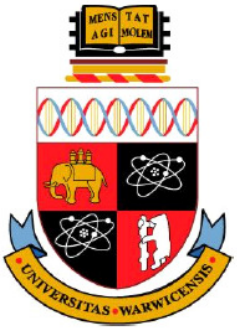

The Corrupting Effects of Oil: A Case Study of Uganda[1]

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Abstract:

This paper examines whether natural resource abundance plays a role in determining the level of corruption. I study the recent oil discoveries in Uganda and adopt a natural experiment framework to compare changes in corruption across districts. I find substantial deterioration of corruption perception for a range of government institutions in the districts where discoveries have been made, and some weak evidence that household bribery has become more rampant. I interpret differential effects across districts as a lower bound of the true underlying effects of oil.

[1] The author is grateful to Professor Sharun Mukand for his supervision and encouragement, Dr Gianna Boero for her informative lectures, and to Professor Gregory Crawford and Professor Rocco Machiavello for their advice on empirical techniques.

Contents

1. INTRODUCTION

The shining growth record of resource-poor East Asian countries and the dismal performance of the resource-rich African, Latin American and Middle Eastern counterparts have long puzzled economists. The term "resource curse" was first coined by **Auty (1993)** to describe the paradoxical relationship between resource abundance and poor growth. **Sachs and Warner (1995)** presented one of the first systematic empirical evidence of the curse. In recent literature, however, the debate is less about whether or not there is a resource curse, but more about what are possible transmission channels at play. Various market channels and institutional channels have since been identified.

In this paper I focus on an institutional channel that operates through rent-seeking activities, an important determinant of the level of corruption. I study the natural experiment of oil[2] discoveries in Uganda to explore the validity of a corruption channel for the resource curse. Uganda is a land-locked country in East Africa. The first commercial discovery of oil was announced in 2006 while most other oil-rich countries discovered their oil reserves in the 1960s – almost three decades before the first data on corruption became available. The relatively late discovery for Uganda creates an important opportunity in studying the institutional channels of the resource curse, by allowing for a clear before-and-after comparison. Moreover, the lack of strong legal and institutional infrastructure meant that Uganda would be highly susceptible the corrupting effects of oil.

The majority of empirical work on the resource curse has been done at a cross-country level. However, there is a growing body resource curse literature[3] that exploits intra-country variation of oil abundance. The advantage of an intra-country study is that many of the cultural, institutional or policy variables that give rise to omitted variable biases in cross-country studies are held constant. The key variable in this line of work has been the local level production value of oil. For instance, a study by **Monteiro and Ferraz (2010)** looked at the relationship between vote buying and oil royalties received by Brazilian municipalities. Because he oil sector in Uganda has not begun production, I use instead a natural experiment strategy that classifies districts groups according their oil potential.

I hypothesize that measures of corruption would be higher for districts with potential for generating a larger amount of oil revenue. Using data from Afrobarometer surveys conducted between 2002 and 2012, I find clear increases in corruption perception of the President and other government officials in districts where oil has been discovered. There is also some indication of more rampant bribery in the public delivery of household services in those districts, although the available data fail to provide any conclusive evidence that this is the case.

[2] Oil is used as a short hand for oil and natural gas throughout this paper
[3] Monteiro and Ferraz (2010), Caselli and Michaels (2012), Michaels (2011) and Aragon and Rud (2011)

2. LITERATURE REVIEW

Within the theoretical economics literature, **Leite and Weldmann (1999)** propose a model in which the capital-intensive nature of resource extraction creates more opportunities for rent-seeking. Another set of models developed by **Lane and Tornell (1999)** and **Torvik (2002)** attribute the increase in rent-seeking to an increase in public sector income. More recent work by **Robinson et. al (2006)** and **Caselli and Cunningham (2009)** emphasize the role of political competition in the resource curse, which can have an effect on corruption.

Thus far, the empirical literature has generated mixed conclusions. **Ade and di Tella (1999)** found fuel and mineral exports to be a significant determinant of corruption perception in the 1980s but not in the 1990s. **Sala-i-Martin and Subramanian (2003)** looked at a sample of 87 countries and found that current institutional quality, including corruption, is negatively associated with the share of mineral and oil exports in GDP in 1970**. Isham et al. (2005)** find that point source and coffee and cocoa exporting countries do poorly across an array of governance indicators, including corruption. Other studies such as **Bhattachryya and Hodler (2010)** and **Hodler (2006)** find that the positive relationship is conditional upon country characteristics. An obvious weakness in these cross-country studies is the potential omitted variable bias caused by unobservable or unmeasured characteristics such as social norms and culture, only some of which can be controlled for with available data. **De Rosa and Iootty (2012)** are first to use global panel data in dealing with unobserved country-specific. However, they did not find any significant effect of natural resource dependence on corruption.

A common criticism of the above literature is the use of resource dependence as a measure of resource abundance. The latter is an exogenous variable determined by geographic factors, but it cannot be observed directly. In the case of oil, oil as a share of total export is commonly used as a proxy for the country's oil endowment. As pointed out by **Brunnchweiler and Bulte (2008)**, this measure is endogenous to underlying institutional factors. High level of corruption, through undermining incentives to invest and innovate in non-oil sectors, can result in an export structure that is skewed towards the oil industry. Using physical quantity of endowment, e.g. proven reserves might not be entirely exogenous either, as the decision by multinational oil companies to prospect may depend on the country's level of corruption. However, the same decision is unlikely to depend on local level corruption. Hence, such problems of reverse causality are less of an issue for my paper.

