Natural resources (Black gold) and human capital in the context of Saudi Arabia

Najla Almutairi

Queen's University Belfast

nalmutiari02@qub.ac.uk

Abstract: A number of studies have suggested that an abundance of natural resource gives rise to what is known as 'Dutch disease', and also distorts the quality of institutions. In contrast, this paper examines whether plenty of natural resource crowds out human capital. The results show that natural resources have a positive effect on human capital in all three measures of human capital.

Keywords: natural resource, human capital, growth, education, resource curse

Introduction

Sachs and Warner (1995) noted that in the nineteenth century, resource-rich economies such as Russia experienced low economic growth compared to resource-scarce economies such as Switzerland and Japan. The topic of natural resources and their relationship to economic growth has received a great deal of attention and considerable discussion in the subsequent literature. A number of empirical studies support Sachs and Warner's conclusion which states that natural resources are indeed a curse, see for example (Kronenberg, 2004; Arezki and Ploeg, 2008 and James and Aadland, 2011). However, other papers argue that an abundance of natural resources positively affects economic growth, and the curse of such resources is not evident, (Lederman and Maloney, 2008; Brunnschweiler, 2008; Alexeev and Conrad, 2009; Cavalcanti *et al*, 2011 and Fan et al, 2012). Indeed, several theoretical and conceptual models are proposed to explain the transmission channels of the natural resources curse. These channels briefly describe Dutch disease, rent seeking, and neglecting investment in education or human capital, lowering investment and saving, and decreasing the quality of an institution. For more details see (Corden and Neary, 1982; Matsuyama, 1991; Rodrigues and Sachs, 1999; Birdsall, 2000; Torvik, 2002; Gylfason, 2007; Holder, 2006; Cabrales and Hauk, 2010). A few studies focused particularly on the effect of natural resources on economic growth via the channel of human capital, as the latter is one of the most important determents of economic growth. Interestingly, the findings produced by these studies are mixed. The differences in the results refer to, for example, either prolonged argument around the most appropriate measure of human capital, or to the types and density of natural resources. See also (Davis, 1995; Gylfason, 2001; Stijns, 2006; Behbudi et al, 2010 and Blanco and Grier, 2012). This study presents new and further evidence in regards to natural resources and human capital, and contributes to the very limited literature in two main aspects. First, Saudi Arabia has not been considered as an individual case in this topic, although it is among the largest exporters of oil in the world. Second, unlike previous studies, the current study employs the VECM model to estimate the nature of relationship between human capital and natural resources. The result identified that natural resources have a positive effect on human capital, and the natural resource curse is not pronounced in the case of Saudi Arabia.

Methods

Econometrics strategy starts firstly with testing the integration of variables and if they are stationary I (0), the process will be estimated using the Vector Autoregressive (VAR) method. However, if all or some of variables have a unit root, cointegration must be conducted and thus the data - generating process is modelled as the Vector Error Correction Model (VECM). Indeed, there are several important issues that must be taken into account with either the unit root or cointegration tests in order to obtain reliable results. For example, lag order selection, deterministic regressors, and the presence of structural shifts in the level of data. In the next step, the adequacy of the model is checked using several tests (test for autocorrelation and test for heteroskedasticity). When the model passes diagnostic tests, Granger Casualty is run as the VAR model can also be used for forecasting purposes.

Findings and argument

In order to investigate the effect of natural resources on human capital, the study covers the period from 1970 until 2014. The result of unit root test, performed by the Augmented Dickey Fuller (ADF) test, indicated that variables have a unit root at the level. However, variables become stationary at the first difference. As variables are integrated of order I (1), cointegration test was run using the Johansen test, and the result of trace test showed that there is one vector cointegration. Thus, as variables are cointegrated, the VECM model was estimated as follows:

$$\Delta y_t = \alpha_0 + \alpha_1 t + \Pi y_{t-1} + \Gamma_1 y_{t-1} + \cdots + \Gamma_{p-1}\Delta y_{t-p+1} + u_t \qquad (1)$$

Where α_0 and $\alpha_1 t$ denote the deterministic term included into the cointegration relation. Also, Πy_{t-1} is the long-term part and Γ_j as (j=1…, p-1) indicate the short-term parameters. y_t represents the variables used by the study: Human capital (H) and natural resources (N). All variables are expressed in logarithmic form except GSCHO, the definition of data and its source is illustrated in the Table (1). The result suggested that natural recourse impact positively and significantly human capital in all three alternative measures of human capital. Moreover, the results indicated the models passed adequacy tests. Oil rents Granger causes only human capital as measured by expenditure on education, which means that oil rents can help to improve the forecasting of expenditure on education as revealed by the Granger causality test.

