



Ramezani, M., Rahimi Boroujerdi, A., Nassiri Aghdam, A., & Mehrara, M. (2019). Political economy of natural Resources and education; A study of the impact of change in the resources rent management on the education quality. *Interdisciplinary Studies in the Humanities*, 11(3), 139-169. doi: 10.22035/isih.2019.3468.3681

Doi: <http://dx.doi.org/10.22035/isih.2019.3468.3681> URL: http://www.isih.ir/article_312.html

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Political Economy of Natural Resources and Education; A Study of the Impact of Change in the Resources Rent Management on the Education Quality

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Received: May. 21, 2019; Accepted: Sep. 18, 2019

Extended Abstract

This article investigated trade-off between human and natural resources emphasizing on education. Some studies have argued that resource-rich countries are exposed to relying on natural resources and neglecting human resources. So that emphasizing on education as a tool of investing in human resources was declined. Ratio of the share of resources rent to the share of taxes was introduced as representative of political economy of natural resources. This variable controlled effects of changing the natural resources rent management. International tests scores (TIMSS, PIRLS and PISA) were considered as education quality measure. A panel data model with fixed effects approach was applied as econometric method at the estimating of education production function's parameters. The findings revealed that effects of political economy of natural resources were significant and then education quality diminished while share of natural resources rent at the government revenues increased. In most cases estimated coefficients for the variable of the share of resources rent to the share of taxes' ratio were robust and negative effect of reducing the dependence of the economy on resources rent on the quality of education was confirmed.

Keywords: education, education quality, natural resources rent, rent management

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INTRODUCTION

The scope of this article is to answer the question "Can one part of the differences in the performance of the school education system of the countries with natural resources be explained in the international standard tests regarding their use of natural resources rent?" This question has been formed by studying in the area of political economy of natural resources, methods for the management of natural resources rent and education economics, evidences in schooling education system of resource-rich and resource-poor countries, the scores of international standard tests (TIMSS, PIRLS, PISA) and why some countries have performed well in almost all of these tests and others have lower levels of performance.

While trying to "examine the relationship between the natural resources rent and the education quality", the researcher based his assessment on the political economy of education. Therefore, this hypothesis was followed: "Education quality decreases with increasing share of natural resources in government revenues".

PURPOSE

Previous studies have mainly focused on the effects of school and family on educational outcomes; Thus, by adding the "effect of political economy of natural resources" to our analytical framework, we have attempted to answer the question of whether the effect of political economy of natural resources can explain some of the differences in the performance of the schooling education system in different countries.

METHODOLOGY

The panel data approach was chosen as the metric study method for test the hypothesis. An education production function with five explanatory variables and one dependent variable was designed and estimated on the basis of the fixed effects model for 79 participating countries in the period 1995–2015. The explanatory variables were:

- 1) Government educational spending and class size as the representative of school resources;
- 2) Per capita gross domestic product and parents' education level as the representative of non-school resources;
- 3) the ratio of the share of natural resources rent to GDP to the share of tax revenues to GDP as the representative of political economy of natural resources effect (How to manage natural resources rent in the economy).

The results of the TIMSS, PIRLS and PISA tests were also used as dependent variable.

The process of estimating the model coefficients was performed using Stata software. The scores were extracted from the International Association for the Evaluation of Educational Achievement data and the results of the Program for International Students Assessment by Organization for Economic Co-operation and Development. The data of model explanatory variables were gathered from the UNESCO Institute for Statistics, World Bank Open Data, Barro-Lee Educational Attainment Dataset, and United Nations Development Programme: Human Development Report.

RESULT

The theoretical and practical significance of the effect of the ratio of resources rent share to taxes share on test scores was emphasized in this study. Based on the Z statistic and probability values, the estimated coefficients along with their signs confirmed the hypothesis of the study.

Increasing one standard deviation of this ratio (by 10/04) resulted in a 7/23, 5/00, 9/24, 6/22, 8/23, and 6/53 units decrease in the fourth and eighth math, science and reading scores respectively. In other words, a shock of one standard deviation to increase the economy's dependence on revenues from natural resources and replace it with tax revenues can reduce scores by 0.10, 0.07, 0.13, 0.10, 0.13, and 0.14 standard deviation respectively. Hence, it can be argued that increasing the importance of resource-based government revenues over non-resource government revenues, which implies that the economy is more dependent on these revenues, would marginalize education as a factor in investing in human resources, leading to lower its quality, efficiency and effectiveness.

In most cases, the estimated coefficients for ratio of resources rent share to taxes share were robust to the different assumptions resulting from the elimination of other explanatory variables and confirmed the negative effect of increasing the dependence of the economy on resources rent on the education quality.