Closely related to this paper is a study by **Vicente (2010)**, who took a difference-in-difference approach in a comparison of Sao Tome and Principe (with oil discovered in 1997) with neighbouring Cape Verde as a control. He surveyed the citizens of both countries in 2004 on their corruption perception then, as well as before 1997 (in retrospect). He found significant results suggesting a greater increase in corruption in Sao Tome and Principe. A weakness of this paper is that Sao Tome and Principe and Cape Verde are, after all, two different countries. And with only two countries, it is entirely possible that what Vicente found was simply a spurious relationship.

3. HYPOTHESES AND CONCEPTUAL FRAMEWORK

Hypothesis 1:

Oil increases corruption in some public institutions more than others

The effect is likely to be strongest for the Office of Presidency and government officials compared to the police because the former groups hold the power over how much to produce, which companies to grant the license to. They are also the ones who have most to gain from the future oil revenue. On the other hand, judges and magistrates should be least affected, at least in the short run, because they belong to the Judiciary which operates independently from the government.

Hypothesis 2:

Oil intensifies political competition, causing resources misallocation and more corruption

There is also a less direct mechanism which links oil to corruption through a political channel, based on the models built by **Robinson et. al (2006)** and **Caselli and Cunningham (2009)**. They argue that resource abundance raises the value of being in power and intensifies competition over political power. This leads the incumbents to allocate more resources on politically-motivated activities such as vote-buying and patronage, thus creating a relative scarcity in the provision of public goods and services.

In an ideal world, I would test this hypothesis using data on public spending, public sector employment, vote-buying and campaign spending at the local level before and after oil discoveries. The Afrobarometer election survey for Uganda contains questions on vote-buying and other election malpractices. However, it has only been carried out once in 2011, rendering it unsuitable for a difference-in-difference analysis. Drawing inspiration from **Vicente (2009)**, I use measures of petty household bribery as an indication of public resource misallocation. Because questions on vote-buying are not included in the regular Afrobarometer surveys, I resort to using increased public bribery as an indication of the scarcity caused by public funds misallocation.

Hypothesis 3:

Oil affects corruption perception and household bribery in oil-rich districts more than others

The mechanism described in both hypotheses above can be applied to local government officials. To the extent that this is the case, we would observe worse scores on both measures of corruption in oil-rich districts. However, due to imperfect information and the subjective nature of corruption perception, these government institutions might score worse in oil-rich districts simply because individuals living there are more informed about incidents of oil-related corruption or that they feel stronger about them. The analysis of household bribery is also constrained by the lack of precision in the data[4]

[4] Only five options are given in the survey: Often, a few times, once or twice, never and don't know.

4. DATA SOURCES AND DESCRIPTION

4.1 Data on corruption perception and household bribery experience

Data on corruption perception and household bribery experience of individuals are from the Afrobarometer, a series of surveys measuring public attitudes on economic, social, and political matters in African countries. Standardization of question wording and response options allows comparability over time. This paper uses data from Uganda Rounds 2, 3, 4, and 5[5]. In each round a random sample of 2400 respondents are interviewed in their local languages.

On corruption perception, the survey asks respondents the extent to which they perceive different public institutions as corrupt. For this analysis I have selected only the institutions that appear in all four rounds of the Afrobarometer survey. They include three government institutions: the Office of Presidency, Government officials and the Police, and an independent institution: the Judges and magistrates[6].

On experience with household bribery, the survey asks respondents how many times in the past year had they have to pay a bribe in return for public goods and services. Again, I have selected only the categories that appear in all four rounds of the Afrobarometer survey, which are: Getting Documents/Permits, Getting Household Services and Avoiding Problems with the Police.

4.2 Data on timing and location of exploration activities

In Uganda, the principal prospective area for oil is called the Albertine Graben. It stretches from the border with Sudan (South) in the north and runs along the border with the Democratic Republic of Congo to Lake Edward in the south. A map showing the status of licensing as of October 2012 is included in **Appendix A**. Data on timing and discoveries of drilled wells are publicly available from the Ministry of Energy and Mineral Development's Petroleum Exploration and Production Department (PEPD) in a document, "*Fact Sheet for Wells in the Albertine Graben as per September 2012*[7]*"*. Of 56 districts in Uganda, nine have been licensed for exploration, and five have been confirmed to contain oil.

Most of the exploration and discoveries took place around in the Western Region (see a District Map of Uganda in **Appendix B**) before 2008, but the exploration areas have been expanded to northward and southward in recent years.

[5] Round 1 is omitted because the questionnaire then differs considerably from subsequent rounds
[6] Other institutions include members of Parliament, tax officials, local councilors, etc.
[7] PEPD (2012b)

5. EMPIRICAL STRATEGY

The goal of this empirical work is to exploit cross-district variation in oil potential to examine the corrupting effects of oil discoveries. When Afrobarometer Round 2 was carried out in 2002, there were 56 districts in Uganda. The number has since doubled as a result of several waves of district creation. To ensure comparability over the four rounds of survey, districts created after 2002 are matched to the 2002 districts from which they were originally part of.

5.1 Discovery, licensed, and unlicensed Areas

Since my hypothesis relies on an increase in value of being in power, I classify the districts into three categories according to their perceived level of future oil revenue. My identification strategy is based on the timing and location of exploration and discoveries. **Table 1** shows which group each district belongs to at each survey round. The *DISCOVERY* area (in orange) is where discoveries have been made, so they have the potential for generating the highest oil revenues. The *LICENSED* area (in yellow) is where exploration is taking place but no discoveries have yet been made, so their potential for oil revenue is uncertain. The other districts (in blue) have no known potential for oil. In the natural experiment sense, discovery and licensed districts would be two treatment groups, and the unlicensed districts would be controls.

