



## **Oil Rent and Financial Environment: A Cross-country Examination**

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### **ABSTRACT**

This study provides an empirical investigation to test one of the transmission channels of resource curse, i.e. financial environment. Our panel data analysis of 70 countries from 2006 to 2014 shows a negative and statistically significant association between oil rent and the quality of financial environment in developing countries, but a positive relationship in developed countries. These findings are robust when we control for other major drivers of financial environment quality, unobservable country- and time-fixed effects. In addition, our main results show that institutional quality, among other independent variables, has a major statistically significant effect on financial environment.

**Keywords:** Resource Curse, Oil Rents, Crowding Out, Financial Market Development

**JEL Classifications:** G10, H10

### **1. INTRODUCTION**

Entrepreneurs and business managers need financial resources to create a new business or expand or provide liquidity for an existing business. Three major providers of funds for businesses include: Business partners, banks (money market) and market (capital market). Financial environment, which includes money market and capital markets, is a subset of the business environment and it can be a major facilitator or pose as a major barrier in this process.

The financial environment affects the development of new firms in two ways. First, through the cost of capital that affects investment decisions in general, and the second, through the characteristics of the financing of new firms or new business ideas (Cuervo, 2005). According to Schumpeter, efficient banking and finance extend technical innovations by identifying the best opportunity for entrepreneurs who have innovative production or manufacturing processes (Schumpeter, 1934. p. 155). Keynes in "A Treatise on Money" also argued for the importance of the banking sector in economic growth. He suggested that bank credit 'is the pavement along which production travels, and the bankers if they knew their duty, would provide the transport facilities to just the extent that

is required in order that the productive powers of the community can be employed at their full capacity' (Keynes, 1971. p. 197).

The relationship between oil rent and financial environment can be explained in the context of two theories: Theory of crowding out effect and theory of financial repression. According to the crowding out effect, if commodity and money markets are both in equilibrium, any increase in government spending that is not associated with an increase in money supply, will increase interest rates and as a result, private sector investment will be reduced. Rising interest rates occur due to changes in money and capital markets (financial environment). Beck explained that there are demand and supply side explanations for the effect of natural resource abundance on financial development. On the one hand, from the supply side, a resource abundant economy can crowd out investment and skills in the financial sector. On the other hand, regarding the demand side, Dutch disease can lead to the expansion of consumer credit as a result of more demand for financial services (Beck, 2011).

Access to oil rents, particularly during the oil boom could cause the expansion of the public sector and increase government

spending. This increases the non-oil budget deficit which means an expansionary fiscal policy and an increase in government demand for goods and services - in turn increasing the demand for money and thus leading to an increase in interest rates. At the same time interest rates go up in other markets (including the informal market). Therefore, money and capital markets (financial environment) are influenced by fiscal policy and cause a reduction in private sector investment. But if the interest rate is controlled by the government, and restrictions are placed on the banking system, obtaining business loans from banks become difficult. In these conditions, interest rates in other markets (including informal market) increases. Therefore, the financing can take place at a higher cost. In these circumstances, financial repression dominates in order to overcome the negative effects of expansionary fiscal policy (Easterly and Schmidt-Hebbel, 1993).

Also during the oil depression, governments must continue to finance their huge expenditure. In this situation, the government influences the financial environment negatively through borrowing from the central bank, selling bonds or postponing the repayment of debt to the bank. Thus in the oil-exporting countries businesses and entrepreneurs are more likely to encounter the problem of financing and the conditions of financial environment are usually not favorable for businesses.

In this paper, the literature review is firstly studied and then data and method are presented and at the following, the results of the model are explained and in the end, the conclusion is discussed.

## 2. LITERATURE REVIEW

Numerous researches, for instance Gylfason and Zoega (2002), Sachs and Warner (1997) and Sala-i-Martin (1997), have found a significant negative correlation between natural resource abundance and economic growth. Confronted with this empirical finding, economists have developed theories that can explain the curse of natural resources. Most economists agree that there must be some sort of crowding out: If natural resources crowd out some activity X, and X is important for growth, then natural resources slow down growth. Plausible candidates for X include education, manufacturing, sound government policy (Kronenberg, 2004) and financial development (Beck, 2010). Mehlum et al. (2006) and Farzanegan (2014) mentioned that lootable natural resources such as oil are the main discouraging force.

