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Do expectations on oil discoveries affect civil unrest? Micro-level evidence from Mali

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Abstract: In recent years, many oil finds were made along the shores of Africa, often triggering high hopes. But do expectations of the consequences of oil discoveries affect subsequent conflict? A number of arguments back this idea. Relative deprivation theory suggests that oil discoveries raise hopes of windfalls, which if not fulfilled, result in frustration and thus increase conflict risk. In contrast, cognitive psychology assumes that the effect of expectations largely works through a confirmation bias and thus depends on whether individuals attach positive or negative expectations to oil discoveries. Given the lack of appropriate data, these relationships have never been tested empirically. Using unique georeferenced data from a representative survey in Mali in 2006, this paper addresses this gap. Our results suggest that expectations indeed significantly contribute to subsequent conflict. The negative or positive character of expectations is critical, working as “self-fulfilling prophecy” rather than frustrated “great expectations”: when people hold negative views on the future effects of oil, the risk of civil unrest increases.

Subjects: African & Third World Politics; Conflict Resolution; War & Conflict Studies; Petroleum & Oil Industries

Keywords: Mali; oil; expectation; resource curse; civil unrest; natural resources; riots

ABOUT THE AUTHORS

All the three authors have work on issues related to natural resources, inequality and expectations for several years. This paper fits very well with the academic portfolio of all three authors. Matthias Basedau is Lead Research Fellow at GIGA German Institute of Global and Area Studies, Siri Aas Rustad is Senior Researcher at the Peace Research Institute Oslo and Elise Must is currently Head of Corporate Social Responsibility at Norsk Hydro.

PUBLIC INTEREST STATEMENT

In recent years, many oil finds were made along the shores of Africa, often triggering high hopes. But do expectations of the consequences of oil discoveries affect subsequent conflict? A number of arguments back this idea. Some argue that oil discoveries raise hopes of windfalls, which if not fulfilled, result in frustration and thus increase conflict risk. In contrast, theories from psychology suggest that the effect of expectations largely works through a self-fulfilling prophecy. Using unique georeferenced data from a representative survey in Mali in 2006, we look into this. Our results suggest that expectations indeed significantly contribute to subsequent conflict. The negative or positive character of expectations is critical, working as “self-fulfilling prophecy” rather than frustrated “great expectations”: when people hold negative views on the future effects of oil, the risk of civil unrest increases.

1. Introduction

In recent years, a number of oil discoveries have been made in several African countries, such as Ghana, Mali, Mozambique, and Tanzania (e.g., Basedau & Mähler, 2011; Collier, 2013; Must & Rustad, 2017). These discoveries often trigger high expectations regarding the benefits for the population. But what will be the effects when these expectations do not materialize or even oil production does not occur in the first place? This article looks at the case of Mali, a Sahelian country, which is one of the least developed countries in the world. Although the country has not produced a single drop of oil, oil is not completely irrelevant in its politics. A number of explorations since 2004 have yielded indications that oil reserves lie beneath the surface in several basins in northern, eastern, and central Mali (Nickle, 2012; Whaley, 2008).¹

There is a vast literature showing how oil may contribute to conflict through for example looting, environmental problems, and corruption (e.g., Ross, 2012; Le Billon, 2012). However, there is less research on how discovery of oil can create expectations among populations, particularly in poor countries (e.g., Collier, 2013; Weszkalnys, 2008), which further can lead to tension and conflict. A number of arguments back the idea that expectations matter. According to relative deprivation theory (e.g., Gurr 1970, 2000), for example, if these expectations do not materialize it can create frustration that increases the risk of violent group conflict. Alternatively, insights from cognitive psychology and behavioral economics (e.g., Gilbert, Krull, & Malone, 1990; Kahneman, 2011; Wason, 1968) imply that expectations produce a confirmation bias, that is, a self-fulfilling prophecy, and thus may play a more independent role. That being the case, the conflict risk might depend on whether people expect good or bad consequences from oil. If people hold negative views on the effects of oil, the risk of conflict should increase.

While oil in itself has not contributed to the conflict in Mali, could the expectations of future exploration have done so? Survey data used in this article from Mali collected in 2006, showed that almost 70% of the respondents believed that oil production was to start soon and more than 70% expected oil to change living conditions for the better. Only around 13% of the respondents feared negative consequences. After the survey, Mali was plunged into civil unrest afterwards, including riots, a *coup d'état* and a bloody civil war in the North in 2012. Despite oil production not having materialized, a number of observers suspect that both civil unrest and the international intervention were partly motivated by oil and other natural resources (e.g., Norwood & Null, 2013; Vanderbruck, 2011).

While practitioners and scholars have started to engage in “expectation management” to smoothen changes in future extractive countries, such as Mozambique and Tanzania (e.g., Collier, 2013), and the literature on the “resource curse” has started to look at the effect of expectations (e.g., Must & Rustad, 2017; Soares de Oliveira, 2007), the oil-conflict link has largely ignored this question. Expectations and other popular attitudes are part of implicit theorizing with regard to many causal mechanisms in the debate on the resource-conflict link, but they are conceptualized as mechanisms or reflexes to material stimuli rather than as variables that make a difference.

Empirically, the relationship between oil, expectations, and violence has never been tested systematically—due to the lack of appropriate data on expectations and other attitudes before the occurrence of violence. By using the unique georeferenced data from the 2006 survey in Mali to systematically investigate the effect of expectations related to oil on conflict, this paper helps fill this gap. Since expectations speak primarily to the motivational aspect of collective action our article use a less organized form of civil unrest—comprising riots and protests—as the dependent variable.

Our results suggest that expectations indeed matter. Although oil is not at center stage of Malian politics, at least on the surface, expectations significantly contribute to the risk of subsequent civil unrest. It is not the sheer knowledge about oil, but the negative or positive character of the expected

consequences that makes a difference. The analysis finds evidence that *negative* expectations work as “self-fulfilling prophecy” rather than frustrated *positive* expectations. The impact of consequences also seems to be partially conditional on whether or not people knew about oil before.

Our main findings are robust to a number of model specifications and controls—especially when controlling for those variables that played a role in Mali’s recent political turmoil and those that may affect expectations and conflict or protest in general. Despite some limitations, this paper contributes in three important ways to the literature: First, it develops a theoretical link between, oil extraction, conflict, and expectations. Second, it shows that expectations matter for the oil-conflict link and probably conflict in general, even in an environment where oil is not extremely politically relevant. Third, by focusing on *individual* expectations, it advances the micro-level study of conflict and shows that “individuals are not just passive, manipulated and invisible actors” (Kalyvas, 2006, p. 390).