Table 1: Classification of Districts by Survey Round

Districts	2002	2005	2008	2012
Bundibugyo	*LICENSED*	*LICENSED*	*LICENSED*	*LICENSED*
Hoima, Kibaale & Masindi	*LICENSED*	*LICENSED*	*DISCOVERY*	*DISCOVERY*
Gulu & Nebbi		*LICENSED*	*LICENSED*	*DISCOVERY*
Arua			*LICENSED*	*LICENSED*
Kanungu & Rukungiri			*LICENSED*	*LICENSED*
All other districts				

5.2 Controlling for Individual Characteristics

Although oil potential varies across geographical locations, there are good reasons to leave the unit of analysis at the individual level (as opposed to aggregating by district). Oil discoveries might affect the corruption outcomes of individuals differently depending on their characteristics, such as age, income, and education. If oil discoveries induce changes in the composition of population sample[8] within districts (e.g. young individuals immigrating to oil-abundant districts for work opportunities, pushing down the average age of the district population), the aggregate district level corruption would also be affected. By controlling for individual characteristics, I can ensure that any indication of increased corruption reflects a more corrupt public sector instead of a changing population.

[8] A new random sample is generated in each round of Afrobarometer

5.3 Identification and Specification

Specification (1)

Assuming treatment effects do not vary over time or across districts

As the data contain observations from several years, I begin with a simple regression specification using two treatment dummies that is defined to be unity for districts and time periods subjected to licensing or discoveries:

$$corruption_{idy} = \alpha + \beta_1 ' X_i + \beta_2 LICENSED_{dy} + \beta_3 DISCOVERY_{dy} + \beta_4 \gamma_y + \beta_5 \delta_j + \varepsilon_{idy} \quad (1)$$

where *i* indexes individuals, *d* indexes location (by district), and *y* indexes years.

The variable *corruption* denotes either corruption perception or household bribery experience; *licensed* is a binary dummy with value 1 for *LICENSED* area (district-year shaded yellow in **Table 1**); *discovery* is a binary dummy with value 1 for *DISCOVERY* area (district-year shaded orange in **Table 1**); γ denotes year fixed effects which account for exogenous changes over time affecting the country; δ denotes district fixed effects which account for the time-invariant characteristics of each district.

The vector *X* denotes a set of individual characteristics included as control variables. They include the respondent's gender, the respondent's age and age-squared, indicator variables for whether the respondent lives in a rural or urban area, 7 fixed effects for the respondent's education attainment, an indicator variable for respondents who are close to the ruling party and the Uganda President Yoweri Museveni, an indicator variable for respondents who have gone without food or water at least several times in the past year, and an indicator variable whether the respondent gets news at least every day in the form of TV, radio or newspaper.

The coefficients of interest are β_2 and β_3: the estimated effects of oil in the *LICENSED* and the *DISCOVERY* areas respectively.

Specification (2)

Allowing treatment effects to vary over time

The previous specification imposes the restriction that the effect of oil discoveries on each group does not vary over the years, an assumption which can be relaxed by interacting the *licensed* and *discovery* dummies *with* a full set of year fixed effects:

$$corruption_{ijldy} = \alpha + \beta_1 ' X_i + \beta_2 \left(licensed_l \times \gamma_y \right) + \beta_3 \left(discovery_d \times \gamma_y \right) + \beta_4 \gamma_y + \beta_5 \delta_j + \varepsilon_{ijldy} \quad (2)$$

The coefficients of interest β_2 and β_3 are vectors of the estimated effects of oil in the *LICENSED* and the *DISCOVERY* areas in each survey year.

Specification (3)

Allowing treatment effects to vary over time and across districts

The previous specifications impose the restriction that the effect of oil does not vary across districts, but as districts vary in the timing of their oil activities, *LICENSED* and *DISCOVERY* areas in one survey year do not represent the same districts in the another survey year. To ensure that the coefficient estimates are not driven by changing district composition, I use an alternative identification strategy where districts are split into four groups:

$$corruption_{idy} = \alpha + \beta_1' X_i + \beta_2 \left(HKM_d \times \gamma_y\right) + \beta_3 \left(GN_d \times \gamma_y\right) + \beta_4 \left(BAKR_d \times \gamma_y\right) + \beta_5 \gamma_y + \beta_6 \delta_d + \varepsilon_{idy} \quad (3)$$

Hoima, Kibaale, and Masindi districts are deonted by the binary dummy *HKM*. They are districts in the Western Region where oil discoveries mainly took place before 2008, and will be the first to begin production.

Gulu and Nebbi districts are denoted by the binary dummy *GN*. They are districts in the Northern Region where oil exploration began in 2004 but had no discoveries until late 2008. They have only recently become the focus of Uganda's oil debate.

Bundibugyo, Arua, Kanungu and Rukungiri, districts are denoted by the binary dummy *BAKR*. Exploration around the area began as early as 1997 in Bundibugyo but no commercial oil has been discovered. Oil expectations are relative low in these districts.

The coefficients of interest are β_2, β_3 and β_4: the estimated effects of oil in the each group of districts over the years. They facilitate the identification of trends.

6. RESULTS

In interpreting the results, there is a caveat. It is most likely that the mechanisms described in **Section 3** affect the whole country. Hence, any additional changes in corruption outcomes observed in oil-rich districts are at best a lower bound of the corrupting effect of oil. In all results tables, both OLS and ordered-logit estimates are reported (***, ** and * indicates significance at the 1, 5 and 10% level), and standard errors are clustered at the district level to address the correlation between observations from the same district.

