frac{Ln(1-t)}{Ln[1 - \frac{T(y)}{y}]} \qquad (8)$$

In (8), $\dfrac{T(y)}{y}$ is average income tax rate. Evans and Sezar (2002) estimated "e" for UK nearly 1.51 respect to (8) equation.

ESTIMATION AND RESULTS

In this paper, I estimate "e" for some selective countries such as China and India. I select these countries, because these countries have many population and so much workers. For estimation of "e", I use from data of marginal tax rate and worker's wages in selective countries for 2013 and I use from (8) equation.I list estimation of "e" for these countries in table (1).

Table 1: Estimation Results

Country	"e"
China	1.42
India	1.53

As table (1), the highest "e" is for India. As I said, "e" is used for allocation recourses to countries and investment in social projects. If we estimate "e" correctly then recourse allocation between countries will be so well and all of countries in world will reach to economic growth

CONCLUSION

In this paper, I survey three methods for estimation "e". As I said "e" is social discount rate. Therefore we should estimate "e" correctly for countries. Then we can allocate recourses to countries correctly and can reach to welfare improvement.

REFERENCE

Attanasio, P., and G. Weber. 1993. Consumption Growth, the Interest Rate and Aggregation, *Review of Economic Studies*. Wiley Blackwell. 60(3): 631-49.

Blundell, R., P. Pashardes, and G. Weber. 1993. What Do We Learn About Consumer Demand Patterns from Micro Data?, *American Economic Review, American Economic Association*. 83(3):570-97.

Cowell, F., and G., Karen. 1999. Welfare weights OFT economic research paper, oft 282. Office of Fair Trading, London, UK.

Evans, D. 2005. The Elasticity of Marginal Utility of Consumption: Estimates for 20 OECD Countries. *Fiscal Studies*. 26(2): 197-224

Evans, D., and H. Sezar. 2004, Social discount rates for member countries of the European Union. *Journal of Economic Studies*. 32 (1): 47 – 59.

Fellner, W. 1967. Operational Utility: The theoretical background and measurement. Ten Economic Studies in the Tradition of Irving Fisher. W. Fellner ed., New York: John Wiley.

Fisher, I. 1927. A statistical method for measuring marginal utility and justice of a progressive Income Tax. Ten Economic Essays

Contributed in Honour of J. Bates Clark. W. Fellner ed. London; Macmillan.

Frisch, R. 1932. The New Methods of Measuring Marginal Utility. Tubingen: Paul Siebeck

Hotelling, H. 1931. The Economics of Exhaustible Resources. *The Journal of Political, Economy*. 39(2):137-175.

Orazio, P.A., and M. Browning, 1993, Consumption over the Life Cycle and over the Business Cycle, NBER Working Paper No. 4453.

Stern, N. 1977. Welfare weights and the elasticity of marginal utility of income. Proceedings of the Annual Conference of the Association of University Teachers of Economics. M. Artis and R. Nobay ed. Oxford: Blackwell.