This article proceeds as follows, the second part discusses how the literature related to the resource curse and cognitive psychology of expectations and tie these together. Then the paper outlines its theoretical framework and hypotheses, before presenting the case study, the methodology, and the results. The paper concludes with a discussion of theoretical implications and challenges for future research.

2. Literature review

Do expectations attached to oil discoveries impact the risk of violent protest and conflict² and, if yes, how exactly? To tackle this question, several strands of the literature deserve closer inspection: the debate on the resource-conflict link, including the works on relative deprivation, and insights from cognitive psychology and behavioral economics on the role of expectations on actual behavior.

2.1. Expectations in the resource curse literature

According to the literature on the resource-conflict link, natural resources can promote violence through three major causal mechanisms (see also Ross, 2004b; Humphreys, 2005; Le Billon, 2008; Koubi, Spilker, Böhmelt, & Bernauer, 2014):

- the *motivation* to take up arms, which may result from resource-related grievances.
- the *opportunity* for conflict by making mobilization financially (or militarily) feasible.

indirect mechanisms—such as state institutions (the “weak state”) and socioeconomic development.

Although the literature has focused on actual production and not expectations, and explicit theorizing is the exception (e.g., Bell & Wolford, 2014), expectations can be important in many ways: Oil and gas discoveries are notorious in creating inflated expectations, and given the long lead time from discoveries to production of petroleum, these expectations will arise long before any revenues start flowing (Weszkalnys, 2008). Concurring, there is an emerging focus on how expectations of high revenues, before these actually accrue, might drive familiar effects of the resource curse, such as increased corruption (Karl & Gary, 2004), changes in real exchange rate (Hayat, Ganiev, & Tang, 2013) and wage increases and inflation (Soares de Oliveira, 2007).

One can connect the expectations especially to motive-related mechanisms. Individuals are the ones who do the fighting; therefore, their perceptions, expectations, and attitudes should matter (see also Kalyvas, 2006, p. 390). Some studies do indeed note that unfulfilled expectations of windfalls might fuel grievances in natural resource rich regions and create incentives for secessionist and other types of conflict.

This concurs with Ted R. Gurr’s classic theory of relative deprivation (e.g., Gurr, 1970, 2000), which expects people to feel deprived, become frustrated, and hence be more aggressive if they do

not get what they think they deserve (see also Feierabend & Feierabend, 1972). Relative deprivation is widely used to refer to a comparison between groups or absolute goals; in fact, however, it also applies to unfulfilled expectations (of oil or other things) that stimulate the mechanism of frustration and aggression. Still, the literature on the resource-conflict link has at best very reluctantly theorized expectations. It is telling that in two major books in the debate (Ross, 2012; Le Billon, 2012), there is no explicit discussion (or an entry in the register) on “expectations,” “perceptions,” or “attitudes.” This also holds true for the concept of relative deprivation, which is hardly mentioned in works on resources and conflict.³ One exception is Østby, Nordås, and Rød (2009). In a cross-country study they find that a combination of natural resources and relative deprivation in sub-national regions increase the risk of conflict. However, their measure of relative deprivation is based on objective economic data, and thus cannot provide a direct test of the postulated grievance mechanism, let alone if these grievances are a result of frustrated expectations.

Only very few studies connect subjective feelings of deprivation (e.g., due to perceived discrimination or dissatisfaction with living conditions) with subsequent conflict⁴; but they rarely use individual-level survey data. While some of these studies support the idea that relative deprivation matters (for participants in the civil war in Sierra Leone, see Mokuwa, Voors, Bulte, & Richards, 2011; Humphreys & Weinstein, 2008; for ethnic groups in Nigeria see Rustad, 2016), none of them directly identify the relative impact of individual expectations on the future or their relation to actual material or other conditions. Generally speaking there are no empirical studies that connect popular expectations of oil with actual violence that ensued afterward.

2.2. Cognitive and social psychology, expectations, and violence

Relative deprivation builds on insights from psychology—namely, that people react aggressively to cognitive dissonance deriving from disappointed expectations (Feierabend & Feierabend, 1972). However, this mechanism is not uncontested, as both cognitive psychology and behavioral economics—an adaptation of psychology to economics—offer other ideas on how expectations affect actual behavior (see e.g., Ariely, 2012; Kahneman, 2011).

According to cognitive psychology, expectations and other beliefs and attitudes play a rather independent role and differ with regard to direction. The classical expectation confirmation model makes satisfaction dependent not only on expectation but also on perceived performance (Oliver, 1977). The non-materialization of hopes linked to oil should reduce satisfaction according to relative deprivation theory. Nonetheless, many experiments have confirmed that people desire their expectations to be confirmed in order to avoid cognitive dissonance (e.g., Ariely, 2012; Gilbert et al., 1990; Kahneman, 2011). Unfortunately, the works on the expectation confirmation model and confirmation bias only refer indirectly to resulting behavior (rather satisfaction), let alone measure violent action. One can, nevertheless, assume that violent behavior is no exception. If people expect positive effects from oil finds, they are less likely to be disappointed; if they hold negative attitudes or feel threatened, a “self-fulfilling prophecy” (Merton, 1948) becomes more probable.

In sum, expectations appear to be quite important for causal mechanisms in the link between oil (and other resources) and conflict, as well as for the study of conflict in general. However, given the lack of theorizing and data, the impact of expectations associated with oil on conflict has thus far not been tested.

3. Theoretical framework and hypotheses

Our theoretical starting point is the concept of expectation. From a psychological point of view, an expectation is a belief about an object in the future, for example, a belief that an event will occur in the future. When such beliefs become more stable or “sticky” they transform into attitudes toward the object (Eagly & Chaiken, 1998). Psychologists distinguish three components in attitudes and this “CAB” model is helpful for our purpose (Rosenberg & Hovland, 1960): First, attitudes have a

cognitive component (C). In our paper, the cognitive component refers to that people know (or believe that they know) that oil production is about to start soon in Mali. Second, the affective component refers to the emotions people link to an object (A). People will expect particular consequences from oil production, either good, bad, or marginal. Third, the cognitive and affective component will result in a motivational or behavioral component (B). According to their expectations on the consequences of oil production, they will develop a certain behavioral tendency, for instance, fears about negative consequences from oil may create or add to grievances resulting from unfavorable present living conditions. These grievances, in turn, increase the likelihood of participating in riots or protests.