Table (1.1): The definition of data and its source

Variable	Definition	Source
LEXPEDU	Expenditure on education in Saudi Riyal	Saudi Arabian Monetary Authority (2016)
LENROL	Gross enrolment ratio, tertiary level, both sexes (%)	World Bank (WDI, 2016)
GSCHO	The growth rate of tertiary level scholarships (abroad)*	General Authority for statistics of Kingdom of Saudi Arabia (2016)
LN	Oil rents as a share of GDP (%)	World Bank (WDI, 2016)

*Scholarships include Arabic and Islamic countries, America and Europe.

Conclusion

This paper sought to present further evidence on whether an abundance in natural resource is a boon or a curse in relation to human capital, taking Saudi Arabia as an example. Contrary to the literature which claimed the harmful effect of natural resource on human capital accumulation, this study identified that such resources do not represent a curse at least in the case of Saudi Arabia. The presence of natural resources and their rents enable investment in education. This, in turn, facilitates the building of human capital. The link between education and human capital accumulation is complex and more investment in education does not automatically lead to more human capital accumulation. In future research, it would be interesting to investigate whether the presence of natural resource creates any adverse effects on the quality of an institution in the context of Saudi Arabia.

Reference

Alexeev, M. and Conrad, R. (2009) “The Elusive Curse of Oil”, Review of Economics and Statistics, 91(3), pp. 586-598.

Arezki, R. and Ploeg, F. (2008). “Can the Natural Resource Curse be turned into a Blessing? The Role of Trade Policies and Institutions”. Oxford Centre for the Analysis of resource Rich Economies.

Behbudi, D. Mamipour, S. and Karami, A. (2010) “Natural Resource Abundance, Human Capital and Economic Growth in the Petroleum Exporting Countries”, Journal of Economic Development, 35(3), pp. 81-102.

Birdsall, N., T. Pinckney and R. Sabot (2001) “Natural Resource, Human Capital and Growth”. In R. Auty (Ed), Resource Abundance and Economic Growth. Oxford University Press, Oxford.

Blanco, L. and Grier, R. (2012) “Natural Resource Dependence and the Accumulation of Physical and Human Capital in Latin America”, Elsevier Journal, 37, pp. 281-295.

Boschini, A., Pettersson, J. and Roine, J. (2007) “Resource Curse or Not: a Question of Appropriability”, Scand. J. of Economics, 109(3), pp. 593-617.

Brunnschweller, C. (2008) “Cursing the Blessing? Natural Resource Abundance, Institution and Economic Growth”, World Development, 36(3), pp. 399-419.

Corden, W. and Neary, J. (1982) “Booming Sector and De-Industrialization in a Small Open Economy”, The Economic Journal, 92(368), pp. 825-848.

Davis, G. (1995) “Learning to Love the Dutch Disease: Evidence from the Mineral Economies”, World Development, 23(10), pp. 1765-1779.

Ding, N. and Field, B.C. (2005). “Natural Resource Abundance and Economic Growth”. Land Economics, 81(4), pp. 466-502.

Fan, R., Fang, Y. and Park, S. (2012). “Resource Abundance and Economic Growth in China”. China Economic Review, 23(3), pp. 704-719.

Gylfason, T. (2001) “Natural Resources, Education and Economic Development”, European Economic Review, Elsevier Journal, 45, pp. 847-859.

Gylfason, T. (2008). “Development and Growth in Mineral-rich countries”. United Nations Research Institute for Social development (UNRISD).

Hodler, R. (2006). “The Curse of Natural Resource in Fractionalized Countries”. European Economic Review, 50 (6), pp. 1362-1386.

James, A., and Aadland, D. (2011). “The Curse of Natural Resources: an Empirical Investigation of U.S. Counties”. Resource and Energy Economics, 33(3), pp. 440-453.

Kronenberg, T. (2004). “The Curse of Natural Resources in the Transition Economies”. Economic of Transition, 12(3), pp. 399-426.

Lederman, D. and Maloney, W. (2002). “Open Questions About the Link Between Natural Resources and Economic Growth: Sachs and Warner Revisited”. Working Papers, N 141.

Lederman, D. and Maloney, W. (2008). “In Search of the Missing Resource Curse”. Policy Research Working Paper 4766, the World Bank.

Papyrakis, E. and Gerlagh, R. (2004). “The Resource Curse Hypothesis and its Transmission Channels”. Journal of Comparative Economics, 32(1), pp. 181-193.

Rodriguez, F. and Sachs, J. (1999). “Why Do Resource Abundant Economies Grow More Slowly?” Journal of Economic Growth, 4(3), pp. 277-303.

Sachs, J. and Warner, A. (1995). “Natural Resource Abundance and Economic Growth”. NBER Working Paper Series 5398.

Sachs, J. and Warner, A. (2001). “The Curse of Natural resources”. European Economic, 45, pp. 827-838.

Stijns, J. (2005) “Natural Resource Abundance and Economic Growth Revisited”, Resource Policy 30, pp. 107-130.

Stijns, J. (2006) “Natural Resource Abundance and Human Capital Accumulation”, World Development, Elsevier Journal, 34(6), pp. 1060-1083.