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From Rentier State and Resource Curse to Even Worse?

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Abstract

The discussion about the rentier state and the resource curse is typically about political oppression and macroeconomic vulnerabilities. Yet, the rentier state and resource curse presumably do even worse. They are also said to account for unequal economic opportunities, poor industrial capacities, and high fertility rates, which in turn explain low investment activities. As the economic, political, and social consequences of the natural resource curse have a long history of being examined separately, our aim is to add to the existing literature by showing their interrelationships in a path-analytical and cross-sectional framework. Building upon this framework, we then develop a simulation model to estimate various political, economic, and social consequences of the resource curse and rentier state. We then apply our model to the Middle East and North Africa, Sub-Saharan Africa, Latin America and the Caribbean, East Asia and the Pacific, and, as a sub-group of it, the four East Asian Tigers: Hong Kong, Malaysia, South Korea and Singapore. Our main interpretation of our simulation is that it is not so much the rentier state and the resource curse that make things even worse, but the fact that unfavorable economic, political, and social characteristics must have prevailed before the primary sector gained its economic relevance. Resource wealth and the rentier state then simply prevented economic, political, and social modernization.

Introduction

There is great research interest in the rentier state and resource curse. Most of this research addresses individual macroeconomic, political, and social aspects. From a macroeconomic perspective, particular interest is given to growth, the Dutch disease, trade, and investment activity. The rentier state argument dominates the discussion of the political dimensions of resource wealth. The analysis of social consequences often refers to gender issues and inequality of economic opportunities.

Little attention has so far been given to a comprehensive analysis of the interrelationship between the various aspects of the oil curse. In this paper, we try to fill this gap by employing a path-analytical perspective. We argue that a path-analytical approach allows for a deeper understanding of the natural resource curse as it reveals direct and indirect transmission mechanisms, whose magnitude and relevance have not yet been acknowledged.

The paper is organized as follows. We review the literature relevant to our approach in section two. A description of the data and methodology underlying our empirical analysis follows in section three. The presentation and discussion of our empirical work is the subject of section four. We conclude with a summary of our main findings in section five. All tables and figures are to be found in the Appendix.

Literature Review

There is a growing consensus that natural resource wealth reduces growth. This relationship is empirically robust as Sachs and Warner (1995) first comprehensively showed. Yet, despite the strong empirical support for the natural resource curse hypothesis, Hausman and Rigobon (2002, p. 1) find that “understanding its causes has been a much harder task.” Although the authors are mainly concerned with the Dutch disease, their complaint should not be limited to it. In addition to the Dutch disease, the literature—see for example Sala-I-Martin and Subramanian (2003)—also regularly names the volatility and the rentier state effect as transmission mechanisms. The rentier state is probably the most complex one.

The Dutch disease relates a natural resource export boom, such as following the natural gas discoveries in the Netherlands in the 1960s, to currency appreciation and, subsequently, loss of export competitiveness of other branches of the economy, typically manufactures. The volatility effect captures the risk exposure to terms of trade shocks that price fluctuations create for countries with undiversified export profiles. The rentier state effect is the most complex mechanism, affecting the society as a whole on various socioeconomic and political levels.

Rents and the idea of rentier states have a long history in political economy. The heart of the discussion has always been that substantial sources of rent incomes adversely affect political development and citizen sovereignty. Ricardo (1817/1996) was the first to develop a systematic concept of rents; he applied it to powerfully illustrate how England's Corn Laws protected the incomes of the landed aristocracy at the expense of the incomes of the newly developing class of industrialists. Later, Lenin (1916, online) simply defined the rentier state as "parasitic, decaying capitalism." This decay process has many facets.