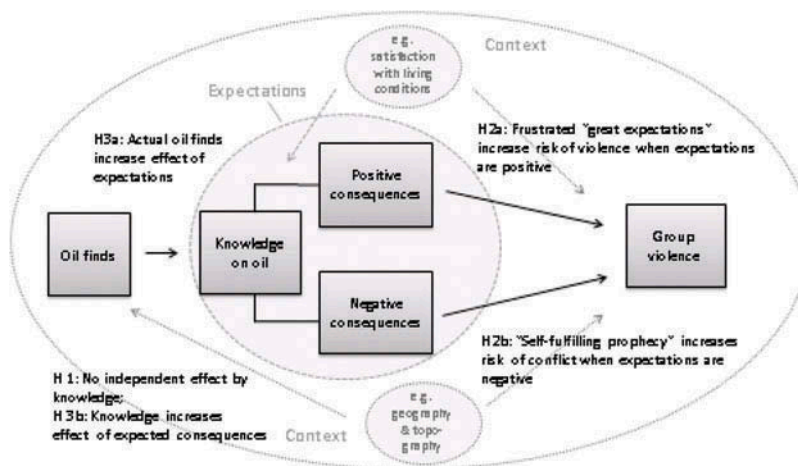
Whether or not, or to what extent a certain behavior will actually occur, will depend on a number of other conditions: First, as expectations refer to the future, it may matter what actually happens afterwards. If production does not materialize—as being the case in Mali—high hopes can turn into disappointment.

Second, the attitude toward oil is not independent from other attitudes and experiences. Negative attitudes toward the state and affairs in general in Mali can inform the attitude toward future oil production. Moreover, other attitudes can independently impact any behavioral tendency (see below).

Third, the salience of the attitude vis-à-vis other attitudes is important, which may be governed by a number of other conditions. For instance, knowing about oil for a longer period before, living in abject poverty or in a region with actual oil finds will make expectations more salient and thus result in a stronger behavioral tendency. Finally, motivation is not sufficient. The individual should also have the opportunity to engage in any given behavior, in this case civil unrest. One can conceptualize civil unrest as a special form of collective action and people need to be motivated and able to exert it (see e.g., Kalyvas & Kocher, 2007; Lichbach, 1998; Olson, 1965). As theorized above, expectations are primarily consequential for individuals' motives and may thus ease or hinder the motivational part of the collective action problem.⁵ With more frustrated individuals available, *ceteris paribus*, collective protest becomes a more likely option. As already mentioned, other variables may impact the relationship. For instance, expectations can depend on other attitudes, such as satisfaction with living conditions or with the political system in general. Opportunity also has its role. For example, protest and riots are more likely to occur in urban and more populated areas. Such contextual variables will count (see next section and Figure 1) and one should not necessarily expect that oil related expectations are the chief variable in explaining civil unrest. However, all other things being equal, overarching hypothesis expects that particular expectations make civil unrest *more* likely.

Yet, how exactly do expectations on oil impact civil unrest?

Figure 1. Theoretical framework hypotheses 1–3.



First, the cognitive component, the knowing of future oil production, will have a minor independent impact on the emergence of civil unrest. For one, pure knowledge might be rather neutral. Moreover, the respondents (or other “ignorant” Malians) will have heard about oil some time after the survey (if not informed by the survey itself). In sum, hypothesis 1 assumes:

H1 (Knowledge): Knowing about the oil in Mali will not have an independent effect on civil unrest.

Regarding the affective component or the “direction” of expectations, one can juxtapose two potentially contradicting hypotheses. As discussed in the literature review, the first one builds on the basic assumption of relative deprivation theory (e.g., Gurr, 1970) and the classical expectation confirmation model (Oliver, 1977, 1980): when windfalls from oil do not materialize, expectations of benefits should create frustration and thus aggression. Accordingly, one can expect:

H2a (Consequences): Unfulfilled positive expectations of the consequences from oil finds will create frustration and hence increase the likelihood of civil unrest.

The alternative hypothesis on the nature of expectations builds on cognitive psychology and behavioral economics and suggests a potentially opposite mechanism (e.g., Gilbert et al., 1990). As people generally tend to see what they expect, frustration will be less likely with positive expectations. In contrast, negative expectations will work as a “self-fulfilling prophecy” (e.g., Merton, 1948). Hence, we propose the following hypothesis:

H2b (Consequences): Negative expectations of the consequences by oil discoveries will become a self-fulfilling prophecy and hence increase the likelihood of civil unrest.

Apart from the direction or the emotions attached, the salience of an attitude matters. The salience of expectations at least partially depends on the actual presence of oil prospects—which will ensure that exploration activities become more likely; reporting, more frequent; and the public debate about it livelier. Although no oil production has taken place in the case of Mali, the prospected oil basins are only located in certain areas of the country (Whaley, 2008). Our next hypothesis thus expects that the impact of expectations will be more pronounced in these regions:

H3a (Salience): The salience and thus the effects of expectations will be moderated by material facts. In areas of oil basins the effects of expectations on civil unrest will be stronger.

Salience will also possibly depend on previous knowledge of oil. When people knew before the survey about oil, it is more likely that they are generally better informed and/or have formed more stable and hence behaviorally more consequential attitudes. The final hypothesis assumes:

H3b (Salience): The salience and thus the effects of expectations will be moderated by previous knowledge. The expectations of people who knew about oil before the survey will be stronger compared to people without previous knowledge.

4. The case of Mali and the survey

The case of Mali offers a unique opportunity to test the paper’s hypotheses. In October and November 2006, the authors and our local partner, *Groupe de Recherche en Économie Appliquée et Théorique* (GREAT Mali, which is directed by Massa Coulibaly), conducted a representative opinion poll with more than 1,000 respondents. The survey covered most parts of the country, except for some very sparsely populated areas in the North. The poll was stratified according to *régions* (first-level subnational administrative unit), urban and rural areas, and gender—but otherwise the selection of communes, villages, and respondents was randomized.

Presumed oil finds stemming from prospecting activities stimulated a lively debate within the country in 2006. Newspapers reported exploratory activities and their potential. Interviews with observers, government members, and officials of political parties revealed that elites were very aware of this potential. While there were explorations of potential oil basins in Mali as early as the 1970s and even some small-scale drilling in the 1980s, it was not until 2004 that more serious investments and exploration started (Nickle, 2012; Whaley, 2008). Mali has five major basins: Taoedeni Basin, Tamesna Basin and Iullemeden Basin, Gao Graben, and Nara Trough (see Map 4). By 2006, 15 exploration blocks within these five basins had been established; in most of them either production-sharing agreements had been signed or were under negotiation.⁶

In 2006, oil production was expected to soon begin—at least that is what the qualitative fieldwork suggested at the time. However, oil production has not yet materialized, though political stability deteriorated sharply after 2006 (see e.g., Morgan, 2012). Since the early 1990s, there have been several uprisings, besides protests and other turmoil, especially rebellions by nomadic Tuareg and other minorities who live in the mostly desert northern part of the country. Nevertheless, the intensity level of the violence was rather low, and uprisings in the 1990s and since the turn of the century were ended by peace agreements that promised more political autonomy and economic opportunities—which had been the prime demands by the rebels (Humphreys & Ag Mohamed 2005).

