The Resource Curse Hypothesis Re-visited: Evidence using Heterogeneous Panel Analysis

9th BIEE Academic Conference, 19-20 September 2012, St. John's College, Oxford, UK.

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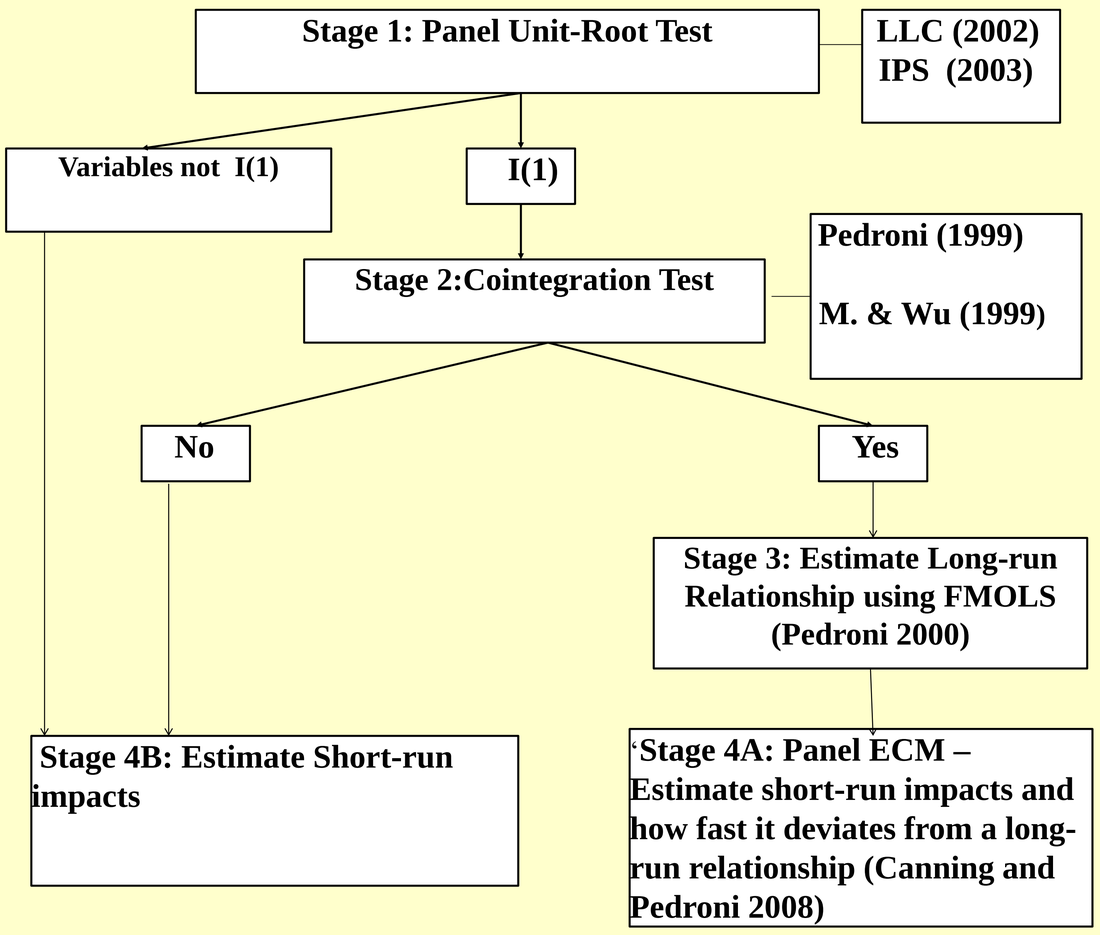
1. Introduction

The Apparent notion that natural resource abundance leads to lower growth performance has attracted much attention in the last two decades. Contributions from the fields of economics and political science have pointed to the particularly strong negative economic and political impact of mineral resource abundance, especially oil – implying that resource abundance is a curse and not a blessing.