Leamer et al. (1990), for example, stress that natural resource abundance promotes inequality of income and economic opportunities. They hypothesize three transmission mechanisms. The first is through the terms of trade effect. It holds that in order to compensate for inevitably deteriorating terms of trade of natural resources relative to value-added goods, which are produced in industrialized economies, developing countries' reliance on natural resources exports is ever increasing and, assuming subsistence wages in the primary sector, therefore widening the income gap between factor labor and factor capital. The second argument starts with the assumption that the extraction of primary resources allows for continuously falling average total costs. The subsequent monopolization process again favors the incomes of factor capital over factor labor. Their third and last argument is that the primary sector does not absorb human-capital intensive jobs, which would provide economic opportunities for predominantly unskilled labor and thus contribute to a dismantling of prevailing inequalities.

Another strand of the literature focuses on political development. Leite and Weidman (1999), for example, provide empirical evidence for the hypothesis that

the wealth of natural resources translates into lower growth mainly because of rent-seeking activities and corruption. Similarly, Ross (2001), in his paper "Does oil hinder democracy?" answers in the affirmative. He also finds that the resource curse is not limited to oil but extends to other minerals, too. According to Ross, the rentier state uses lower tax rates and higher security expenditures to undermine political opposition. Although the nexus between oil rents and authoritarianism enjoys great support in the literature, Elbadawi and Makdisi (2005) argue that it is not sufficient to explain the democracy deficit in the Arab world.

Besides economic and political aspects, the literature also hints at links between resource wealth and social development, especially the role of women. If resource wealth translates into inequality of economic opportunities, then we can also make use of Repetto (1979) who argues that inequality translates into higher fertility rates. This can occur directly and indirectly. Direct effects have mostly cultural reasons. Indirect effects, on the other hand, are often attributed to the absence of a middle class, which prevents the development of a competitive industrial base and thus withholds social and economic empowerment opportunities for women. Przeworski (2004) also reports empirical evidence for direct relationships between political authoritarianism and high fertility rates. Eventually, Brander and Dowrick (1994) show that high fertility rates drive up dependency ratios, eat up savings, and dampen investment activities. The absence of a strong manufacturing base also undermines investment activity and thus growth.

As most of the research on the natural resource curse and the rentier state appears to focus exclusively on partial transmission mechanisms, researchers such as, for example, Papyrakis and Gerlagh (2004, p. 190) complain that the "mechanism behind the transmission channels can be investigated more thoroughly." Welcoming such criticism as an invitation for future research, we would like to add to the existing literature a path-analytical framework of the resource curse that jointly captures and analyzes some of the various interdependent economic, social, and political relationships.

This exercise will help clarify the following question: Is there really a transmission mechanism from the rentier state and resource curse to even worse?

If that were the case, a simulation of a hypothetical dismantling of the resource curse would show meaningful economic, political, and social gains. On the other hand, if the simulation fails to generate those meaningful improvements in human development, a natural conclusion would be that the resource curse and rentier state coincide with unfavorable economic, political, and social fundamentals rather than being their cause.

Data and Methodology

We argue that the export share of primary products as a percentage of total merchandise exports (PRIEXP) captures a country's vulnerability to the resource curse best. In addition, our model consists of the following variables:

- Real per capita economic growth (GROWTH).
- Exports of manufactured products as a share of GDP (MANUEXPSHR).
- The Polity 2 score of the Polity IV data project, which can take discrete values between minus ten (highly autocratic) and plus ten (highly democratic). However, for convenience reasons we indexed the Polity score between zero and one (POLITY).
- Gross capital formation net of foreign aid (NETGCF).
- Fertility rate (FERT).
- Estimated household income inequality indicator "2" from the University of Texas Income Inequality Data Project (EHII2), which reads like the Gini-coefficient.
- Per capita income in 2000 USD as a control variable.

All variables are averages of the 1990-2003 period. Our sample consists of all countries for which data was available. Table 1 of the Appendix summarizes the data and sources.

Figure 1 of the Appendix provides a visual illustration of the main paths from natural resource wealth to the various economic, political, and social development indicators.

As our main interest is the economic, political, and social dimensions of the resource curse, we program a dynamic simulation model based on Figure 1. The basic idea is to simulate the social, economic, and political responses to a hypothetical transition to primary resource exports that would correspond to their predicted values when using per capita income as the independent variable.
The setup of the model in terms of stocks, flows, and valves is illustrated in Figure 2.