Review of the literature on the relationship between oil rent and financial environment indicate that oil rent can weaken financial markets. Gylfason and Zoega applied the Solow growth model to 85 countries over the period 1965-1998 and found that countries which are more dependent on natural resources have lower level of financial development (Gylfason and Zoega, 2002). Beck shows that resource-based economies have lower level of financial development and their banks are more liquid, better capitalized and more profitable, but give fewer loans to firms (Beck, 2010). He points out that there is some indication of a natural resource curse in financial development. Bhattacharyya and Hodler examine the relationship between financial development and natural resource revenues. Based on their model, resource revenues undermine financial development in countries with

poor political institutions, but not in countries with comparatively better political institutions (Bhattacharyya and Hodler, 2010). Yuxiang and Chen, using provincial panel data of China covering the period 1999 to 2006, concentrate on the resource curse by focusing on the relationship between mineral resource abundance and financial development. Their result indicates a negative and strong relationship. They suggest that the resource-rich regions tend to have a slower rate of financial development compared to resource-poor regions (Yuxiang and Chen, 2011). Hooshmand et al. (2013) studied the impact of the oil rent on financial development using generalized method of moments for 17 selected oil exporting countries, over the period 2002-2010. Their result suggests that oil rent has had a negative effect on financial development and has provided the context for the weakening financial markets. Elhannani et al., using an econometric growth regression model tested the impact of financial development in Algeria over the period 1980-2014, and their results showed that the financial development enhanced economic growth but it has not contributed in reducing the negative effect of oil rents.

Summarizing our literature review, we can define the following hypothesis for our empirical examination:

Hypothesis 1: Higher levels of oil rents reduce the quality of financial environment.

## 3. DATA AND METHOD

The data-set we use in our empirical work is a 9-year panel covering the period from 2006 to 2014 for 70 countries. The dependent variable is financial market development as a proxy for the quality of financial environment. These data are from The World Economic Forum's annual Executive Opinion Survey, which feeds into its Global Competitiveness Reports (GCR). The data-set we use in our empirical work is a 9-year panel covering the period from 2006 to 2014 for 70 countries (Appendix Table 1).

We are mainly interested in the effect of the oil rent on financial environment. Oil rent has a major share of natural resources rents. The estimates of natural resources rents are calculated as the difference between the price of a commodity and the average cost of producing it. This is done by estimating the world price of units of specific commodities and subtracting estimates of average unit costs of extraction or harvesting costs (including a normal return on capital). These unit rents are then multiplied by the physical quantities which countries extract or harvest to determine the rents for each commodity as a share of gross domestic product (GDP). The source of this data is World Development Indicators of the World Bank. In order to facilitate comparison between the coefficients of the model and to match the scales of variables, the scale of oil rent variable is changed with the following conversion formula<sup>1</sup>:

$$6 * \left( \frac{\ln(\text{country score} + 1)}{\ln(\text{sample maximum} + 1)} \right) + 1 \quad (1)$$

Resource rents are largely exogenous in the model. The major driver of rent, commodity prices are given to countries

<sup>1</sup> This formula is used by GCR.

exogenously. For example, oil rent is determined in international markets and are affected largely by factors beyond the control of the domestic economy. Production of resources also depends on flow of capital and investment, political stability of target country, related geographical region and so on (Farzanegan, 2014). Thus it is reasonable to assume that a large part of within-country variation in our key independent variable (rents) is exogenous with financial market development.

We are also interested in understanding the difference between the effect of oil rent in developing and developed countries. A better management of natural resource rents in developed countries should matter for the financial environment-rents nexus. In oil-exporting developing countries, the majority of resource rents are injected into the economy through the state spending, but in oil-exporting developed countries, the majority of resource rents is saved in the banking system or invested abroad (Table 1).

Therefore, we can scrutinize our hypothesis and rewrite it in the following two separate hypotheses:

Hypothesis 2: Higher levels of oil rents decreases the quality of financial environment in developing countries.

Hypothesis 3: Higher levels of oil rents enhance the quality of financial environment in developed countries.

