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Informational Transparency in Oil-Dependent States:

The Key to Credible Commitment for Sustainable Economic Development?

Master Thesis

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Abstract

Recent studies have addressed the institutional reversal of the resource curse on economic growth and development but have remained inconclusive regarding the oil curse. To clarify this relationship, the study outlined here adds a new layer to the institutional quality narrative. It does so by incorporating findings on the importance of credible commitment of the state to rule of law and property rights for promoting sustainable economic development. While credible commitment is usually created by tax revenue bargaining, this study argues that oil-rich countries with typically low tax revenue can compensate the lack of the bargaining mechanism towards credibility with higher informational transparency. Therefore, this study conducts a fixed-effects regression of oil-dependent states from 1995-2010 to investigate the role of informational transparency (credibility) and political constraints on the executive (commitment to rule of law) in promoting sustainable economic development. Next to their separate influences, an interaction effect of the two explanatory variables is modeled to test the theorized relationship appropriately.

The study finds a substantial and robust positive correlation of transparency and manages to clarify the positive correlation of political constraints on the executive by adding the interaction effect between the two. Contrary to the initial expectation, the interaction effect is negative suggesting a compensatory or substituting relationship between the two parent variables. The findings presented in this paper suggest a new narrative of credible commitment via transparency complimentary to the established factors institutional quality and property rights. However, further research is needed to conclusively consolidate the theoretical considerations behind the empirical observations.

Introduction

The literature on economic development has focused extensively on the question why some countries are more successfully developing than others. While geography, institutions and trade policy are the commonly supported categories of explanations, there seems to be no universal pattern of development (Rodrik 2003). As in many other fields, resource-rich countries have received particular attention. For a long time, it seemed as there was an unconditional resource curse affecting sustainable economic development[1] via various domestic phenomena such as Dutch Disease (Sachs/Warner 1997), patron-client political systems and predatory state behavior, or more global causes like diminishing returns and price volatility (Atkinson/Hamilton 2003, Grabowski et al. 2015). High value point-resources (e.g. hydrocarbon fuels, minerals and ores) have a particularly negative effect in this regard (Boschini et al. 2013). However, recent studies have examined important scope conditions (Menaldo 2016, Ross 2012) and even the reversal of the resource curse through appropriate institutional quality (Boschini et al. 2013; Mehlum et al. 2006) that prevents "grabbing" (i.e. the capturing of rents or rent-seeking instead

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[1] Henceforth also referred to as economic development, human development or as its indicator HDI.

of "productive" economic activities). Despite convincing results for other point-resources, these findings have been largely inconclusive in regard to the particularly persistent "oil curse". This study frames the underlying mechanism of institutional quality as understood in the studies above as part of the overarching concept of credible commitment of the state to private economic actors. To clarify the role of institutions and add a further layer to this narrative, the crucial role of transparency[2] (Barma et al. 2012; Williams 2011) in creating credibility of the state's commitment to institutional constraints is investigated. This study argues that credibility via transparency affects the effectiveness of institutions and is a necessary addition to understand and clarify the role of institutional constraints on oil-dependent states.

Recent studies have examined scope conditions for the resource curse, arguing that appropriate institutional quality can reverse the resource curse (Boschini et al. 2013; Mehlum et al. 2006; Menaldo 2016). Considering that most of the negative effects initially mentioned are connected to an institutional incapability to coordinate economic resources and development effectively, it is logical that institutional quality is pivotal in explaining the consequences of resource wealth. Especially easily centralized point-resources are strongly affected by property rights- (Acemoglu/Johnson 2005) and rule of law institutions, since these institutions constrain the government in the government-citizen relationship (Boschini et al. 2013). In their study, Boschini et al. (2013) further divide these property rights institutions into rule-based (political constraints on the executive[3]) and outcome-based (institutional quality) measuring dimensions. However, they only find a significant reversal for ores and metals in interaction with outcome-based indicators but the ambiguity of oil and rule-based dimensions remains unresolved and the oil curse generally appears more persistent than all other resource curses (Ross 2012).

Grabowski et al. (2015: 250) point to the crucial role of the state in promoting economic development by committing to the rules i.e. the mentioned property rights and rule of law institutions. However, a state capable enough to guarantee and enforce these conditions can also easily revoke them (Grabowski et al. 2015: 250). Therefore, Grabowski et al. (2015) argue it is crucial that states not just commit to these rules but create *credible commitment* on which private economic actors can rely. Grabowski et al. (2015: 251) prescribe a mechanism comparable to tax revenue bargaining between the state and a bulk of society (similar to Levi 1988) to create credible commitment. This mechanism does not apply to states with a significant oil revenue

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[2] The level of transparency in this paper is assessed by the accessibility, amount, accuracy and timeliness of political, economic and social information the state provides (see section on research design).
[3] Henceforth also referred to as political constraints.

as they do not rely on a broad tax base and are able to provide substantial public benefits nonetheless (Barma et al. 2012: 59, Williams 2011: 490).

Recent findings by Williams (2011) suggest a significant role of government transparency in alleviating the oil curse by decreasing corruption and patronage as well as improving reliability for private market participants. Despite acknowledgement for the role of transparency (e.g. Ross 2015), little research has followed up.

Research question and objectives

Summing up the gaps identified in the literature, the factors of political constraints on the executive as purely rule-based measure of commitment has not shown any significant effect in prior research. Transparency has been identified as a crucial factor for resource-rich and especially oil-rich countries. This study argues that both variables have to be considered together as they contribute to the same underlying mechanism and concept of credible commitment (through transparency). Oil-reliant countries typically lack transparency in their actions and are not reliant on tax revenue bargaining as the traditional path to credible commitment. Both observations suggest that informational transparency[4] has a crucial role in oil economies to create more credible commitment to political constraints (institutionalized rules), which in turn promotes private economic activity and thus sustainable economic development.

Combining these strands of literature offers an alternative explanation how some oil-dependent states are more capable of making credible commitment to institutionalized rules and consequently improve the conditions for economic development. The thesis will test this explanation by investigating the research question *to what extent informational transparency improves the credibility of oil-dependent states' commitment to political constraints as a factor of sustainable economic development.*

This question will be answered by conducting a fixed-effects (FE) regression of countries with a significant oil revenue (>10% of GDP) from 1995-2010. The chosen method allows controlling for unobserved time-invariant factors (Allison 2009) and solely focusing on the dynamics of the key explanatory variables. Answering the question yields new evidence on the role of informational transparency for alleviating the oil curse. By identifying it as part of the credible commitment problem of the state, this study finds an interaction between more credibility gained by informational transparency and the commitment to constraints on the executive power. This finding adds more depth to the institutional quality narrative (e.g. Mehlum et al.

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[4] In distinction to Williams' (2015) other indicator a*ccountable transparency* - henceforth used interchangeably with transparency.

2006; Boschini et al. 2013) by incorporating the mechanism of credible commitment of the state, so that not just administrative capability but also the interaction of government and society is included. Consequently, it reduces the ambiguity of findings related to the reversal of the oil curse, since a lack of transparency seems to be especially related to oil (Williams 2015). By doing so, the inconclusive findings on the reversal of the negative economic effects of oil are improved. The clarification of the outlined relationships also yields vital indications for policy-makers seeking to promote economic development via increased transparency.

Analytical Framework

To understand how the aforementioned concepts relate to each other and lead to credible commitment and economic development in oil economies, it is necessary to outline the concept of credible commitment and its implications. Based on this, the relationship with transparency, institutional quality and political constraints to promote economic development in oil economies will be discussed and summarized into one single narrative on which the hypotheses of the study build.

Recent studies point to credible commitment as one of the key patterns of economic development in general (Grabowski et al. 2015) and for resource-rich countries in particular (Barma et al. 2012; Menaldo 2016). Grabowski et al. (2015) provide a concise concluding observation in their book in which they tie credible commitment to state capacity building processes of tax revenue bargaining that gradually create both institutionalized accountability and reliability as a consequence. Barma et al. (2012) present a significantly more complex and technical model of development revolving around what they call the credibility of intertemporal commitment. In combination with political inclusiveness, it determines the capability of a country to reallocate resource rents in favor of sustainable, widespread development (Barma et al. 2012: 54). These two dimensions are largely interdependent, as the enforceability of extractive bargains and policy stability over time (credibility of intertemporal commitment) and the incorporation of diverse interests go mostly hand-in-hand (Barma et al. 2012: 54).