However, the respective peace agreements were only partially honored, and rebellion resumed in early 2012. This time the uprising took a different flavor (Van Vliet, 2012); while the new rebels largely held the same secular grievances as its predecessors, a number of splinter groups quickly emerged and made claims for an Islamist state—which was at least partially inspired by Islamist rebels in neighboring Algeria. The Malian armed forces, which were poorly equipped and trained, lost several battles to the rebels, and the disgruntled leadership of the Malian military overthrew the democratically elected government in March 2012. The political turmoil in the capital and all over the country, including protesting and rioting, further helped the rebels, who were able to occupy large parts of northern Mali, including major cities, such as Gao, Kidal, and Timbuktu. Events took a further dramatic turn when a massive rebel offensive in early 2013 threatened the capital of Bamako in the South (Whitehouse, 2014). Troops led by the former colonial power France intervened and managed to push back the rebels, who withdrew to the desert but continue to engage in guerrilla warfare.

The analysis of the causes of conflict and civil unrest cover a wide range of issues (e.g., Bøås & Torheim, 2013; International Crisis Group, 2012; Morgan, 2012; Norwood & Null, 2013; Salem & Ahmed, 2013), in particular the Tuaregs' grievances about the failure to honor prior peace agreements and other Malians' dissatisfaction with general living conditions. Other analysts point to the detrimental effects of climate change on food security; the spillover of extremist Islamist ideology from neighboring Algeria; the return of heavily armed Tuareg mercenaries from Libya, who had fought for Gadhafi; and the weakness of the Malian state and/or military.⁷

At first glance, oil does not appear among the prominent conflict causes. Several authors, however, have pointed to the role of natural resources, portraying Mali as a “resource rich” country. Although only rather moderate amounts of gold are extracted in the country, there are allegedly huge reserves of uranium and oil. Some authors suspect that the trouble in Mali, especially the Tuareg conflict and France's intervention, is motivated by these resources (e.g., Salem & Ahmed, 2013; Vanderbruck, 2011). It has also to be stated that there is very little literature that explicitly analyses the causes of protest and riots, our dependent variable.⁸ Most authors deal with the rebellion in the North. Protests and riots are at least partially connected to this rebellion. The number of protest events slightly increased after 2004, when exploration activity, started, but peaks in 2012 with almost 40 events. The majority of events are connected to the rebellion.

5. Methodology

This section outlines how variables were generated and what estimation technique was employed.

5.1. Geo-coding of survey data

In order to link each respondent in the survey to specific riot events, the paper uses geographic information systems (GIS) software, to match the geographical position of the survey points with the exact geographical position where the conflict event took place. Although the opinion poll was originally not georeferenced, it was possible to use information on village and commune names in the original and completed questionnaires to identify the location of each respondent and assign geographical coordinates. Figure 2 shows the geographical spread of the survey and the *cercle* (second-level subnational administrative units). In total, the poll includes 123 survey points and 1,026 respondents.

5.2. Estimation technique

The data is organized as a cross-sectional dataset using respondents as the unit of analysis; however, in order to control for dependence between the respondents within each unit, we cluster on survey points in the analyses. As shown in the subsequent section, the dependent variable in this analysis is a count of events variable and as Figure 3 (further down) indicates that the variable has an inflated 0, that is, many of the respondents have not experienced riots and protests.

Figure 2. Survey points and administrative units.

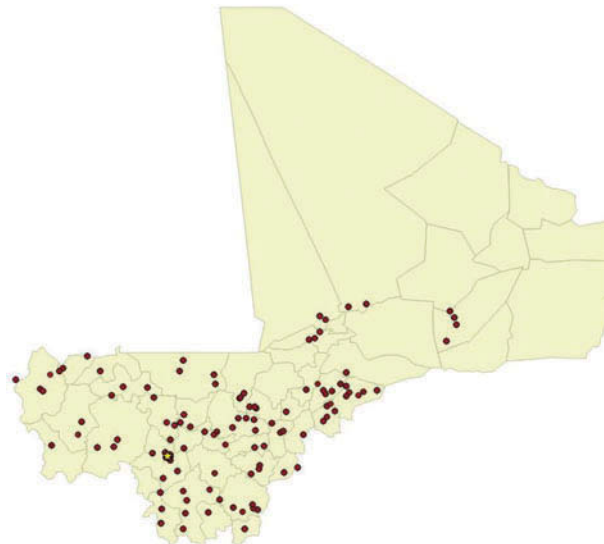
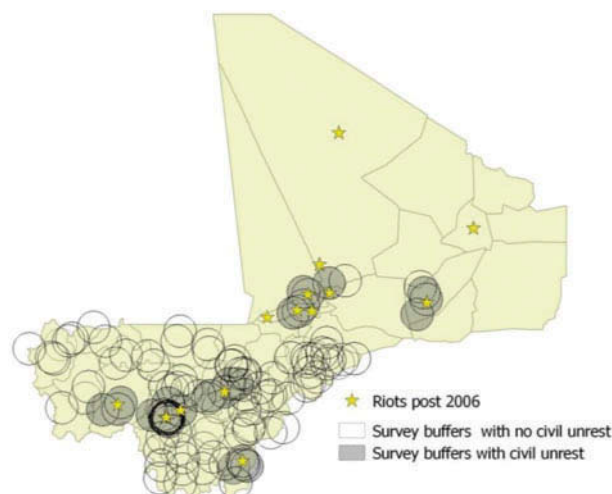


Figure 3. Number of respondents and riot/protest events.



Further, from the descriptive data Table A1 in the appendix one can see that the variance is exceeding the mean by a great deal, this means that the distribution is over-dispersed. The difference between 0 and number exceeding 0 indicates the difference from experiencing riots and not, while the difference between the numbers exceeding 0 says something about how many riots the respondent has experience. Thus, the difference between 0 and 1, means something different than the difference between 1 and 2. To analyze this type of independent variable, a regular OLS regression is not suitable for this analysis and we use a negative binomial regression, which gives us the probabilities for occurrence of numbers higher than 0.

