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Scheduled Tribes, Agricultural Production, and Naxalite Violence in India

Arun Bodapati

Indian Prime Minister Manmohan Singh has called the Maoist insurgency India's greatest internal security threat. Though the conflict historically dates back to the 1960s, the past decade has seen a resurgence of violent activity across the eastern half of India that shows little sign of abating. Though the violence is primarily justified on economic grounds; it is also strongly associated with India's tribal populations, creating some difficulty in perceiving the sources of the violence. Some papers propose a strongly economic view of the conflict, while other papers prefer to emphasize the ethnic grievances of the individuals engaged in conflict. This paper finds that the interaction of these two factors explains how both greed and grievance affect the presence of violence. By interacting each district's share of Scheduled Tribes (ST) members with each district's mean crop value, this paper shows that among the districts with high ST populations, those with higher crop values experience less violence overall. Furthermore, this effect is more noticeable in the southern portions of the affected area, where ST proportions are highest.

Introduction

As one of the most populous and diverse countries in the world, India has been affected by various forms of political violence since it gained its independence in 1947. Though religious violence, secessionist violence, and international wars have all occupied Indian attention, the threat from Communist-inspired rebels, called Maoists or Naxalites, is perhaps the most relevant internal threat to India today. The movement's founding dates back to at least 1967 in the village of Naxalbari, where an agitated tribe sought to overthrow the landlords while disgruntled peasants considered forming a Communist party in emulation of Mao Zedong. Though they were a significant threat during the 1970s and 1980s; in the 1990s, the rebels were largely disorganized and seemed to have been effectively frustrated.

However, for the past decade, a renewal of Communist violence has occurred throughout Eastern India with such intensity that the region is referred to as the "Red Corridor" (Banerjee). With almost 6,000 fatalities in the past seven years alone, the conflict has earned the title of India's "biggest internal security challenge" from Prime Minister Manmohan Singh (SATP 1, The Hindu). Though fatalities have decreased from year to year, recent attacks in 2013 suggest that the conflict is far from resolved.

This paper seeks to explain the occurrence of Maoist violence at the district level in India. Using a cross sectional OLS regression model for the districts (in 2001) of nine Indian states (Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Karnataka, Maharashtra, Orissa, Uttar Pradesh and West Bengal), I consider the effects of various economic and ethnic variables on five measures of violence

from 2005 to 2011. These variables are obtained primarily from the Indian Government or international organizations, such as the United Nations. Among these variables, the share of Scheduled Tribes (ST) individuals in a district is a significant predictor of violence, being strongly positively correlated with all five measures. However, it would be erroneous to reduce the explanation of violence to a purely ethnic one. The importance of crop value as a proxy for agricultural income in districts with high shares of ST members, especially those in the south, is also strongly correlated with violence. The negative effect of greater crop values on violent incidents and deaths suggests that relevant agricultural production plays an important role in determining whether an individual will resort to extremism or not.

Additionally, the paper also finds some evidence to suggest that violence increases with greater forest cover, and decreases with greater human development, as measured by the proxy variable of literacy. While previous papers have emphasized either economic "greed" or "grievances" associated with factors such as ethnicity, with one at the expense of the other, I suggest that the interaction of the two is necessary to obtain a better view of why violence occurs and how it can be understood in the context of India. Furthermore, by incorporating a larger sample size, I believe this paper offers a more accurate depiction of violence in India, as opposed to a narrow presentation of a few violent districts that would be vulnerable to criticisms of selection bias.

Before presenting my results, I provide multiple sections that will add context to the study. Below, I begin with an overview of relevant literature, first addressing conflict in general before moving onto works dealing with Maoist violence in India specifically. After a discussion of the literature on Maoist conflict, an explanation of the history and nature of the conflict itself follows, detailing where and when it occurred, how it has varied across time, and how the insurgents have justified it. After establishing the background, I outline the hypotheses for the occurrence of violence, each of which I will test. I then proceed to describe the data used and their sources before outlining methodology. Finally, the results are discussed and conclusions drawn from there.

Literature Review
Literature on Conflict

An overview of some important works on general conflict will help to highlight the key issues discussed in literature on conflict – for this study, the issue of "greed and grievance." A good starting point for anyone interested in the literature on conflict is Miguel and Blattman (2010), which provides a comprehensive discussion of the various issues, approaches, and problems encountered in research on conflict. Sections 2.3 and 2.4 attribute violence to social or economic causes, that is, the problem of "greed vs. grievance." Miguel and Blattman hold that economic motivations are generally better theorized, but there is also no denying the importance of ethnicity in conflict. There are various competing explanations for which factor is most important. In ethnicity, some advance the argument that shared culture facilitates strategic coordination (e.g., language facilitates communication) while others emphasize the political and social marginalization of some groups in causing conflict. Economic indicators can lend themselves to multiple explanations as well. Income could be used to suggest state capacity, the opportunity cost of violence, or asymmetric information according to Miguel and Blattman. In offering an explanation of a possible cause of conflict, one must take care in justifying his theory.

The most notable works that favor the "greed" approach over that of "grievance" are Collier

and Hoeffler (2004) and Fearon and Laitin (2003). Both of these pieces study violence at the country level over a period of decades, and both find an economic explanation of violence more tenable than an ethnic or religious approach. In fact, Collier and Hoeffler find that greater ethnic or religious fractionalization might decrease the likelihood of civil war. However, their explanations of the economic effects on violence somewhat differ: Collier and Hoeffler hold that economic factors are primarily important for the finance of rebellion, while Fearon and Laitin believe that economic indicators are proxies for conditions that would favor insurgency, such as state capacity, poverty level, etc. This paper is closer to the approach of Fearon and Laitin, which suggests that a combination of economic and geographic factors indicate which areas are vulnerable to violence, both in terms of recruitment and the actual experience of violent incidents. Fearon and Laitin's choice to use per capita income as a measure of a state's overall capacity is somewhat questionable; therefore I do not use income as a proxy for state capacity in my study.

Though economic explanations are usually more accurate when left theorized, they are not without criticism; Miguel and Blattman's key example is Cramer (2002). Cramer, from a political economy perspective, criticizes what he views as reductionist tendencies in economic explanations of political violence. He asserts that these explanations rely on a generalization of methodological individualism (which underlies most classical theories of economics) to the social composition of a state, which he deems improper. Though an individual may be easily understood and rational, it is difficult to say that the same applies to a country's population. This is an extremely theoretical problem; my study does not thoroughly address it. Of more interest is Cramer's supposition that economists jump to conclusions about their proxies. While these indicators may suggest an indirect economic effect on conflict, past studies have tended to assert that these are the key causal factors in explaining violence. I try to mitigate these concerns through my interaction of "greed" and "grievance" variables in an attempt to see how the two factors influence each other.

Literature on Naxalite Conflict

A comprehensive overview of the literature on Naxalite violence up to 2012 can be found in Kapur, Gawande, &Satyanath (2012). In this paper a few of the more closely related past studies will be discussed.

Borooah (2008) is one of the earliest district-level analyses of Naxalite conflict, finding that both poverty and illiteracy contribute to greater violence, whereas higher Scheduled Castes and Tribes percentages do not. Though these findings are interesting, the dependent variable is open to some questions, specifically because the sample covers an area where other forms of violence (e.g. Hindu-Muslim) are observed. Also worth mentioning is the division of violence into violence against women and crimes against public order. How these are related to Naxalite violence is unclear, so the findings may not apply strictly to the Naxalite insurgency, but to conflict in India over this time period.

Hoelscher, Miklian and Vadlamannati (2011) link violence in the area to the scheduled populations most strongly, with some evidence of terrain being important as well. This paper shares some similarities with Hoelscher, Miklian and Vadlamannati (2011) regarding data – both use the 2001 Census of India and the District Domestic Product information provided by India's State Planning Commission. However, different years are chosen for the domestic product figures. Hoelscher et al. use a smaller sample size that omits certain high violence districts (notably, Gadchiroli). Furthermore, they fail to distinguish

between Scheduled Castes and Tribes, both of which may have salient differences worth exploring.

Kapur, Gawande and Satyanath (2012) offer an in depth panel analysis of the conflict over four states, linking violence to negative vegetation shocks, where vegetation is used as a measure of livelihood for the rural populations. The paper does not include two particularly important states, West Bengal and Orissa, in the sample. Whether high vegetation used to represent forests suggests the importance of forests for strategic reasons or for economic reasons is also not addressed. I distinguish agricultural vegetation from forest vegetation using the United Nations' Food and Agricultural Organization data, allowing me to ultimately distinguish between the economic impact of crops and forests and between the strategic and economic impact of the forested area.

Background

India's tremendous ethnic and economic diversity has historically been a point of tension, but shortly following independence from the British Empire, the politicization of these divides became more extreme. While the Indian government favored a sort of democratic socialism, various oppressed groups gravitated towards the communist ideologies of Marx, Lenin, and, most importantly, Mao. The idea of a "People's War" in the manner of Mao Zedong's could be found as early as 1948 in the "Andhra Thesis" associated with the Telangana peasant uprisings, an economically inspired revolt against the landlord classes (Hindustan Times).

The proper genesis of Maoist violence must be traced to West Bengal in 1967, in the village of Naxalbari, from which the term Naxalite is derived. Displeasure with the landholding practices of the upper classes led to armed revolt by members of the Santhal tribe. Though the initial revolt was quickly crushed, it inspired a surge of class-based resentment that eventually crystallized with the formation of the Communist Party of India (Marxist- Leninist) in 1969 under the leadership of Charu Mazumdar, Kanu Sanyal, and Jangal Santhal. Their aim was the destruction of all "class enemies" and the spread of their communist ideology across India through violent means. Though they advocated uprising across India, their movement was located primarily near the party's origin in West Bengal and Bihar. Despite the fact that revolutionary sentiment was stirring in Andhra Pradesh, violence initially remained in Northern India (Singh).

As the movement was initially prominent, the Indian government effectively struck back. With the death of party leader Charu Mazumdar in 1972, the movement quickly fragmented and decreased in intensity. Disorganized and disheartened, party leaders decreased violent activity and attempted unsuccessfully to restore party unity (Hindustan Times). As the movement lost strength in West Bengal, Maoists in Andhra Pradesh gained support, roused by the sentiments of poets and artists. Kondapalli Seetharamaiah capitalized on this growing fervor by establishing the People's War Group in 1980. Though also violent, it was less radical than its Bengali counterpart in its calls for the destruction of class enemies. The movement was powerful throughout the 1980s, but as with the Bengali Naxalites, effective government counteraction and the loss of the party leader (this time Kondapalli) hurt organization and morale, and the movement was diminished once again (Hindustan Times, Singh).

The Communist groups bided their time, training new cadres and preparing them for another surge in the forest districts of what are now Jharkhand and Chhattisgarh. This was motivated in no small part by the ideal of a "Liberated Zone" centered in the forest region, Dandakaranya, and eventually

spreading north and south as far as Nepal. With the 2004 announcement that the People's War Group and the CPI (ML) (under different names, due to being banned officially) would merge to form the Communist Party of India (Maoist), the stage was set for the most recent episodes of Maoist violence. As part of the agreement, the two armed wings of the parties, the People's Guerilla Army and the People's Liberation Guerilla Army respectively merged into the People's Liberation Guerilla Amy (PGLA). Though the resulting structure of the party is unclear, it is obvious that the two military branches still operate for the most part separately, with the armed wing of the Maoist Communist Centre focused around Bihar, Jharkhand, West Bengal and Uttar Pradesh while the People's War Group focuses on Andhra Pradesh, Chhattisgarh, Orissa and the other southern states. The new party has crystallized its firm support of a Maoist ideology (as opposed to a Marxist-Leninist one) and the goal of the "annihilation of class enemies," with extreme violence as the end and means to it. Among the party's leaders, it is worth noting as well that the current General Secretary Muppala Lakshmana Rao (alias "Ganapathi") is from Andhra Pradesh, suggesting the importance of the southern branch in the renewed Maoist conflict (SATP 2).