To create credibility the incentive to break a commitment must be low, i.e. either payoffs are low or the costs or risk of being sanctioned are low (Barma et al. 2012: 59). It can be generally assumed that states or state elites in control of resource rents or oil rents specifically have relatively high payoffs and low risk of being sanctioned because they do not rely on taxation as a possible interaction channel between state and society (Moore 2008). Most importantly, these states have a low risk of being detected when they deviate from former commitments (Williams 2011). According to Barma et al. (2012: 59), institutional factors determine the possibilities and

constraints as they define the arenas of interaction, and consequently, both formality and transparency of decision-making.

In sum, they find that two of the key principles towards sustainable development are a commitment of the state to a set of rules that enables interaction between it and society or private economic actors (via property-rights institutions) and, secondly, transparency of economic regulations and management to improve government credibility (Barma et al. 2012: 30).

This is in line with the argument made in this study that commitment of the state to certain rules (i.e. rule of law) based on institutional constraints is necessary to create sustainable development built on private economic actors and not exclusively on the state-dominated extractive sector. However, this commitment's credibility depends on how transparent the economic and political activities of the state are. Therefore, if state A and B have equal commitment to constraints but A has a higher level of transparency, state A will create a more *credible* commitment to private economic actors and thus promote more sustainable and widespread economic development. State A achieves that by informing private economic actors more reliably about its actions, which makes the state both more accountable and more predictable in the eyes of this group as well as the civil society. In turn, the confidence for investments and taking economic risks throughout all sectors in state A's economy is increased. Furthermore, this increased information about the state's actions and its adherence to or violation of institutionalized rules affects the economic effectiveness of states' commitments to these rules and constraints decisively. Consequently, only when investors and the society are convinced by the regular and rule-based functioning of the executive and its administration they will actually rely on these institutions and enable their full beneficial effect for the functioning of the economy. Transparency can create this credibility by proving the correctness of the state's conduct, but also by showing the responsiveness of the state to demands.

Resource-rich states that rely less on tax revenues have difficulties in overcoming the commitment problem (Barma et al. 2012: 59; Grabowski et al. 2015:251) as they have not created the institutional accountability that follows tax revenue bargaining (North/Weingast 1989). They also have difficulties because these states can counteract sanctions for breaking commitments by providing substantial rent rewards or sanctions themselves (Barma et al. 2012: 59). This is especially true for high value point-resources such as oil that are easily appropriated and centrally controlled by the state. Consequently, economic and political activities are less transparent (Ross 2012).

Transparency is a relatively new concept in the natural resource literature (Ross 2015). While many scholars agree that transparency matters, it is not clear how to grasp such a wide concept and which dimensions really matter. Additionally, it is unclear how to separate it from other institutional factors (Bauhr/Grimes 2017). Nonetheless, Williams (2011) shows empirically that informational transparency has a significant effect on economic growth that alleviates the negative effects of point-resources. In line with the credible commitment argument above, Williams (2011) argues transparency decreases corruption, makes capturing rents (i.e. regulatory capture enabling large-scale rent-seeking) harder and allows the society to hold government and institutions accountable. In addition, it diminishes patron-client networks and enables private market participants to make efficient and informed investments (Williams 2011). The found correlation on economic growth even holds up while controlling for institutional quality and corruption, indicating that it adds to the narrative of institutionally caused reversals of the resource curse (Boschini et al. 2013; Mehlum et al. 2006) and that it influences more than the well-established link of resources and institutional quality via corruption (Ross 2015). This underscores the importance of the credible commitment via transparency argument put forth in this paper.

Oil-dependent states are the prime example of the resource curse and although this curse has been questioned and limited significantly by scope conditions, the oil curse seems more persistent than any other curse (Ross 2012). Similarly, Boschini et al. (2013) disaggregated the resource curse but could not find a reversal for oil separately. This paper sets out to investigate the credible commitment mechanism of oil-dependent states more closely. Different from most analyses, it will do so by looking at the factors for differing success of economic development within this group of countries. In order to do that, it is crucial to highlight which mechanisms stall economic development for oil-rich countries. Factors that are beyond the scope of the individual state such as diminishing returns and price volatility that are typical for oil revenues will be accounted for in the analysis, but do not play a role in the credible commitment argument contended here. That also means that complex and idiosyncratic countercyclical policies as a successful path for some countries (Ross 2012) are not taken into further consideration. The remaining factors can be divided into the category of Dutch Disease on the one hand where the state is unable to prevent an overconcentration in the extractive sector or promote the manufacturing sector. Credible commitment can help to mobilize private economic actors and improve

the effective reallocation of resource rents (Barma et al. 2012: 54). The largest share of alleviation, however, is created by effective institutions and depends on the disbalance of oil revenues compared to revenues from other sectors (Grabowski et al. 2015: 236). On the other hand, the category of Nigerian Disease is mainly caused by institutional weakness that leads to increased corruption and rent-seeking (Williams 2011) as well as patron-client networks. In sum, the state loses institutional enforcement capacity and becomes less accountable and less predictable due to the non-transparent nature of informal processes. This effect is significantly worsened in oil-rich states, because of the widespread nationalization of the oil industry (Ross 2015) that tends to diminish transparency further. In those situations, both the reversal of the resource curse through institutional quality and the credible commitment of the state via transparency and political constraints should have the strongest impact in promoting sustainable development.

Resulting from the discretion that weakened institutions and patron-client networks bring, states are less accountable and often have less political constraints due to their rent-system (Herb 2009; Ross 2012). Institutional quality as one kind of constraints has been used successfully to reverse the resource curse. However, rule-based constraints on the executive have not yielded a clear correlation for any kind of resource (Boschini et al. 2013), despite the emphasis of recent studies on the importance of commitment to rule of law, property rights and policy stability for economic development (e.g. Acemoglu/Johnson 2005; Barma et al. 2012; Edwards 2017; Grabowski et al. 2015; Menaldo 2016). This thesis argues that only once the level of credibility is taken into account, rule-based constraints on the executive develop a clear effect that goes beyond the regular explanations of institutional quality. For oil-reliant states that do not substantially rely on reciprocal revenue bargaining due to their resource revenue (Moore 2008: 62), transparency provides an alternative to create credibility as Williams (2011) has shown. Overall, this mechanism should increase the effects of commitment to stable policies, which in turn provides good conditions for private economic actors to foster economic development.

Examples for the promotion of sustainable development by increased transparency[5] similar to the theorized mechanism can mainly be found in countries with significant mining industries but rarely for oil. Although the general thrust for transparency is relatively recent, some positive experiences in Latin America could be reported at the EITI (Extractive Industries Transparency Initiative) conference in November 2013. There was common agreement that the EITI project "improves trust and communication between civil society, government and the private sector

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[5] Often regarding the resource sector specifically, however.

to overcome conflict that has existed for many, many years. In addition, it favors poverty reduction and human development of the population[.]" (World Bank 2014). Positive examples in this regard are among others Honduras and Peru (World Bank 2014), Botswana and Chile (World Bank 2018), but also Ghana as a country that is transferring lessons from its mining sector's transparency policy to its comparatively small oil sector (Van Alstine 2014: 27). Symptomatically, many of the oil-dependent economies analyzed here are not members of EITI. Tellingly, two analyzed countries that actually were founding members of the EITI have diverted substantially in their transparency progress. Nigeria announced from the beginning transparency measures that even go beyond the EITI criteria (Eigen 2007), but implementation and enforcement have proven complicated and were repeatedly suspended by strong opposition (Van Ingen et al. 2014: 371). Contrary to that, Azerbaijan has left EITI in 2017 after it was suspended due to non-satisfactory progress. This step that may cause a loss of trust by the World Bank but also private economic actors was likely supported by the prospect of continued investments in Azerbaijan's Southern Gas Corridor Project as it is a vital interest of the European energy market (Alili/Bittner 2017).

Research Design

To test whether the credible commitment via transparency argument made above holds up in the selected oil economies, four hypotheses are derived. They are designed to test the effect of the two explanatory factors separately (*H1*, *H2*) and in the theorized interaction effect (*H3*). Finally, the question needs to be answered whether the observed effect is distinct from outcome-based institutional quality, which has been successfully used (Mehlum et al. 2006; Boschini et al. 2013) to explain the reversal of the resource curse in general (*H4*). Taken all together, these hypotheses, if confirmed, give support for the argument that both credibility (transparency) and commitment to rule of law (political constraints) have a positive effect when considered in one model. Furthermore, the interaction of both increases the total effect and finally, the effect is distinct from prior explanations focusing on institutional quality exclusively.

H1: Informational transparency is positively correlated with economic development.

H2: Political constraints on the executive are positively correlated with economic development.