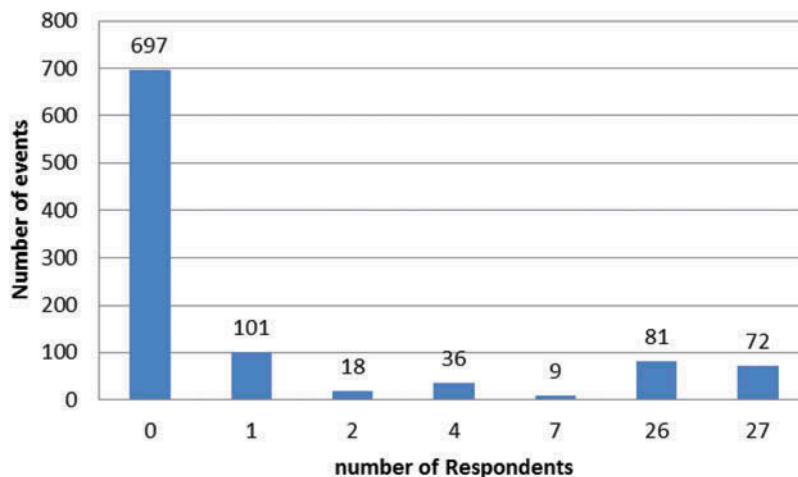
5.3. Dependent variable: civil unrest

Expectations speak primarily to the motivational aspect of collective violent action and our analysis therefore uses civil unrest, comprising protests and riots, as the dependent variable. Protests and riots do not require high organizational levels and other favorable opportunity structures and should therefore be more strongly affected by expectations. We use the Social Conflict Analysis Database (SCAD version 3.1), which includes geographical information on protests, riots, strikes, intercommunal conflict, government violence against civilians, and other forms of social conflict between 1990 and 2013 (Salehyan et al., 2012). Based on this data, we coded a variable that includes demonstrations, riots, and strikes⁹ between 2007 and 2013, and, by using GIS software, count events within a 55 km buffer zone around each survey point. Then the events were linked with the respondents belonging to each specific survey point. This means that some conflict events will be associated with several survey points if the buffer zones overlap (see Figure 4). We use a buffer zone instead of administrative units because there is a large variation in the size of the administrative units and they are hence not fully comparable. Further, some of the survey points are close to the administrative region borders and might therefore be closer to events in other administrative regions than their own. Between 2007 and 2013, there were 55 riots and protest events in Mali, with a total of 39 fatalities.

Most respondents have experienced no riots/protest events, but approximately 16% have experienced between 1 and 7 events, while about 15% have experienced more than 7, this is shown in Figure A1 in the appendix.

Not all conflict events are included because the survey was not conducted close to all of them. One could suspect that there was a potential selection bias toward places with less conflict as security reasons might have prevented the study being conducted in places experiencing more conflict. However, this was not the case. The survey excluded the sparsely populated northern parts of the country for financial reasons rather than for security concerns. In addition, Figure 4

Figure 4. Conflict events and buffer zones.



shows good variation on our dependent variable, which also suggests that, if anything, there is no severe selection bias.

5.4. Independent variables

In the survey, the respondents were asked whether they had **knowledge** about the prospective oil production. A vast majority of 70% of the respondents knew about oil in Mali and believed production was about to start soon, which is the item to test H1. We code all that have had heard about the oil as 1 and the rest 0.

A second item captured the quality of their expectations, which are the expected **consequences**. Perhaps understandably, given it is one of the poorest and least developed countries in the world, 72.7% of respondents had indeed great expectations and agreed that “oil will solve a lot of problems.” Only 12.7% feared adverse effects of the “resource curse” and agreed that “oil will create many other problems”.¹⁰ These expectations on the consequences rest on scarce information and are mainly grounded in people’s perceptions. This, however, is not a disadvantage, but rather an excellent opportunity to test whether there is a relationship between different qualities of expectations and the risk of civil unrest—as one can exclude that any of these effects related to oil actually stem from the production of oil.

The consequences variable is based on the following question (Q56): *Do you think that the extraction of oil will contribute to the development in Mali?*¹¹ Table 1 gives an overview and the distribution of responses. To be able to test both H2a and H2b, we created a squared term of the expectation variable to investigate whether there is a curvilinear relationship between expectations and violence.

5.4.1. Oil (discoveries)

To test H3a, which investigates the relationship among prospected oil deposits, expectations, and civil unrest, one needs to locate the oil basins and associate them with the survey points. We thus georeferenced a map indicating the potential oil basins in 2006 (Nickle, 2012; Whaley, 2008) and overlaid their location with the survey points (Figure 5), coding those respondents living within the oil basins as 1 and the others as 0. To test H3a, an interaction term between *oil* and *consequences* was created. In addition, we control for oil basins in all the models. In order to test the conditional effect of knowledge in H3b a similar interaction term between *knowledge* and *consequences* was used.

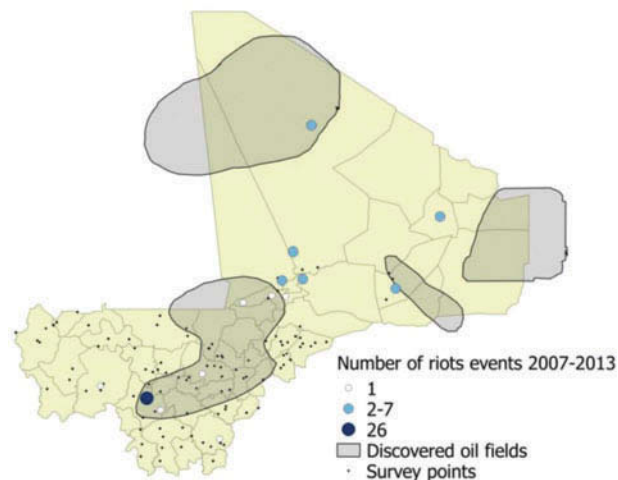
5.5. Control variables

As argued above, the relationship between oil, expectations, and violence does not develop out of context. Therefore, the analysis also controls for a number of additional variables—all of which have proven important in other studies and/or are theoretically important for the relationship.

Table 1. Oil and expectations in the survey

Response	Frequency	% (valid)	Code in dataset
“Yes, it will resolve a lot of problems”	704	72.7%	1
“To some extent”	117	12.1%	2
“Not at all, nothing will change”	25	2.6%	3
“On the contrary, I fear that oil creates other problems”	123	12.7%	4
Total	969	100%	
<i>I don't know</i>	8	-	<i>Missing</i>
<i>No answer</i>	49	-	<i>Missing</i>

Figure 5. Survey points, civil unrest events, and oil basins.



First, we control for a number of standard variables that impact conflict. One of the main predictors of conflict is previous conflict. We therefore use the UCDP GED data to calculate the number of conflict events between 1990 and 2005 in the second administrative region (cercle) that the respondent lives in. A measure for population within each survey buffer is included, using CIESIN's Gridded Population of the World (GPW) 2005 and used GIS tools to calculate the size of the population within each buffer. The variable is further log transformed. We also control for whether the respondent lives in an urban (1) or rural (0) area.