The conflict continues to this day, and the movement has spread from its origins in West Bengal and Andhra Pradesh to focus now in Dandakaranya and the Bihar- Jharkhand area, where violence is still strongest. Despite this, there have been some changes to the Maoists that offer hope for an end to the conflict in the foreseeable future. One major event in the last year worth noting is the expulsion of Sabyasachi Panda, one of the most prominent leaders of the movement in Odisha (referred to elsewhere in this paper as Orissa) by the CPI (Maoist) after a critical letter addressed to party head Ganapathi. Key criticisms of the party included his dissatisfaction with its abuse of Adivasis or Scheduled Tribes members, who form a significant base of support, his suspicion of Ganapathi's motives in leading the party and the dominance of Telugu comrades over Oriya comrades in Orissa. As a result, Maoist infighting has been observed in Orissa, a particularly fragile battleground state in the past few years. Other positive indications include the generally decreasing death tolls over the past three years and the virtual end of Maoist activity in Andhra Pradesh, which was once a center of the movement.

Overall, the picture of the Maoist conflict is muddled. There have been recent events to suggest success by the Indian government against left wing extremists, but as the South Asia Terrorism Portal's assessment pages note; some of these decreases are rather modest. Moreover, in some cases, it is apparent that the insurgents are intentionally lying low. Recent attacks such as the one in Latehar in early 2013 in which well equipped rebels surprised Indian forces and caused 16 deaths serve as a reminder of the insurgents' enduring threat to India's security. While there may be an opportunity to decrease Maoist violence, the situation is generally quite precarious and any action taken must be efficient and well-directed. Hypotheses

There are many possible explanations for the presence of violent communist activity in Eastern India, relating primarily to income, development, ethnicity, resources, and geography. In order to reflect this diversity and discern which factors have greater explanatory power, the following hypotheses are tested:

Main Hypotheses

Hypothesis 1: Districts with higher proportions of Scheduled Tribes members will experience greater violent activity.

The key grievance hypothesis is based on ethnicity. As the STs have often been discriminated against in the past, they remain at a disadvantage, even today. Maoist rebels claim this as one justification of their conflict and furthermore use these ST populations as a recruitment pool. It is expected that because many Maoist rebels are ST members and because they seek to gain the support and attention of these populations, greater violence will be observed in districts with significant ST populations.

Hypothesis 2: Districts with higher crop value will experience less violent activity.

Hypothesis two is meant to accommodate the consideration that Maoist conflict is a rural, as opposed to urban, phenomenon. Since agriculture is the primary livelihood of Eastern India's rural population, the mean crop value of each district is regressed on the dependent variables (Jha 9). It is assumed that an opportunity cost explanation of violence is valid here; however, instead of considering the gross product of a district's economic activity, the focus is on the supposedly more salient agricultural income. With higher agricultural income, the opportunity cost of switching from agricultural activity to violence as a means of acquiring resources is presumably raised as well. Therefore, with higher agricultural income less violence should be observed.

Hypothesis 3: Among districts with higher proportions of Scheduled Tribes members, those with higher crop values will experience less violence.

Those districts with high percentages of ST members tend to be rural and depend heavily on agriculture for income. In order to examine the continued effect of ethnicity and economic welfare, the interaction of the variables STs share and mean crop value is tested. It is assumed that if the mean crop value of districts with high ST percentage is higher, the opportunity cost of violence increases as well. Therefore, less violence should be observed in these districts throughout the states in the analysis.

Hypothesis 4: In districts with large percentages of Scheduled Tribes members, higher crop values will be associated with even less violence in the southern districts of India.

As noted in the background section, much of the violence now is centered in southern districts, such as those in Chhattisgarh (Bastar, Dantewada), Maharashtra (Gadchiroli), and Orissa. Since these areas are most prone to violence (and also feature some of the greatest amounts of ST members), it is possible that income derived from agriculture is even more important in this region, so the value of crops here might be linked even more closely with violence. Therefore, the previous interaction of mean crop value and STs share will also be interacted with a dummy variable south, coded 1 for districts in the southern area of the conflict and 0 for those in the northern areas. It is expected that the relationship will be negative; as crop values are higher, violence will be lower. This follows the same reasoning presented earlier regarding the opportunity cost of conflict.

Other Hypotheses

Hypothesis 5: Districts with higher proportions of Scheduled Castes members will experience greater violent activity.

Hypothesis five is almost the same as the first hypothesis, but here, Scheduled Castes are considered. While many previous studies tend to treat Scheduled Tribes and Scheduled Castes as one entity due to mutually shared grievances stemming from caste discrimination, there are differences between Scheduled Tribe communities and Scheduled Caste communities that suggest division of the two is preferable. The key justification for separating the two in this study is because of the differing importance of rural agricultural production for the two communities: "Agriculture forms the main occupational category for the entire population; but the position of the Scheduled Tribes differs from that of others in returning a very heavy agricultural population" (Chauhan 259). Scheduled Caste members are also often dependent on rural agriculture, but the difference in extent of this dependence between the two has been noted since the start of Maoist conflict in the late 1960s. To see if this supposition holds up, the two communities are separated and their dependence on agricultural income is tested separately as well. If different results are observed, this difference may merit greater consideration in future research. For Scheduled Castes, it is once again expected that with greater percentages in a district there will be a greater likelihood of violence; they are an aggrieved population that may be targeted as potential recruits for Maoist activity.

Hypothesis 6: Districts with higher income per capita will experience less violent activity.

The sixth hypothesis tests the standard "greed" contention that it is general economic welfare that will predict the incidence of conflict best. It is supposed that with lower income, the opportunity cost of giving up relevant economic activity to participate in violence to obtain resources or a greater standard of life is lower as well. To this end, the measure of each district's per capita income is regressed on the multiple dependent variables. This follows a general trend in the conflict literature, which sees in per capita income an effective proxy for economic well-being, strengthening the "greed" pedigree of this hypothesis.

Hypothesis 7: Greater development in a district is associated with less violent activity.

Though related to the greed hypotheses above, development also captures some aspects of "grievance" as well. The development of a district should represent quality of life reasonably well and may capture some aspects of quality of life not captured by economic measures. Two measures of development are tested here. The first, literacy, corresponds to human development. It is assumed that where the population has greater access to education and literature, there will also be less incentive to engage in destructive activity. Intuitively, there is a greater opportunity to experience a better life without resorting to violent means. The second measure of development is road share, corresponding to infrastructure and technological development. In a district with more roads, it may be expected that there is a greater ability to connect with the outside world; this would allow for easier transportation of economic products and for

the airing of grievances to higher levels of government. These should make violence a less attractive option for grieved parties.

Hypothesis 8: Districts with a greater share of rivers will experience less violent activity.

Recently the Indian government has made the provision of potable water for the inhabitants a focus of its efforts in Maoist affected districts (Indian Express). While there is an aspect of development, as the government is attempting to provide drinking water, at its root this is probably more a question of resource availability. Thus, while the amount of water in a district is not the same as the amount of potable water, it is reasonable to assume that where availability of the former is greater, so is availability of the latter. The share of rivers in a district should approximate the amount of water available to the district's inhabitants. With less difficulty obtaining a vital resource, individuals in Maoist affected districts will have less incentive to join in violent activity.

Hypothesis 9: Districts with greater forest cover will experience greater violent activity.

Previous studies that have focused on the relationship between forest cover and conflict have tended to find significance. However, this has been alternately explained as relating to the livelihood of ST members (Kapur et al.) or the strategic advantage offered to Maoist rebels. While this paper does not discount either of these explanations, it is hoped that the relationship of this variable to the economic variables above will help distinguish which of the two explanations is more likely. If forest cover and income are significant while crop value is not, this might suggest the livelihood explanation. If forest cover is significant while income is not or crop value is, the latter explanation might seem more accurate. The choice to hypothesize a positive correlation between violence and forest cover owes primarily to the predominance of this assumption in past literature.

Data

Unit of Analysis

Though state level analyses of Naxalite activity have been conducted in the past, recently, there has been a pronounced shift towards analysis at the district level. This work follows that trend. Whereas many other studies focus on a relatively small area of high conflict, the districts included here come from all nine states that had experienced Maoist violence by May 2011. Consequently, this paper's analysis covers a wider area, parts of which are quite free of violence. However, it is beneficial to include these for a greater understanding of why conflict does not occur in some districts that are still geographically close to the area of conflict. The analysis here is cross sectional; though a time series approach would be preferable, availability of data has limited the ability to conduct an appropriate time series test. To address issues of causality, the independent variables correspond to an earlier time period than the dependent variables. A relatively wide range of controls is added to limit problems of endogeneity.

Dependent Variables: Maoist/ Naxalite Violence

Maoist violence is measured here with five different dependent variables, all obtained from the

South Asia Terrorism Portal (SATP). The first measure, violent incidents, is taken from the Maoist Major Incident reports from 2005 to May 2011. The other four variables measure conflict by the number of deaths over the same period. In addition to a variable measuring the total number of deaths, there are variables measuring communist, civilian, and police deaths. By seeing which districts have more Communist deaths and which ones have more civilian deaths, differences in the nature of conflict become apparent. This in turn allows for a more accurate assessment of the state of Maoist violence in India to be made. In order to match these data to the available demographic data, it was necessary to locate each incident and death in the appropriate district existing in the year 2001. As a result, violence occurring in such high-risk districts such as Bijapur (Chhattisgarh) and Narayanpur is recorded as having occurred in Dantewada and Bastar, respectively. The high standard deviations for all five dependent variables are worth noting, though many districts are free of violence, a few districts are particularly violent. However, regressions attempted without the most violent district yielded the same results regardless. Thus, all districts from the nine selected states remain in the sample. Figures 1 and 2 provide a good picture of the spread and extent of violence across India.

Summary of Dependent Variables

Variable	Observations	Mean	Std. Dev.	Min.	Max.
Maoist incidents	274	1.872263	8.215622	0	120
Communist deaths	274	3.894161	20.56883	0	315
Civilian deaths	274	3.255474	20.34034	0	263
Police officer deaths	274	3.744526	23.23318	0	344
Total deaths	274	10.89416	60.94957	0	922

Independent Variables: Demographic

The majority of the demographic measures used for this analysis are derived from the 2001 India Census. As a government-sanctioned census, reliability should not be an issue. As this is a cross sectional analysis, the use of demographic information recorded before the occurrence of violent conflict should at least partially mitigate problems of causality. Variables measuring literacy and ethnic composition (percentage of Scheduled Tribes and Scheduled Castes) were obtained by dividing the total count of literates, Scheduled Tribes and Scheduled Castes members by each district's total population for percent measures. Population and area are also controlled for, being transformed logarithmically.

Economic

The primary economic variable is the gross domestic product per capita for each district in the year 2001, measured in rupees at 1999-2000 prices. This data is obtained through India's State Planning Commission. Again, values from 2001 are used to match the variables available from the census and to

limit problems of causality. Another proxy for economic well-being is found in the mean value of crops harvested in each district in the year 2000, measured in Geary- Khamis dollars. Whereas per capita income covers all economically productive sectors in a district, this measure is expected to reveal more accurately the importance of agricultural production in a district. This data is available in a raster format from the Food and Agriculture Organization. By averaging the value of each cell over the boundaries of the districts, a measure for each district was obtained.