H3: The positive correlation of political constraints with economic development is higher/lower proportionally to the level of informational transparency.

H4: These correlations hold up while controlling for outcome-based measures of institutional quality (ICRG).

To test these hypotheses a fixed-effects (FE) regression will be conducted to account for systematic endogeneity as identified in the data by the Hausman test and suggested by theoretical considerations of time-invariant factor categories such as geography and historically rooted trajectories of institutions but also the initial level of development. In addition, some of these factors will be considered indirectly through their influence on institutions and vice versa (Rodrik 2003: 5). Disadvantages of this method are comparatively larger standard errors, which can make estimations less precise (Allison 2009). Different to most studies, the analysis will consider only states with significant oil revenues (>10% of GDP). This threshold is comparable to Mehlum's et al. (2006) for resource revenues in general and is established practice since Auty (1993) set it up (Edwards 2017). Setting no threshold would lead to the inclusion of states that do not face the same consistent conditions of oil-reliance and distort the analysis.

Following Edwards' (2017) stance, it is important to not just focus on different outcomes between oil states and non-oil states, but also to investigate different outcomes and dynamics within the group of oil states exclusively. This can create new insights, which can then be integrated in the larger context beyond oil-producing states.

Although the complexity and idiosyncrasies of economic development make single-case studies an essential part of the research, this thesis will attempt to establish a common factor of development that has been observed in case studies throughout the world as a missing piece in studying the oil curse and its conditions. The selected regression technique is the best method to assess such a universal mechanism as theorized.

The analyzed *data* is obtained from the Quality of Government dataset (Teorell et al. 2018) and has been combined with transparency data (Williams 2015). Considering the available data for the explanatory variables and control variables (see below) this selection leaves a comparatively small sample size of 21 countries with on average 10.2 country-year observations (215 in total) as units of analysis. As these numbers show, the sample is unbalanced and covers only the period between 1995-2010 due to data availability problems particularly with indicators for

economic development and property rights. Nonetheless, the selected group of countries represents 21 out of 30 countries that fit the selection pattern during that time. The aspiration of the analysis is less focused on prediction but rather on proving the validity of the hypothesized correlations and assessing their impact on average within the given group of countries.

Starting with the theoretically relevant variables, *economic development* as dependent variable (DV) is regularly reduced to economic growth focusing only on GDP/capita. However, the concept of economic development is much broader and is understood here as a self-sustaining growth that includes structural changes in the production of goods and services, technological upgrading and finally, widespread improvement of human development (Grabowski et al. 2015: 6). Derived from that, the concept can be divided into strictly economic factors such as size of different sectors and GDP/capita on the one hand and human development factors like education and health – but also equality. There is no measure that would integrate all of these categories, but the Human Development Index (HDI) offers the best available compromise for the time being and it has been used in similar studies (e.g. Bulte et al. 2005). It provides a broader perspective than just GDP as it is not as easily distorted by high oil revenues. GDP/capita will nonetheless be used as an alternative specification to validate the regression results and make them more comparable to studies using this more popular indicator. For completeness, the minor issue of stationarity for both variables is discussed in the appendix.

Institutional quality as the main layer of the resource curse reversal mechanism will be measured by using the International Country Risk Guide (ICRG), which is a compound measure covering different indicators within the categories of corruption, law and order and bureaucratic quality (Teorell et al. 2018).

Political constraints on the executive will be modeled using an indicator with the same name from the Polity IV dataset (Marshall et al. 2016). It was also used as a rule-based measure of institutional quality (Boschini et al. 2013), but the author sees no direct conceptual overlap concerning his contended theoretical argument. The ICRG index is more about administrative capabilities, whereas political constraints can be understood as the commitment of state elites to commonly agreed (in the sense of an abstract social contract) rules.

For *transparency,* the analysis will use a new dataset provided by Williams (2015). The indicator that fits best with this explanation (informational transparency) relates to the quantity and quality of economic, social and financial information and the citizen's ability to access this information. With its primary focus on information relevant to market participants (Williams

2015: 6) this indicator is ideal to capture the credibility and trust gained by providing transparent information.

Typically used time-variant *control variables* are trade openness (share of imports and exports on GDP) and population/population growth[6]. Furthermore, the actual amount of oil revenue is an important factor that influences states beyond the dichotomous selection threshold as it differs significantly between the countries and over time. The extreme price volatility of oil can be modeled by including the oil price. More recently, the role of female labor force has been found to be a significant explanatory factor (Ross 2012) that is included to not mistake its effects on economic development with the explanatory variables. Finally, a democracy index should be included as political constraints on the executive are highly correlated with the level of democracy which itself is a strong predictor for the HDI. For the sake of the theorized relationship, these separate logical narratives should be treated separately. However, mathematically the measure for democracy is too highly correlated ($r > 0.8$) with political constraints to yield conclusively distinct estimations in the regression model.

Table 1 - Countries and years included in the analyzed sample

Country	Obs.	Years
Algeria	12	1996, 2000-2010
Angola	7	1999-2000, 2006-2010
Azerbaijan	12	1999-2010
Ecuador	7	2000, 2004-2008, 2010
Egypt	4	2005-2008
Gabon	16	1995-2010
Iran	14	1996-1997, 1999-2010
Kazakhstan	11	2000-2010
Kuwait	15	1996-2010
Libya	15	1996-2010
Nigeria	8	2003-2010
Norway	1	2000
Oman	11	2000-2010
Papua New Guinea	3	1999-2001
Qatar	12	1999-2010
Saudi Arabia	15	1996-2010
Syria	12	1996-2007
Trinidad and Tobago	2	2005-2006
United Arab Emirates	10	2001-2010
Venezuela	12	1995-1997, 2000-2008
Yemen	16	1995-2010

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[6] Due to the fixed-effects approach, all variables represent changes from the country-specific mean, which can be considered as measuring growth.

Analysis

The following analysis will first examine the given data on both a univariate and bivariate level. To assess the differences and idiosyncrasies of the selected group of countries and put them in context, the computed values will also be compared to a global sample of countries. Due to data availability, this global comparison group encompasses 106 countries including the countries selected for this analysis.

As for the regression analysis, the results will be reported for a FE-model with Driscoll-Kraay standard errors (Hoechle 2007) to address encountered issues of heteroscedasticity, serial auto-correlation and likely spatial correlations. Unlike most correction methods, this approach also works for unbalanced data, which the selection criterion and general data availability caused (Hoechle 2007). Using this correction method deals appropriately with all model assumption violations that were detected. After testing the hypotheses on this best-practice model, further robustness checks will be performed and indications for the conducted analysis are discussed. Additionally, improvements for future analyses are suggested based on these checks.

Univariate Inspection

The univariate inspection of the variables gives a first impression of the features and idiosyncrasies of the analyzed countries. To put these values into perspective it is insightful to compare the DV and the key explanatory variables with the mentioned global sample of countries. Generally, the group of countries selected for this analysis is more homogenous and has slightly lower values in these indicators than the global average. Only for GDP/capita the average of oil economies is about 55% higher and GDP growth is also 1.5 percentage points higher than the global sample. Even though the first observation was to be expected, the second one contradicts the intuition of an oil curse on GDP growth at least on an average level in this superficial and inconclusive univariate overview. Similarly, the HDI average is almost the same as in the global comparison group (comparison group = 0.7).

As for the explanatory variables, the average of informational transparency in the analyzed country group is clearly lower than globally (63). Furthermore, the average degree of political constraints is nearly half as high in the selected oil abundant states. Moreover, the mean for quality of government is clearly lower (0.58). However, the variation for the selected country group is only half as large indicating a more homogenous trend. In spite of being more homogenous than the global sample, there is still a wide range of diversity among the analyzed coun-

tries. For instance, the minimum of HDI is relatively low even on a global level, but also includes one of the highest scores in the data.[7] Another extreme difference is the population size, which is almost four times larger than in the global comparison sample. Possible explanations are likely related to higher birth rates in oil-abundant states (Ross 2012), but maybe also the greater likelihood for the existence of significant and marketable oil resources in large area states.

