

# Opponent's Report on Dissertation Thesis

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Author:	<b>PhDr. Ayaz Zeynalov M.A.</b>
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Title of the Thesis:	Essays on Natural Resource Richness, Economic Growth and Institutional Quality
Type of Defense:	<b>DEFENSE</b>
Date of Pre-Defense:	December 7, 2016
Opponent	<b>Prof. Dr. Richard Frensch</b>

Address the following questions in your report, please:

- a) Can you recognize an original contribution of the author?
- b) Is the thesis based on relevant references?
- c) Do the results of the thesis allow their publication in a respected economic journal?
- d) Are there any additional major comments on what should be improved?
- e) Were the comments raised at the pre-defense, addressed in the dissertation submitted to the regular defense?
- f) What is your overall assessment of the thesis? (a) I recommend the thesis to be defended without major changes; (b) The thesis is not defensible.

(Note: The report should be at least 2 pages long.)

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## Content of the Report:

Report on

“Essays on Natural Resource Richness, Economic Growth and Institutional Quality”

submitted by Ayaz Zeynalov

to the Faculty of Social Sciences, Charles University in Prague

The author studies interrelationships between natural resources, growth and institutions. In particular, chapter 2 provides a meta-analysis of the link between natural resources and economic growth. Chapter 3 links the question of natural resource exports' potential to crowd out manufacturing activity to the quality of institutions in post-Soviet countries. In chapter 4, the author studies the impact of similarities in country income and institutional quality on the bilateral trade of Azerbaijan. Interestingly, and positively, the three chapters are quite well related, more than is typically the case in cumulative dissertations.

Interesting and original results are obtained:



- In terms of accounting for differences in results across studies on the effect of natural resources on economic growth, the following study characteristics are found to be especially important: including interactions between natural resources and institutional quality, controlling for the level of investment activity, distinguishing between different types of natural resources, and differentiating between resource dependence and abundance.
- Against the experience of post-Soviet countries, natural resource exports do not crowd out the manufacturing sector once sufficiently high quality institutions are in place. With low institutional quality, the natural resource curse prevails.
- Similarity of income and institutions with trading partners accounts for higher bilateral exports of Azerbaijan between 1995 and 2012.

The chosen topics are of obviously high policy relevance. While there is a general sense of acknowledgment concerning the importance of institutions, we still know too little on the link between specific institutions, resource abundance, dependence or exports, and patterns of specialization, trade and growth.

The author's is a purely empirical contribution, testable hypotheses are not derived in a formal theoretical setting but are taken from or motivated by the relevant literature. Consequently, data construction and preparation, choice and exercise of empirical methods and robustness issues stand at the forefront.

The author spends considerable effort on combining and constructing appropriate data for estimation purposes, thus creating unique data bases: this is particularly true for the 43 studies providing 605 different regression specifications assembled in chapter 2, as well as for the innovative measures to instrument for institutional quality and resource exports in chapter 3.

The author applies appropriate and state of the art estimations, ranging from meta-regression models in chapter 2 to pooled OLS, fixed and random effect models and generalized two-stage least squares (2SLS) in chapter 3, and Poisson Pseudo Maximum Likelihood (PPML) and conditional fixed-effects Poisson regressions in chapter 4. Throughout, the author tries to embed his own hypothesis testing into frameworks that give him the opportunity to also confirm previous results, uses a number of alternative specifications and additional robustness exercises.

#### *Summing up and recommendations*

- a) As already outlined in my report for the pre-defense, the three content chapters of the thesis do indeed provide original and innovative contributions to their respective fields. Chapters 2 and 3 represent joint work with two and one co-author(s), respectively. As the authors equally share in their joint contributions, the individual contribution of the candidate to these two chapters is both original and substantial.
- b) The three content chapters of the thesis are based on relevant references. On my very few respective queries in my comment for the pre-defense, the candidate responded splendidly.
- c) All three chapters of the thesis have already been published in highly respectable international journals.
- d) In my comments for the pre-defense I raised queries (i) – (xiii) (reproduced below) to be addressed by the author. The candidate did address all queries in a new chapter "Response to Reviewers for the Dissertation Defense." I do not have any additional major comment on what should be improved.



- e) My comments raised at the pre-defense essentially amounted to my written comments for the pre-defense (see item d)), now all satisfactorily addressed in new chapter "Response to Reviewers for the Dissertation Defense."
- f) In terms of an overall assessment, **I do recommend the thesis to be defended without major changes.**

*Appendix: My queries on specific parts and some queries, as raised in my comments for the pre-defense.*

*On the Introduction*

- (i) The introduction is missing so far.

*On Chapter 2: Natural Resources and Economic Growth: A Meta-Analysis*

With more than fifty pages, this chapter is the longest of the thesis.

I have the following major query:

- (ii) In this chapter, potential publication bias is controlled for by relating the size effect (partial correlation coefficients) of natural resources on economic growth to precision (inverse standard errors).  
Another or additional straightforward possibility would be to include more primary studies not formally published.  
Why is this not done here?

*On Chapter 3: Natural Resources, Manufacturing and Institutions in Post-Soviet Countries*

I have the following major queries:

- (iii) It is unclear whether in equation (3.2) resource exports are measured in nominal or in real terms. If the former, does this imply that rising resource prices may affect resource exports and terms of trade simultaneously, so that terms of trade may not exogenously affect exports?

Equation (3.3) sets up a growth regression.