Estimates from the ordered-logit regressions are quantitatively identical to those from OLS regressions. Hence, I will go through the results based on the OLS estimates, as they are much easier to interpret. For a proper interpretation of the ordered-logit estimates, see the marginal effects (evaluated at the means) reported in the **Appendices C and D**.

6.1 Main findings for Corruption Perception

The three specifications generate largely similar conclusions, suggesting that the exploration activities and oil discoveries may have the same effects regardless of location and time. Although specification (2) tells a more subtle story involving trends, results from specification (1) allows easier comparison of the relative magnitude of the effects in *LICENSED* and *DISCOVERY* areas. In **Table 2**, there is a clear positive relationship between a district's oil potential and the perceived level of corruption in all three government institutions. They are perceived as more corrupt in the LICENSED area where exploration takes place than the unlicensed areas, and as most corrupt in the DISCOVERY area where oil potential is the highest. As expected, perceived corruption in ***Judges and Magistrates*** is the same in all districts regardless of their oil potential.

For corruption in ***Office of Presidency***, the estimated magnitude of the effect of oil in the high potential DISCOVERY area is twice as large as that in the low potential LICENSED area. However, since there is only one Office of Presidency in the whole country, this variation can only be attributed to subjective factors (as I have explained in setting out **Section 3, Hypothesis 3**).

For corruption in ***Government Officials***, the effect in the DISCOVERY area has a similar magnitude to that for ***Office of Presidency***, but it is hard to say the extent to which this is attributed to local officials. Exploration activities in the LICENSED area do not seem to have any statistical significant effect.

For corruption in ***Police***, the magnitude of the effect in the DISCOVERY areas is estimated to be three times as big as that in the LICENSED areas. However, the effects in both areas are somewhat smaller than the effects for the corruption in the other two government institutions. Results from specification (2) and (3) are analyzed in **Section 7** as part a robustness check.

6.2 Main findings for Household Bribery

Results generated from specification (1) are not reported because they are not very informative. Results from specification (2) are reported in **Appendix G**. The only indication of an increase in bribery due to oil is the positive coefficient on DISCOVERY*2008 for ***Getting Household Services***. This is either due to biased estimates, or simply because oil has no effect on household bribery. I present my main findings with interpretation of the estimated coefficients from specification (3), as it allows me to study group-specific trend. Results are reported in **Table 3**.

Uganda's first oil discoveries took place in ***Hoima, Kibaale and Masindi*** districts in the Western Region. Therefore they have been high potential DISCOVERY areas in both the 2008 and 2012 survey rounds. Although there is a marked increase in the number of bribes being asked in ***Getting Permits/Documents*** and ***Getting Household Services*** in 2008, following the discoveries, it would seem that whatever caused it did not persist in the 2012 survey round.

More recent oil discoveries have been shifting to the Northern Region in the districts of ***Gulu and Nebbi***, which became part of the DISCOVERY area in the last survey round. Their coefficients reveal something not observed in the specification (2): the number of bribes being asked in ***Getting Household Services*** and in ***Avoiding Problems with the Police*** increased following oil discoveries.

Bundibugyo, Arua, Kanungu and Rukungiri districts have been licensed for exploration years but no discoveries took place yet. There seems to be a downward trend in the number of bribes being asked during the first three survey rounds, but bounced back to the 2002 level in the last survey round. The fluctuations probably have little to do with oil as these districts have rather low potential for oil and do not seem to differ from the control group in measures of corruption perception.

Based on these results, I would say that no conclusion should be drawn yet as to whether oil discoveries make local government officials more corrupt, although all DISCOVERY districts seem to report an increased number of bribes being asked immediately after their initial discovery. It is also worth bearing in mind that the mechanism natural resources are only indirectly linked to household bribery through a myriad of political processes and resource misallocation. Hence, it will probably take longer for the effects, if there are any, to materialize.

Table 2: Estimates of the Determinants of Corruption Perception; specification (1)

Dependent Variable: How many of the following people are involved in corruption								
	Office of Presidency		**Government Officials**		**Police**		**Judges and Magistrates**	
	OLS	**OLOGIT**	**OLS**	**OLOGIT**	**OLS**	**OLOGIT**	**OLS**	**OLOGIT**
LICENSED	**.140***	**.294***	-.001	-.047	**.069***	**.172***	0.012	.000
	(.074)	(.164)	(.046)	(.132)	(.039)	(.088)	(.050)	(.117)
DISCOVERY	**.358*****	**.884*****	**.255*****	**.619****	**.224****	**.567****	-.071	-.173
	(.107)	(.249)	(.090)	(.251)	(.107)	(.255)	(.092)	(.216)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. obs	9,565	9,565	10,253	10,253	10,694	10,694	9,890	9,890
No. districts	56	56	56	56	56	56	56	56
R-squared	.148	.072	.070	.032	.031	.013	.044	.020

Table 3: Estimates of the Determinants of Bribery; specification (3)