Table 2 - Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.	Source[8]
Human Development Index (HDI)	215	0.68	0.115	0.38	0.92	United Nations Development Program (2017)
Informational Transparency	215	51.27	10.189	31.00	79.00	Dataset for Information and Accountability Transparency (2014)
Institutional Quality of Government *Index of the dimensions corruption, law and order, bureaucracy quality*	215	0.47	0.115	0.22	0.94	International Country Risk Guide (2017)
Political Constraints on the Executive *(Decision Rules)*	215	2.68	1.457	1.00	7.00	Polity IV Annual Time-Series (2017)
Oil rents as % of GDP	215	27.27	12.455	10.24	65.42	World Development Indicators (WDI), World Bank (2017)
Trade Openness *sum of exports/imports of goods and services*	215	80.23	23.801	32.65	178.99	WDI, World Bank (2017)
Constant Oil Price in 2000 dollar/brl	215	40.79	18.780	13.62	77.79	Ross/Mahdavi (2015)
Total population in million *(de facto)*	215	22.10	30.70	0.57	159.00	WDI, World Bank (2017)
Female labor force *% of total labor force*	215	28.31	13.201	11.46	50.53	WDI, World Bank (2017)
Degree of Property Rights *existence of according laws, enforcement by government, likelihood of expropriation*	215	38.19	19.237	10.00	90.00	Heritage Foundation, Index of Economic Freedom (2017)
GDP/capita *based on purchasing power parity (PPP) in constant 2011 International Dollar*	199	31085.3	32279.1	1744.06	125141	WDI, World Bank (2017)
GDP growth *annual % of constant local currency*	209	5.603817	6.175152	-8.93262	34.5	WDI, World Bank (2017)

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[7] This single observation is Norway 2000, which does not directly influence the regression analysis - see Appendix for more information

[8] Most of the data was accessed via the Quality of Government Dataset (Teorell et al. 2018)

In sum, a large variation also within the small group of analyzed oil economies is evident. *Figure 1* below further illustrates the great variation of the DV Human Development (HDI) for those countries where data availability allows overseeing a longer time span. By comparing the first available value with the final observation year of the analysis, the variation of HDI both between the countries and within the country itself become apparent. Three crucial conclusions can be drawn from this. The levels for specific years (between-variation) but also the development performance over time (within-variation) differs significantly between these countries. Except for a few outliers, the variation seems to have decreased i.e. the levels of the HDI for different countries are closer. This is in line with the literature arguing that oil wealth is on average beneficial for economic development at low levels of development, but at some point stalls diversification (Grabowski et al. 2012: 243) and thus also private economic activity.

As pointed out in the methodology section, the FE-regression analysis conducted in this paper is designed to explain the different development performances of the analyzed countries over time rather than the variation of development levels between those analysis units. Considering the observations from *Figure 1*, this step is not just due to statistical necessity, but is also justified by the inspection of the DV.
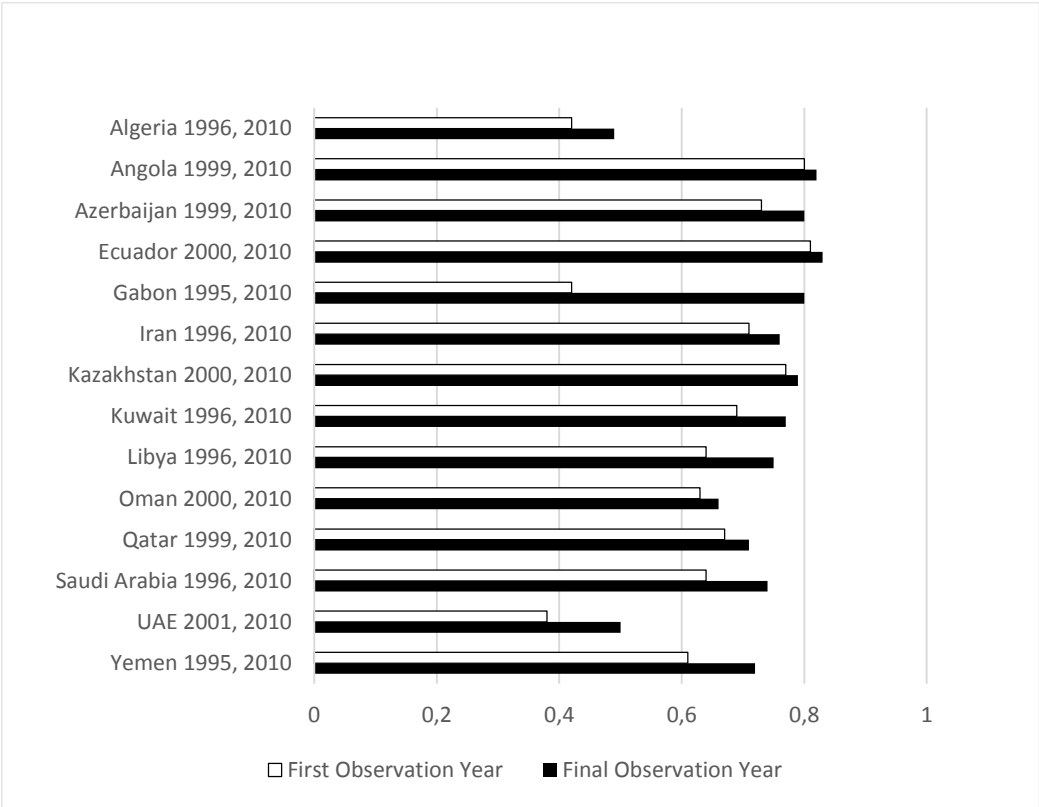

Figure 1 – HDI variation for selected countries

Bivariate Correlations

The bivariate correlation table gives an overview about the effects for each variable with another, but without taking the influences of other correlated factors into account. Therefore, the table does not provide a conclusive picture. Instead, it is a first indication of the magnitude of each correlation and its direction. For the DV HDI, it can first be seen that informational transparency has a moderate positive correlation as expected (*H1*). Surprisingly, political constraints have a minor but negative correlation coefficient going against *H2*. In comparison, the correlation for the global data are significantly more positive for both (transparency r=0.72; pol. constraints r=0.41). These coefficients indicate that political constraints in the analyzed oil economies are set in a different context and thus follow a different pattern. Furthermore, the role of informational transparency is diminished in oil economies. Nonetheless, it still constitutes the second largest positive coefficient. The measure of institutional quality confirms its influential status in the literature as it has a strong positive correlation that stands out as the highest coefficient regarding the DV. Remarkably, oil income itself has no clear correlation with economic development – this supports the position held in the literature that oil income itself is neither positive nor negative on economic growth, but largely depends on other factors. Moderate correlations for the remaining control variables confirm the expectations except for female share of labor forces. This is surprising as a lower share is considered to be part of the explanations of why some oil economies have lower levels of economic development. A possible explanation could be that, when only oil abundant states are considered, a higher share of female labor rather indicates insufficient oil rents for households, which makes it necessary for women to be involved in also generating income.

Table 3 - Bivariate correlations

	1	2	3	4	5	6	7	8	9	10	11	12
1. HDI	1.00											
2. Informational Transparency	0.34	1.00										
3. Political Constraints	-0.21	0.38	1.00									
4. Institutional Quality	0.61	0.09	-0.13	1.00								
5. Property Rights	0.32	0.19	0.02	0.44	1.00							
6. Oil rent (% of GDP)	0.01	-0.24	-0.46	-0.01	-0.08	1.00						
7. Trade openness	0.08	0.05	-0.23	0.10	0.23	0.37	1.00					
8. Oil Price	0.16	0.27	0.00	-0.15	-0.26	0.21	0.16	1.00				
9. Population Size	-0.38	-0.13	0.35	-0.30	-0.35	-0.23	-0.49	0.15	1.00			
10. Female labor force	-0.35	0.39	0.27	-0.51	-0.17	-0.07	0.16	0.03	0.01	1.00		
11. GDP/capita	0.68	0.13	-0.28	0.63	0.57	0.14	0.30	0.04	-0.38	-0.49	1.00	
12. GDP growth	0.01	0.20	-0.06	-0.11	-0.13	0.07	0.11	0.19	0.09	0.17	0.08	1.00

Concerning the key explanatory variables, it can be seen that informational transparency and political constraints are both moderately and positively correlated, which is in line with the expectation that there is a reinforcing interaction between the two. Regarding the established explanations of economic growth under resource abundance, both property rights and institutional quality only show low positive correlations with transparency or political constraints. This supports the expectation that these indicators do not overlap with the traditional explanations but measure a different dynamic. Likewise, the correlation of oil rents and the two explanatory variables are clearly negatively correlated, whereas oil rents appear to not be unambiguously correlated with property rights or institutional quality. A straightforward interpretation of this could be that in countries where oil rents are lower there are more informational transparency and political constraints as more democratic institutions and open information are more likely. Vice versa, it is clear that transparency is positively correlated with sustainable economic development (HDI) and it could possibly be related to processes that make countries less reliant on oil. As with most correlations, there is no indication for a direction of the causality (assuming that spuriousness was sufficiently controlled for) and both mechanisms may be at work simultaneously. As for political constraints, the second expectation (*H2*) is not supported by the data. In the regression analysis, the interaction effect will be included to clarify the surprising bivariate correlation of political constraints and economic development, which seems counterintuitive on the bivariate level.