Second, we include controls that could affect our dependent and independent variable *consequences (of oil)*. Expectations on consequences could be a proxy for how the respondent views Mali's political system and its institutions in general (and they could also affect conflict risks). For this reason, we also include a variable measuring the respondent's *trust in institutions*. This is a composite variable consisting of four variables that ask whether the respondent has trust in traditional leaders, local administration, the president, and the parliament. For each institution, the respondent could answer (1) "no trust," (2) "little trust," (3) "moderate trust," and (4) "much trust." For the variable used in this paper, we added the values of the four subvariables, thus creating a composite measure ranging from 4 to 16, where 4 denotes "little trust" and 16 reflects "much trust."

A variable measuring how satisfied the respondent is with her or his living conditions in general is additionally included. This way, we are able to control for general socioeconomic grievances, such as food security or scarcity in other basic needs that could also affect the way the respondent answers the question about expectations. The variable is coded 1 for "not satisfied" and 4 for "very satisfied." The regressions also control for the respondents' education levels, the variable goes from 1—no schooling (N=829) to 6—master level. This variable is important as it may mediate peoples' understanding of how oil resources affect the society and therefore also their expectations related to the prospects of oil.

Finally, the analysis controls for a number of variables that many authors and observers name as having been particularly important in Mali's recent conflicts (e.g., International Crisis Group, 2012; Morgan, 2012). The recent rebellion has often been portrayed as a Tuareg uprising. Using the Geo-EPR dataset on ethnic groups (Wucherpfennig et al., 2010), we identified those respondents who live in an area that is defined as "Tuareg" and code such respondents 1 and all the rest 0.

Because some of the rebel groups that emerged after 2006 held extremist religious views, religious orientation might be important. Following the advice of our Malian partner, the original

survey included a “Wahhabite” (fundamentalist Sunni Muslim faith of Saudi descent) response option to the question on the religious identity of the respondent. Although almost 900 respondents ticked “Muslim,” a significant minority of around 6% identified themselves to be *Wahhabite*. Descriptive statistics for all variables can be found in Table A1 in the Appendix.

6. Results

The results are reported in Table 2. Model 1 is testing whether just *knowing about oil* has an effect on the likelihood of civil unrest. It becomes evident that the coefficient is negative; however, the relationship is not significant. Model 2 includes the *consequences* variable, which indicates how the

Table 2. Regression results on oil, expectations, and civil unrest events (negative binomial regression)

	Model 1	Model 2	Model 3	Model 4	Model 5
Variables	Civil Unrest	Civil Unrest	Civil Unrest	Civil Unrest	Civil Unrest
Knowledge about oil	-0.172 (0.152)				-0.851** (0.320)
(expected negative) Consequences		0.147* (0.0727)	1.287* (0.500)	0.112 (0.0880)	-0.122 (0.120)
(positive expectations) Consequences squared			-0.234* (0.0925)		
Interaction: oil and consequences				0.0500 (0.156)	
Interaction: knowledge and consequences					0.326* (0.157)
Oil	0.465 (0.409)	0.467 (0.432)	0.449 (0.421)	0.383 (0.454)	0.508 (0.419)
Conflict history	0.371** (0.0732)	0.360** (0.0754)	0.367** (0.0750)	0.359** (0.0756)	0.355** (0.0752)
Wahhabite	-1.128 (1.721)	-0.939 (1.768)	-1.001 (1.683)	-0.956 (1.772)	-0.988 (1.725)
Tuareg	3.993 (6.954)	3.743 (5.325)	3.625 (5.229)	3.795 (5.498)	3.766 (5.132)
Perception of living conditions	-0.197* (0.0841)	-0.164* (0.0807)	-0.147 (0.0776)	-0.164* (0.0794)	-0.143* (0.0702)
Population in buffer zone (ln)	2.259** (0.417)	2.203** (0.405)	2.197** (0.412)	2.203** (0.405)	2.199** (0.401)
Education	0.128* (0.0670)	0.0856 (0.0590)	0.111 (0.0813)	0.0847 (0.0573)	0.0935 (0.0604)
Trust	-0.0215 (0.0348)	-0.0131 (0.0284)	-0.0143 (0.0307)	-0.0122 (0.0284)	-0.0191 (0.0299)
Urban	0.837 (0.492)	0.777 (0.445)	0.760 (0.406)	0.781 (0.451)	0.804 (0.438)
Lalpha	0.263 (1.285)	0.291 (1.042)	0.242 (1.036)	0.293 (1.058)	0.274 (0.990)

(Continued)

Table 2. (Continued)

	Model 1	Model 2	Model 3	Model 4	Model 5
Variables	Civil Unrest	Civil Unrest	Civil Unrest	Civil Unrest	Civil Unrest
Constant	-29.85**	-29.55**	-30.51**	-29.51**	-28.85**
	(5.761)	(5.388)	(5.331)	(5.447)	(5.444)
Observations	895	858	858	858	854

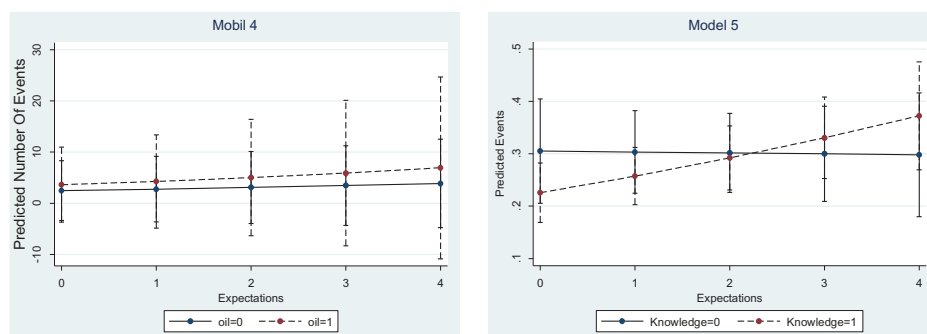
Robust standard errors in parentheses.
 ** $p < 0.01$; * $p < 0.05$.

respondents think the oil will contribute to the development of Mali. There is also evidence that (negative) consequences are positive and significant at the 0.05 level, suggesting that civil unrest events are more likely to happen close to survey points where respondents with negative views on the consequences of oil production live. This finding supports our general idea, which proposes there is a link between expectations and civil unrest; it also confirms H2b, which suggests that civil unrest is driven by negative expectations through a self-fulfilling prophecy. Apparently, it is not the knowledge of the oil that matters, but the consequences people expect.

The support for H2b implies that conflict is less driven by unfulfilled “great expectations” as expected by H2a. However, H2a and H2b are not mutually exclusive. For instance, one cannot rule out convex curvilinear relationship where both very positive and very negative expectations increase risk civil unrest. Therefore, Model 3 additionally includes a squared term of the expectation variable in order to test this nonlinear relationship. In the analysis, it emerges that both the variables are significant, one positive and one negative indicating a curvilinear relationship. However, the curve is concave, thus opposite of what was expected, further the 95% confidence interval indicates that this result cannot be trusted. This is illustrated by a marginal effect plot in the appendix (Figure A2).