Dependent Variable: How many times in the past year being asked for a bribe						
	Getting Documents/Permits		**Getting Household Services**		**Avoiding Problem with Police**	
	OLS	**OLOGIT**	**OLS**	**OLOGIT**	**OLS**	**OLOGIT**
HKM	**.195****	**.799***	-.010	**-13.4*****	**.311*****	**.986*****
	(.075)	(.480)	(.045)	(1.043)	(.049)	(.181)
HKM*2002	.043	-.132	.017	.037	**-.075***	**-.390****
	(.093)	(.573)	(.041)	(.776)	(.045)	(.189)
HKM*2008	**.240*****	**.776****	**.356*****	**1.72*****	**-.148****	-.353
	(.081)	(.318)	(.113)	(.374)	(.066)	(.218)
HKM*2012	**-.118***	-.545	**-.147*****	-.414	**-.167****	**-.574****
	(.070)	(.467)	(.055)	(.567)	(.068)	(.250)
GN	.008	.042	**-.341*****	**-2.14*****	**-.170*****	**-.647*****
	(.085)	(.356)	(.037)	(.090)	(.061)	(.255)
GN*2002	.067	.419	**.388*****	**2.31*****	**.185*****	**.800*****
	(.089)	(.368)	(.059)	(.188)	(.068)	(.272)
GN*2005	.057	.199	**.204*****	.473	.113	.369
	(.139)	(.528)	(.074)	(.494)	(.094)	(.367)
GN*2012	-.039	-.208	**.220*****	**.964*****	**.212****	**.591***
	(.083)	(.461)	(.077)	(.247)	(.082)	(.339)
BAKR	**.198*****	**.716*****	**-.147****	**-14.0*****	**.238*****	**.690*****
	(.046)	(.230)	(.071)	(1.184)	(.036)	(.122)
BAKR*2005	-.071	-.217	**-.143*****	**-2.44*****	**-.148*****	**-.530*****
	(.081)	(.398)	(.051)	(.689)	(.045)	(.131)
BAKR*2008	**-.213****	**-.630***	**-.194*****	**-.824*****	**-.227*****	**-.757*****
	(.081)	(.342)	(.070)	(.197)	(.054)	(.176)
BAKR*2012	.066	.196	.227	.442	.022	.033
	(.095)	(.271)	(.211)	(.363)	(.072)	(.227)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
District fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. obs	11,131	11,131	11,135	11,135	11,166	11,166
No. districts	56	56	56	56	56	56
R-squared	.074	.055	.096	.095	.058	.040

Note: Variables corresponding to the DISCOVERY area are shaded in grey.

6.3 Control variables

Coefficient estimates of the individual control variables (not reported) are consistent with the findings from previous studies such as **Mocan (2008)**. I find that bribery experience is increasing, but at a decreasing rate, in age, and is lower for females than for males. Individuals with political ties, identified by using level of trust in the President and the ruling party as proxies, perceive the government as less corrupt and are less likely to experience (or report) bribery. The individuals who keep themselves up to date with news and political affairs have worse perception of corruption, although they are no more likely to experience bribery as the other individuals.

7. ROBUSTNESS CHECKS

In **Appendix E**, I test that the estimates are indeed constant over time. For corruption in ***Office of Presidency*** and ***Government Officials***, the positive coefficients in the *DISCOVERY* area in 2008 and 2012 are consistent with the results generated using specification (1), although the effects in the LICENSED area became ambiguous.

For corruption in ***Police***, the positive coefficients in the *DISCOVERY* area in 2008 became negative and statistically insignificant in 2012. The possibility that oil has no effect on corruption in the police does not undermine my hypothesis because, compared to the President and government officials, the police is less directly involved to the oil sector.

Interestingly, but perhaps also not so relevant to the oil sector, the corruption perception in ***Judges and Magistrates*** are improving over the years in the *DISCOVERY* area.

In **Appendix F**, I test that my results are not driven by changing district composition. The *HKM* dummies represent ***Hoima, Kibaale and Masindi*** which belonged to the *LICENSED* area in the first two survey rounds, and became part of the *DISCOVERY* area in the later rounds. There is an increase in corruption perception in ***Office of Presidency*** and ***Government Officials*** in the 2008 and 2012 survey rounds, as expected, although only the effect on the former group is statistical significant.

The *GN* dummies represent ***Gulu and Nebbi*** districts which belonged to the *LICENSED* in 2008 survey round and became part of the *DISCOVERY* area in the final survey round. The coefficient estimates lend further support to my hypothesis that there is a marked increase in corruption perception in ***Office of Presidency*** and ***Government Officials*** following oil discoveries in the two districts.

The BAKR dummies represent ***Bundibugyo, Arua, Kanungu and Rukingiri*** districts where no discoveries have been made despite exploration efforts. The statistically insignificant coefficient estimates fluctuating between positive and negative values concur with the ambiguous findings for the LICENSED binary dummy in specification (1) across all public institutions. This suggests that corruption perception in these districts do not differ what is observed in the unlicensed control group. This is perfectly reasonable outcome because the oil potential in these districts is still uncertain.

8. CONCLUSION

The evidence presented in this paper adds to new and growing line of work in the resource curse literature that uses within-country variation in oil endowments to examine the effect of oil abundance on institutions. Closely related to this paper are studies by **Vicente (2010)** who also seeks to investigate the corrupting effect of oil by adopting a natural experiment framework.

I have shown a clear positive relationship between a district's oil and the perceived level of corruption in all three government institutions: the Office of Presidency, the Government Officials and the Police. In particular, the relationship is much stronger in areas where discoveries have taken place than the licensed areas where exploration has yet to bear fruit. To determine whether this relationship changes over time, I modified the specification to allow for time-variation in the coefficient estimates. Although the relationship disappeared for perceived corruption in Police, the other results remain unchanged.