Regression Results

A first regression of the key explanatory variables (also referred to as core model) reveals some indication about the relationship of these variables on economic development. Building up the model by adding one variable at a time, two observations can be made regarding the first hypotheses. The expectation (*H1*) that informational transparency is positively correlated with the HDI can be confirmed throughout all models. Regardless of the inclusion of other variables, this effect remains stable and significant showing that the established explanatory factors in the literature (institutional quality, property rights) do not measure this relationship indirectly. Therefore, this relationship is distinct from the former factors and bears additional explanatory value, which is also supported by the increased explained variance (adj. within-R²) between *model 1* (core model) and *model 4*.

Tabelle 4 – Regression results

	(1) HDI	(2) HDI	(3) HDI	(4) HDI	(5) HDI	(6) HDI	(7) HDI	(8) HDI	(9) HDI	(10) HDI
Informational Transparency	0.0022*** (0.0002)	0.0035*** (0.0005)	0.0034*** (0.0005)			0.0046*** (0.0007)	0.0021*** (0.0004)	0.0021*** (0.0003)	0.0018*** (0.0002)	0.0018*** (0.0001)
Political Constraints	0.0005 (0.0016)	-0.0031 (0.0038)	-0.0010 (0.0030)		0.0041* (0.0015)	0.0217** (0.0072)	-0.0021 (0.0052)	0.0109* (0.0049)	0.0113*** (0.0029)	0.0135*** (0.0032)
Institutional Quality	-0.1880*** (0.0266)		-0.0864 (0.0525)	-0.1852*** (0.0279)	-0.1964*** (0.0322)	-0.0765 (0.0481)	-0.1910*** (0.0292)	-0.1325*** (0.0262)	-0.1161*** (0.0223)	-0.1019** (0.0300)
Property Rights	-0.0005** (0.0002)			-0.0013*** (0.0002)	-0.0013*** (0.0002)		-0.0005 (0.0002)	-0.0003 (0.0001)	-0.0000 (0.0001)	-0.0000 (0.0001)
Interaction Effect						-0.0005** (0.0001)	0.0001 (0.0001)	-0.0002* (0.0001)	-0.0002** (0.0001)	-0.0002** (0.0001)
Population Size								0.0038*** (0.0001)	0.0018*** (0.0005)	0.0016** (0.0004)
Oil rent									-0.0006** (0.0002)	-0.0006** (0.0002)
Oil price									0.0007*** (0.0001)	0.0008*** (0.0001)
Trade Openness									-0.0001* (0.0001)	-0.0001* (0.0001)
Female Labor Force										0.0011 (0.0007)
Constant	0.6757*** (0.0265)	0.4952*** (0.0259)	0.5423*** (0.0503)	0.8171*** (0.0186)	0.8109*** (0.0178)	0.4813*** (0.0589)	0.6843*** (0.0364)	0.5612*** (0.0348)	0.5982*** (0.0265)	0.5627*** (0.0440)
N	219	309	290	314	312	290	219	219	215	215
Within-R^2	0.57	0.41	0.42	0.32	0.34	0.44	0.57	0.67	0.8	0.8
Adj. Within-R^2	0.56	0.41	0.41	0.32	0.33	0.43	0.56	0.66	0.79	0.79

Standard errors in parentheses
* $p<0.05$; ** $p<0.01$; *** $p<0.001$

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Just like its bivariate correlation, the role of political constraints is rather counterintuitive and the high p-value (0.42 for *model 2*) reflects the ambiguity of the correlation in the data. Due to this ambiguity, it cannot be clearly determined whether political constraints have a positive or negative correlation with development in the models discussed so far. Adding the related variables institutional quality and property rights (*model 1*) increases this ambiguity (p=0.77) but improves the model overall (adj. within-R² for *model 1* and *model 2*).

Especially the correlation effect of institutional quality is clarified when property rights are also considered in the model. This step renders institutional quality significantly negative. While the analysis undertaken in this paper does not claim predictive power, the significance values and confidence intervals are used as a measure of the accuracy of the correlation effect estimation. As in the case of institutional quality, only once a certain degree of significance is reached it can be assumed with reasonable likelihood whether the correlation is positive or negative.

Curiously, in the case of institutional quality and property rights it can be noted that both are negatively correlated with the HDI, which is partly related to the unconventional choice of DV.[9] This finding is also consistent when transparency and constraints are not considered (*model 4*). The effect strength of the property rights indicator is, however, almost negligible in most models and would not visibly affect the HDI value, which only has two decimal places.

Returning to the most puzzling finding regarding the research question; the role of political constraints stood out in both the univariate and bivariate analysis. Moreover, it is also the indicator that is the most affected by the other explanatory variables in the regression analysis. However, leaving out informational transparency renders the correlation effect of political constraints significantly positive (*model 5*). This shows that the indicator for transparency and the one for political constraints do have some overlap in what they measure but transparency can explain the variance in economic development more accurately, which is also reflected in the more detailed discussion of the interaction effect later on.

When the hypothesized interaction effect between the two variables (*H3*) is added, this relationship is clarified and all three coefficients (the two indicators and their interaction term) are significant (*model 6*). However, this is only the case when property rights are not included. Once property rights are accounted for, both the interaction effect and political constraints become highly insignificant (*model 7*). This only changes when additional control variables are

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[9] See robustness checks below for a comparison with GDP/capita – the tendency is also towards a negative effect

included. Most substantially, the inclusion of the population size (*model 8*) turns these two variables significant again but renders property rights slightly insignificant (p=0.07).

Due to the prior theoretical consideration and expectations, the analysis is strongly concerned with this complex of conceptually related variables of state behavior and population size as a necessary clarifying indicator. A possible interpretation of what the observed changes reveal could be as follows: informational transparency and political constraints seem to partially measure the same developments regarding HDI. The interaction effect clarifies this relationship and consequently results in more accurate (i.e. significant) estimations of the distinct individual correlation coefficients. When property rights are included, it turns both political constraints and the interaction effect equally insignificant indicating that the real issue lies with political constraints here. Property rights are virtually not correlated with this variable (see *table 3*) and they even have opposing correlation directions with the DV, which makes measuring similar dynamics in a multivariate model unlikely. The changes the inclusion of population size causes might be more insightful as it has a positive bivariate correlation with political constraints (r=0.35) but it is also negatively correlated with property rights (r=-0.35). The interpretation the author finds most plausible is that population size is associated with a more complex political system (i.e. likely more political constraints) but it makes a joint mobilization for certain political demands (property rights) less likely. Proving or disproving such speculations, however, is beyond the realms of this paper and only of secondary importance to its research interest.

Considering the important changes the addition of population size led to, the inclusion of the remaining control variables will further test the robustness of the correlation coefficients in the established model. The first block of control variables is concerned with the economic conditions that largely determine the influence oil abundance has on a particular country. Firstly, that is the actual share of oil rents of the total GDP. While all observations were selected to represent countries with high oil revenues, there is a substantial range (from 10-65%) how much of the economic output is actually generated by oil rents. This number fluctuates not just between states but also over time and with different magnitudes. Secondly, the volatility of the oil price is a largely exogenous, but substantial factor that supports the explanatory value of oil rents. Lastly, trade openness is a more general factor of economic development, which has been shown to be crucial (Rodrik 2003: 5). Taken separately, only the oil price is significant and clearly improves the whole model even though property rights become completely insignificant (p = 0.99) by adding this indicator. Including these closely related factors as one conceptual

block (*model 9*) leads to the best model (in terms of explained within-variance and parsimony), in which all three new variables are significant and apart from the indicator for property rights the model is clearly improved. The negative consequences for the property rights correlation, especially caused by the inclusion of oil prices in the model, could indicate that the influence of property rights on economic development depends on the overall economic situation that is largely determined by oil-generated income. While the bivariate correlation is not very strong (r = -0.26), there seems to be a coincidence of higher oil prices and worse property rights situations. Following the commonly proposed narrative, property rights can only be enforced by the economic elite if the state relies on taxing the income they generate (Grabowski et al. 2015; Moore 2008). The higher the oil price – and thus the higher the income from oil – the less the state is incentivized to grant property rights in general as the dependence on private economic actors is lower. However, it was shown early on in the analysis that although the correlation is significantly negative, the effect magnitude of property rights is negligible once all other factors are considered. Therefore, the interpretation is just one possibility since the effect itself is minor enough to be caused by a multitude of subtle indirect correlations.