It is unrealistic to assume that oil rents alone determine financial environment quality. There are other time-variant variables which may affect the dependent variable in addition to oil rents. To account for other channels of causality, we add a set of control variables. Empirical research has shown that the quality of institutions should matter for the financial environment-rents nexus. Thus, we expect to see a positive sign for the quality of institutions variable. The quality of institutions indicator, obtained from GCR, is the first pillar of Global Competitiveness index and includes public and private institutions. All variables are converted to a 1-7 scale in order to facilitate comparison between the coefficients of the model.

We need to control for other factors influencing the financial environment, country-specific properties which are important but difficult to measure and usually are constant over time (e.g., culture, tradition and so on). The same is true for time-specific shocks such as international financial crisis in a specific year which can affect financial markets across countries, international shocks in oil markets or political events.

**Table 1: Average resource rents and saving of resource rents (% of GDP)-2006-2014**

Group	Resource rents	Saving of resource rents
Developed countries	1.7	0.7
Oil exporting	6.0	3.7
Non-oil exporting	0.9	0.1
Developing countries	13.9	1.1
Oil exporting	25.9	2.2
Non-oil exporting	6.7	0.3

Source: World Bank (2013) and own calculations. GDP: Gross domestic product

To measure the effect of oil rent on financial environment, we estimate the following country- and year-fixed effects panel regression for 70 countries from 2007 to 2014:

$$fin_{it} = cons + \beta_1.oil_{it} + \beta_2.oil_{it}.developed_{it} + \beta_3.gdpg_{it} + \beta_4.Z_{it} + u_i + \theta_t + \varepsilon_{it} \quad (2)$$

The subscripts denote the country *i* and the time period *t*. The dependent variable is financial market development (*fin*). The main variable of interest is oil rent (oil) in developing and developed countries. The dummy variable (*developed*) is zero for developing countries and one for developed countries. *Z* includes other drivers of financial environment such as GDP per capita growth rate, macroeconomic circumstances and the quality of institutions. In contrast to cross-country regressions, we allow for country (*u<sub>i</sub>*) and time (*θ<sub>t</sub>*) fixed effects. Country-fixed effects eliminate the latent heterogeneity between countries. Such heterogeneity between countries may originate from different factors which are country-specific elements.

We use 1-year lag of GDP per capita growth rate for the possible time lag effect. Appendix Table 2 shows the name of countries included in the basic model for financial environment-oil rent estimation.

## 4. RESULTS

The empirical focus of the paper is how oil rent shapes financial environment within and across countries and that there is a significant difference in the role of oil rent between developed and developing countries. Our estimations start with looking at financial market development and oil rent per capita, adding other control variables in order to see how the oil-financial development nexus changes in different specifications. The results for this specification (Equation 1) are estimated by ordinary least squares, with country- and year-fixed effects to reduce the risk of omitted unobservable factors. This is examined against Limmer (Chow) test and Hausman test.

In addition, we report the robust t-statistics on the basis of White-period standard errors. The White-period method assumes that the errors for a cross section (country) are heteroskedastic and serially correlated (cross section clustered).

Table 2 shows the results. It shows that the effect of oil rent on financial market development is negative and statistically significant for all models for developing countries, following a specific to general approach. Model 1 in Table 2 shows that a 1% increase in oil rent reduces financial environment quality by -0.17% which is statistically significant at 95% confidence interval, controlling for country and time-fixed effects. In subsequent models, we add other control variables which may have an effect on financial market development across countries.

Model 5 divide the role of oil rent in developing and developed countries. It shows that a 1% increase in oil rent reduces financial environment quality by -0.16% in developing countries but the same increase in oil rent in developed countries increase financial

**Table 2: Determinants of financial environment quality estimation: Country-and year-fixed effects**

Independent variable	Dependent variable: Financial market development				
	(1)	(2)	(3)	(4)	(5)
Constant	4.95*** (21.48)	4.83*** (17.56)	3.95*** (13.39)	1.38*** (4.27)	0.82** (2.32)
Oil	-0.17** (-2.32)	-0.23** (-2.83)	-0.22*** (-2.79)	-0.15** (-2.14)	-0.16** (-2.12)
Oil*developed		0.26 (1.32)	0.32* (1.68)	0.30* (1.80)	0.40** (2.48)
gdp per capita growth <sub>i</sub> (-1)			0.17*** (4.92)	0.09*** (2.98)	0.07** (2.33)
Institutions				0.64*** (11.96)	0.60*** (11.48)
Macroeconomic					0.15*** (4.13)
Observations	552	552	490	490	490
Countries	70	70	70	70	70
Adjusted R <sup>2</sup>	0.87	0.87	0.90	0.92	0.94