We comprehend the following variables as stocks: Per capita income, primary export share, political development, household income inequality, fertility rate, manufacturing export share, and investment rate. Each stock variable has a vent which can replenish or drain the stock variables' contents subject to initial values. To which extent stock variables change their levels depends on their assigned rates of change. In our model, those rates of change depend on the changes of other stock variables, whose relationship we will estimate in a cross-sectional framework.

Programming the model requires also being considerate of eventual natural boundaries. For example, fertility rates cannot fall below zero and the polity score has a maximum value of one. We also assume economic and social limits such that investment rates do not exceed forty percent and the inequality indicator does not fall below thirty.

Another problem arises from the fact that per capita income and growth formed a non-computational causal loop. To solve this problem, we instrument per capita income by primary exports, which is the only remaining exogenous variable. The exogenously determined decline of natural resource exports determines the change of per capita income, which feeds back into the change of inequality, polity, fertility, manufacturing export share, and investment. The model requires estimating the following equations:

$$GROWTH=\beta_1+\beta_2 NETGCF+\beta_3 PRIEXP+\varepsilon_1 \quad (1)$$

$$EHII2=\beta_4+\beta_5 LnYCAPHAT+\beta_6 PRIEXP+\varepsilon_2 \quad (2)$$

$$POLITY=\beta_7+\beta_8 LnYCAPHAT+\beta_9 PRIEXP+\varepsilon_3 \quad (3)$$

$$MANUEXPSHR=\beta_{10}+\beta_{11} EHII2+\beta_{12} LnYCAPHAT+\varepsilon_4 \quad (4)$$

$$FERT=\beta_{13}+\beta_{14} EHII2+\beta_{15} POLITY+\beta_{16} MANUEXPSHR+\beta_{17} LnYCAPHAT+\varepsilon_5 \quad (5)$$

$$NETGCF=\beta_{18}+\beta_{19} FERT+\beta_{20} LnYCAPHAT+ \beta_{21} MANUEXPSHR+\varepsilon_6 \quad (6)$$

$$LnYCAPHAT=\beta_{22}+\beta_{23}(PRIEXP)+\varepsilon_7 \quad (7)$$

$$PRIEXP=\beta_{24}+\beta_{25}(LNYCAP)+\varepsilon_8 \quad (8)$$

The model is programmed based on the robust regression results.

Empirical Results

In order to illustrate the significance of the individual links in the path-analytical framework of Figure 1 and 2, we estimate equations (1) to (8) using regular OLS and robust regression. The robust regression procedure we employ is an iterative weighted least square process based on Hintze (2001). The robust regression results, which are summarized in Table 2, show that all relationships are meaningfully significant except for manufacturing exports on fertility rates. This, however, is rather due to a multicollinearity problem between manufacturing exports and inequality rather than economic insignificance, as the correlation matrix of Table 3 suggests.

Next, we simulate the development implications associated with a change from real to predicted primary resource exports for various regions of the worlds. Those

regions are: The Middle East and North Africa (excluding Israel), Latin America and the Caribbean, Sub Saharan Africa, East Asia and the Pacific (excluding Japan, New Zealand, Australia, and the so-called East Asian Tigers), and the East Asian Tigers (Hong Kong, Malaysia, Singapore, South Korea), respectively. The starting values of the simulation and the predicted primary resource export shares are summarized in Table 4.

The simulation set-up is as follows. For the first ten periods, only the initial values are displayed, implying an initial growth rate of zero. After ten years, we successively remove one percentage point from the actual primary resource export share until the predicted value from equation (8) is reached. This then changes all other variables until primary resource exports reach their predicted value. From this period on, all stock variables again become constants. A comparison of the horizontal segments of each curve can then be used to compute the effects of the deviation of primary resource exports from their predicted values. Tables 5 and 6 of the Appendix summarize the simulation runs graphically and numerically.

