

**Title:**

The Effect of Health Capital on Income Equality in OECD countries – Implication for National Health Insurance and Private Health Insurance

**Purpose of research:**

As a sequel to our presentation of the APRIA 2014 which focused on the effect of health capital on **economic growth** in OECD countries, this study investigates the effect of health capital on **income inequality** depending upon how to finance health care expenditure – national health insurance system (NHI system, i.e. Korea system) vs. national health system (NHS i.e. UK system) vs. Private health insurance system (PHI system USA, Switzerland).

Since countries with NHI system or NHS system in most cases maintain PHI system as well, we can estimate the effect of all the systems in combination to see relative impact of those system on income inequality. The PHI is a focal point in this research which may either enhance or aggravate income equality, depending upon the major social class of the PHI's policyholders

**Background of research:**

Health promotion plays a pivotal role not only in economic growth (Hartwig, 2010) but also in income equality. Unlike high income people, low income people suffer from lack of disposable income as well as from less opportunity to enjoy healthy life. Possibly, the latter class may be more protected by NHS or by NHI and less protected by PHI to some degree. This reasoning, however, may be subject to coverage or comprehensiveness of NHS or NHI.

Increasingly, numerous governments tend to spend most of its public budget on health promotion, in spite of difference in shape of public health service system. With the National Health System (NHS) and National Health Insurance (NHI) in major typology of the public health service system, the former is likely to be more progressive (Wagstaff, et al).

## Model for Empirical analysis:

Income disparity model is a basic framework for this empirical research, which is conducted with respect to human capital including health capital in a dynamic panel data set-up;

- Human capital (medical expense) → Income disparity (Gini's coefficient)

$$\Delta GINI_{it} = \beta_1 \Delta GINI_{it-1} + \beta_2 \Delta \ln GDP_{it} + \beta_3 \Delta (\ln GDP_{it})^2 + \beta_4 \Delta \ln HE_{it} + \beta_5 \Delta \ln PEE_{it} + \beta_6 \Delta GD_{it} + \Delta e_{it}$$

Where GDP = Gross Domestic Product,

HE = Health Expenditure,

PEE = Ratio of children entering in to primary or middle school

TI = Investment divided by GDP

GD = GDP divided by government debt

GINI = Gini ratio

Taking previous research tradition, health is measured with the following three variables; life expectancy, survival rate of adult, and medical expense.

## Data/Methodology

Using the OECD Health Data, SWIID(Standardized World Income Inequality Database), World Bank Edstats (for school entering), we examine if health care expenditures as a proxy of health capital are related to income inequality around OECD 26 countries 1980-2008. And this study examines different implications of health care financing through taxes (NHS), public insurance (NHI), and private health insurance (PHI)

As to methodology, we hire system GMM (General Method of Moments) to

control potential endogeneity problem between GNP and GINI. And we try to explore the possibility whether the inverse – U Kuznets hypothesis can be accepted or not by applying a non-linear regression model.

## **Results:**

The following is our finding through this empirical research.

First of all, over the 30 years period (1980-2008), the research finds a negative relationship between total/public/public/private current health expenditures and GINI, which implies a positive effect of the former to the latter.

Second, the balanced panel data analysis over 20 years (1999-2008), the same results as the above were found except the insignificant impact of PHI on GINI

Third, interestingly, the PHI was found to significantly influence GINI only in NHI system, but not in NHS system.

We need to discuss the results in more detail.

## **Reference:**

- Allerano, M., and S.R. Bond(1991), "Some of tests of specification for panel data: Monte Carlo evidence and application to employment equation," *Review of Economic Studies* 58, pp.277-297.
- Anand, S., and S.M. Kanbur(1993), "The Kuznets process and the inequality-development relationship," *Journal of Development Economics* 40, pp.25-72.
- Barro, R.J.(1997), *Determinants of Economic Growth: A cross-country empirical study*, Cambridge Massachusetts, The MIT Press.
- Bloom, D.E. and David C.(2001), "The Effect of Health on economic growth: theory and evidence," NBER Working Paper No.8587.
- Blundell, R., and S. Bond(1998), "Initial conditions and moment restrictions in dynamic panel data models," *Journal of Econometrics* 87, pp.115-143.
- Hartwig, J.(2010), "Is health capital formation good for long-term economic growth? - panel Granger-causality evidence for OECD countries," *Journal of Macroeconomics* 32, pp.314-325.

- Knowles, S., and P.D. Owen(1995), "Health capital and cross-country variation in income per capita in the Mankiw-Romer-Weil model," *Economics Letter* 48, pp.99-106.
- Kuznets, S.(1955), "Economic Growth and Income Inequality," *American Economic Review* 45, pp.1-28.
- Le Grand, J.(1982), *The Strategy of Equity. Redistribution and the School Services*, London: George Allen & Unwin Ltd..
- Li H., and L. Huang(2009), "Health , education, and economic growth in China: empirical findings and implications," *China Economic Review* 20, pp.374-387.
- Mankiw, N.G., D. Romer, and D.N. Weil(1992), "A Contribution to the Empirics of Economic Growth," *Quarterly Journal of Economics* 107, pp.407-439.
- Rivera, B., and L. Currais(1999a), "Economic growth and health: direct impact or reverse causation?" *Applied Economics* 33, pp.761-764.
- Solow, R.M.(1956), "A Contribution to the Theory of Economic Growth," *Quarterly Journal of Economics* 70, pp.427-443.
- Solt, F(2009), "Standardizing the World Income Inequality Database," *Social Science Quarterly*, 90(2), pp.231-242.
- Weil, D.N.(2007), "Accounting for the effect of health on economic growth," *Quarterly Journal of Economics* 122(3), pp.1265-1306.