Robust t-statistics in parentheses. \*\*\* and \*\* indicate significance at 10%, 5%, and 1%, respectively

environment quality by 0.24%, controlling for country and time-fixed effects:

$$\frac{d(fin_{it})}{d(oil_{it})} = -0.16 + 0.40 \times developed_{it} \quad (3)$$

Model 5 shows the most general specifications in which we have controlled for main control variables, besides oil rent and fixed effects. The size of negative-estimated effect of oil rent on financial market development in developing countries has decreased from -0.22% in Model 3 to -0.16% in Model 5 which are statistically significant at 95% confidence interval, controlling for country and time-fixed effects. Thus, our first hypothesis is supported by data. But the size of positive-estimated effect of oil rent on financial market development in developed countries has increased from 0.10% in Model 3 to 0.24% in Model 5 which are statistically significant at 95% confidence interval, controlling for country and time-fixed effects. Therefore, our second hypothesis has also empirical support.

Economic growth rate of the past year has a robust association with financial market development. The quality of institutions has a robust positive and statistically significant effect on financial market development at 99% confidence interval, controlling for country and time-fixed effects. Model 5 shows that a 1% increase in institutions quality increases financial environment quality by 0.60%. Macroeconomic circumstances which is an indicator representing inflation rate, government budget balance, government debt, and gross national saving and country credit rating has also a robust positive and statistically significant effect on financial market development at 99% confidence interval.

### 5. CONCLUSION

The obtained results show that oil rent has a negative impact (-0.16%) on financial market development in developing countries but it has a positive effect (0.24%) in developed countries. This is likely due to the fact that in developing countries, the majority of oil rents are injected into the economy through state

spending, but in developed countries, the majority of oil rents are saved in the banking system or abroad. Therefore, better management of resource rents could probably alter the role of oil rents and its impact on the financial environment in developing countries. It is noteworthy that better management of resource rents need appropriate fiscal policy. The results also show that institutional quality enhances the level of financial market development significantly. So the results suggest that improving the institutional quality is a necessary condition to promote the financial development level.

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## APPENDIX

### Appendix Table

**Appendix Table 1: Variable descriptions**

Variables	Scale	Source	Definition
Financial market development	1-7	GCR	Financial market development indicator (pillar 8)
Oil: Oil rent per capita	1-7	World Bank Database	Oil rent is difference between the value of crude oil production at world prices and total costs of production. (constant 2005 US\$)
Developed	Dummy variable	UN classification	For developed countries equals 1 and for developing countries equals 0
gdp per capita growth <sub>i</sub> (-1)	1-7 and 1-year lag	World Bank Database	Annual percentage growth rate of GDP per capita based on constant local currency
Institutions	1-7	GCR	Institutions indicator (pillar 1)
Macroeconomic	1-7	GCR	Macroeconomic environment indicator (pillar 3)

GCR: Global competitiveness reports

**Appendix Table 2: List of countries in financial environment-oil rent model**

Developed oil exporting countries						
Canada	Denmark	Norway	UK			
Developed non-oil exporting countries						
Australia	Cyprus	Greece	Japan	New Zealand	Switzerland	
Austria	Finland	Iceland	Luxembourg	Portugal	USA	
Belgium	France	Ireland	Malta	Spain		
Bulgaria	Germany	Italy	Netherlands	Sweden		
Developing oil exporting countries						
Algeria	Belize	Colombia	Indonesia	Mexico	Tunisia	
Argentina	Bolivia	Ecuador	Iran	Nigeria	UAE	
Bahrain	Cameroon	Gabon	Malaysia	Saudi Arabia	Venezuela	
Developing non-oil exporting countries						
Brazil	Costa Rica	Hong Kong	Malawi	Paraguay	South Africa	Uruguay
Burundi	Cote d'Ivoire	India	Morocco	Peru	Thailand	Zambia
Chile	Gambia	Korea, Rep.	Nicaragua	Philippines	Turkey	
China	Ghana	Lesotho	Pakistan	Sierra Leone	Uganda	