DISCUSSION

In order to test the correct way of transferring the effects of the political economy of natural resources on the education quality, robustness analysis was performed related to the ratio of resources rent share to taxes share to different assumptions. Therefore, the alternatives were estimated by eliminating some explanatory variables. For almost all cases, the coefficient of the ratio of resources rent share to taxes share was statistically and practically significant. This implies acceptance of





the political economy of natural resources effect on the education quality: The change in the pattern of management of natural resource revenues affects the quality of education. Accordingly, the study hypothesis is robust to the various assumptions resulting from the elimination of explanatory variables and is acceptable. Of course, the effect intensity for math and science scores was higher than for reading scores, which decreased relative to all three subjects as they moved to higher educational grades. Thus, the greater dependence of governments on resource revenues threatens more the quality of early education. Given the robustness of the results, the main question at the forefront of the debate has a positive answer: Changing the way natural resources rent management in the economy can change the education.

CONCLUSION

The findings of the study showed that the effect of the political economy of natural resources on the education quality is significant. Thus, as the share of natural resources rent increases in government revenues, the quality of education decreases and this effect can explain some of the differences in the performance of educational systems in different countries. The coefficient of the ratio of resources rent share to taxes share are, in most cases, robust to various assumptions about the elimination of school and non-school resource variables and confirm the negative effect of increased economic dependence on resources rent on education quality.

Therefore, reforming tax policies and shifting the dependency of income sources on governments' budgets in resource-rich countries from resource-based revenues to tax-based revenues is suggested. This can be in line with the economic development strategy correction and is seen as an effective, useful and necessary strategy to enhance the quality, efficiency and effectiveness of the education system as well as safeguard the revenues from natural resources as inter-generational and efficient wealth.

NOVELTY

Designing an indicator to track the effects of changing in the management of natural resources rent and its inclusion as an explanatory variable in the education production function to investigate its impact on education quality has been the innovation of the present study. Using this indicator can make significant results available for public policy and decision-making in the field of education. These results can be used to correct and redesign macroeconomic socio-economic development strategy based on education.

BIBLIOGRAPHY

- Auty, R. M. (1994). Industrial policy reform in six large newly industrializing countries: The resource curse thesis. *World Development*, 22(1), 11–26. doi:10.1016/0305-750x(94)90165-1
- Auty, Richard M. (1993). *Sustaining development in mineral economies: The resource curse thesis* (1st ed.). London: Routledge
- Baltagi, Badi H. (2008). *Econometric analysis of panel data* (4th ed.). Chichester: John Wiley & Sons.
- Barro, R. J. (2001). Human capital and growth. *American Economic Review*, 91(2), 12–17. doi:10.1257/aer.91.2.12
- Barro-Lee educational attainment dataset (2013). Retrieved from Barro-Lee Internet Database.
- Becker, G. S. (1962). Investment in human capital: A theoretical analysis. *Political Economy*, 70(5), 9–49. doi:10.1086/258724
- Boissiere, M., Knight, J., & Sabot, R. (1985). Earnings, schooling, ability, and cognitive skills. *The American Economic Review*, 75(5), 1016-1030.
- Bornhorst, F., Gupta, S., & Thornton, J. (2009). Natural resource endowments and the domestic revenue effort. *European Journal of Political Economy*, 25(4), 439–446. doi: 10.1016/j.ejpolco.2009.01.003
- Bowles, S. (1970). Towards an educational production function. In *Education, Income, and Human Capital* (pp. 11-70). NBER.
- Bravo-Ortega, C., & de Gregorio, J. (2005). *The relative richness of the poor? Natural resources, human capital, and economic growth*. Policy Research Working Papers. doi:10.1596/1813-9450-3484
- Coleman, J. S. (1995). Equality of Educational Opportunity (COLEMAN) Study (EEOS), 1966. *ICPSR Data Holdings*. doi:10.3886/icpsr06389.v3
- Corden, W. M. (1984). Booming sector and Dutch disease economics: Survey and consolidation. *Oxford Economic Papers*, 36(3), 359–380. doi: 10.1093/oxfordjournals.oep.a041643
- Corden, W. M., & Neary, J. P. (1982). Booming sector and de-industrialization in a small open economy. *The Economic Journal*, 92(368), 825–848. doi:10.2307/2232670
- Greene, W. H. (2012). *Econometric analysis*. ISBN: 978-0-13-139538-1.
- Glass, G. V., & Smith, M. L. (1979). Meta-analysis of research on class size and achievement. *Educational Evaluation and Policy Analysis*, 1(1), 2–16. doi:10.3102/01623737001001002