Figure 1: Total Number of Maoist-Related Violent Incidents, 2005-2011
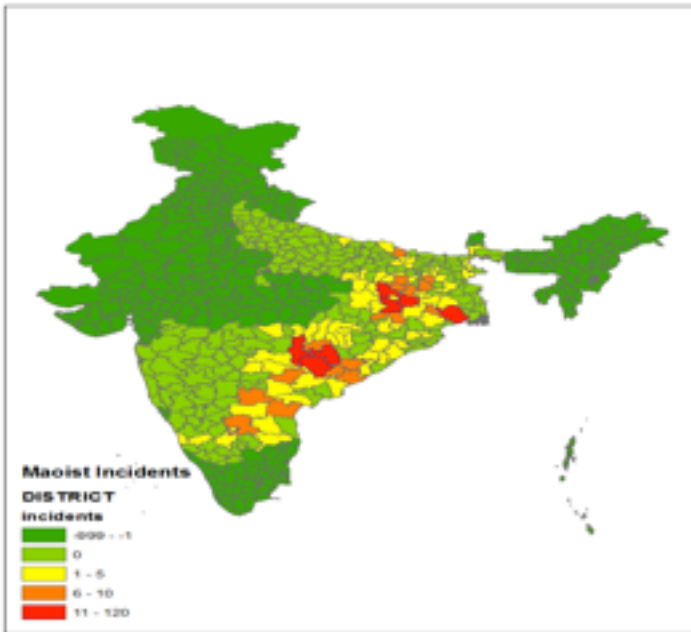
Note: values less than zero indicate districts not included in sample

Figure 2: Total Number of Maoist-Related Deaths, 2005-2011

Total Deaths

DISTRICT

totaldeath

- -999 - -1
- 0
- 1 - 10
- 11 - 30
- 31 - 922
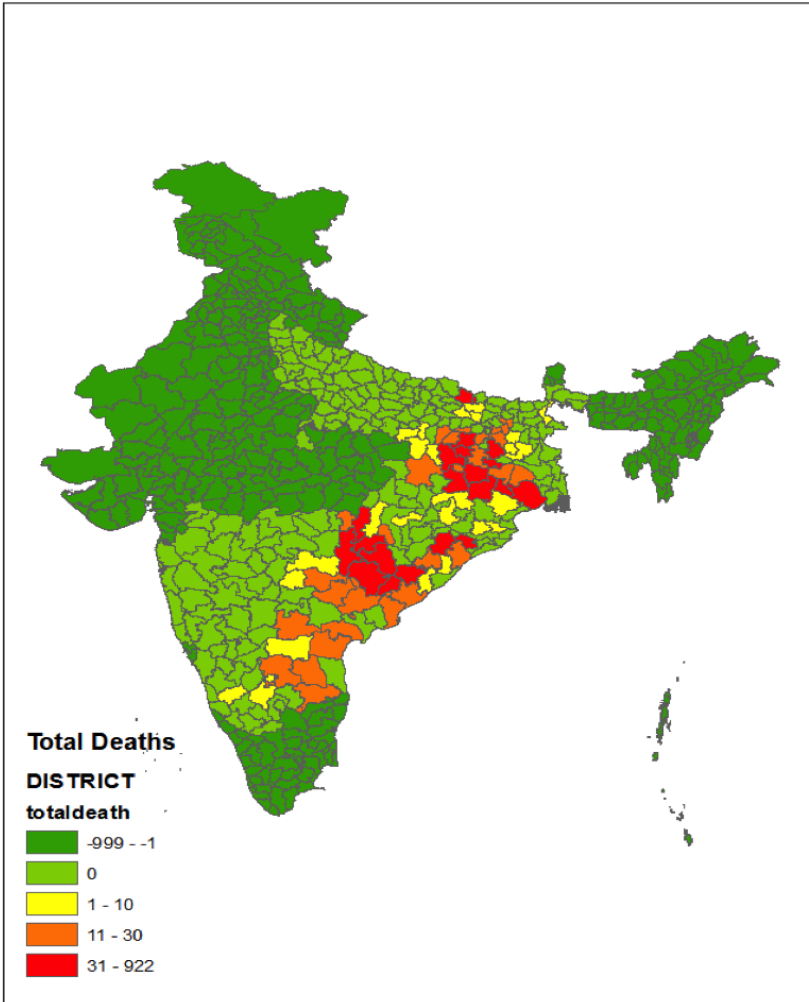
Environmental

The average amount of forest cover for each district was also obtained from the United Nations' Food and Agricultural Organization. As with crop value, averaging the values of each cell in the raster file for each district was necessary to obtain the variable used in the analysis.

Measures of road cover and water availability were derived from vector files available at the website for DIVA-GIS. The files themselves are part of the Digital Chart of the World. The former variable is a measure of the number of roads in a district, controlling for area. For the water variable, the total amount of water from rivers was used (once again, controlling for the area of each district).

Summary of Independent Variables

Variable	Observations	Mean	Std. Dev.	Min	Max
ST share	274	9.918203	15.81748	.0001305	78.51858
Mean crop value	274	3481.798	1531.069	0	8616.32
Per capita income	274	13556.07	7185.738	4465	46197
SC share	274	16.76347	7.089107	1.444798	50.1128
Literacy	274	49.80949	12.04752	24.1824	77.60902
River share	274	21.69994	7.40516	0	53.09839
Road share	274	165.655	167.1124	60.81486	2633.059
Percent forest	274	16.76386	19.64688	-1.75e-06	85.4131

Interactions

While the variable ST share is strongly associated with violence, it may not be a sufficient explanation for the occurrence of conflict. In order to address issues of endogeneity between the "greed" and "grievance" variables as well as geographic variables, the following terms are interacted:

First, to address the relationship between income derived from crops and the ST share, the variables meancropvalue and stshare are multiplied to form a new variable, stcrop. This is regressed using the standard controls as well as stshare and meancropvalue. To address the possibility that crop value is also related to Scheduled Caste communities, scshare and meancropvalue are multiplied to form the new variable scshare, which corresponds in its function to stshare.

Second, to consider the geographic question of whether this relationship between ethnicity, crops, and violence is more important in the south, stcrop is next multiplied by a dummy variable south, coded 1 for southern districts and 0 for northern districts. This division is made on the basis of districts in the states of Andhra Pradesh, Chhattisgarh, Orissa, Karnataka, and Maharashtra, which are considered to be in the south. The other four states are considered as northern. This is regressed using the standard controls, stshare, meancropvalue, stcrop, south, and the interactions of stshare and south and meancropvalue and south.

Research Design

   This paper employs a cross-sectional model featuring the 274 districts of nine Indian states based on the boundaries existing at the time of the 2001 census. Though a time series analysis and an instrument variable would be desirable for a more robust and reliable study, unfortunately, this data was not readily available. As mentioned earlier in the data section, problems of time are addressed by using measures for the independent variables that predate the period in which the dependent variables' measures were first made. This model is an improvement on previous models primarily for its wider range. While other studies focus only on the epicenters of violence, they fail to consider how areas just around these foci manage to remain without violence. Though violence is certainly spatially clustered, inclusion of border districts free from violence may reveal something about why violence does not spread beyond the simple explanation of area and distance. Also, the years from which previous studies tend to collect data for independent variables tend to be quite diverse; by choosing data from only 2000 to 2001, this paper presents a fairly accurate picture of a district with all its varying factors at one point in time. Although other cross-sectional studies favor measurements of independent variables from the same period as the measurements of their dependent variables, problems of endogeneity arising from this similarity are often unaddressed. Here, problems of reverse causality are circumvented by the choice of independent variables from 2001; violence in 2005 cannot affect crop values in the year 2001. Another attempt to address problems of design is found in the five dependent variables. In order to decrease the likelihood that an association between an independent variable and violence is adventitious, this same independent variable can be regressed with four other measures of violence, decreasing the likelihood that any relationship found significant owes to chance. While all of these measures come from the SATP, this source is considered reliable and has been used either alone or in combination with other datasets in multiple previous papers on the subject of Naxalite violence. With regards to the possibility of the underreporting of violence, it is not unreasonable to assume that underreporting is fairly consistent across districts such that the data still offers a fairly accurate assessment of the spread and extent of violence in the Red Corridor.

The regressions carried out are as follows:

   1.First, all variables but meancropvalue and the interaction terms are regressed on the dependent variable of Maoist Incidents, primarily to test Hypothesis 1. To test Hypothesis 2, meancropvalue is added to the previous regression and then the interaction of stshare and meancropvalue, stcrop is finally added.

   2.This last regression featuring the interaction term is then repeated for the other four dependent variables, which measure Communist deaths, civilian deaths, police officer deaths, and total deaths.

   3.To ascertain that the effect of crops pertains primarily to Scheduled Tribes as opposed to Scheduled Castes members, an interaction of scshare and meancropvalue called sccrop is added to the previous regressions for all five measures of conflict.

   4.To test Hypothesis 4, that the interactions between stshare and meancropvalue are more prominent in the southern districts of the Red Corridor (as defined in this study), the previous regressions on all five dependent variables are repeated with scshare replaced by stcropsouth as the main independent variable, and stsouth, southcrop, and south are added to the regression to control for the interactions of south with stshare and meancropvalue.

Results

      The first table displays the results of the initial regressions on the dependent variable of Maoist incidents. In all cases stshare, the proportion of ST members in a district's population, is significant at the 1% level, suggesting that the presence of ST members does indeed increase the likelihood of violence at the district level. Adding the interaction variable stcrop, significance is once again observed at the 1% level, which provides support for Hypothesis 3 that among districts with high stshare, those with higher mean crop values will experience less violence. In all three of the regressions in Table 1, literacy is significant at the 5% level and is negatively correlated with violent incidents.

Table 1: Effect of stshare, meancropvalue and stcrop on Maoist Incidents

	(1) Incidents	(2) Incidents	(3) Incidents
stcrop			-0.000237*** (0.0000393)
meancropvalune		-0.000202 (0.000412)	0.000332 (0.000397)
stshare	0.145*** (0.0430)	0.142*** (0.0435	0.683*** (0.0986)
poplog	4.952* (2.518)	5.181** (2.564)	4.502* (2.410)
percapitalincome	-0.0000743 (0.0000908)	-0.0000768 (0.0000910)	-0.0000515 (0.0000856)
scshare	-0.00179 (0.0741)	0.00491 (0.0754)	0.0692 (0.0716)
literacy	-0.106** (0.500)	-0.111** (0.0509)	-0.110** (0.0478)
rivershare	0.0167 (0.0736)	0.0306 (0.0790)	-0.0275 (0.0748)
roadshare	0.00246 (0.00332)	0.00230 (0.00335)	0.00391 (0.00315)
arealogged	1.507 (2.093)	1.459 (2.099)	1.997 (1.972)
percentforest	0.0931** (0.0391)	0.0901** (0.0396)	0.0713* (0.0373)
Constant	-32.23** (13.95)	-32.84** (14.02)	-32.26** (13.17)
N	274	274	274
r2	0.203	.204	.301
rmse	7.458	7.469	7.013

Standard errors in parentheses   *p<0.10, **p<0.05, ***p<0.01
Forest share is also significant, but by the time the interaction variable stcrop is added, forest share is significant only at the 10% level.

While the hypotheses regarding these variables may have some explanatory power, many of the other hypotheses receive minimal support from the first table. River share and road share, proxies for resource provision and development, receive little support. Scheduled Castes share and per capita income are also insignificant; an explanation of conflict will not be driven only by one of greed or grievance. It should be noted that the mean crop value itself is not statistically significant. This reinforces the contention that the conflict is not reducible to an essentially economic explanation, even after accounting for geography and occupation; one must take into account which grieved communities depend on this economic production most. It is the interaction of greed and grievance that offers the most accurate perspective on conflict.

The second table repeats the third regression of the first table for the other four dependent variables available. It does this to test how far the possible explanatory variables of the first regressions may succeed in explaining or indicating the presence of conflict. The evidence is strongly in favor of the importance of stshare and stcrop again, as the two are significant at the 1% level for all four variables. This bolsters support for Hypotheses 1 and 3 considerably. The variables which were insignificant in the first table remain so in the second table — never once do variables such as scshare and roadshare receive statistical support. Literacy and forest cover remain significant in some cases, but not for others. Both are insignificant when the variable of civilian deaths is considered; in so far as literacy and forest cover are important, it is in their effects on police and Communist deaths.

