

## Alternative capital for alternative development: Investigation of possible development transition using capital method

### Abstract

How to move from current unsustainable pattern of development to a sustainable one? The traditional growth is industry-centered, and pursuing the growth of GDP, profit, income, materials, and the investment of physical capital. This pattern of development is confronted with limitation of natural resources, inequality in society, and loss of happiness.

Research debate in 1970s lays the ground work for a new pattern of growth, such as Space-Ship Economy by Boulding (1966), Limits to Growth by Meadows *et al* (1972; better known as by Club of Rome), the application of Net Energy concept by Odum (1973) and Steady-State Economy by Daly (1974). Recently, the research on prosperity without growth (Jackson 2009) as well as on degrowth (Latouche 2004, Schneider *et al* 2010, Victor 2011) has reignited the discussion on an alternative development pattern in time of economic downturn. Most of the work criticises on the conventional pattern and draws the picture of an ideal pattern. Nevertheless, related research rarely addresses detailed plans about how to reach the alternative pattern of development.

The traditional route to development has been centred on technology improvement and physical capital accumulation. Technology improvement, regardless how it is actually applied, potentially contributes to an increase in extending the lifespan of products and of human beings, and to a decrease in work hours (Fogel 1999). The accumulation of physical capital reinforces the production cycle and stresses material demand and supply. Pressure is often further placed on financial management that backs up physical capital. Increasing demand for capital causes current production to rise. What could be the alternative to the conventional combination of capital input that could be applied to avoid overload with material production?

The alternative pattern should also consider the following challenges facing the neoclassical growth model. The threat to social sustainability and to environmental sustainability in the conventional development path has become prevalent. Being nostalgic about (re-)connecting with nature and with other human beings is commonly observed nowadays. Economic sustainability is also unsecured. Several countries face limits to material growth in addition to the financial crisis of 2008 onwards. While it is often argued that rich countries should consider abandoning the

on-going growth pattern, the possibility for a country to flourish without high income is rarely addressed. The stereotype concept of “carefree, happy poor” can hardly explain low income countries’ good performance in education and in health.

Here we make an attempt to propose a possible route of transition in the perspective of capital. That is to focus on the investment of human capital and of social capital. The strategies for transformation will be also based on the shifting the resources to human-centered investment. Although the plan will crowd out the investment in physical capital, it will contribute more directly to the enhancement of well-being of individuals at a broader base.

This article provides preliminary answer to the above questions using capital method. The concept of capital has long been crucial for economic development, from Solow growth model to linking capital stock with sustainable development (Daly 1972; Pearce and Barbier 2000). This article adopts the capital method to look at the substitutability among types of capital. Chang (2013a) reviews the discussion on the capital method. Within the capital method, the four capital method is widely accepted. It incorporates stocks of physical capital (‘manufactured capital’, ‘produced capital’ or ‘man-made capital’), human capital, social capital and natural capital (Ekins 1992; United Nations et al. 2003; Ekins et al. 2008). There is also five capital method in which financial capital is included (Bebbington 1999; United Nations 2008). However, most financial assets drop out of the national wealth accounting because for every asset there exists somewhere else a liability of an exactly offsetting size.

Capital method, suggested by Chang (2013a), offers a basis for understanding that development is not entirely random but can possibly be managed through investment in specific stocks. Furthermore, like in neo-classical growth theory, it provides a framework that explains why spending income on investment rather than current consumption is likely to enhance well-being in the future. Thirdly, it allows us to consider the relation among different types of capital.

Recall the discussion about the four features of the growth model. In the context of sustainability, output and the corresponding welfare measurement should be adjusted to cover environmental and social dimensions. With this expansion in the meaning of output, capital input therefore demands enrichment. First of all, the analysis of the relationship among different types of capital, such as substitutability, may enrich the interpretation of the input factors in the production function. Secondly, the inclusion of capital in the capital-output ratio could be expanded to

capital other than physical capital with the understanding of substitutability among different sorts of capital. Thirdly, given the same reason, the inclusion of capital in the capital-labour ratio could be expanded to capital other than physical capital. Lastly, related to the reinterpretation of output, several dimensions in the alternative wealth measurements, such as life satisfaction, are associated with social capital and human capital. The interaction between these types of capital and physical capital could be introduced in the analysis via capital method.

Capital method is employed here to examine the substitutability and complementarity among four-capital. The four types of capital are namely physical capital, human capital, social capital and natural capital. We have conducted pair-wise comparison and focuses on analysing the substitution and complementarity within each pair of capital.

The preliminary findings regarding pair-wise comparison between social capital and natural capital, that between social capital and human capital, and that between physical capital and natural capital are demonstrated. A prototype is constructed in order to demonstrate the preliminary findings of the relationship between social capital, human capital, natural capital and physical capital in welfare attainment. There are 14 factors and 29 processes identified in the prototype.

It is noteworthy that social capital and natural capital may reinforce each other via collaboration and stability of a community. Social capital such as family bonds and community ties provide material and spiritual supports, as well as channels of passing along traditional values and skills. Capital of these sorts may, to a certain extent, serve as substitute for physical capital input as well as enhancement of well-being.

Keywords: capital method, degrowth, human capital, social capital, development transition