

Секція 2 **ФІНАНСОВО-КРЕДИТНИЙ МЕХАНІЗМ РОЗВИТКУ
СУБ'ЄКТІВ ГОСПОДАРЮВАННЯ:
ВІТЧИЗНЯНИЙ ТА ЗАРУБІЖНИЙ ДОСВІД**

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**HUMAN CAPITAL,
INDUSTRIAL GROWTH AND RESOURCE CURSE**

However the evolution of the economy from one cone to the next one requires a substantial upgrade of labor skills. Authors show that this transition could be problematic in resource rich economy as the increase in physical capital accelerates the substitution of labor in production and lowers the return to labor and human capital associated with it. This would not happen in resource poor economy as an increase in physical capital here will make labor more scarce factor of production and increase its payoff which in turn stimulates the investments in skills. Therefore one of the model results is that when we compare the resource rich economy to resource poor economy we expect the tougher deficit of the most skilled labor in the former one. Testable prediction of this result is that the industries which require sophisticated human capital inputs would be disadvantaged in resource rich countries relative to industries that technologically less dependant on the highly skilled labor. This disadvantage should disappear when we differentiate industries based on their demand for lower or average levels of human capital. These are the hypotheses that we test in our paper applying the now-standard methodology proposed by Rajan and Zingales (1998).

To test this prediction we construct the measures of industrial sectors' human capital requirements from data on the distributions of the levels of human capital of workers within US industries. Under the assumption that labor market and the corresponding market of human capital in U.S. are mobile we can use the observed distributions of human capital in the U.S. industrial sectors as a proxy for the demand of industries for lower and high levels of human capital. Assuming further that this demand is derived from production technologies and technologies spread fast across the world we can carry over the measures of industrial human capital demands to other countries. Then we examine whether industrial sectors that are relatively more skilled labor intensive develop disproportionately slowly in countries with higher contribution of natural resource sectors in overall GDP

To reflect the heterogeneity of human capital and the fact that intensity of industries with respect to labor skills demand depends on the particular level of labor skills we construct several rankings of manufacturing industries for successive levels of human capital – from low skilled to high skilled ones.

For illustrative purpose consider the following example. According to our measures of high-skilled labor intensity industry Machinery has higher demand for very skilled labor relative to industry Metallurgy. According to our hypothesis we expect Machinery to develop relatively slowly than Metallurgy in countries that have more natural resources compared to resource poor ones. Let us compare the growth of these industries in three countries, Norway, Belgium, and Austria, over the period 1990–2000. Consistent with our arguments, in Norway, which is one of the richest natural resource countries, Machinery grew at a 4 percent lower annual real rate than Metallurgy. In Belgium, which is among the poorest countries in terms of hydrocarbon production, Machinery grew at 2 percent higher rate than Metallurgy, and in Austria, which is among the countries with lowest share of primary export in overall GDP, Machinery grew at 1,5% higher rate than Metallurgy.

We implement a test of the theory in a cross-section of countries and industries. Our estimations show that when we measure industry skill intensity on the basis of the industry's demand for high-skilled labor (top deciles of human capital distribution) then we observe the significant systematic loss in growth rates of industries with higher demand relative to those with lower demand in countries rich in natural resources compared to resource poor countries. Moreover these estimated losses become insignificant as we use ranking of industries based on the demand for less or averagely sophisticated labor.

The problem that comes along this evolutionary path and at some point can prevent the further development of the country is that the new more capital-intensive technologies require more skilled labor. However as pointed above the availability of natural resources makes the sufficient accumulation of skills and human capital very unlikely as the return to labor declines as economy accumulate physical capital which is not the case in countries with insignificant amount of resources where capital accumulation makes labor and correspondingly human capital more critical factors of production. The underdevelopment of skills can prevent the country from switching into new more advanced product mixes and lock the country in the previous cone of diversification.

We can summarize the human capital channel that transmits resource abundance to industrial development in the following way. The existence of natural resources in an economy provokes the decline in the return to labor and subsequently to human capital as physical capital stock accumulates in the economy. This prevents the development of new more sophisticated

industries as there is not enough skilled labor. In other words, the resource rich economy faces a trap of skilled labor underdevelopment.

An important feature of the model is that in the world of global trade the movement from natural resource extraction to capital and resource intensive manufacturing requires a substantial upgrading of the human capital but when most of savings are generated by a few resource-owners it may be difficult for the economy to transfer those savings in the sophisticated human capital assets.

When we apply the model findings to actual industrial development across the countries we could expect that those industrial sectors which technologies are more intensive in sophisticated human capital will be in disadvantage in economies rich in natural resources. The model prediction is that while there are enough workers with average skills in the resource rich economy it is the insufficiency of marginally high skills in the resource rich economies that prevents the successful development of new industries.

Our findings are consistent with the argument developed in theoretical literature that deteriorative effect of natural resources on the development of industrial sectors could be the byproduct of the capital accumulation process in the resource abundant open economies that undermines the development of high skilled labor force. As a sustainability of economic growth is conditional on the development of innovative high skilled industries then the natural resources pose a real threat to the long-run industrial development of resource rich countries. This problem becomes even more dramatic if we take into account the irreplaceable nature of most natural resources and it emphasizes the need of proper government policy to address the threat. And not just spending on general education is important but special measures to ensure the development of very sophisticated and professional human capital need to be implemented.

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