Since Hypothesis 3, regarding the interaction between crops and ST members is so strongly significant, a test of crop value and Scheduled Castes members' interaction is warranted to see to what extent ethnicity affects the conflict. The interaction variable sccrop is added to the regressions for all five dependent variables. In every case sccrop is never significant, while all other possible explanatory variables retain their previous significances. This suggests quite strongly that Naxalite conflict is not primarily an answer to caste-based oppression, given the low explanatory power of both scshare and sccrop. It is apparent from previous studies that the conflict involves economic activity greatly; hence, not all historically disadvantaged populations are inherently legitimate recruitment pools for Maoist groups. This does not contradict the view that ethnic grievances are an important source of conflict; however, without considering the importance of economic greed as well assertions about grievance and Maoist violence will be inaccurate. The economic performance of rural populations, especially ST individuals, will likely impact the spread and intensity of Maoist violence greatly.

Table 2: Effect of stcrop on four measures of deaths

	(1) Total	(2) Communist	(3) Police	(4) Civilian
stcrop	-0.00181*** (0.000297)	-0.000648*** (0.0000994)	-0.000697*** (0.000110)	-0.000468*** (0.000107)
stshare	5.183*** (0.745)	1.762*** (0.249)	2.048*** (0.276)	1.372*** (0.268)
meancropvalue	0.00430 (0.00300)	0.00136 (0.00100)	0.00204* (0.00111)	0.000899 (0.00108)
poplog	25.64 (18.23)	8.184 (6.090)	6.425 (6.749)	11.03* (6.544)
percapitalincome	-0.000349 (0.000647)	-0.0000432 (0.000216)	-0.000142 (0.000240)	-0.000164 (0.000232)
scshare	0.227 (0.541)	0.102 (0.181)	0.0992 (0.200)	0.0261 (0.194)
literacy	-0.652* (0.361)	-0.289** (0.121)	-0.240* (0.134)	-0.122 (0.130)
rivershare	-0.346 (0.565)	-0.0946 (0.189)	-0.135 (0.209)	-0.117 (0.203)
roadshare	0.0270 (0.0238)	0.00979 (0.00796)	0.0113 (0.00883)	0.00590 (0.00856)
arealogged	12.72 (14.92)	5.595 (4.984)	3.597 (5.523)	3.526 (5.355)
percentforsest	0.407 (0.282)	0.174* (0.0943)	0.184* (0.104)	0.0496 (0.101)
Constant	-190.5* (99.57)	-64.06* (36.87)	-50.47 (36.87)	-76.01** (35.75)
N	274	274	274	274
r2	.273	0.288	0.314	0.159
rmse	53.03	17.72	19.64	19.04

Standard errors in parentheses   *p<0.10, **p<0.05, ***p<0.01

Table 3: Effect of sccrop on all five dependent variables

	(1) Incidents	(2) Total	(3) Communist	(4) Police	(5) Civilian
sccrop	0.0000130	0.000255	0.0000821	0.000154	0.0000194
	(0.0000520)	(0.000393)	(0.00131)	(0.000145)	(0.000141)
stcrop	-0.000235***	-0.00176***	-0.000632***	-0.000667***	-0.000464***
	(0.0000407)	(0.000307)	(0.000103)		(0.000110)
stshare	0.674***	5.003***	1.705***	1.940***	1.359***
	(0.105)	(0.796)	(0.266)	(0.294)	(0.286)
meancropvalue	0.000106	-0.000166	-0.0000725	-0.000654	0.000561
	(0.000992)	(0.00749)	(0.00250)	(0.00277)	(0.00269)
poplog	4.411*	23.85	7.609	5.346	10.89
	(2.442)	(18.45)	(6.166)	(6.824)	(6.630)
percapitalincome	-0.0000516	-0.000350	-0.0000436	-0.000142	-0.000164
	(0.0000857)	(0.000648)	(0.000217)	(0.000240)	(0.000233)
scshare	0.0252)	-0.640	-0.177	-0.424	-0.0396
	(0.191)	(1.440)	(0.481)	(0.532)	(0.517)
literacy	-0.113**	-0.708*	-0.307***	-0.274**	-0.127
			(0.124)	(0.138)	(0.134)
rivershare	-0.0253	-0.301	-0.0802	-0.108	-0.113
	(0.0754)	(0.570)	(0.191)	(0.211)	(0.205)
roadshare	0.00398	0.0284	0.0103	0.0122	0.00601
	(0.00317)	(0.0240)	(0.00801)	(0.00886)	(0.00861)
arealogged	2.123	15.21	6.397	5.099	3.715
	(2.040)	(15.42)	(5.152)	(5.701)	(5.539)
percentforest	0.0715*	0.412	0.175*	0.187*	0.0500
	(0.0374)	(0.283)	(0.0944)	(0.104)	(0.102)
Constant	-31.33**	-172.1*	-58.14*	-39.36	-74.62**
	(13.71)	(103.6)	(34.63)	(38.32)	(37.24)
N	274	274	274	274	274
r2	0.301	0.275	0.289	0.317	0.159
rmse	7.026	53.09	17.74	19.63	19.08

If it is indeed true that primarily rural districts with high ST shares are likely targets for violence, which ones are most at risk? There is a geographic component to the violence, so the five dependent variables are now tested in conjunction with the new interaction variable stcropsouth, made on the intuition that violence is more closely connected to the previous interaction variable stcrop in states such as Chhattisgarh and Orissa. As shown in Table 4, this variable is once again significant at the 1% level for all five dependent variables, and is correlated negatively with violence as hypothesized, lending credibility to Hypothesis 4 on Maoist conflict. Also worth noting is the positive coefficient for the variable stsouth, which affirms the conviction that ST share is more closely linked to violence in Southern India. Literacy and forest cover retain significance for both the measure of violent incidents and that of Communist deaths, though neither is significant for police or total deaths. Once again, only weak extrapolation regarding these two variables can be made. We must be careful about drawing conclusions regarding development and the role of forest area in conflict. The other possible explanatory variables – per capita income, river share, road share, and Scheduled Castes share are all once again insignificant – should be sufficient to rule these variables out as predictors of conflict for the purposes of this study.

Having looked at the results of each table separately, it is now beneficial to combine the results and treat the variables of interest generally. The weakest variable that showed significance at any acceptable level was percentforest, the percentage measure of forested area in a district.

Table 4: Effect of stcropsouth on all five dependent variables

	(1) Incidents	(2) Total	(3) Communist	(4) Police	(5) Civilian
stcropsouth	-0.000386*** (0.000115)	-0.00320*** (0.000865)	-0.00104*** (0.000290)	-0.000888*** (0.000322)	-0.00217*** (0.000309)
stcrop	0.0000500 (0.000105)	0.000605 (0.000792)	0.0000894 (0.000266)	-0.0000483 (0.000295)	0.000564** (0.000283)
southcrop	0.00274*** (0.000845)	0.0204*** (0.00636)	0.00668*** (0.00213)	0.00690*** (0.00237)	0.00684*** (0.00227)
stsouth	0.962*** (0.262)	8.144*** (1.967)	2.508*** (0.660)	2.510*** (0.733)	3.127*** (0.702)
south	-9.812*** (3.529)	-71.00*** (26.55)	-18.05** (8.898)	-23.97** (9.887)	-28.98*** (9.476)
stshare	-0.0444 (0.247)	-1.042 (1.857)	-0.0478 (0.623)	0.194 (0.692)	-1.188* (0.663)
meancropvalue	-0.000408 (0.000463)	-0.00133 (0.00348)	-0.000254 (0.00117)	-0.0000612 (0.00130)	-0.00102 (0.00124)
poplog	3.649 (2.609)	21.55 (19.63)	9.661 (6.580)	6.197 (7.311)	5.695 (7.008)
percapitalincome	-0.0000192 (0.0000860)	-0.000150 (0.000647)	-0.0000120 (0.000217)	-0.0000703 (0.000241)	-0.0000673 (0.000231)
scshare	-0.0145 (0.0777)	-0.407 (0.585)	-0.0213 (0.196)	-0.103 (0.218)	-0.283 (0.209)
literacy	-0.0973* (0.0531)	-0.596 (0.400)	-0.337** (0.134)	-0.237 (0.149)	-0.0226 (0.143)
rivershare	-0.0369 (0.0735)	-0.414 (0.553)	-0.0889 (0.185)	-0.157 (0.206)	-0.168 (0.197)
roadshare	0.00278 (0.00324)	0.0164 (0.0244)	0.00400 (0.00817)	0.00680 (0.00908)	0.00558 (0.00870)
arealogged	2.463 (2.357)	13.23 (17.73)	2.400 (5.943)	2.611 (6.603)	8.221 (6.329)
percentforest	0.0735** (0.0369)	0.409 (0.278)	0.173* (0.0931)	0.162 (0.103)	0.0742 (0.0992)
Constant	-24.14* (13.17)	-131.0 (99.08)	-51.06 (33.21)	-31.80 (36.90)	-48.17 (35.37)
N	274	274	274	274	274
r2	0.347	0.329	0.388	0.359	0.232
rmse	6.828	51.37	17.22	19.13	18.34

It certainly cannot be treated as a primary predictor of violence, but it was consistently significant for the measures of violent incidents and communist deaths and was significant for police deaths in all but the last regression involving the variable stcropsouth. That this variable was always significant in predicting communist deaths but never once significant for civilian deaths is telling; given this fact, it would be difficult to advance the hypothesis that forested land is important in predicting Maoist violence because of its economic importance to tribal populations as Kapur et al. find. In this paper forest area is positively correlated with violence and is associated primarily with the deaths of the combatants: communists and police forces. The most logical conclusion one could draw from this result, if it has any legitimacy as a predictor of violence, is that districts with dense forested land are likely to contain more Naxalites due to the strategic advantages they provide.

Literacy, like forest cover, had some explanatory power in the regressions on violence. Until the table featuring interaction variable stcropsouth was generated, literacy was significant (often at the 5 % level) for all dependent variables except civilian deaths. In the last table it was insignificant for police deaths and total deaths as well. For all of these instances it was negatively correlated with violence. While the case could be made that this points to the hypotheses regarding development offered by other papers, I might qualify this slightly. First, if development does indeed negatively affect the presence of violence, then this study suggests this is true primarily for human development as opposed to general or technological development; other measures such as road share were consistently insignificant. While the human development hypothesis certainly seems intuitively appealing, the insignificance of literacy on civilian deaths certainly merits consideration. For a result like this to be observed it is likely that Maoists attack even high literacy districts and cause civilian casualties in the process, suggesting human development is not strictly the primary concern of Maoist fighters. However, the strong support for fewer communist deaths in districts with high literacy does highlight some importance to literacy and education. Though the explanation is certainly debatable, districts with high levels of human development may host fewer communists (hence fewer communist and police deaths), but given the communist preoccupation with something more than development, they may target high development districts anyway.