The simulation results suggest that the resource curse is economically quite significant with respect to per capita income. The Middle East and North Africa, for example, foregoes on average a per capita income potential of more than $5000 (in 2000 USD) due to its excessive reliance on natural resource exports. On the other hand, the East Asian Tigers enjoy on average $1600 more in per capita income for barely relying on the extraction of primary resources.

However, all other economic, political, and social variables, although statistically significant, hardly change their economically meaningful levels. With respect to regions heavily oriented towards the extraction of natural resource rents, this implies that unfavorable social, economic, and political development potentials coincide with the resource curse and rentier state rather than being their result. In other words, it is not so much the rentier state and the resource curse that make things even worse, but the fact that already unfavorable economic, political, and social characteristics prevailed before the primary sector gained its relevance. The resource curse and rentier state then conserved this unfavorable social fabric.

Conclusions

There seems to be widespread consensus that the resource curse and rentier state account for various adverse economic, political, and social developments. In this paper we explore those links empirically. Our findings strongly support the notion that economies relying heavily on natural resource exports pay an economically meaningful price in foregone income potentials. Yet, although there are also statistically significant links between natural resource exports and other indicators of human development, our simulation results suggest that their economic significance is overrated. From our perspective, it seems more correct to conclude that the resource curse and rentier state prevented human development from unfavorable initial levels rather than having caused them. Thus, it is not so much "from rentier state and resource curse to even worse" than "from not really good in the first place to not even better because the resource curse and rentier state matter." Successful human development in many developing regions will therefore not only depend on a transition from rent extraction in primary sectors to rent creation in secondary and tertiary ones, but also a new social contract.

Appendix

Table 1 Data and sources

Variable	Source
Exports of primary goods as a percentage of total merchandise exports	World Development Indicators Database 2006 and authors' calculations
Gross capital formation net of foreign aid	
Manufactures exports as a percentage of merchandise exports	
Per capita income in 2000 US dollars	World Development Indicators Database 2006
Number of children that would be born to a woman	
Annual percentage growth rate of gross domestic product per capita	
Estimated household income inequality indicator "2" (The data had some missing values, which we estimated using Hintze's (2001) "Multivariate Normal Missing Value Estimation" option)	University of Texas Income Inequality Data Project
Polity 2	University of Maryland, Center for International Development and Conflict Management / George Mason University, Center for Global Policy

Figure 1 From rentier state and resource curse to even worse: causal relationships

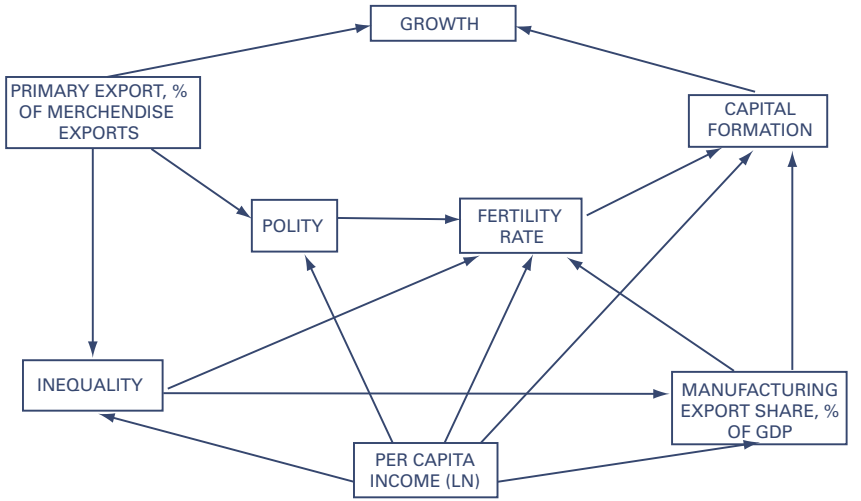

Figure 2 Simulation setup: From less resource curse and rentier state to how much better?