Adding the last control variable (share of female labor force) yields no substantial improvement for the final model and the indicator remains insignificant. This does not mean that this variable has no relevance for economic development, since the bivariate correlation clearly shows the opposite. It instead means that most of the observed variation is already well enough explained and this variable cannot add a significant amount of new information within this particular model.

Before completing the analysis, the theoretically possible impact of the analyzed IVs on HDI should be assessed based on the predictions of the regression analysis. Comparing this to the total change in HDI will put the role of the analyzed factors into a larger perspective. To keep this tangible and realistic, the statistically expected difference is calculated from the difference of HDI when an independent variable is moved up from the minimum value in the sample to the mean value (ceteris paribus). This shows that the expected change of the HDI is relatively low for all variables with the highest increases coming from informational transparency (0.036), population size (0.034) and political constraints (0.023). The strongest decreases can be found for institutional quality (-0.025) and oil rent (0.01). For a scale like HDI that ranges from 0 to 1, these large-scale changes in IV only translate into small increases of economic development. This rather theoretical consideration shows that economic development is not determined by a few factors. Instead, it is a quite complex process usually extending over a long period. On

average, the observed countries have increased their HDI by 0.05 from 2000 to 2010. With this number in mind, it can be seen that even though the change achieved by each variable is relatively minor on a total scale, the analyzed factors can provide a substantial boost compared to the total average increase that was achieved.

Reviewing the insights gained from the regression analysis, the hypothesis *H1* concerning the positive correlation of transparency was confirmed with statistical certainty of more than 99.9%. Based on the final model (*model 10*) with the included interaction effect, the coefficient of political constraints is significant enough to conclude with reasonable likelihood, that there is also a significant, positive correlation with economic development as formulated in *H2*. The interaction effect between informational transparency and political constraints appears to be supported by the analysis judging by the improvements it provided for the initially ambiguous and volatile role of political constraints in the selected oil economies. Admittedly, the final model covers enough influential factors to not rely on the interaction effect to improve explanatory power or accuracy of the model. Especially the inclusion of the factors population size, oil price and female labor share can clarify the relationship of political constraints with economic development almost as good as the interaction. Nonetheless, the interaction effect provides a more parsimonious and slightly more accurate model that can explain a substantial amount of economic development based on state features and actions instead of more abstract economic factors, which were covered by the control variables. The interaction effect itself, however, behaves not as expected in *H3*, which will be discussed in the following section.

Interaction Effect

Calculating the total impact of informational transparency, political constraints and their interaction effect on economic development shows that the relationship is less straightforward than initially expected (*H3*). The strongest impact on economic development occurs when informational transparency is high but political constraints are low.[10] Likewise, the lowest total effect can be found when political constraints and transparency are low. An increase from the minimal available value for political constraints in the country sample to the maximum while holding informational transparency constant at the minimum increases the HDI by 0.04. Vice versa, increasing transparency from the minimum to the maximum leads to an increase of almost 0.08. Consequently, transparency takes a more substantial role in increasing economic development

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[10] All described observations are based on the point estimate as the most likely correlation coefficient for each variable (taken from *model 10*).

but, as the total effects show, the individual impacts are relative to each other. The higher the level of political constraints, the lesser informational transparency can further improve economic development. Conversely, the higher the value for transparency the smaller the improvement that can be made by increasing political constraints. This goes up to the point where increasing political constraints actually appears to decrease the total effect on HDI on the highest level of transparency. These illustrating descriptions and the minus-sign for the interaction in the regression models shows that the interaction effect is rather counteracting the additive effect of its parent variables.
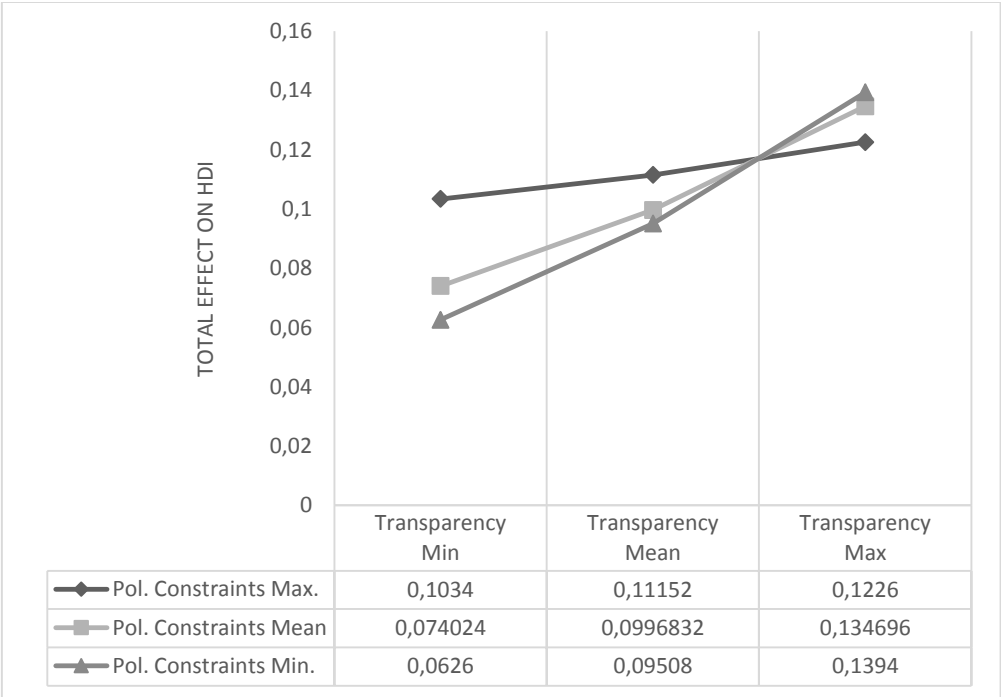

	Transparency Min	Transparency Mean	Transparency Max
Pol. Constraints Max.	0,1034	0,11152	0,1226
Pol. Constraints Mean	0,074024	0,0996832	0,134696
Pol. Constraints Min.	0,0626	0,09508	0,1394

Figure 2 - Interaction effect between informational transparency and political constraints on the executive (*Total effect of interaction term and parent variables on HDI*)

Regarding these observations, the interaction effect that was designed to measure the concept credible commitment via transparency does not act as expected. Higher levels of politial constraints seem to limit the positive effects of transparency. Similarly, a high level of transparency seems to be less beneficial the higher political constraints are. Likely, both factors can partially substitute each other's positive effects on higher levels leading to some kind of ceiling effect. As for the maximum level of transparency, more political constraints seem to rather hinder economic development. Consequently, the interaction effect does not tell a story of amplification but one of substitution with a more substantial role for transparency. Substitution here means that one variable can already lead to a higher level of development so

that the additive effect of the other variable is increasingly limited by the level of the former variable. This suggests that both variables affect to some degree the same underlying mechanism, so that they limit each other's effect on HDI via this shared unobserved mechanism. While this is definitely not the credible commitment via transparency concept as initially expected, it could very well be that credible commitment is the underlying mechanism that ties both variables together. On low levels both variables are almost complimentary, on high levels credibility (created by transparency) can replace the effects of more commitment completely. Both factors cannot and should not be considered separately but only in relation to each other, as the analysis strongly suggests. The substituting effect ties in well with a linkage pointed out in the theoretical framework, indicating that the institutional setup determines the transparency of state actions (Barma et al. 2012: 59). A simultaneous, reversed link is also very likely: the higher the level of transparency regardless of the institutional setup, the lesser the quality of the setup can contribute to transparency the other way around.

Referring back to the key concept of this paper, credible commitment cannot conclusively be shown by this analysis. However, it could be observed that modelling an interactive relationship between the two factors is indeed clarifying the initially puzzling role of political constraints in the selected sample. Contrary to the initial expectation, the two factors do not amplify each other's effect proportionally or even unconditionally on all levels. Consequently, hypothesis *H3* cannot be confirmed. However, there is statistical evidence for a linear interaction that describes the increasing substitution between the parent variables, which suggests they share an underlying mechanism within which their effects on HDI interfere. Therefore, at least on a more abstract quantitative level, there seems to be some indication for a crucial role of a common factor like credible commitment, but this interpretation is by no means conclusive. Whether the specified interaction effect really reflects the concept of credible commitment remains to be shown in further studies, especially on a qualitative level.