H3a expects that the effect of expectations on violence is stronger in areas with oil basins as the salience of the attitude will be higher. Model 4 adds an interaction term between *oil* and *consequences* in order to test whether the effect of expectations is conditional on the respondent living in an oil region or not. In Model 4 neither the *interaction term* nor the interaction factors are significant. We also plot this relationship using a marginal effect plot Figure 6 (to left), the dashed prediction line indicates that there is an increase of events in oil rich regions when people have negative expectations compared to non-oil regions. However, the 95% confidence interval indicates an insignificant find for all the values for the interaction term, which is consistent with the findings in Model 4. One explanation for this finding may be that the negative expectations people hold concern the effect of oil on the development of the country’s economy as a whole, and not local effects of oil developments—making where you live less relevant.

Figure 6. Marginal effect plot for the interaction terms in models 4 and 5 with 95% confidence intervals.



Testing hypothesis 3b, Model 5 includes an interaction term between people's knowledge of oil and expected consequences from oil. We find that the interaction term is positive and significant, suggesting that when people know about oil, there is an increasing risk of civil unrest events the more negatively people view the expected consequences compared those with no knowledge. The graph to the right in Figure 6 supports this as the dashed line (knowledge) is steeper than the solid line (no knowledge). However, it also indicates that it is not significantly differently from those that did not know as the confidence intervals for the two variables are crossing each other; nonetheless the trend is quite clear in this graph.

By and large, the control variables act as expected. *Conflict history* is positive and significant—that is, the more conflict the region has experienced the more likely we are to see more riots and protests. The urban dummy positive and has a *p*-value between 0.05 and 0.1 in all the models, suggesting that riots/protests happen more often in urban areas. The population variable is positive and highly significant; more riots/protests occur where there are more people.

Trust in institutions proves to be negatively linked to the occurrence of riots/protests, which implies that in areas where respondents have less trust in the government, more civil unrest occurs. However, the relationship is not significant. The variable *perception of living conditions* is negative (i.e., the worse off respondents think they are the more likely there will be conflict) and statistically significant in all models. The education variable is positive, that is, the higher education a respondent has the more likely it is that riots/protests will happen close to them, but it is only significant in Model 1.

Finally, the Wahhabite variable is negative and the *Tuareg* variable turns out to be positive, but both are not significant. While extremist views are indeed associated with violence in Mali, this seems to be related to armed conflicts, if anything, and not to riots and protests.

6.1. Robustness tests

We performed a number of robustness checks in order to test whether or not our results hold when we employ alternative measures for our independent and dependent variables.

Principally, the unit of analysis is the respondent. Therefore, the dependent variable is operationalized as the number of civil unrest events in the buffer zone of the respondent. One can argue that other types of geographical units would more adequately capture civil unrest events—for example, subnational regions or a differently sized buffer zone. Therefore, we run the models with the second level of administration (cercle), as well as a 30 km buffer zone as the basis for the calculation of the independent variable. For the administrative regions the results hold and are highly significant with exception of the interaction in Model 5. While using 30 km buffer zone the results replicate the trends but the significance disappears (see Appendix, Tables B1 and B2) suggesting that the effect plays out in a wider zone only—which seems plausible in a vast country like Mali,

One can further argue that our analysis does not rely on individual-level data on civil unrest and that the dependent variable has the same value for all respondents at a given survey point. Although this latter issue could be problematic, we have clustered on—and therefore controlled for to a certain extent—survey points in our analyses. We nevertheless also recalculated the results using the survey point as a unit of analysis, computing the average values for all the variables for all respondents within the buffer zone of each survey point. This procedure substantially reduces the number of observations (121 survey points). The results stay the same, except for the interaction between *knowledge* and *consequences* which is now insignificant (Table B3).

Further, we use the SCAD data to see if we find the same results for violent conflict events that are connected to the state, that is (mostly), armed conflict. We code an event variable using the categories that are more closely linked to violence: Pro-Government Violence (Repression), Anti-Government Violence, Extra-government Violence, Intra-government Violence, the results can be

found in Table B4 in the Appendix. Again the bivariate results hold. The coefficients for Models B4_3 to B4_4 correspond with the main analysis, but lack significance. However, Model B4_7 shows that the interaction between knowledge and expectations are significant and supporting the findings in Model 5 in the main analysis. This suggests that expectations are relevant for several types of violence, but more prominent for riots/protests. This finding is not unexpected and increases the confidence in the validity of our results as armed conflict requires more opportunity and is less motive (and expectation) driven than riots/protests are.

Additional robustness checks used a dummy variable set for expectations, and the main results hold. Finally, Models 2, 3, and 4 were replicated with a sample which only included those who had heard about oil, assuming that you can only have formed meaningful expectations if you knew about the oil. We still find the same results, but they lose significance (The analyses are available upon request).

Beyond statistical robustness one may ask whether there is any anecdotal evidence that oil and associated expectations have served as actual drivers of civil unrest—be it as a motivation for rebels, rioters, or protesters. We therefore systematically check entries in several editions of the *Africa Yearbook* and the quarterly country reports by the Economist Intelligence Unit, as well as “issues” of conflict events in the SCAD database. Generally, the sources show little direct evidence regarding oil as a motive for the insurgents, protestors or rioters. Most of the events are connected to dissatisfaction over living conditions or government policies. Very many are connected to the rebellion in the North and its repercussions for politics in the capital.

Yet, the link is not completely absent: One can find that the Malian government was concerned about security problems in the North because of the threat to oil exploration (Economist Intelligence Unit, Country Report Mali, 2008 February 2008: 6).¹² The opposition was concerned because of oil. Interviews by one of the authors with officials of the *Rassemblement pour le Mali* (RPM), the then major opposition party in 2006, revealed that the RPM was extremely concerned about the oil exploration fearing an “explosion du Nord”.¹³

There is also evidence that riots and protests have been substantially on the rise since 2004, the year when major oil exploration started. While on average less than two riot/protest events occurred before 2004 (1.79), the mean stands at far more than six (6.8) between 2005 and 2013. Even when one excludes 2012, where their number peaked at 38 events, it is still almost three (2.9).

Summing up, we do not think the lack of direct anecdotal evidence makes our causal story implausible. First, actual causes do not need to be a central part of the public discourse and debate in order to matter. Second, and more importantly, we did not expect that expectations of oil are the sole or even a main reason for violence and protest in Mali. We have hypothesized that it is a contributing one and our evidence confirms this proposition. It might be remarkable that these expectations matter in the first place in a country with no oil production. One can assume that expectations of oil matter much more in countries where oil is actually produced.