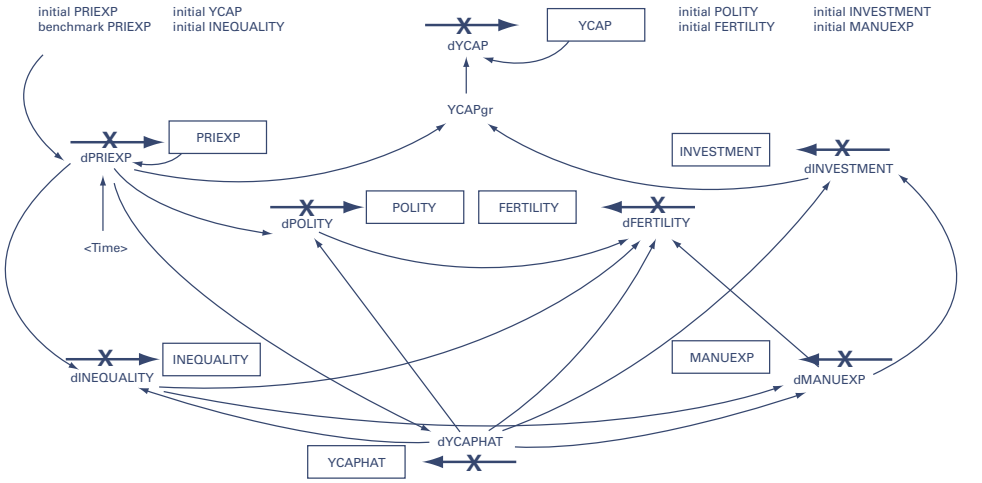

Table 2 Regression results underlying simulation model

	DV: GROWTH	
	OLS	Robust Regression
NETGCF	0.057 (0.00)**	0.059 (0.00)**
PRIEXP	-0.016 (0.01)**	-0.015** (0.00)**
R^2	13.7	
N	134	134

	DV: NETGCF	
	OLS	Robust Regression
FERT	-2.454 (0.00)**	-2.294 (0.00)**
MANUEXPSHR	0.058 (0.18)	0.067 (0.06)*
YCAP (Ln)	2.854 (0.00)**	2.658 (0.00)**
R^2	50.6	56.0
N	133	133

	DV: FERT	
	OLS	Robust Regression
EHII2	0.080 (0.00)**	0.083 (0.00)**
POLITY	-1.183 (0.00)**	-1.115 (0.00)**
MANUEXPSHR	-0.435 (0.20)	-0.007 (0.23)
YCAP (Ln)	-0.435**	-0.451
R^2	67.3	70.5
N	119	119

	DV: MANUEXPSHR	
	OLS	Robust Regression
EHII2 YCAP (Ln)	-0.884 (0.00)** 2.591 (0.02)**	-0.816 (0.00)** 1.320 (0.05)**
R^2	23.8	32.0
N	131	131

	DV: POLITY	
	OLS	Robust Regression
PRIEXP	-0.004 (0.00)**	-0.004 (0.00)**
YCAP (Ln)	0.077 (0.00)**	0.088 (0.00)**
R^2	38.6	53.4
N	138	138

	DV: EHII2	
	OLS	Robust Regression
PRIEXP	0.068 (0.00)**	0.059 (0.00)**
YCAP (Ln)	2.160 (0.00)**	-2.305 (0.00)**
R^2	37.8	45.9
N	133	133

	DV: LNYCAP	
	OLS	Robust Regression
PRIEXP (Ln)	-0.014 (0.00)**	-0.015 (0.00)**
R^2	6.7	8.1
N	160	160

	DV: PRIEXP	
	OLS	Robust Regression
YCAP (Ln)	-4.780 (0.00)**	-5.128 (0.00)**
R^2	6.7	8.1
N	160	160

Note: **= significant at 5%, * = significant at 10%, p-values in parentheses.