The expected correlations (*H1, H2*) and the interaction effect itself, however in the opposite direction as hypothesized, remained robust throughout most model specifications. Loosening the expectation of *H3* and taking the existence of an interaction as a finding on its own (regardless of the direction of the effect), hypothesis *H4* can also be upheld and all three coefficients taken together as one concept add to the predominant narrative of institutional quality and property rights. However, a caveat has to be made regarding *H4* as the underlying assumption that economic growth and economic development behave similarly regarding the institutional quality measure proved wrong in the following section.

Robustness Checks[11]

Finally, the most interesting test for robustness is whether the results can be replicated with GDP/capita as the standard measure for economic growth most findings in the literature build on. As can be seen in *model 11* below, the answer is clearly no. The explained variance is substantially lower (R²=0.23) indicating that there are very distinct relationships and dynamics at work. While the significance of the key explanatory variables can be improved by lagging them for example by three years, the share of explained variance is only slightly improved (R²=0.33). The economic factors reflected by the control variables constitute a larger share of explanatory power than in the model with economic development as DV.

Although the model created in the analysis cannot simply be transferred, informational transparency remains a stable and significant factor even in this apparently distinct context. This underscores the importance and influence of transparency on a wide field of economic development and growth. Factors that are typically found to be positively correlated in the literature (property rights, institutional quality) have positive point estimates but they are not significant enough in this particular model specification to be acceptably conclusive. Contrary even, the coefficients rather tend towards the negative once the significance is improved with lag structures.

In sum, it can be said that the presented results cannot simply be transferred to the debate around economic growth – even more so it was shown that economic growth and economic development are distinct phenomena. This is surprising, since one third of the HDI is made up by the GNI and GDP/capita and HDI are consequently highly correlated (r=0.69).

Table 5 – GPD/capita as alternative DV

	(10) HDI	(11) GDP per capita
Informational Transparency	0.0018*** (0.0001)	150.3491*** (35.4509)
Political Constraints	0.0135*** (0.0032)	1350.7645 (1414.3473)
Interaction Effect	-0.0002** (0.0001)	-25.3856 (25.4079)
Institutional Quality	-0.1019** (0.0301)	4507.6629 (10961.9191)
Property Rights	-0.0000 (0.0001)	73.9606 (65.7725)
Population Size	0.0017** (0.0004)	-217.4461** (55.2267)
Oil rent	-0.0006** (0.0002)	127.2349* (56.8315)
Oil price	0.0008*** (0.0001)	87.0336** (26.3425)
Trade Openness	-0.0001* (0.0001)	-170.2404* (66.9017)
Female Labor Force	0.0011 (0.0007)	808.2263* (280.2930)
Constant	0.5627*** (0.0441)	6069.0734 (13801.3924)
N	215	212
within-R²	0.802	0.23

Standard errors in parentheses
* p<0.05; ** p<0.01; *** p<0.001

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[11] See Appendix for a discussion of further robustness checks that did not have major implications for the results of this study.

Accordingly, more studies should put emphasis on understanding sustainable economic development rather than just economic growth. As pointed out before, researchers should pay more attention to the research interest they pursue. Typical causes of the oil curse in the literature such as Dutch Disease are primarily a matter of sustainable economic development, whereas economic growth will only be limited by the resource revenue that can be generated and the current demand of the global economy. Especially in the case of natural resources the GDP is easily bloated by the extraction sector and tells very little to what extent and how effectively economic success and growth are spread out in the society. The effective allocation of resource rents (countering the Nigerian Disease) as well as conducive and reliable conditions that boost private economic activity are key components of sustainable economic development in resource rich countries. Admittedly, the HDI is a limited indicator for this paper's theorized concept of development and therefore, the need for a more appropriate indicator is evident. Nonetheless, a factor like HDI is the more nuanced option regarding the typical narratives present in the resource economy literature.

Conclusion

This paper set out to answer the question to what extent informational transparency improves the credibility of oil-dependent states' commitment to political constraints as a factor of sustainable economic development. Although the central concepts of this research question are too complex to be conclusively answered by one study alone, the conducted quantitative analysis revealed several robust patterns within the group of oil-reliant countries using the HDI as DV for economic development.

The most consequential observation is clearly that a regression model that explains economic development in the form of HDI is not transferable to the concept of economic growth with a narrow focus on GDP/capita. This finding also marks the strongest limitation of this paper as it cannot fully connect to most of the statistical findings in the debate. Although empirically limiting, this observation raises the theoretical question on the importance of measures of economic development rather than economic growth for the analysis of resource-rich countries. Secondly, the importance of informational transparency could be observed throughout all models and even for economic growth. While the measurement and definition of transparency are still under debate, the robustness and explanatory power that the used indicator in this study showed is promising. This could also be the most practical implication this paper provides: although neither causality nor universal truth can be claimed by the results, transparency appears to be an

influential factor that is comparatively easy to implement and can improve the performance of institutional settings for economic development significantly. Further efforts should be made to improve the understanding of the relationship between transparency and economic development.

Next, political constraints on the executive stood out as the variable for which the analyzed countries diverged the most with an opposite correlation direction. In the regression analysis, this indicator was the most ambiguous and quite sensitive to the inclusion of other variables. The relationship with economic development could only be clarified by the fully specified model or more parsimoniously by adding an interaction effect between political constrains and informational transparency. This step was further supported by the explanatory overlap between these two variables regarding the HDI. Only after the interaction effect was included both variables remained significant and did not interfere with each other indirectly anymore.

In this regard, the interaction effect was statistically justified and successful. Primarily however, the interaction followed the theoretical consideration of modeling the abstract concept of credible commitment via transparency. The conducted analysis showed that transparency plays a crucial role in determining the correlation of political constraints indicating a mutual interaction that might relate to an underlying concept such as credible commitment

In sum, at least statistically speaking there is indication for a mechanism such as credible commitment via transparency that bears explanatory power and appears to hold up for the analyzed group of oil-dependent countries. Moreover, these factors are distinct from the established narrative of institutional quality and property rights, since these factors were accounted for in the model. In this regard, this study added new insights to the gaps it identified, but more research needs to follow up.

As pointed out in this paper, the concept of credible commitment encompasses more than just state features (i.e. institutions) or state actions (i.e. outcome-based institutional quality). Credible commitment describes a dyadic relationship between government and society or between government and private economic actors specifically regarding the theorized causal mechanism in this paper. To advance the importance of this relationship, transparency has been successfully introduced as an indicator of this relationship. However, this still constitutes a state-centered approach to this relationship and neglects the processes on the other side of it. To substantiate the observations made here further, it would be valuable to move beyond state features and actions in order to assess the perceptions of private economic actors under certain conditions of

transparency and political constraints. The analyzed data in this paper can provide help for selecting insightful cases. Furthermore, it should be tested whether this concept of credible commitment via transparency can also be identified under different conditions (different natural resources, levels of tax-reliance to consider tax-bargaining mechanisms). This would yield further understanding of what the observed correlation actually entails practically.

Overall, this paper has gathered promising findings that might add a new factor to the established narrative of economic development and give new clarifications of the correlations present in oil-dependent countries in particular. These findings are by no means conclusive and invite further research. Considering the persisting importance of point-resources now and in the future, as well as the increasing necessity for states to communicate relevant information transparently the interest to improve the understanding of credible commitment and informational transparency should be strong for both researchers and policymakers.

References

Acemoglu D., Johnson S. (2005). Unbundling institutions. *Journal of Political Economy*, 113(5): 949–995.

Alili A., Bittner V. (2017): The cost of Azerbaijan's leaving the Extractive Industries Transparency Initiative (EITI): Analysis of the impact of economy and civil society. Baku: Center for Economic and Social Development Press.

Allison P. (2009): Fixed effects regression models. SAGE, Los Angeles.

Atkinson G. and Hamilton K. (2003): Savings, growth and the resource curse hypothesis. *World Development*, 31(11): 1793–1807.

Auty R. (1993) Sustaining Development in Mineral Economies: The Resource Curse Thesis. London: Routledge.

Bauhr M., Grimes M. (2017) Transparency to curb corruption?: Concepts, measures and empirical merit. *Crime, Law and Social Change* 68(4), 431–458.

Barma N., Kaiser K., Le T., Viñuela L. (2012): Rents to riches?: The political economy of natural resource-led development. World Bank Publications.

Boschini A., Pettersson J., Roine J. (2013): The Resource Curse and its Potential Reversal. *World Development*. 43:19-41.

Bulte E., Damania R., Deacon R. (2005): Resource intensity, institutions, and development. *World Development* 33(7):1029–1044.