The strongest statistical support is reserved for the variables **stshare, stcrop and stcropsouth.** In every instance these three variables were significant at the 1 % level and correlated with violence in the direction predicted. Thus, the relevant three hypotheses of this paper must be regarded as the strongest of those tested in predicting communist violence in the affected areas of Eastern India. There is little doubt that districts with a higher proportion of Scheduled Tribes members are prone to more violent activity. While there is certainly an ethnic component to this, though, one cannot rush to assume this conflict is thus driven primarily by ethnic grievance; if it were so, the variables pertaining to Scheduled Castes should have been significant as well, though they were not in any case. The previous aggregation of Scheduled Castes and Tribes into one overall Scheduled Population (as seen in previous papers such as Hoelscher et al.'s, which found this of primary significance) is somewhat misguided. There are significant historical, geographic and occupational differences between Scheduled Castes and Scheduled Tribes, not to mention other less salient differences. The interaction terms serve well in helping to understand how Scheduled Tribes share is influential upon the various measures of conflict. Certainly Scheduled Tribes are influential upon conflict, but when crop values in relevant districts are taken into account, this effect is lessened. As displayed in the following graph of mean crop value's marginal effect on Maoist Incidents, holding ST

share constant,

Marginal Effect of Mean Crop Value on Maoist Incidents
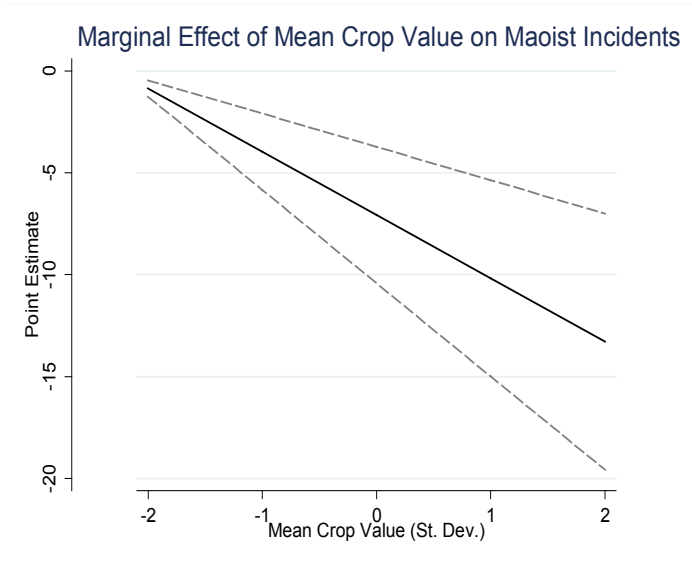
Note: a value of zero indicates the independent variable's mean

increasing crop values consistently decreases violent incidents, with an increase of about one standard deviation (approximately $1500) decreasing violence by around 5 incidents. This result is supported by the same graph corresponding to total deaths, provided at the end of this paper. Though one cannot draw too much from this graph alone, combining this graph with the other results shows that a purely ethnic account of violence would fall far short of accurately explaining conflict in the Red Corridor. Agriculture must be considered when connecting these two factors. Members of the Scheduled Tribes live away from urban areas and many depend on agriculture for their livelihood. This in turn links Maoist violence, which often involves these tribal ethnicities, to agricultural production in the district. Higher crop values consistently contribute to decreasing violence in conflict prone districts, suggesting agricultural programs aimed at improving yield, quality, and income for particularly dependent individuals are best suited to combating the problem of Naxalite violence. Following the same intuition, the consistent significance of stcropsouth suggests that the relationship between workers from Scheduled Tribes and crop values in the district is more salient in the districts considered "southern" for the purposes of this study (those in Andhra Pradesh, Chhattisgarh, Orissa, Maharashtra, and Karnataka). Therefore, for predictive purposes the importance of ST share and crop value should be emphasized for these states, though they are also strong predictors of violence in other affected states such as Jharkhand and Bihar.

Conclusion

Having presented this study's results, it is now worth considering what would constitute effective action based on these findings. The Indian government might consider investing more in education. Though the results are not as strong as those for crop value, higher literacy seems to decrease Maoist violence significantly. This is not a call for development and urbanization in general – other measures of development such as road share were consistently insignificant, suggesting development of this sort cannot be relied upon to decrease the incidence of conflict. Of course, how far one can increase human development without the development of infrastructure and technology is questionable.

Though there is a connection between violence and forest area, the results did not support an economic explanation of this. The generally weak significance in all cases but those involving police and communist deaths suggests that the part forests play in conflict is due primarily to terrain. The only policy recommendation that seems sensible given such information is that police will have to patrol forest areas with greater scrutiny. It does stand to reason that insurgents resorting to guerilla tactics would congregate in areas difficult of access, and no areas in the Red Corridor offer as much difficulty of access as forests. It is evident that one cannot properly consider the issue of Naxalite violence in India without addressing both the relevant economic and ethnic factors. The economic explanation of violence, even if narrowed down to account only for agricultural performance, falls short as an effective description of the causes of violence if the ethnic group that depends on agriculture is not considered. Similarly, one cannot offer a satisfactory explanation of violence based on ethnicity if one denies the economic source of that ethnicity's general welfare. Which of these two factors can be addressed best by the Indian government? One cannot manipulate ethnicity- to redress grievance an external source of that grievance must be dealt with. Therefore, this study offers the issue of agricultural production as one avenue whereby this problem can be solved. The results of the previous regressions affirm the intuition that higher crop values can decrease violence in likely areas, such as those with high proportions of Scheduled Tribes individuals and those in the southern states. From this it would be reasonable to suggest that decreasing the likelihood of violence can be achieved through rural employment and welfare. In this regard, the Indian Government's National Rural Employment Guarantee Act (NREGA) is properly oriented. However, the success of such a program will likely require attention to detail in where and how to implement the program. If the results of this study are accurate, as I believe them to be, the Indian Government would do well to focus on the provision of rural employment primarily in states like Chhattisgarh and Orissa and to pay greater attention to the employment of Scheduled Tribes members, who are more frequently targeted by Naxalite insurgents as potential recruitment candidates. This is not to diminish the severity of the conflict in states like Jharkhand or to deny the difficulties and discrimination facing members of Scheduled Castes; however, this method of stemming the tide of Maoist violence would be most effective in cutting Maoist support enough to shift the government's concern away from insurgents and towards the other problems that face a prominent developing nation.

Figure 3: Communist Deaths, 2005-2011
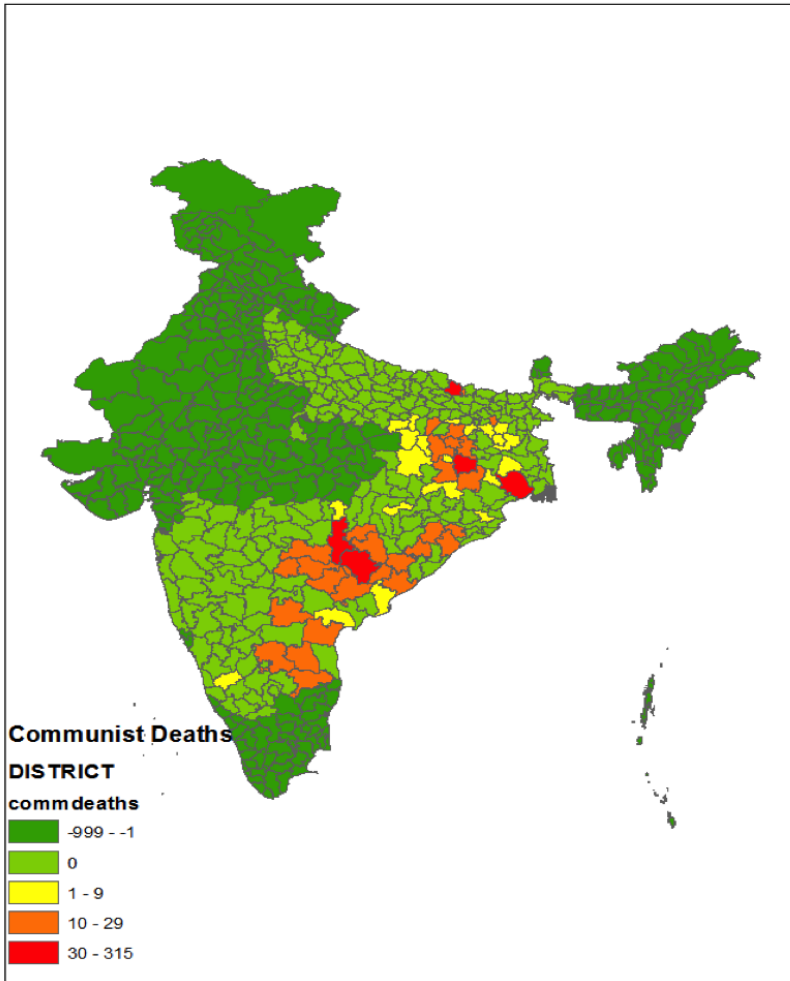
Figure 4: Civilian Deaths, 2005-2011
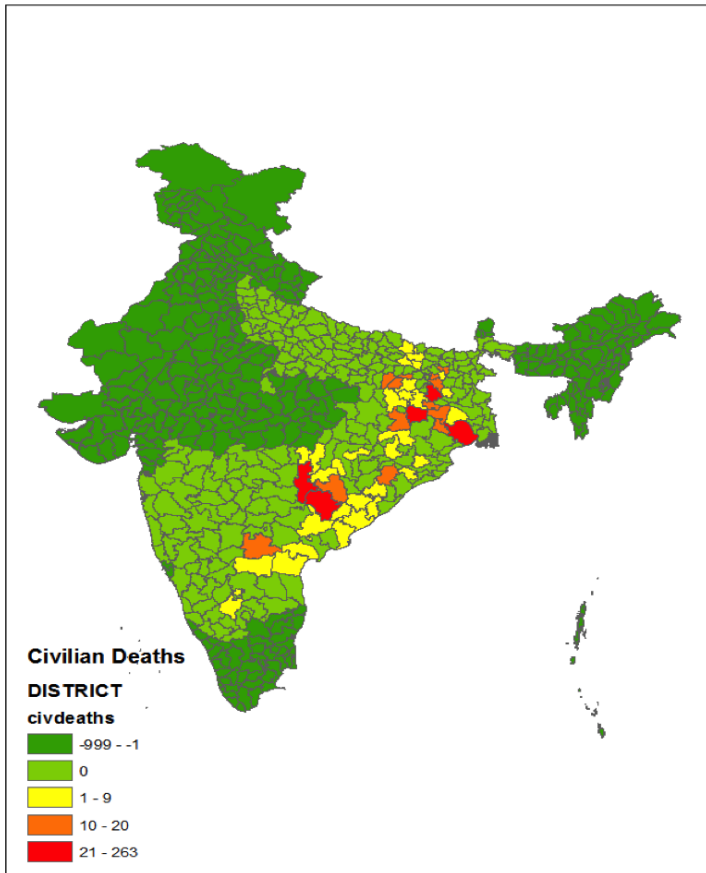
Figure 5: Police Officer Deaths, 2005-2011