Table 3 Spearman-Rank correlation coefficients among model variables

	LnYCAP	GROWTH	POLITY	EHII2	MANUEXP	PRIEXP	FERT	NETGCF
LnYCAP	1.00	0.23	0.58	-0.56	0.47	-0.31	-0.69	0.63
GROWTH	0.23	1.00	0.22	-0.19	0.20	-0.29	-0.23	0.31
POLITY	0.58	0.22	1.00	-0.51	0.40	-0.48	-0.59	0.20
EHII2	-0.56	-0.19	-0.51	1.00	-0.53	0.34	0.73	-0.51
MANUEXP	0.47	0.20	0.40	-0.53	1.00	-0.35	-0.64	0.52
PRIEXP	-0.31	-0.29	-0.48	0.34	-0.35	1.00	0.36	-0.23
FERT	-0.69	-0.23	-0.59	0.73	-0.64	0.36	1.00	-0.62
NETGCF	0.63	0.31	0.20	-0.51	0.52	-0.23	-0.62	1.00

Table 4 Starting values for simulation (Unweighted regional averages, 1990–2003)

	MENA	**SSA**	**LAC**	**EAP**	**Tigers**
Per capita income (2000 USD)	5205	944	3638	3384	10,959
Growth rate (in percent)	0.0	0.0	0.0	0.0	0.0
Primary export share (% of merchandise exports)	61	37	19	28	9
Predicted primary export share	22	31	24	24	18
Polity	0.2	0.5	0.9	0.6	0.6
Inequality	47	47	46	44	37
Manufacturing export share (% of GDP)	7	6	7	12	78
Fertility	4	5	3	3	2
Investment rate net of aid (% of GDP)	19	7	19	16	32

Table 5 Simulation runs

Table 5a
Simulation run of per capita income

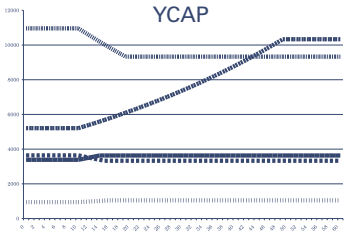

Table 5b
Simulation run of polity

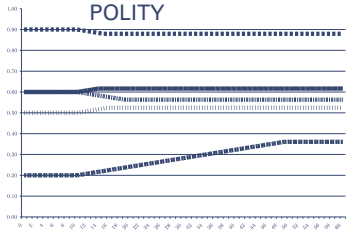

Table 5b
Simulation run of inequality

Table 5d
Simulation run of manufacturing export share

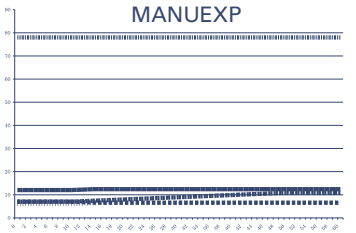

Table 5e
Simulation run of fertility

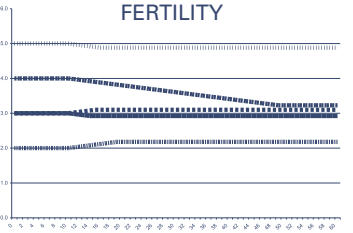

Table 5e
Simulation run of investment

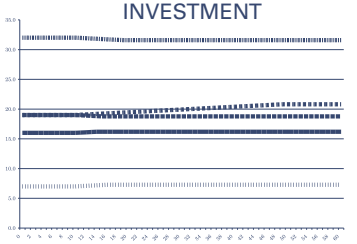

Table 6 Economic, political, and social dimensions of the natural resource in different regions of the world

Foregone..↓.. due to the resource curse in	**MENA**	**SSA**	**LAC**	**EAP**	**Tigers**
Per capita income (2000 USD)	5125	105	-311	246	-1630
Polity index	0.16	0.02	-0.02	0.02	-0.04
Equality	3.6	0.6	-0.5	0.4	-0.8
Manufacturing export share (% of GDP)	3.8	0.6	-0.5	0.4	0.0
Fertility reduction	0.8	0.1	-0.1	0.1	-0.2
Investment rate net of aid (% of GDP)	1.8	0.3	-0.2	0.2	-0.4

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