I then turn to the political argument that expected oil revenue increases the value of being power, thus intensifying political competition. An implied consequence is the misallocation of public funds that might be reflected in an increased level of bribery experienced by Ugandan households and particularly the ones in oil-rich districts. My analysis is unable to provide any conclusive evidence.

As a final note, I should clarify that my analysis cannot identify the impact of oil on the overall level of corruption in Uganda. Hence, the differential effects that are observed between districts are at best a lower bound of the true underlying effect of oil. Where no differential effects are observed, for example in household bribery, oil could actually be exerting an effect on the nation as a whole. In fact, the World Bank has identified a "growing petty corruption, and the perceived culture of impunity for the failure of public servants to deliver goods of services paid for by governments"[9] in Uganda.

9. LIMITATIONS AND FUTURE DIRECTIONS

One of the biggest concerns with using Uganda as a case study is probably the uneven distribution of discoveries across the country. Because most prospecting activities have been taking place in Albertine Graben basin, a lot of these discoveries located close to or on the border with the Democratic Republic of Congo. This can be problematic if there are contemporaneous shocks affecting corruption perception/bribery in the area that are not related to oil. I have considered a possible source of such shocks related to Congolese refugees flooding into the Western region of Uganda, but I found that most of these refugees enter through borders in the Kisoro District, which is rather far away from the Albertine Graben. They are often quickly relocated to settlement communities scattered across the Western Region, not necessarily close to the border. There are however many other possibilities that the border could have an impact on the oil-districts. To identify them, I would need to get a better understanding of the geopolitics in the area.

[9] World Bank (2013)

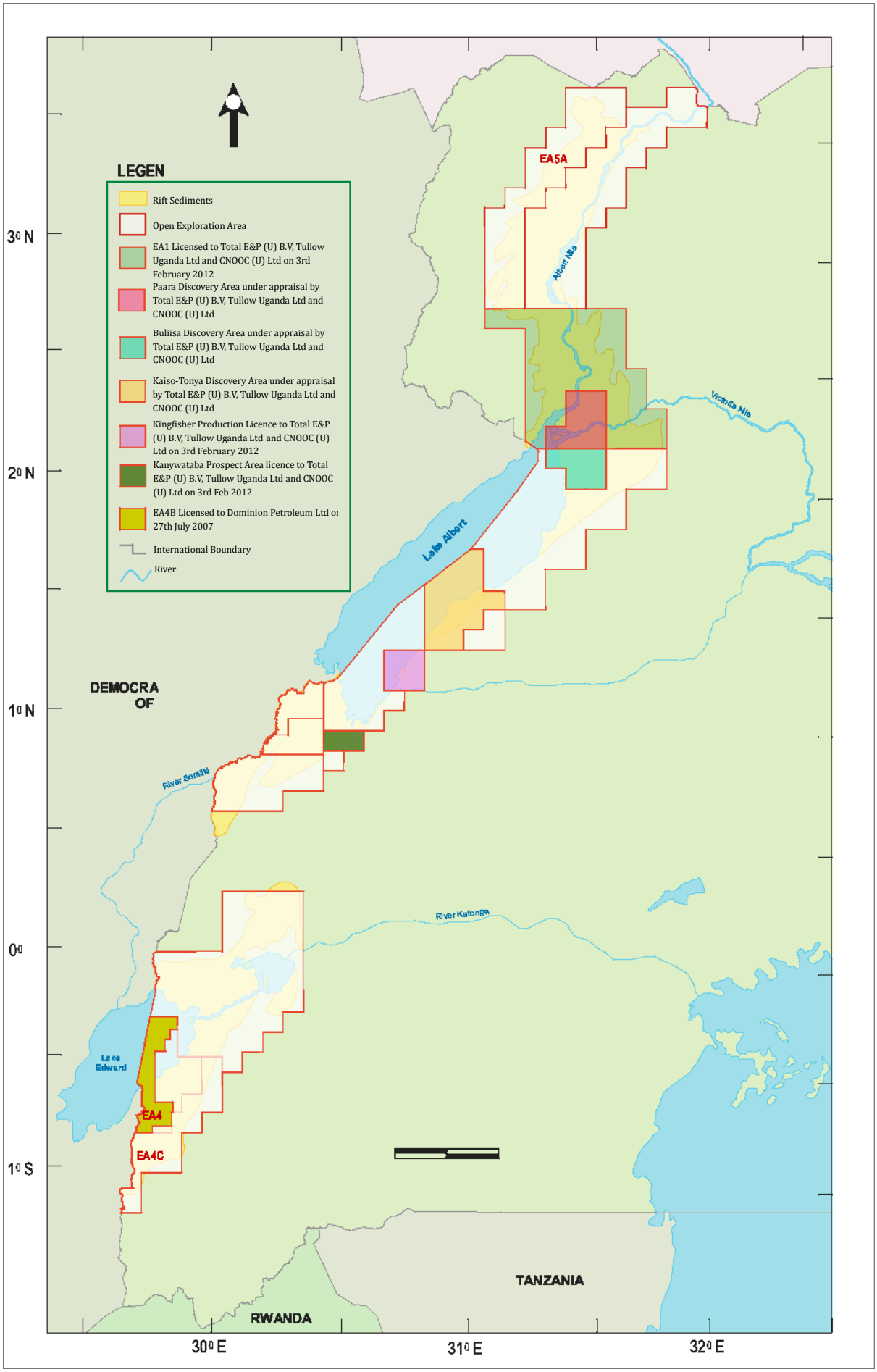
Another concern is the subjective nature of corruption perception, which can be influenced by imperfect information (e.g. individuals from districts without oil might be less informed about the oil-related corruption) or driven by emotions (e.g. individuals from oil-rich districts are likely to feel stronger about oil-related corruption, hence responding with "All government officials are corrupt" even when they might not believe that to be the case.

