

INTEGRATING HUMAN CAPITAL, INVESTMENT, INSTITUTION, AND NATURAL RESOURCE: EMPIRICAL EVIDENCE FOR THEIR RELATIONSHIPS WITH ECONOMIC GROWTH AND DEVELOPMENT

Rina Mihashi, GPSS, ID 47-126847
Advisor: Associate Professor Masaru Yarime
Co-Advisor: Associate Professor Hirotaka Matsuda

ABSTRACT

Human capital, investment, institution, and natural resource are among the determinants of economic growth and of development. Davis (1995) compares the magnitudes of the changes in the levels of development during period 1970-1989 between mineral exporters and non-mineral exporters, using wide range of development indicator. This master's thesis examines more recent time period (1990-2010), and the association between resource abundance and the long-run development. Resource export (a flow) is considered as the measure of resource dependence (Davis, 1995; Sachs and Warner, 1997; Bulte et al., 2005; Brunnschweiler and Bulte, 2008; Mihashi and Yarime, 2013; Mihashi et al., 2013), whereas resource abundance is measured as a stock (e.g. asset value of natural capital). The natural capital considered in this thesis includes cropland, pastureland, timber and non-timber forest resources, protected areas, and subsoil assets. Subsoil assets include energy resources (oil, natural gas, hard coal, lignite) and other mineral resources (bauxite, copper, gold, iron, lead, nickel, phosphate, silver, tin, zinc).

The relationships between the total of human capital, institutional quality, investment rate, and resource abundance and (1) economic growth, and (2) long-run development, are not well understood as previous literature has treated these four factors independently. Relatively resource-rich countries (e.g. Ireland, Trinidad and Tobago, and United Kingdom) seem to have experienced relatively small change in the level of development, vice versa (e.g. Morocco and

Mozambique). However, there are some relatively resource-rich countries that have experienced relatively large increase in the level of development (e.g. Cameroon and Niger). Similarly, some relatively resource-poor countries have experienced relatively small increase in the level of development (e.g. Portugal and Jamaica). Other factors that seem to have been associated with the magnitude of the change in the level of development are human capital, investment rate, and institutional qualities; Cameroon and Niger have relatively low scores on these three factors, Jamaica has relatively high scores, and Portugal has relatively low score on human capital but high scores on investment rate and institutional qualities. What seem to be related to the magnitude of change in the level of development are not only these four independent factors but also the total of these four factors. Thus, this master's thesis examines the association between the total of human capital (H), investment rate (I), institutional quality (I), and natural resource abundance (R), measured by the HIIR index, and the level of development.

The contributions of this master's thesis are the following. The work by (1) Brunnschweiler and Bulte (2008) is extended by examining the relationship between the natural resource abundance and the level of development, and (2) Bulte *et al.* (2005) is extended by examining the long-run development, and additional indicators of human welfare and development. This master's thesis also extends previous works by (1) examining the differences in long-run growth and development across and within regions and the underlying factors that explain such differences, and (2) introducing the HIIR index that measures the total of human capital, investment rate, institutional quality, and natural resource abundance. The objectives of this master's thesis are to examine the relationships between natural resource abundance and (1) economic growth, and (2) long-run development, and the relationships between the HIIR index and (1) and (2). Cross-country statistical analysis of the data for period 1990-2010 is conducted to examine these

relationships. The aim is to find initial conditions that are associated with subsequent long-run growth and development.

The following were the main findings. When accounting for regional differences, European countries and OECD members that experienced relatively fast growths were found to have relatively high natural resource abundance. This was not the case for African countries. African countries that experienced relatively fast growths had relatively high human capital accumulation. European countries and OECD members had relatively high GDP per economically active population (aged 15-64) and experienced relatively rapid economic growth compared to African countries during the past two decades. Second, relatively rapid economic growth was associated with relatively high score on the HIIR index in Europe but not in Africa and among OECD members. Third, when regional differences were not accounted for, countries that experienced relatively fast economic growths experienced relatively small changes in the level of development. When regional differences were accounted for, the changes in the levels of development did not vary by growth rates among European countries. The OECD members that grew relatively fast experienced relatively large increases in the levels of development. In contrast, the African countries that grew relatively fast experienced relatively small increase in the level of development. European countries and the OECD members had relatively high levels of development and experienced relatively small changes in the magnitudes of the levels of development compared to African countries. Finally, regardless of regional differences, countries that experienced relatively large increase in the levels of development had relatively low scores on natural resource abundance and on the HIIR index.

Depending on the values of GDP per economically active population and region-specific factor, the associations between growth rate and (1) natural resource abundance, (2) the HIIR index, and

(3) human capital might vary. Similarly, depending on the levels of development and region-specific factors, the association between the magnitude of the change in the level of development and growth rate might vary.

Since the aim of this paper is to find some initial conditions associated with subsequent long-run growth and development, the discussion focuses on Africa that has relatively low levels of development. For African countries that already have relatively high levels of development to increase their levels of development marginally, some initial/past conditions that may be important are to (1) have large total of human capital, investment rate, institutional quality, and natural resource abundance, and fast economic growth, and (2) invest in education and infrastructure, and manufacturing and services (i.e. diversifying the economy), driving the economic growth. For African countries that still have relatively low levels of development to increase their levels of development dramatically (they tend to have small total of human capital, investment rate, institutional quality, and natural resource abundance, and experience slow economic growth), receiving and spending the foreign aids to improve their levels of development may be one of the important points.

Key words: development, human capital, institution, investment, natural resource, sustainability