Police Deaths

DISTRICT

poldeaths

- -999 - -1
- 0
- 1 - 9
- 10 - 19
- 20 - 344
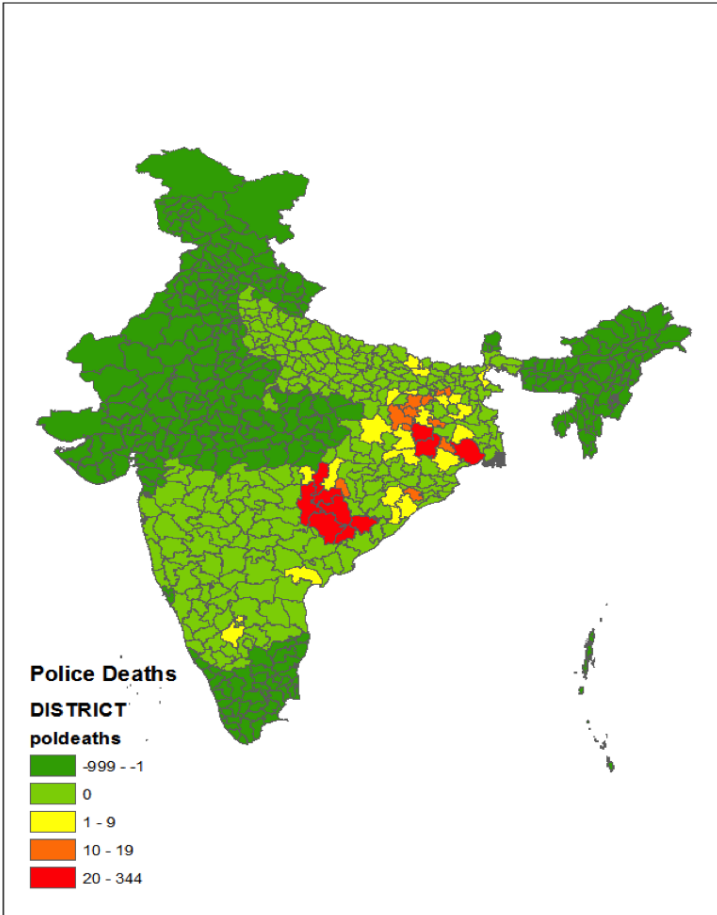
Figure 6: Percentage of Scheduled Tribes Members in Population, 2001
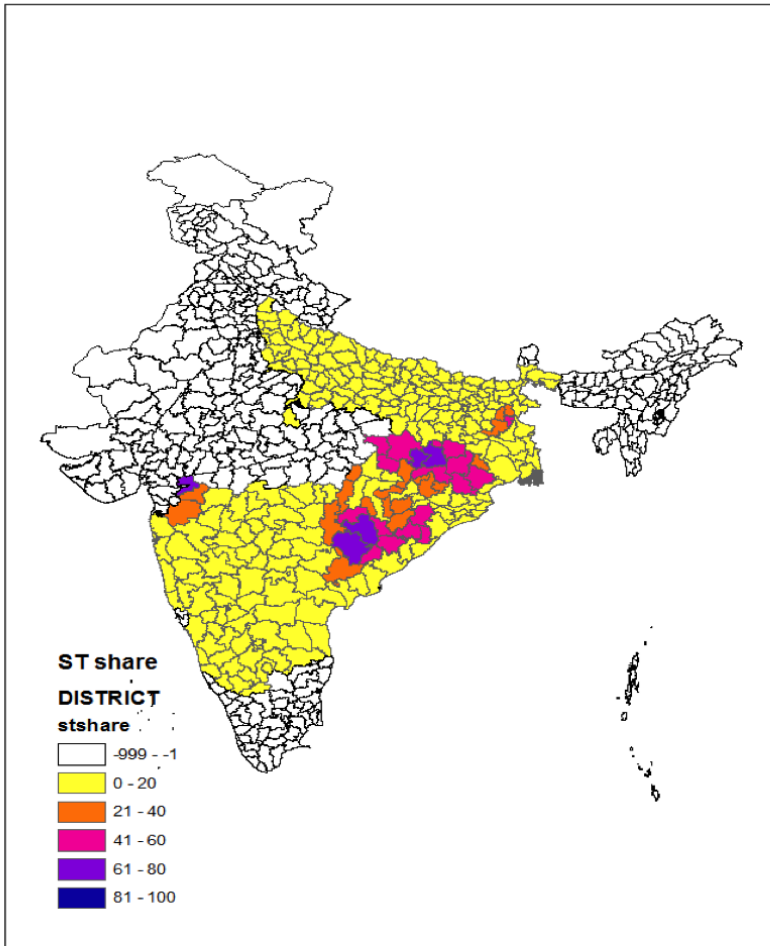
Figure 7: Literacy Rate, 2001

Literacy Rates
DISTRICT
literacy
- -999 - 0
- 1 - 20
- 21 - 40
- 41 - 60
- 61 - 80
- 81 - 100
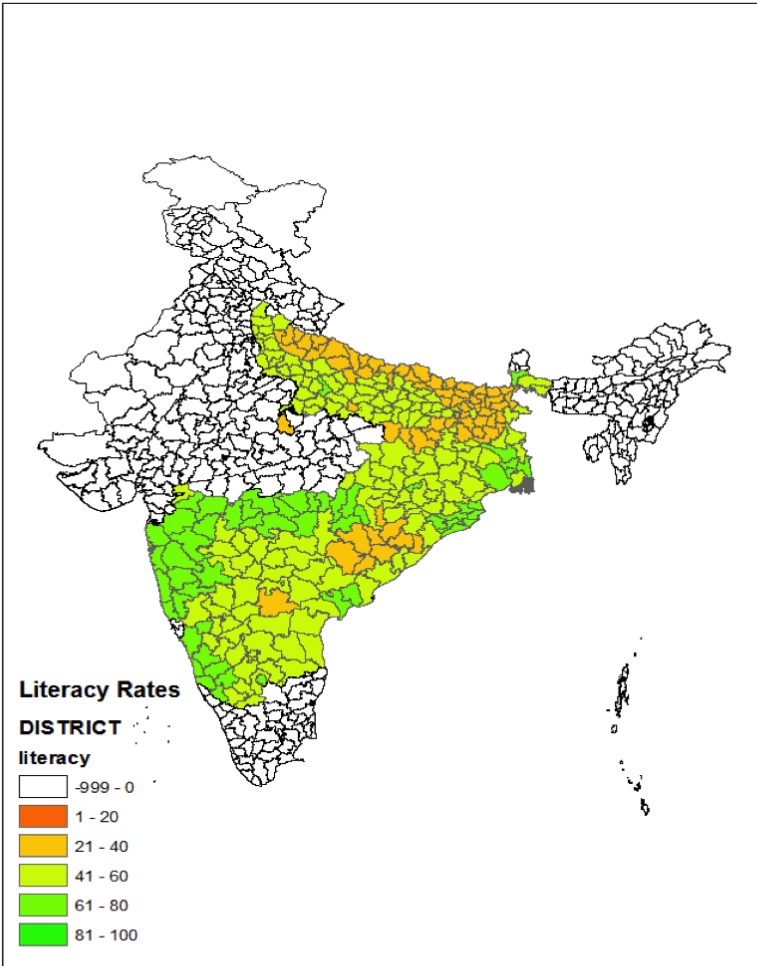
Figure 8: Forest Cover, 2000
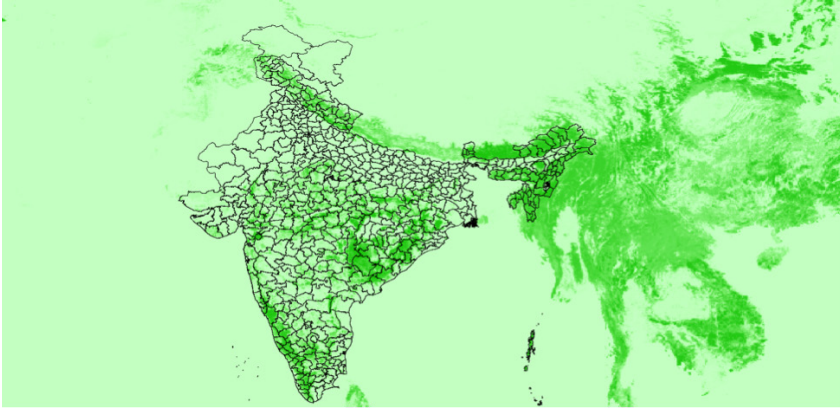
Values for each district range from 0 to 100 percent cover

Figure 9: Total Crop Production Value, 2000
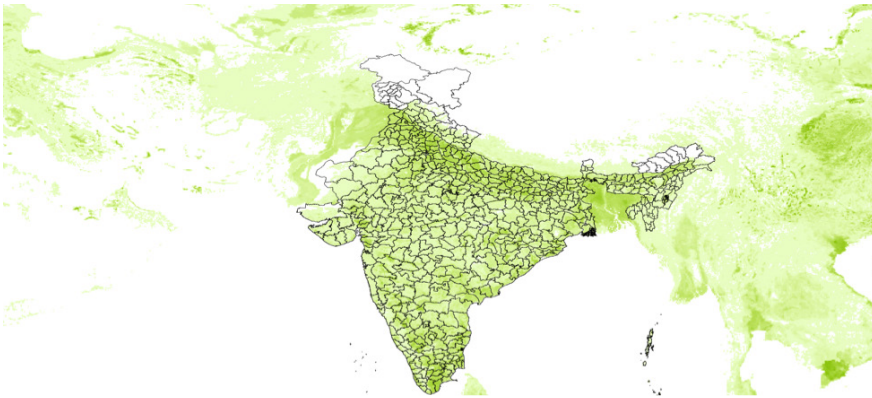
Values for each district range from 0 to 8616 GK$

Marginal Effect of Mean Crop Value on Total Deaths
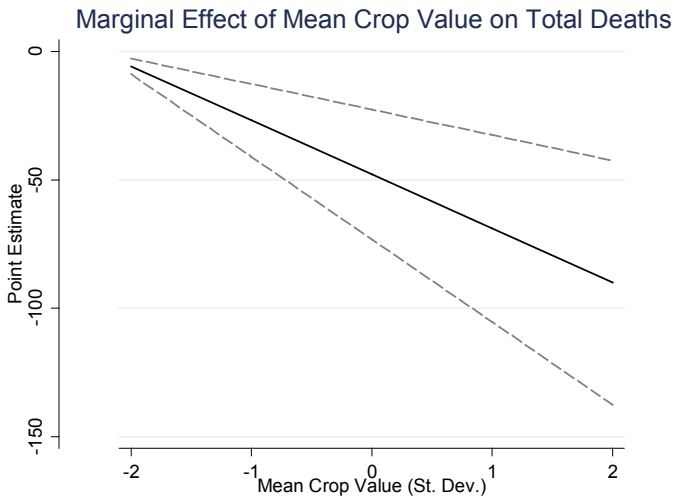
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Firing Up the Right: Palestinian Rocket Attacks and Israeli Public Opinion

Marcus Chiu

Does exposure to rocket fire from the Gaza Strip in Israel affect Israeli public opinion towards the Israeli-Palestinian conflict? This paper relies on a multivariable regression model based upon Israeli electoral demographic data, merged with 2006 and 2009 pre-election studies conducted by The Israel National Election Studies. I find that residents of localities within rocket range during elections are typically more conservative on national security issues, are less flexible on issues with the peace process, have a greater threat perception of Arabs, and are more likely to vote for right-wing parties. It is thus expected that there will be an increasing ideological rightward shift as the range of rocket fire from Gaza strip continues to extend further into Israel.

Since the al-Aqsa Intifada, Israel has experienced rocket attacks from Palestinian factions onto Israeli settlements. These attacks were negligible at first, with rocket attack ranges that only reached Israeli settlements in or near the perimeter of the Occupied Palestinian Territories. After Israel's disengagement plan, which evacuated all Israeli settlements in Gaza and subsequently moved many of them to areas closer to the West Bank, Hamas soon defeated Fatah in the 2006 elections and gained control of Gaza Strip. Rocket attacks have since increased dramatically in number, magnitude, and range, and generally continue to originate from Gaza Strip. The context of rocket firing activity outside of warzones is relatively recent and limited to the Israeli-Palestinian conflict. Because of this and the sensitivity of the issue, the availability of data is very limited.

Much of the scholarly focus has thus instead focused on "acts of terrorism," as this information is more robust in both time and space and more easily accessible. These acts have mainly included suicide bombings, bombings, and kidnappings and occur most frequently in the West Bank (Judea and Samaria), but do not include rocket attacks that, as mentioned, originate from Gaza Strip. Consequently, there is little understanding as to the implications of rocket firing into Israel on Israeli public opinion and voting behavior. Noting a shift in the Israeli electorate further to the right, this paper examines the exposure to rocket fire as a contributing factor to this shift.

To do this, a comparison is made between individuals both in and out of rocket range, and their attitudes towards several issues relating to the Israeli-Palestinian conflict. The implications of the results are numerous and in some ways similar to current literature on terrorism and its effect on public opinion. My analysis shows that conservative individuals are more likely to be against the peace process and land-for-peace deals, especially in neighborhoods in Jerusalem; they are likely to perceive Arabs in a more threatening manner; they tend to agree with more militaristic responses towards Palestinian attacks; and finally, that changes in these opinions have translated into changes in voting behavior. Increased rocket

range and subsequent attacks are therefore counterproductive in regards to the peace process between Israelis and Palestinians. As a result of these conclusions, this paper presents a preliminary examination of the exposure to rocket fire and its effects on public opinion, expanding existing literature on terrorism into the realm of rocket attacks, and allowing for a more complete and concise study of threats from the occupied Palestinian territories towards Israel proper.