This paper is also constrained by the categorical nature of most of the Afrobarometer questions. Responses from the bribery questions shed no light on the amount of bribes asked for or the number of times they are asked. Also, I argued in **Section 5.2** that individual characteristics should be controlled for. However, a lot of the most important characteristics, such as income level or occupation, are not directly measured.

A final concern is the blunt identification strategy of generalizing all districts with oil discoveries as one homogenous group. These districts obviously vary in the size of their oil endowments, but I am not aware of published statistics on proven reserves at the district level (more research is needed).

There are many ways this research can be developed further. If give more time, would refine the unit of comparison to the county/sub-county level. Besides, the mechanisms described in **Section 3** not only depend on the size of oil endowments, but also on how oil royalties are expected to be distributed across local administrations – particularly through the political channel (within a single district in Uganda, there are five levels of local elected governments).

Appendix A: Status of Licensing in the Albertin Graben in Uganda



Source: PEPD(2012a)

Appendix B: Maps showing the Administrative Regions and Districts in Uganda

Source: UNICEF(2010)

Appendix C: Marginal Effects of the Ordered-Logit Estimates for Corruption Perception

Dependent Variable: How many of the following people are involved in corruption								
	Office of Presidency		**Government Officials**		**Police**		**Judges and Magistrates**	
	Licensed	**Disc'y**	**Licensed**	**Disc'y**	**Licensed**	**Disc'y**	**Licensed**	**Disc'y**
All of them	**.029***	**.088*****	-.004	**.059****	**.036***	**.120****	3.2E-05	-.019
	(.016)	(.025)	(.012)	(.024)	(.019)	(.054)	(.013)	(.023)
Most of them	**.039***	**.117*****	-.007	**.096****	-7E-05	-2E-04	3.8E-05	-.022
	(.022)	(.033)	(.021)	(.039)	(.000)	(.000)	(.015)	(.028)
Some of them	**-.047***	**-.141*****	.010	**-.133****	**-.032***	**-.106****	-5E-05	.028
	(.027)	(.041)	(.028)	(.054)	(.017)	(.048)	(.019)	(.034)
None of them	**-.021***	**-.063*****	.002	**-.022****	**-.004***	**-.013****	-2E-05	.014
	(.012)	(.017)	(.005)	(.008)	(.002)	(.006)	(.009)	(.017)
Individual controls	Yes		Yes		Yes		Yes	
District fixed effects	Yes		Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes		Yes	
No. obs	9,565		10,253		10,694		9,890	
No. districts	56		56		56		56	
Pseudo R-squared	.072		.032		.013		.020	

Appendix D: Marginal Effects of the Ordered-Logit Estimates for Household Bribery

Dependent Variable: How many times in the past year being asked for a bribe									
	Getting Documents/Permits			Getting Household Services			Avoiding Problem with Police		
	HKM08	HKM12	GN12	HKM08	HKM12	GN12	HKM08	HKM12	GN12
Often	**.020****	-.013	-.005	**.034*****	-.008	**.019*****	-.012	**-.018****	**.021***
	(.009)	(.014)	(.013)	(.008)	(.011)	(.006)	(.008)	(.009)	(.012)
A few times	**.030****	-.020	-.008	**.045*****	-.011	**.025*****	-.016	**-.026****	**.029***
	(.014)	(.020)	(.019)	(.011)	(.015)	(.006)	(.011)	(.013)	(.016)
Once or twice	**.064****	-.042	-.017	**.077*****	-.018	**.043*****	-.027	**-.042****	**.047***
	(.029)	(.043)	(.041)	(.020)	(.025)	(.011)	(.017)	(.020)	(.026)
Never	**-.114****	.075	0.03	**-.156*****	.036	**-.087*****	.054	**.087****	**-.097***
	(.051)	(.077)	(.072)	(.037)	(.050)	(.023)	(.035)	(.041)	(.054)
Individual controls		Yes			Yes			Yes	
District fixed effects		Yes			Yes			Yes	
Year fixed effects		Yes			Yes			Yes	
No. obs		11,131			11,135			11,166	
No. districts		56			56			56	
Pseudo R-squared		.055			.095			.040	

Appendix E: Estimates of the Determinants of Corruption Perception; specification (2)

Dependent Variable: How many of the following people are involved in corruption								
	Office of Presidency		**Government Officials**		**Police**		**Judges and Magistrates**	
	OLS	**OLOGIT**	**OLS**	**OLOGIT**	**OLS**	**OLOGIT**	**OLS**	**OLOGIT**
LICENSED*2002	**.369***	.864	-.097	-.305	**-.398*****	**-.907*****	**-.479*****	**-1.12*****
	(.213)	(.535)	(.122)	(.328)	(.071)	(.156)	(.135)	(.296)
LICENSED*2005	.143	**.352***	.049	.053	.043	.095	**-.064***	-.120
	(.088)	(.202)	(.088)	(.244)	(.054)	(.117)	(.037)	(.104)
LICENSED*2008	**.203*****	**.425****	.008	-.024	**.183*****	**.420*****	.041	.069
	(.072)	(.170)	(.054)	(.148)	(.046)	(.101)	(.061)	(.153)
DISCOVERY*2008	**.522*****	**1.34*****	**.230*****	**.532****	**.229****	**.678*****	**-.327*****	**-.761*****
	(.144)	(.331)	(.085)	(.226)	(.127)	(.263)	(.102)	(.246)
LICENSED*2012	.001	-.034	-.036	-.129	-.048	-.068	.049	.044
	(.110)	(.256)	(.086)	(.266)	(.095)	(.216)	(.056)	(.121)
DISCOVERY*2012	**.375*****	**.931*****	**.260*****	**.623*****	-.015	-.016	**-.192*****	**-.423*****
	(.116)	(.249)	(.083)	(.221)	(.084)	(.199)	(.062)	(.137)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. obs	9,565	9,565	10,253	10,253	10,694	10,694	9,890	9,890
No. districts	56	56	56	56	56	56	56	56
R-squared	.148	.072	.071	.032	.035	.015	.046	.020

