



Oil dependence, quality of political institutions and economic growth: A panel VAR approach[☆]

Nikolaos Antonakakis^{a,b,*}, Juncal Cunado^c, George Filis^d, Fernando Perez de Gracia^b

^a Department of Business and Management, Webster Vienna Private University, Praterstrasse 23, 1020 Vienna, Austria

^b Economics and Finance Subject Group, University of Portsmouth, Portsmouth Business School, Portland Street, Portsmouth PO1 3DE, United Kingdom

^c Universidad de Navarra, Facultad de Económicas y Empresariales, Departamento de Economía, Campus Universitario, 31080 Pamplona, Spain

^d Bournemouth University, Department of Accounting, Finance and Economics, Executive Business Centre, 89 Holdenhurst Road, BH8 8EB Bournemouth, UK

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ABSTRACT

This paper examines the resource curse hypothesis both within and between countries of different democratic footprint, based on a dynamic model that properly accounts for endogeneity issues. To achieve that, we apply a panel Vector Auto-Regressive (PVAR) approach along with panel impulse response functions to data on oil dependence variables, economic growth and several political institutional variables in 76 countries classified by different income groupings and level of development, over the period 1980–2012. Our results suggest that controlling for the quality of political institutions, and in particular the constraints to the executives, is important in rendering the resource curse hypothesis significant. Doing so, the resource curse hypothesis is documented mainly for developing economies and medium-high income countries. Specifically, when economies from the aforementioned groups are characterised by weak quality of political institutions, then oil dependence is not growth-enhancing.

1. Introduction

In their 1995 influential study titled “Natural resource abundance and economic growth”, Sachs and Warner started a well-known line of research focusing on natural resources. They obtained a negative conditional relationship between economic growth and resource dependence using a cross section of international data, in line with the resource curse hypothesis. More specifically, they report that economies with abundant natural resources tend to experience lower economic growth compared to economies with scarce natural resources. Sachs and Warner (1999, 2001), Gylfason et al. (1999) and Rodriguez and Sachs (1999), among many others, also find a negative relationship between growth and resource abundance or dependence.¹ However, the evidence in favour of the resource curse hypothesis is by no means conclusive (see, for example, Raddatz, 2007; Brunnschweiler and Bulte, 2008; Alexeev and Conrad, 2009; van der Ploeg and Poelhekke, 2010, among others).² Alexeev and Conrad (2009), for

example, demonstrate that high endowments of oil have a positive effect on per capita Gross Domestic Product (GDP), contradicting most of the empirical literature on the resource curse, while Brunnschweiler and Bulte (2008) find that resource dependence does not negatively affect growth and they define the resource curse as a “red herring”. However, van der Ploeg and Poelhekke (2010) challenge these results explaining that ignoring the volatility channel may lead to conclude that there is no resource curse. These authors find that while resource exports boosts growth in stable countries, they make especially volatile economies even more volatile, worsening growth opportunities in these countries.

In this study we re-examine the resource curse hypothesis in an attempt to shed more light into that field. The resource curse hypothesis literature reveals the following empirical regularities.

First, natural resource abundance is associated with various negative development outcomes (Sachs and Warner, 1995, 1999, 2001; Brückner, 2010), although the opposite evidence is still present

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* Correspondence to: Department of Business and Management, Webster Vienna Private University, Praterstrasse 23, 1020 Vienna, Austria.

E-mail addresses: nikolaos.antonakakis@webster.ac.at (N. Antonakakis), juncado@unav.es (J. Cunado), gfilis@bournemouth.ac.uk (G. Filis), fgracia@unav.es (F.P.d. Gracia).

¹ Previously, Gelb (1988) and Auty (2002) also documented this relationship.

² See, for example, Frankel (2010) and van der Ploeg (2011) for recent surveys.

(Alexeev and Conrad, 2009).

Second, existing explanations for the resource curse do not adequately account for the role of social forces or external political and economic environments in shaping development outcomes in resource abundant countries, nor for the fact that, while most resource abundant countries have performed poorly in developmental terms (i.e., the cases of Angola and Congo, rich in oil, or the group of OPEC countries) a few have done quite well (i.e., Norway).

Third, recommendations for overcoming the resource curse have not generally taken into account the issue of political feasibility. More generally, it is argued that the basic problem with the literature is that researchers have been too reductionist since they have tended to explain development performance solely in terms of the size and nature of countries' natural resource endowments. Nevertheless, a consensus is emerging that various political and social variables mediate the relationship between natural resource wealth and development outcomes (i.e., Isham et al., 2005; Mehlum et al., 2006a, 2006b; Andersen and Aslaksen, 2008; Bhattacharyya and Hodler, 2010; Bjorvatn et al., 2012; Collier and Goderis, 2012; El Anshasy and Katsaiti, 2013). Even more, most of the studies have not fully addressed the issue of endogeneity and reverse causality between the variables of interest (Collier and Goderis, 2012). In this paper, we address all the above issues when analysing the resource curse hypothesis.³

Thus, more specifically, the objective of this paper is to re-examine the dynamic links of the resource curse hypothesis both within and between countries of different democratic footprint. To achieve this, we apply a panel Vector Auto-Regressive (PVAR) approach along with panel impulse response functions to data on oil dependence (approximated by oil rents as a percentage of GDP, oil share as a percentage of GDP and oil revenue per capita),^{4,5} economic growth and several political institutional variables (i.e., polity IV index and its sub-indices and the political rights index), together with additional control variables. We consider 76 countries classified by different income groupings, level of development, as well as, their level of democracy over the period 1980–2012.