In the next section, I will briefly examine the already established literature on terrorism in Israel and its effect upon Israeli public opinion. Afterwards, I will move onto an overview of the data and method of analysis. The results will be interpreted in the proceeding section, and final comments will be made in the conclusion. References to tables and figures will be made throughout this paper, a list of which can be found on page 26.

The Literature

Due to the lack of information and context specific nature of the issue of rocket attacks outside of warzones, the majority of academic work has focused on the issue of terrorism, which also occurs outside of the Israel-Palestine region. However, because the majority of activities classified under most academic definitions of "terrorism" occur in the West Bank, studies on the effects of "rocket attacks," which mainly originate from Gaza Strip, have been largely ignored. Consequently, there cannot be a detailed analytical study that encompasses all Palestinian terrorist attacks in Israel and on Israeli citizens.

Acts of terrorism, especially suicide bombings, are very different from rocket attacks in this context. Suicide bombings are hard to detect and defend against. They can occur anywhere, can cause severe damage- especially if undetected- and are typically precise in their targets. Rocket attacks, on the other hand, originate from a single, generally-known location and are highly inaccurate. The injury and death toll from both activities are illustrative of this – suicide bombing is much more effective in causing civilian casualties. Drawing from the nature of the activities, as well as geographical and contextual similarities, the literature on terrorism can nevertheless shed light on the effects of rocket firing. Although their characteristics pose different forms of security threats, they are similar in that they are carried out for the purpose of political gain and for increasing the perception of fear. Therefore, the implications of both are also similar; one such implication, as we shall see later in the results section, is that terrorism shifts the Israeli electorate to the right (Arian 2001; Berrebi, Klor 2006; Berrebi Klor 2008; Gould, Klor 2010; Arian, Shamir 2011).

Israeli public opinion predictably reacts strongly to deaths of Israeli citizens (combatant and non-combatant), and the perceived threat and distrust of Arabs in general consequently increases as a result (Herman, Yuchtman-Yaar 2002; Fielding, Penny 2008; Maoz, et al. 2002; Maoz, McCauley 2009). Such deaths have large and important impacts on the prospect of peace between Israelis and Palestinians, and contribute significantly to trends in public opinion. According to several opinion polls, such as those conducted by the Israel National Election Studies, the National Security and Public Opinion Project, the Joint Israeli-Palestinian Poll, and many others, some of the general trends that can be seen since the Second Intifada are that:

- The majority of Israelis continue to support the idea of "two states for two peoples."
- An overwhelming majority reject the idea that the peace process should be stopped.
- Most Israelis favor the evacuation of some settlement blocs in West Bank as part of a peace

agreement.
- Attitudes towards (Israeli) Arabs have become increasingly negative.
- There is growing distrust towards Palestinian (and Palestinian politicians) as "partners in peace," although most recognize that there are no other viable solutions.
- A majority are skeptical about any reconciliation with Hamas.

Many of these trends (Shamir, Sagiv-Schifter 2006; Shamir, Shamir 2007; Meir, Bagno-Moldavsky 2010; Arian, Shamir 2011) are widely attributed to the violence stemming from Palestinians in the West Bank and Gaza Strip. Studies on the effects of terrorism have mushroomed since the time of the al-Aqsa Intifada, as information and media coverage at the time of the Camp David Accords put the Israeli-Palestinian conflict in international spotlight. Using such data, which is widely available in comparison to that of rocket attacks, scholars have applied and developed various models, most of which have shown and converged into a common consensus on the rightward-shifting effects of such violence.

Other scholarly works have also focused on the effectiveness of terrorist activity, many of which suggest that such activity succeeds in acquiring short term gains, mainly between Palestinian factions, but fails to induce overall government policy compliance (Haushofer, Biletzki, Kanwisher 2010; Abrahms 2012). Similarly, other studies focus on the effectiveness of the Israeli government in preventing further attacks (Dugan, Chenoweth 2012), to which a consensus has been reached on the ineffectiveness of pure military tactics. Instead, researchers assert that both carrots and sticks should be used in resolving this conflict.

While the numbers of terrorist activities are on the decline – no suicide bombings have occurred in Israel for the past three years – rocket attacks are gradually increasing (Johnston Archive 2012; Jewish Virtual Library 1993). Especially in the context of the Arab Awakening and decreased restrictions on migration along the Gaza-Egypt border, improvements in rocket technology in the Gaza Strip too are on the rise. This being said, the nature of academic literature should now likewise be shifting its focus onto the effects of rocket attacks, drawing on the insights gained from pre-existing work on terrorism. This paper serves such a purpose.

Overview of Data & Analysis
The data used in this paper's research comes from two main sources: from Ph.D. students Anna Getmansky and Thomas Zeitzoff, at New York University's Department of Political Science, as well as 2006 and 2009 pre-election studies performed by the late Asher Arian and Michal Shamir at The Israel National Election Studies. In this section, I will provide an overview of the variables used in my research, and explain the empirical method of analysis.

Independent Variables
The Getmansky-Zeitzoff dataset compiles demographic and electoral information for each locality in Israel. Also in the data are the two main independent variables to be used for the paper's regression model:

InRange: A dummy variable that determines whether a locality is in range of rocket attacks from Gaza

Strip during an election period; 0 represents a locality not in range, and 1 represents one in range.

InRange_cum: The cumulative version of InRange that is on a scale from 0 to 3, where 0 represents a locality not in range, and 3 represents a locality's third election in range. Elections used in this analysis are from 2003, 2006, and 2009.

As the range of rocket fire can only increase, there can be no localities that cease to be in range after having been in range; the change in maximum rocket ranges after each election can be seen in Figure 7. Due to the sensitivity of this issue, the Israel Defense Forces (IDF) restricts public access to data on the exact locations of rocket attacks; as such information could be used to adjust and improve the accuracies of rockets by perpetrators in Gaza Strip. Despite lacking exact location of rocket landings, the inaccuracy, and therefore uncertainty of rocket attacks, can produce significant psychological effects simply through exposure to attacks.

The IDF publically announces rocket fire ranges and threats of imminent attacks through the Red Color early warning radar system, among other forms of communication. However, such information can only be disseminated after an attack. Using the logic that ranges only increase over time, it can therefore be plausibly assumed that individuals in localities in range know that they are exposed to potential rocket attacks. Those near the maximum range, on the other hand, have greater uncertainty as to their exposure, and do not know when they will be within range until after an attack. The InRange(_cum) variable accounts for these effects.

The final dataset, after merging the Getmansky-Zeitzoff dataset with those of the 2006 and 2009 Israel national election studies by locality, is presented at the individual level. Accounting for the year, demographic variables are used to control for possible confounding effects on Israeli public opinion. These include:

Year: A dummy variable; 0 and 1 represent 2006 and 2009, respectively.
Male: A dummy variable for sex, with 1 representing a male sex.
AgeGroup: Groups; 18-22; 23-29; 30-39; 40-49; 50-59; 60-69; 70-79; 80+.
Consumption: A measurement of household expenditure relative to the national average, as determined by the individual. Groups: much more than average; a little more than average; about the average; a little less than average; much less than average. This variable is used as a proxy for household income.
%Jews: The percent Jewish population within a locality ranging from 0 to 1.

Of these control variables, Male, AgeGroup, and Consumption are measured at the individual level, and thus locality as well, whereas the variables %Jews and InRange(_cum) are measured only at the locality level. A statistical summary of the two main rocket range variables, and all other variables, can be found in Appendix A.

Dependent Variables
Dependent variables, namely questions present in both the 2006 and 2009 election studies, are

separated into four categories. A fifth category of questions specific to the 2009 survey are also included. These categories and questions are:

1. National Situation

NS_Situation: Perception of Israel's current national security situation.
NS_Plus5: Perception of Israel's national security situation in five years' time.
GenSituation: Perception of Israel's general situation.

2. Peace Process

AchievePce: Whether a peace agreement can be achieved with the Palestinians.
PceEndConflict: Whether a peace agreement with Palestinians/Arabs will end conflict.
StopPP: Support for stopping the peace process even at the risk of another war.
LandForPce: Support for land-for-peace deals with Palestinians.
Jerusalem: Support for the return of Arab neighborhoods in Jerusalem as part of a peace agreement with Palestinians.
TwoState: Support for the establishment of a Palestinian state in Judea, Samaria, and Gaza Strip (the Occupied Palestinian Territories; borders unspecified).

3. Perception of Arabs

EmigrateArabs: Support for government encouragement of the emigration of Arabs.
ArabInjure: Whether one worries about oneself and/or loved ones being injured by Arabs.
ArabGoal: Perception of the "final goal" of Arabs towards Israel and Israeli-Jews.

4. Voting Behavior

SecurityVote: Whether security issues will most influence vote.
PeaceVote: Whether the peace process will most influence vote.
FavorParty: The party an individual favors most; seven parties in this variable are arranged according to their position towards the establishment of a Palestinian state. More details on the variable can be found on page 39.
RightVote: A measurement of a locality's percentage of right-wing votes. This is the only dependent variable not taken from the election studies but instead the Getmansky-Zeitzoff dataset.

5. 2009 Specific

SettlementEvac: Opinion on the evacuation of settlement blocs as part of peace agreement.
CastLead: Opinion on the success of IDF's operation Cast Lead in Gaza in 2008.
FireReaction: Opinion on method of response if rocket fire continues from Gaza.

The actual wording of questions and more accurate descriptions of relevant variables are displayed alongside regression tables. It should also be noted that the election studies are separated into various versions performed in waves for the purpose of improving question formats; some questions are also directed at target audiences (i.e. specific questions that are only asked to Israeli-Jews and not Israeli-

Arabs, although these questions are few in number).

Across-the-board questions that are common in all versions have higher numbers of observations. On the other hand, version-specific questions have smaller sample sizes. All observational sets are nevertheless randomized and representative of the Israeli electorate. Although most of the dependent variables are of the former question type, some are of the latter. As a robustness check, and for comparability, the results of the variables with larger observations are also restricted to the version-specific observations of variable PceEndConflict due to its similarity in observational sets with all other version-specific questions. To serve as a visual comparison and to highlight areas of skepticism where changes in results occur, restricted results of across-the-board variables are shown along with the original. There appears to be little variation for most variables when restricted.

The empirical method of analysis follows a simple multivariable regression model; where Y is any one of the dependent variables mentioned above. The control variables appear in the order of their mention, with variables AgeGroup, Consumption, and %Jews shortened to "Age," "Income," and "Jews," respectively for the purposes of presentation.

$$Yilt = b0 + b1Yeart + b2Maleil + b3Ageilt + b4Incomeilt + b5Jewslt + b6InRange(\_cum)lt + \varepsilon ilt$$

As each observation is representative of an individual within a locality, subscripts i and l represent the individual and locality levels respectively, with t denoting the year. The dependent variable RightVote – under the category of voting behavior – is a measurement of the locality rather than the individual; it is denoted as Ylt. Each regression is then clustered at the locality level as all individuals in the same locality face the same level of range exposure to rocket fire, as well as other locality level demographic data. Although there are many more questions of similarity between the 2006 and 2009 surveys, the purpose of this paper will focus the on Israeli public opinion towards the Israeli-Palestinian conflict and towards Arabs. As a result, questions related to the political, legal, and socio-economic conditions of Israel will be put aside as a separate opportunity for future research. The separation of selected questions into these five categories will allow for more detailed and robust interpretations of the effects of rocket attacks on Israeli public opinion, the implications of which will affect interactions between Israelis and Palestinians on the domestic and policy levels.