Appendix F: Estimates of the Determinants of Corruption Perception; specification (3)

Dependent Variable: How many of the following people are involved in corruption								
	Office of Presidency		Government Officials		Police		Judges and Magistrates	
	OLS	OLOGIT	OLS	OLOGIT	OLS	OLOGIT	OLS	OLOGIT
HKM	**-.413*** **	**-1.15*** **	.008	-.021	.742***	1.61***	.527***	1.21***
	(.128)	(.338)	(.053)	(.128)	(.135)	(.341)	(.059)	(.171)
HKM*2002	.354	.908	-.194	-.468	**-.516*** **	**-.201*** **	**-.434** **	**-1.08*** **
	(.222)	(.576)	(.154)	(.380)	(.111)	(.247)	(.169)	(.385)
HKM*2008	**.419*** **	**1.16*** **	.102	.277	.101	.367	**n.283** **	**-.710** **
	(.126)	(.318)	(.094)	(.233)	(.173)	(.373)	(.119)	(.300)
HKM*2012	**.230** *	**.708** **	.041	.148	**-.235** *	**-.538** *	**-.169*** **	**-.423*** **
	(.122)	(.332)	(.051)	(.147)	(.126)	(.303)	(.061)	(.159)
GN	**-.082** **	**-.197** **	.058	.182	.333***	.698***	.184***	.408***
	(.038)	(.093)	(.055)	(.156)	(.027)	(.065)	(.045)	(.090)
GN*2002	**-.252*** **	**-.559*** **	.015	.097	**-.211*** **	**n.431*** **	-.002	.043
	(.045)	(.106)	(.067)	(.184)	(.032)	(.072)	(.058)	(.124)
GN*2005	-.040	-.007	-.001	-.009	**-.231*** **	**-.519*** **	**-.139** **	**-.284** **
	(.070)	(.189)	(.141)	(.387)	(.052)	(.113)	(.058)	(.137)
GN*2012	**.238*** **	**.584*** **	**.396*** **	**1.09*** **	-.084	-.134	**-.197** **	**-.399** *
	(.067)	(.116)	(.061)	(.151)	(.074)	(.184)	(.098)	(.215)
BAKR	.088	.131	**.283*** **	**.740*** **	**.574*** **	**1.23*** **	**.217*** **	**.516*** **
	(.120)	(.295)	(.065)	(.183)	(.070)	(.168)	(.053)	(.110)
BAKR*2005	-.235	-.573	**-.156** *	**-.376** *	**-.227*** **	-.534	**-.287*** **	**-.698*** **
	(.204)	(.507)	(.078)	(.223)	(.051)	(.113)	(.052)	(.136)
BAKR*2008	.100	.181	-.040	-.137	**.092** *	**.203** *	-.057	-.160
	(.139)	(.302)	(.075)	(.208)	(.054)	(.123)	(.081)	(.202)
BAKR*2012	-.113	-.304	-.090	-.261	-.128	-.266	-.044	-.173
	(.185)	(.431)	(.115)	(.349)	(.129)	(.294)	(.065)	(.151)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. obs	9,565	9,565	10,253	10,253	10,694	10,694	9,890	9,890
No. districts	56	56	56	56	56	56	56	56
R-squared	.149	.073	.071	.033	.036	.015	.047	.021

Note: Variables corresponding to the DISCOVERY area are shaded in grey.

Appendix G: Estimates of the Determinants of Bribery; specification (2)

Dependent Variable: How many times in the past year being asked for a bribe						
	Getting Documents/Permits		**Getting Household Services**		**Avoiding Problem with Police**	
	OLS	**OLOGIT**	**OLS**	**OLOGIT**	**OLS**	**OLOGIT**
LICENSED*2002	.003	-.346	.060	.543	.002	-.253
	(.095)	(.493)	(.094)	(.800)	(.046)	(.177)
LICENSED*2005	-.050	-.236	-.001	.074	.010	-.090
	(.106)	(.379)	(.077)	(.434)	(.059)	(.198)
LICENSED*2008	**-.155****	**-.511****	**-.178***	-.292	**-.164*****	**-.585*****
	(.058)	(.199)	(.096)	(.415)	(.053)	(.169)
DISCOVERY*2008	.197	.568	**.393*****	**2.23*****	-.076	-.245
	(.118)	(.390)	(.145)	(.726)	(.072)	(.229)
LICENSED*2012	.108	.300	.275	**0.912***	.087	.242
	(.124)	(.444)	(.234)	(.546)	(.083)	(.258)
DISCOVERY*2012	**-.159****	**-.715****	-.074	.309	-.033	-.253
	(.080)	(.380)	(.104)	(.728)	(.070)	(.243)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
District fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. obs	11,131	11,131	11,135	11,135	11,166	11,166
No. districts	56	56	56	56	56	56
R-squared	.074	.055	.095	.092	.056	.038

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