Three are the main contributions of the paper to previous existing economic literature. First, as far as the methodology is concerned, instead of using previous methodological approaches such as cross-section (Sachs and Warner, 1995, and many others), panel data (Bhattacharyya and Hodler, 2010; Boyce and Emery, 2011; Cavalcanti et al., 2011; Bjorvatn et al., 2012), panel error correction models (Collier and Goderis, 2012) or time-varying cointegration (Apergis and Payne, 2014) models, in this paper we estimate different panel VAR models. To our knowledge, this is the first paper that adopts a panel VAR approach and panel impulse response analysis to study the dynamic impact among oil dependence, the quality of political institutions, and economic growth by taking into account the endogeneity of these variables, as well as controlling for commonly used variables in the endogenous economic growth theory.

The advantages of using a panel VAR methodology relative to methods previously discussed so as to examine the oil-based resource curse hypothesis are several. First, and in contrast to cross-country, panel data models allow us to control for unobservable time-invariant country characteristics, reducing concerns of omitted variable bias.

Second, time fixed effects can also be added to account for any global (macroeconomic) shocks that may affect all countries in the same way. Third, the inclusion of lags of the variables helps to analyse the dynamic relationship between the different variables. Thus, impulse response functions based on PVARs can account for any delayed effects on and of the variables under consideration and thus determine whether the effects between the variables of interest are short-lived, long-lived or both. Such dynamic effects would not have been captured by panel regressions. Fourth, and most importantly, PVARs are explicitly designed to address the endogeneity problem, which is one of the most serious challenges of the empirical research on the resource curse hypothesis, by treating all variables as potentially endogenous.⁶ Last but not least, PVARs can be effectively employed with relative short-time series due to the efficiency gained from the cross-sectional dimension.

Our second contribution concerns the variables that are employed in this study. More specifically, we include three key variables, namely, oil dependence (proxied by three alternative indicators discussed in detail in the Section 2.1.), economic growth and institutional quality, together with other commonly used control variables that can potentially affect economic growth (i.e., labour force participation, gross fixed capital formation, foreign direct investment and openness). The inclusion of all these variables, together with their interactions (please see Section 2.1. for details), will allow us to account for the interdependencies among the quality of political institutions, economic growth and oil dependence. In order to better characterize the relationship between these variables, we also estimate the PVAR for different sub-groups of countries based on different characteristics, such as, income level or developing stage, so as to check whether the impact of institutional quality and oil dependence variables on economic growth potentially differs among each of these sub-groups of countries.

Finally, our third contribution is the use of a panel database for 76 countries over the period 1980–2012 to conduct a PVAR to explore for the resource curse hypothesis. According to the literature, the results on the resource curse hypothesis largely depend on the time frame analyzed (Freudenburg, 1992), which calls for the need of longitudinal research studies (Freudenburg, 1992; Easterly, 1999; Ross, 2007). In a recent paper, Davis and Cordano (2013) also support the use of panel data and use longitudinal data in 57 countries from 1962 to 1997 in order to investigate whether economic growth in countries with substantial mineral or energy extraction has a greater or lesser tendency to be pro-poor than in countries with less extractive activity. We believe that the use of this panel database will provide valuable new insights regarding the resource curse hypothesis from a dynamic perspective.

Of course, the impact of the quality of the institutions and democracy on economic growth has also been documented in many papers (Barro, 1999; Acemoglu et al., 2001, 2008, 2002; Papyrakis and Gerlagh, 2004; Epstein et al., 2006; Glaeser et al., 2007; Papaioannou and Siourounis, 2008). Furthermore, the interaction between natural resources and economic growth, taking into account the role of institutions has been also previously studied by Isham et al. (2005), Mehlum et al. (2006a, 2006b), Hodler (2006), Andersen and Aslaksen (2008), Bhattacharyya and Hodler (2010), Bjorvatn et al. (2012), Brückner et al. (2012), Collier and

³ In addition, related literature also considers the called “dutch disease”, where the resource exports increase exchange rates and reduce the competitiveness of other domestic exporting sectors (i.e., Sachs and Warner, 1995; Gylfason et al., 1999; Sala-i Martin and Subramanian, 2013), nevertheless this falls outside the scope of this paper.

⁴ Brückner (2010) shows that the negative relationship between resource dependence and economic growth is larger when resource dependence is calculated using a real measure of the share of natural resource exports in GNP adjusted for cross-country differences in the prices on non-tradables.

⁵ We concentrate on oil dependence, given that oil is one of the most consumed and tradable natural resources IEA (2015). In addition, as suggested by Ross (2001), oil resources have antidemocratic properties.

⁶ The endogeneity problem in cross-country and panel data models has been previously addressed by the inclusion of different instrumental variables (Alexeev and Conrad, 2009; Cotet and Tsui, 2013), and by estimating the model using 2 or 3 Step Least Squares models (Brunnschweiler and Bulte, 2008; Busse and Gröning, 2013), Generalised Method of Moments (Lederman and Maloney, 2003; Maloney and Lederman, 2008) or Arellano-Bond Generalised Method of Moments (Yaduma et al., 2013). The difficulty in measuring good instruments of the variables included in these types of studies, such as oil dependence and quality of institutions, better justifies the use of panel VAR models, which help to alleviate the endogeneity problem by treating all variables as potentially endogenous.

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