- (iv) The dependent variable in (3.3) is the share of manufacturing in GDP. As the share of manufacturing in GDP would be lowered by any increase in resource sector activity, even with manufacturing activity remaining unchanged: why is this specification a valid test of whether natural resources crowd out manufacturing?
- (v) The authors use initial gdp in their growth regression (equation (3.3) rather than the initial manufacturing share of gdp, thus missing the chance to estimate speed of convergence. Why?
- (vi) The authors voice criticism of standard growth regressions on the basis of omitted variable bias. In line with their criticism, they use estimators that use predominantly time variation.  
In fact, there has been a long-running debate in growth empirics on how to exploit the variation available in panel data. If per capita income growth depends on the initial level of countries' technologies, omitting this variable indeed causes heterogeneity bias: in the absence of measurement error using only within-country variation dominates estimators also using between-country variation. Without omitted variable bias but in the presence of measurement error, and when explanatory



variables are more time persistent than measurement error, however, the opposite is true. Hauk and Wacziarg (2009) perform a Monte Carlo study to assess the effects of both sources of bias on various estimators used in per capita income growth regressions and find that within estimators greatly overstate the speed of convergence and bias steady-state variable estimates towards zero. Estimators that use at least some between-country variation tend to overestimate steady-state variable influence but are probably closer to the true speed of convergence. Especially, the SUR estimator used in Barro and Sala-i-Martin (2004) performs best in terms of estimating speed of convergence. However, the between estimator (OLS applied to a single cross-section averaged over time) performs best in terms of overall bias.

Could the author discuss his choice of estimators against the results in Hauk and Wacziarg (2009)?

*On Chapter 4: The Gravity of Institutions in a Resource-Rich Country*

This chapter is the only single-authored study in the dissertation.

I have the following major queries:

- (vii) The text of this chapter should once more be checked and improved by a native English speaker. The text is difficult to understand in several places.
- (viii) In his introductory discussion of gravity, the author regularly refers to theoretical models (e.g., page 89, second para). However, the most important developments in this respect, i.e., the identification and decomposition of trade costs within structural gravity approaches, compatible with new and new new theories of trade (as, e.g., described in Anderson, 2011), are not mentioned. Perhaps there are two possibilities: either to tone down the theory discussion or extend it.
- (ix) While the interpretation of results is always in terms of trade flows, the basic gravity equation (4.2) is formulated not in terms of trade flows but in terms of openness measures (other countries' imports from Azerbaijan as fraction of their GDP), at the same time omitting mass variables (exporter and importer GDP) from the list of explanatory variables – why?
- (x) The author draws on Helpman (1987) to motivate GDP similarity as a driver of trade. In Helpman (1987), however, for GDP similarity to play a role presupposes the existence of substantial intra-industry trade. How does this motivation relate to the facts of Azerbaijani trade?
- (xi) The (trade) data are probably in nominal terms. Are there period (time) effects, to account for price variations over time, as recommended, e.g., in Baldwin and Taglioni (2006)?
- (xii) Potentially related to item (ix) above: the underlying data are non-standard for a gravity approach: it seems, the trade data are systematically unbalanced, to represent only exports from one country (Azerbaijan) to its trading partners. I.e., Azerbaijan is the only exporter, at the same time all importer countries are represented only by their imports from Azerbaijan. If this is indeed so, this has potential implications on the validity of the imposed gravity structure, which is generally represented by country-specific expenditure functions (for the importers), country-specific allocation functions (for the exporters) and adding-up constraints, such that the sum of all allocated production or expenditure simply is constrained to be exporter and



importer-specific GDP, respectively. Given the systematically unbalanced data, the adding-up constraint on the importer side is not guaranteed to be met.

Why didn't the author use all Azerbaijani trade, i.e. exports from Azerbaijan plus all partner countries' exports to Azerbaijan?

- (xiii) Potentially related to the previous item, the treatment of multilateral trade resistance (MTR) is so far not made explicit in this chapter: intuitively, the higher the trade barriers of a country with the world for fixed trade barriers with a specific country, the more the country will be driven to trade with this specific country (for formally linking this notion to complete specialisation and gravity, see Anderson and van Wincoop, 2003).

For reduced-form gravity specifications using panel OLS, Baldwin and Taglioni (2006) recommend subsuming MTR under time-invariant country-pair specific effects combined with time-variant country- (or different exporter- and importer-) specific fixed effects.

Fally (2015) examines the role of adding-up constraints as the key difference between structural gravity with MTR indexes and reduced-form gravity with simple fixed effects by exporter and importer: estimating gravity equations using the Poisson Pseudo-Maximum-Likelihood Estimator with fixed effects automatically satisfies these constraints and is consistent with MTR indices as in Anderson and van Wincoop (2003).

Could the author discuss his treatment of MTR across his different specifications against the recommendations of the relevant literature under the specific conditions of his systematically unbalanced panel data?

#### References

- Anderson, James E. (2011), The gravity model. *Annual Review of Economics* 3(1): 133-60.
- Baldwin, Richard, and Daria Taglioni (2006), Gravity for dummies and dummies for gravity equations. NBER Working Paper 12516.
- Barro, Robert J., and Xavier I. Sala-i-Martin (2003), *Economic Growth*, 2nd edition. MIT Press.
- Fally, Thibault (2015), Structural gravity and fixed effects. NBER Working Paper 21212.
- Hauk, William, and Romain Wacziarg (2009), A Monte Carlo study of growth regressions. *Journal of Economic Growth* 14(2): 103-47.

Date:	March 29, 2017
Opponent's Signature:	
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