Most papers in the literature tend to follow Sachs and Warner (1995) cross-sectional specification which some recent studies (Cavalcanti et al. (2011; van der Ploeg (2011) among others) have identified important drawbacks on – endogeneity problem associated with cross-sectional estimation, it does not take into account time dimension of the data and the few studies that apply panel data technique make use of homogenous approaches such as the traditional fixed or random effects estimators or GMM estimators which impose high degree of homogeneity across the countries. In testing for the resource curse hypothesis, this study therefore applies a heterogeneous panel analysis which recognises that there is substantial degree heterogeneity in the growth experience of different resource abundant countries.

2. Methodology: Panel Causality Testing Framework



Variables - Real GDP, investment as a share of GDP, institutional quality, per-capita oil production and per-capita oil reserve.

Panel A - OPEC Member Countries

Panel B - Other Net Oil Exporting Countries

Panel C - Net Oil Importing Countries

Estimating Long-run Relationship

Consider the following long-run relationship which is estimated using FMOLS:

$$y_{it} = \alpha_i + \beta_1 inv_{it} + \beta_2 iq_{it} + \beta_3 oprd_{it} + u_{it}$$

The above equation is also estimated by replacing per-capita oil production (oprd) with per-capita oil reserve (orsv).

The group-mean panel FMOLS estimator for the coefficient of β is:

$$\hat{\beta}_{GFM} = N^{-1} \sum_{i=1}^{N} \hat{\beta}_{FM,i}$$

and the associated t-statistics is calculated as:

$$t\hat{\beta}_{GFM} = N^{-1/2} \sum_{i=1}^{N} t\hat{\beta}_{FM,i}$$

To determine short-run effects of oil abundance, and how fast the system reverts to a long-run equilibrium, a panel error correction model is estimated using the following equation:

$$\Delta y_{it} = \alpha_0 + \sum_{k=1}^{m} \alpha_{1ik} \Delta y_{it-k} + \sum_{k=1}^{m} \alpha_{2ik} \Delta inv_{it-k} + \sum_{k=1}^{m} \alpha_{3ik} \Delta iq_{it-k} + \sum_{k=1}^{m} \alpha_{4ik} \Delta oprd_{it-k} + \lambda_{1i} ect_{it-1} + u_{it}$$

Following Canning and Pedroni (2008), we apply the lamba-Person test to compute the significance of the panel test, which takes the form:

$$P_\lambda = -2 \sum_{i=1}^{N} InP_\lambda$$

Where InP_λ is the log of p-value associated with individual country i's F-Test for the null hypothesis $\lambda = 0$

3. Results :

Panel Unit-Root Test – All series integrated of order one [I(1)].

Panel Cointegration Test

- Pedroni – While Group-rho test statistic was not significant, Group-PP and Group-ADF test statistic were significant for all three panels – indicating evidence of long-run cointegrating relationship between the variables.
- M. & Wu – Further confirms evidence of cointegration for all three panels.

Estimating Long-run Relationship

	INV	IQ	OPRD	ORSV
Panel A	0.63***	0.34*	-0.02**	-
	0.41***	-0.17	-	0.22*
Panel B	0.53	3.13***	-0.07***	-
	0.35*	1.56***	-	-0.62***
Panel C	1.53***	0.94*	0.48**	-
	1.63***	0.07	-	-0.33***

Panel Causality Test

- **Panel A –** Both oil production and oil reserve has a short-term impact on economic output and the system reverts to a long-run equilibrium
- **Panel B –** Oil production has a short-term impact on output and the system reverts to a long-run equilibrium
- **Panel C –** Oil production has a short-term impact on output and the system reverts to a long-run equilibrium.

4. Conclusion

This work re-investigates the resource-curse paradox by analysing the impact of oil production and oil reserve on economic performance of oil rich developing countries from a panel context. Using oil production as a proxy for natural resource, the study was able to establish evidence of resource-curse for the group of OPEC (Panel A) and other net oil exporting countries (Panel B) while no evidence of resource-curse was found for the net oil importing countries (Panel C).

Oil reserve on the other hand shows evidence of resource curse for Panels B and C while Panel A shows a positive relationship. The result is therefore mixed, depending on the measure of resource abundance.

On a final note, the study concludes that oil abundance is not always a curse and oil rich developing countries could benefit more from their natural resource by adopting growth and welfare enhancing policies and also ensuring the presence of strong and vibrant institutions.