Busse M., Gröning S. (2013): The resource curse revisited: governance and natural resources. *Public Choice* 154(1–2):1–20.

Rodrik D. (2003): In Search of Prosperity: Analytic Narratives on Economic Growth. Princeton University Press, Princeton.

Edwards Z. (2017): Boon or bane. Examining divergent development outcomes among oil- and mineral-dependent countries in the Global South. *International Journal of Comparative Sociology* 58(4):304–332.

Eigen P. (2007): Fighting Corruption in a Global Economy: Transparency Initiatives in the Oil and Gas Industry. *Hous. J. Int'l L.* 29:327-354.

Grabowski R., Shields M., Self, S. (2015): Economic Development: A Regional, Institutional, and Historical Approach. Second edition, Routledge, London.

Herb, M. (2009: A nation of bureaucrats: political participation and economic diversification in Kuwait and the United Arab Emirates. *International Journal of Middle East Studies* 41(3): 375-395.

Hoechle, D. (2007): Robust Standard Errors for Panel Regressions with Cross-Sectional Dependence. *Stata Journal* 7(3): 281-312.

Kam, C., Franzese, R. (2007). *Modeling and Interpreting Interactive Hypotheses in Regression Analysis*. Ann Arbor: University of Michigan Press.

Levi M. (1988): Of Rule and Revenue. Univ. Calif. Press, Berkeley.

Marshall M., Gurr T., Jaggers K. (2017): Polity IV Project: Political Regime Characteristics and Transitions, 1800-2016. Data available at: http://www.systemicpeace.org/inscrdata.html

Moore M. (2008): Between coercion and contract: competing narratives on taxation and governance. In: Taxation and State Building in Developing Countries: Capacity and Consent, ed. Bräutigam D., Fjeldstad O.-H., Moore M., 34–63. Cambridge, UK: Cambridge Univ. Press

Mehlum H., Moene K., Torvik R. (2006): Institutions and the resource curse. *Econ. J.* 116(1):1–20.

Menaldo, V. (2016): The Institutions Curse. Oil Curse or Monarchical Exceptionalism.

North D., Weingast B. (1989) Constitutions and commitment: the evolution of institutions governing public choice in seventeenth-century England. J. Econ. Hist. 49(4):803–32

Ross M. (2012): The Oil Curse: How Petroleum Wealth Shapes the Development of Nations. Princeton, NJ: Princeton Univ. Press.

Ross M. (2015): What Have We Learned about the Resource Curse? *Annu. Rev. Polit. Sci.* 18 (1):239–259.

Sachs J., Warner A. (1997): Natural resource abundance and economic growth. Cambridge, MA: Center for International Development and Harvard Institute for International Development.

Teorell J., Dahlberg S., Holmberg S., Rothstein B., Alvarado Pachon N., Svensson R. (2018): The Quality of Government Standard Dataset, version Jan18.
University of Gothenburg: The Quality of Government Institute. http://www.qog.pol.gu.se
doi:10.18157/QoGStdJan18

Van Alstine J. (2014): Transparency in Resource Governance: The Pitfalls and Potential of "New Oil" in Sub-Saharan Africa. *Global Environmental Politics*, 14(1): 20-39.

Van Ingen C., Wait R., Kleynhans E. (2014): Fiscal policy and revenue management in resource-rich African countries: A comparative study of Norway and Nigeria. *South African Journal of International Affairs*, 21(3): 367-390.

Wenzelburger G., Jäckle S., König, P. (2014): Weiterführende statistische Methoden für Politikwissenschaftler. Eine anwendungsbezogene Einführung mit Stata. Munich: Oldenbourg/De Gruyter.

Williams A. (2011): Shining a Light on the Resource Curse: An Empirical Analysis of the Relationship Between Natural Resources, Transparency and Economic Growth. *World Development*, 39(4):490-505.

Williams A. (2015): A global index of information transparency and accountability. *Journal of Comparative Economics*, 43(3): 804-824.

World Bank Group (2014, January 16): Transparency Builds Confidence Among Latin American Stakeholders in Extractive Industries.
URL: http://www.worldbank.org/en/news/feature/2014/01/16/transparency-builds-confidence-among-latin-american-stakeholders-in-extractive-industries [2018, June 5]

World Bank Group (2018, April 10): Keynote Address: Transparency and Public Accountability is at the Core of Good Corporate Governance.
URL: http://www.worldbank.org/en/news/speech/2018/04/10/keynote-address-transparency-public-accountability-the-core-good-corporate-governance.print [2018, June 5]

Appendix

Stationarity

Both used DVs (Human Development Index and GDP/capita) are typically prone to violations of the time-series regression assumption of stationarity, meaning that inherently the variable (on average) is continuously growing over time. The standard tests have shown that this kind of non-stationarity is present in the given data, but it is still on an acceptable level to raise no critical issues or clear violations (Wenzelburger et al. 2014: 142).

Panel-clustered standard errors

Overall, the preferred model correction using Driscoll-Kraay standard errors has performed well throughout the analysis. The used estimation method was compared to the most suitable alternative – panel-clustered robust standard errors. This approach is less affected by small amounts of observations as given in the conducted analysis. The computed standard errors with this method are less efficient with the given data structure, but are well suited for a further robustness check. In *model 12* (below) it becomes clear that the fully specified model has not substantially changed in regard to the key explanatory variables apart from the interaction effect whose significance decreased. This does not question the existence of the interaction but rather the accuracy of the effect estimation for particular levels of its parent variables (Kam/Franzese 2007: 99).

Control variables such as population and trade openness have become less significant. Contrary to that, the share of female labor force and the interaction effect have gained new weight and most remaining correlation coefficients only become significant once these two variables are included. Furthermore, the indicator for political constraints is even more susceptible to the inclusion or exclusion of other variables to the extent that models with less control variables remain comparatively inconclusive regarding political constraints. Generally, these observations can be related to less efficient, larger standard errors that increase sensitivity of the estimations to the inclusion of other variables. The increased influence of the mentioned variables underscores their explanatory weight for a statistical model with less efficient estimates.

Nonetheless, the results for the fully specified model are unambiguous enough to give the already presented findings more support. Despite this, one should be cautious with the validity of the smaller variable-set Driscoll-Kraay models since these results cannot be conclusively confirmed with the cluster model. Most of the problems that lead to larger standard errors in the cluster model stem from the unbalanced nature of the data, which is not ideal for this approach. Better data availability for more countries would certainly help to improve these models. With enough countries to cover a broad field of variation, it is also worth considering to change the standard approach (Auty 1993; Edwards 2017) of a fixed minimum threshold for resource abundance per observation and rather work with average values as the first variant is prone to create unnecessary gaps in the time-series.

Influential outliers

The exclusion of the only influential outlier observation (Norway 2000) in *model 13* has not changed the results from model 10, which is only logical considering the demeaned fixed-effects approach that was taken in this paper. Although the exclusion of Norway was suggested by standard tests and theoretical reasons (Edwards 2017) it was left in the sample, because it cannot distort the results as proven in *model 13*.

Table A.1 – Further Robustness Checks

	(10)	(12) Clustered Std. Err.	(13) Outliers
	HDI	HDI	HDI
Informational	0.0018***	0.0018***	0.0018***
	(0.0001)	(0.0003)	(0.0001)
Political Const	0.0135***	0.0135*	0.0135***
	(0.0032)	(0.0058)	(0.0032)
Interaction Ef	-0.0002**	-0.0002	-0.0002**
	(0.0001)	(0.0001)	(0.0001)
Institutional C	-0.1019**	-0.1019***	-0.1019**
	(0.0301)	(0.0233)	(0.0301)
Property Right	-0.0000	-0.0000	-0.0000
	(0.0001)	(0.0002)	(0.0001)
Population Siz	0.0017**	0.0017	0.0017**
	(0.0004)	(0.0011)	(0.0004)
Oil rent	-0.0006**	-0.0006*	-0.0006**
	(0.0002)	(0.0003)	(0.0002)
Oil price	0.0008***	0.0008***	0.0008***
	(0.0001)	(0.0001)	(0.0001)
Trade Openne	-0.0001*	-0.0001	-0.0001*
	(0.0001)	(0.0002)	(0.0001)
Female Labor	0.0011	0.0011	0.0011
	(0.0007)	(0.0012)	(0.0007)
Constant	0.5627***	0.5627***	0.5615***
	(0.0441)	(0.0340)	(0.0440)
N	215	215	214
within-R²	0.802	0.802	0.802

Standard errors in parentheses
* p<0.05; ** p<0.01; *** p<0.001