Interdisciplinary
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Abstract



- Gylfason, T. (2001). Natural resources, education, and economic development. *European Economic Review*, 45(4-6), 847-859. doi:10.1016/s0014-2921(01)00127-1
- Hanushek, E. A. (1979). Conceptual and empirical issues in the estimation of Educational Production Functions. *Human Resources*, 14(3), 351-388. doi:10.2307/145575
- Hanushek, E. A. (2003). The failure of input-based schooling policies. *The Economic Journal*, 113(485), F64-F98. doi:10.1111/1468-0297.00099
- Hanushek, E. A., & Kimko, D. D. (2000). Schooling, labor-force quality, and the growth of nations. *American Economic Review*, 90(5), 1184-1208. doi:10.1257/aer.90.5.1184
- Hanushek, E. A., & Woessmann, L. (2008). The role of cognitive skills in economic development. *Journal of Economic Literature*, 46(3), 607-668. doi:10.1257/jel.46.3.607
- Heyneman, S. P. (1976a). A brief note on the relationship between socioeconomic status and test performance among Ugandan primary school children. *Comparative Education Review*, 20(1), 42-47. doi:10.1086/445862
- Heyneman, S. P. (1976b). Influences on academic achievement: A comparison of results from Uganda and more industrialized societies. *Sociology of Education*, 49(3), 200. doi:10.2307/2112231
- Heyneman, S. P. (1979). Why impoverished children do well in Ugandan schools. *Comparative Education*, 15(2), 175-185. doi:10.1080/0305006790150206
- Hoxby, C. M. (2000). The effects of class size on student achievement: New evidence from population variation. *The Quarterly Journal of Economics*, 115(4), 1239-1285. doi:10.1162/003355300555060
- Hsiao, C. (2014). *Analysis of panel data* (No. 54). Cambridge University Press.
- IEA. (2019). *TIMSS & PIRLS International Study Center*. Boston College, Lynch School of Education. Retrieved from TIMSS & PIRLS Internet Database.
- James, A. (2015). US state fiscal policy and natural resources. *American Economic Journal: Economic Policy*, 7(3), 238-257. doi:10.1257/pol.20130211
- Jensen, B. (2010). *Investing in our teachers, investing in our economy*. Melbourne: Grattan Institute.
- Kern, S., Cornelius, P., Dutta, S., Frenkel, M., Koblenz, W. H. U., Reisen, H., & Walter, N. (2008). *Commodity and non-commodity sovereign wealth funds*. Deutsche Bank Research, July 2008.
- Lederman, D., & Maloney, W. F. (Eds.). (2006). *Natural resources, neither curse nor destiny*. doi:10.1596/978-0-8213-6545-8
- Lee, J.-W., & Barro, R. J. (2001). Schooling quality in a cross-section of countries. *Economica*, 68(272), 465-488. doi:10.1111/1468-0335.00257

- McGuirk, E. F. (2013). The illusory leader: natural resources, taxation and accountability. *Public Choice*, 154(3-4), 285–313. doi:10.1007/s11127-011-9820-0
- Murshed, S. M. (2004). *When Does Natural Resource Abundance Lead to a Resource Curse?* Discussion Papers 24137, International Institute for Environment and Development, Environmental Economics Programme. doi: 10.22004/ag.econ.24137
- Madankar Arani, A., & Arani M (1388/2009). Āmuzeš va towse'e, mabāhes-e novin dar eqtesad-e āmuzeš [Education and development, new topics in education economics]. Tehrān, Irān: Našr-e Ney.
- OECD Organization. (2018). Programme for International Student Assessment. Retrieved from PISA Internet Database.
- Prebisch, R. (1959). Commercial policy in the underdeveloped countries. *The American Economic Review*, 49(2), 251-273.
- Ramezani, M., (1387/2008). Barrasi-ye asar-e navasānāt-e darāmadhā-ye nafti-ye dowlat bar baxš-e gheyr-e ghābel-e tejārat-e eqtesād-e Irān; Motāle'e-ye mowredi dar baxš-e maskan ba estefāde az teknik-e VAR [A study about the effect of fluctuations in government oil revenue on the non-tradable sector in the economy of Iran; A case study in the housing sector using VAR technique] (Unpublished M.A. thesis). University of Tehran, Faculty of Economics, Tehrān, Irān.
- Sachs, J., & Warner, A. (1995). Natural resource abundance and economic growth. NBER Working Paper Series, doi:10.3386/w5398
- Schanzenbach, D. W. (2014). *Does class size matter?* Northwestern University, National Education Policy Center.
- Schleicher, Andreas. (2012). *Knowledge and skills are infinite-Oil is not*. Retrieved from <https://oecdeditoday.com/knowledge-and-skills-are-infinite-oil-is-not/>
- The World Bank (2019). *World Bank Open Data*. Retrieved from WB Internet Database.
- UNESCO Institute for Statistics (2012). *International standard classification of education: ISCED 2011*. Montreal: UNESCO Institute for Statistics.
- UNESCO Organization (2019). *UNESCO Institute for Statistics*. Retrieved from UIS Internet Database.
- United Nations Development Programme. (2019). Human Development Reports. Retrieved from HDR Internet Database.
- Varga, Julia. (2011). *Economics of education*. Department of Economics: ELTE Faculty of Social Sciences
- Wood, A., & Mayer, J. (1998). Africa's export structure in a comparative perspective (October 1998). dx.doi.org/10.2139/ssrn.141201
- Woodhall, M., & Psacharopoulos, G. (1985). *Education for development: an analysis of investment choices*. World Bank.



Interdisciplinary
Studies in the Humanities

Abstract

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. MIT Press.

Zyngier, D. (2014). Class size and academic results, with a focus on children from culturally, linguistically and economically disenfranchised communities. *Evidence Base*, 1(3), 1-24.



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Studies in the Humanities

Vol. 11
No. 3
Summer 2019