7. Discussion and conclusion

This paper has investigated whether individual knowledge and expectations of the consequences of oil discoveries affect subsequent conflict risk. Although a neglected area of theory and research in the debate on the resource-conflict link, a number of arguments back this assumption. Relative deprivation theory, for example, suggests that oil discoveries create hopes of windfalls, which if not fulfilled, result in frustration and thus should increase the risk of conflict. In contrast, cognitive psychology assumes that the effect of expectations depends on whether individuals have positive or negative expectations of oil discoveries. When people hold negative views regarding the effects of oil, conflict risks should increase.

Given the lack of appropriate data at both the individual and the group level, however, the relationship has never been empirically tested. By using unique georeferenced data from a

representative survey on the expectations regarding oil discoveries in Mali in 2006 and georeferenced event data on subsequent conflict, this study is the first to systematically investigate whether and how individual expectations attached to oil finds affect the subsequent conflict risk.

Our empirical findings clearly indicate that individual expectations matter—although oil is not at the heart of politics in Mali. More precisely, negative expectations were mainly found to increase the risk of subsequent conflict through a “self-fulfilling prophecy” effect. We do not find significant evidence that the nature of the expectations effect is conditional on the salience of attitudes, that is, the presence of previous knowledge on oil basins and living in oil regions. Nonetheless, the analysis alludes to the trend that we theorize.

The basic results are quite robust to a number of alternative specifications, especially when controlling for variables that played a role in the recent armed conflict in Mali or are important for conflict and the formation of attitudes in general (e.g., previous conflict, religious extremism and ethnic exclusion, satisfaction with living conditions, and trust in political institutions). Our findings have substantial implications for the debate on the resource-conflict link and the study of conflict in general. It appears that individuals’ expectations are an important intervening variable and their quality or “direction” matters. Expectations are by no means negligible reflexes to material givens from beneath the ground that do not require closer inspection.

Despite the fact that our results substantially contribute to conflict research in general, one has to consider a number of caveats in our study. First, our paper only looks at one particular country and one type of violence in a limited time period. Mali might form a special case given specific circumstances, such as the very pronounced weakness of the state. Further studies in other countries, such as Mozambique or Tanzania need to confirm or modify our results. Second, this paper only used a cross-sectional framework of testing but would need year-wise data on expectations and violence in order to find out whether causal patterns are stable. Third, the paper could not use data on the actual involvement of individuals in the rioting and fighting. Fourth, and probably most importantly, one cannot rule out that expectations relate differently to violence when actual oil production takes place. In other words, if there is a more solid base for people to assess “performance” (i.e., whether their expectations are being met), disappointment may possibly have a stronger effect. Given the situation in Mali, where production has not yet started, we simply cannot assess this impact. In general, however, one can assume that the effects of expectations are very much likely stronger in countries with actual production than in Mali with its relatively low relevance of oil.

In sum, our results may serve as a first step in justifying and stimulating research on the link between oil, expectations thereof, and conflict, as well as the link between individual expectations and civil unrest in general. The topic under investigation is not a matter to be confined to the ivory tower; it is highly relevant for countries with future resource extraction projects and for resource governance in general. If our findings are correct, steps should be taken avoid the development of great expectations; at the same time, however, it is at least equally important to prevent the emergence of an alarmist debate focused on risks and problems.

Supplementary material

The supplemental material for this article can be accessed here <https://doi.org/10.1080/23311886.2018.1470132>

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Notes

1. This information relies on an article in the petroleum geoscience magazine *GeoExpro* (Whaley,

- 2008) and refers to the situation in 2008; after earlier explorations had proven unpromising in the 1970s, activities started again in 2004 with the Australian company Baraka Petroleum taking five blocks for exploration. An airborne exploration survey commenced in December 2006 and was completed in July 2007 (Petroleum Africa, 25 July 2007; <http://www.petroleumafrica.com/mali-airborne-survey-complete/> accessed December 2014).
- In the following, if not indicated otherwise, we use “violent conflict” and “conflict” as synonyms. Violent conflict refers to an incompatibility between at least two groups where physical force is used. It also includes less organized forms of conflict, such as riots.
 - Neither Ross (2012) nor Le Billon (2012) and the seminal work by Collier and Hoeffler (2004) mention the concept nor cite Gurr’s seminal work.
 - Typically, studies that use survey data conceptualize attitudes as dependent variables (e.g., De Juan & Pierskalla, 2016).
 - They also may increase or reduce opportunity—though rather indirectly and as an epiphenomenon of motive—given that the availability of motivated recruits forms a favorable opportunity structure from the perspective of potential leaders. Other factors, such as the physical infrastructure, rough terrain, the availability of arms, and pre-existing associations more directly ease the opportunity-related part of the collective action problem of conflict.
 - See also: <http://www.ogj.com/articles/print/volume-103/issue-20/special-report/worldsquot-remote-basins-afford-many-exploration-opportunities.html>.
 - Some authors point to rivalries between the Tuareg and other groups from northern Mali, as well as their involvement in the smuggling of drugs and other contraband (e.g., Bøås & Torheim, 2013).
 - Exceptions might be Benjaminsen (2008) and Simmons (2013) who discuss food scarcity as a possible cause of several forms of conflict in Mali. However, Benjaminsen refers to the time before the oil explorations and both authors find little evidence for a direct link between food scarcity and conflict in Mali (e.g., Simmons: 21).
 - The SCAD dataset includes six categories that fit into our dependent variable: organized demonstrations, spontaneous demonstrations, organized violent riot, spontaneous violent riots, general strike, and limited strike. For a description of each category see the codebook by Salehyan and Hendrix (2014).
 - Interestingly, elite interviews revealed much more skeptical views on the consequences of oil production.
 - The question was originally asked in French (or in local languages by interviewers): « Pensez-vous que l’exploitation du pétrole contribuera au développement du Mali? » Response options: « Oui, le pétrole résoudra beaucoup de problèmes; » « Quelque peu »; « Pas du tout, ça ne changera rien »; « Au contraire, je crains que le pétrole ne crée d’autres problèmes ».
 - Moreover, natural resources form at least part of some of the potential causes of the conflict (e.g., Norwood & Null). Some authors point to northern groups’ interests in protecting their drugs- and contraband-smuggling activities. Others argue that gold and uranium play a role. Renewable resources and/or food security seem to have been only indirectly relevant or a consequence rather than a cause of the conflicts (Benjaminsen, 2008; Simmons, 2013, pp. 12, 21, 37–8).
 - Officials of other parties were also more skeptical on possible consequences than the average Malian, however, usually much less alarmed than the RPM officials.
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