Results

Similar to the separate categories of dependent variables described above, I will begin first by examining the opinions regarding the national situation of Israel. I will then move on to questions that concern the peace process between Israel and the Palestinians, Israelis' perception towards Arabs, changes in voting behavior, and then onto questions specific to the context of 2009. The final category is to serve as consummation of the implications interpreted from the previous categories. Regression tables and figures – a list, which can be found in the appendix – are likewise categorized and are referred to throughout this section. A more accurate wording of the questions, as well as their answer scales, can be found above each respective table.

It should also be noted that %Jews often has a significant and large effect on many of the dependent variables analyzed. The considerable effects of this variable are shown to not be caused by

outliers; this can be referred to in figure 8 in Appendix B. Nevertheless, this and other control variables are not the focus of this paper and thus will only be briefly mentioned here.

National Situation

A clear and obvious difference between the results of the variables in this category – in reference to Tables 1.1 and 1.2 – is that the exposure to rocket fire certainly affects an individual's perception of Israel's security situation, but not the perception of Israel's general situation; this illustrates the importance of other issues, such as the economic and democratic state of Israel, on the general Israeli public opinion. Counter to common perceptions, however, is the direction of the coefficient of InRange(_cum), which suggests that those who are in range of rocket fire think more positively regarding Israel's national security situation.

Additionally, those in range view Israel's future national security situation more positively. This is even more pronounced with individuals in localities that have consecutively been in range during elections; localities that have been in range for the third time during elections are likely to think more positively of Israel's future security situation by slightly more than one unit, in comparison to those who are outside of rocket range.

It is possible that these results occur not because individuals in range feel safer, but because individuals outside of range have the perception that the difference in danger would become much higher once one becomes in range. Those in range are likely to be more knowledgeable and experience in precautionary measures to rocket attacks. They may also be more wary that rocket attacks are highly inaccurate and that, in comparison to acts of terrorism, deaths are very rare. As rocket ranges are updated by the Israel Defense Forces, those in range will also know that government preparations and policies would be directed towards their localities. As mentioned before, those just out of range would likely experience greater uncertainty in regards to their exposure and security. The fear of becoming exposed to rocket attacks could thus remain high for those yet in range. It therefore appears that being in range of rocket fire changes one's relative perception of the nation's security situation in a more positive light, which does not have a spillover effect towards the perception of the nation's general situation.

Similar to the effects of being in range and with higher levels of significance, the larger the share of Jewish population in a respondent's locality, the more positive he or she is towards Israel's future security situation; an individual in a pure Jewish locality is likely to think more positively by one integer. The effect of household consumption suggests that those who spend less tend to think more negatively about both the current and future security situation. Interestingly, sex has a very significant effect on perspectives of the current security situation, with males half a unit more positive than females. Whatever the explanation, it is unlikely to be solely related to the IDF as the security force conscripts women who also have the right to serve in any position.

The Peace Process

As shown in Tables 2.1 and 2.2 – variables AchievePce and PceEndConflict, respectively – the year 2009 saw a shift to a more pessimistic view towards the viability of the Palestinian peace process ; an average citizen was less likely to believe that a peace agreement could be achieved, and even if such a deal were made, public opinion was less convinced that conflict with the Palestinians and Arab states would end.

Given the context of post-election civil conflict between Hamas and Fatah for administrative control over West Bank and Gaza Strip, as well as the subsequent lack of progress with the peace process, the negativity would be understandable.

Yet even when controlling for the general differences in attitudes from 2006 to 2009, those in range of rocket attacks still experience a minor increase in doubt towards the possibility of reaching a peace agreement. More significantly, however, is the share of Jewish population in one's locality; complete Jewish localities are much more negative in this case by half an integer. However, the significance of these variables disappears when asked whether a peace agreement would end conflict. The differences between these two tables thus illustrate that the negative effects of the demographic variables, including InRange, are only applicable to the individual's immediate situation, and not to what he or she believes to be the future situation. Although it cannot be interpreted from the results of PceEndConflict that individuals are more optimistic as with NS_Plus5, we do see that exposure to rocket fire does not strictly impede one's hope for an end to conflict due to a future peace agreement.

Nevertheless, as shown in the following tables, the immediate negative effects of being in range can be significant and large. When it comes to the issue of stopping the peace process altogether, as shown on Table 2.3, the significance and effects of InRange(_cum) become even greater. The maximum effect of InRange_cum – the coefficient multiplied by three – is larger than that of %Jews, moving one to a more negative attitude towards the peace process. Although the coefficients do not appear to be numerically large, they should not be taken lightly as the variable only ranges from 1 to 4 and the implications of the question itself are many.

Even though exposure to rocket fire leaves no significant imprint on whether a peace agreement would end the conflict, the finding would be irrelevant if it was preferred for the peace process to be stopped; the potential effect of exposure. Moreover, the significance and effects increase when restricted to a smaller sample size, which suggests that the variability of the effect holds an even greater negative impact. Of course, current public opinion trends show that a vast majority of Israelis are against the halting of the peace process, as shown by a lack in significant effects in the yearly difference, implying that Israelis are not increasingly favoring stopping the peace process over time. However, having controlled for this, being in range itself still pushes Israelis towards such a direction. Over time, the range of rocket fire only increases, increasing the number of Israelis affected by InRange and the maximum effect of InRange_cum after each election. Therefore a potential risk in rocket exposure is that such trends could stop, and perhaps even reverse.

On land-for-peace deals, rocket fire exposure generally lacks a significant or large effect. However, as the restricted results suggests, exposure can have some significant effect depending on the sample. Though the larger observational set lacks signs of such an effect, it can nevertheless be interpreted that exposure does not have a major impact on land-for-peace deals. Other variables that are significant appear to negatively affect public opinion, shifting individuals to become less willing to exchange territories for peace. The effects become more pronounced when restricted, with household consumption and local Jewish population having a very large significant effect; an individual whose household spends much less than the national average are half a unit more pessimistic than one who spends much more than the national average; and likewise, individuals in Jewish localities are more conservative by over half a unit. As previously noted, the response scale ranges from 1 to 4.

In the case of land-for-peace deals specific to Arab neighborhoods in Jerusalem, however, the effect of InRange(_cum) increases and becomes highly significant. Even while controlling for the other variables – notably %Jews, which has a large and understandable coefficient, especially given the nature of the "Jerusalem Question" – InRange still has a relatively significantly large effect. On a scale from 1 to 4, those in range of rocket fire are 0.356 units more conservative, and those in their third election in range would prefer to retain these neighborhoods by a larger coefficient of 0.564. Note that rockets fired from Gaza Strip, unlike those in the more recent attacks of 2012, had yet to reach localities near Jerusalem in 2009. That being said, those in range, compared to those living in Jerusalem, would therefore be less willing to surrender Arab neighborhoods as part of a peace agreement. An overall implication of this is that an individual who agrees that Arab neighborhoods should be returned is more inclined to believe that they should instead be retained. Given the importance of the "Jerusalem Question" in the peace process, reduced flexibility on this issue could be detrimental to the success of negotiations.

On a similar note, the exposure to rocket attacks also has an effect on attitudes towards the establishment of a Palestinian state, albeit not as strong as those just mentioned. Coefficients are reduced and the significance of InRange(_cum) diminishes when restricted which, on a brighter side, illustrates room for skepticism towards the significance of the unrestricted results. The absence of a strong significant effect is understandable given the lack of viable alternative solutions to the conflict. However, the significant effects of other demographic controls do not appear to change as much. Counterintuitively, the Year effect shifts attitudes to a more conservative stance whereas the AgeGroup effect does the opposite. It is possible that this is due to the larger time and historical dimension present in AgeGroup, and other possible contextual confounders present in the Year variable. The coefficients of %Jews and AgeGroup remain quite large and significant as with the previous variable, but in this case, move in opposing directions; those older are more so "definitely" in support of the Two-State solution, whereas localities with greater Jewish populations tend to "definitely not" support the idea.

Nonetheless, even though other demographic variables have a larger overall significant effect, it is much easier for the maximum potential effect of being in range to be achieved in comparison to having a complete Jewish locality, and to have a household expenditure that is much more than the national average. The relatively smaller coefficients of InRange and InRange_cum should not be taken lightly in its size due to its incessant growth in range and cumulative effect.

Perception of Arabs

The questions asked in this section – the results of which can be found on Tables 3.1-3.3 – serve to reveal greater implications of the effects of rocket fire; in each case, being in range would increase the negativity of an individual's perception of Arabs. It should, however, be mentioned that there were slightly more participants who preferred not to answer because of the sensitive nature of the questions. Regardless, the number of observations is still large.

The demographic effects on one's attitude towards government encouragement of Arab emigration reveal that those in older age groups, as in the previous results, are more liberal and perhaps place more value on the democratic nature of Israeli society; those with lower than average income tend to be more conservative, and may also want the promotion of Arab emigration to reduce competitiveness in the labor market and the spread of public welfare. The effects of InRange(_cum), however, are even

greater. They show that while the origins of rocket attacks are outside of Israel-proper, individuals in range of fire would be more willing to support the reduction of the Arab population inside of Israel.

A similar effect can be seen towards the worry of injury of oneself or one's loved ones by Arabs, with an InRange_cum coefficient increasing after restriction to 0.190 towards a more threatened position. With high statistical significance, the implications are that although the origins of rocket attacks are foreign (in the Occupied Territories); there is also an increased threat perception among Israelis of Arabs domestically. As rocket range extends further north, the Israeli populace become more negative in their perceptions of Arabs as a whole, even after controlling for other variables.

This is also the case for those of lower household expenditures, which can be expected due to greater similarities in socioeconomic positioning and thus physical interaction, as well as the reasons mentioned above. The effects of the remaining demographic variables are, however, more ambiguous, with their significance large but effects relatively small. The changing perceptions between 2006 and 2009 may not necessarily be a trend, but instead due to the context of violence; where the 2006 election saw greater conflict with and between Palestinian factions, and the latter saw the end of the IDF's Operation Cast Lead and a cessation of violence.

In the final question of this section we see, again, greater threat perception towards the intention of Arabs. With the recent flurry of rocket attacks from Gaza Strip, where the majority of radical Palestinian factions reside, the shift in attitudes is predictable. Although the Year variable suggests that such a rightward shift in attitudes has increased, we cannot know whether or not this is a trend due to the limited time frame of this study; whether these changes are reactionary or permanent is questionable. The results illustrated by these three variables provide clearer insights as to what this means for the state of Israel's relationship with its Arab population and neighbors, and Israel's democratic and demographic policies; matters which should be expanded upon in future work.

Voting Behavior

In looking at the coefficients of InRange(_cum) on table 4.1, we see that being in range is highly significant in pushing individuals towards basing their voting decisions on security issues. As the two dependents are dummy variables, the low coefficients still have a relatively large effect; the votes of those in their third election in range are likely to be influenced by security issues by 30 percentage points more than those out of range. What is implied by this, in comparison to the results of PeaceVote, is that those who are in range care more about the promotion of security issues than the peace process. As a result, we see that even in the voting behavior of an individual, exposure to rocket attacks promotes more militaristic, rather than diplomatic, policies in regards to the Israeli-Palestinian conflict. If the effect of being in range is sustained as the maximum range of rocket fire from Gaza Strip extends, we will see an Israeli electorate that would be increasingly inclined to vote based on security policies after each election period.

This is clearly shown in Tables 4.2 and 4.3; the former illustrates an individual's preferred party, and the latter highlights the share of right-wing votes received on the locality level. In both cases we see a general electorate shift towards right-wing parties for 2009 in comparison to 2006, and in both cases, we see that exposure to rocket fire has a highly significant and large added contribution to this rightward shift.

Although other demographic variables also have significant effects, these only appear on the individual level. As those in higher age groups are more liberal, and as those in higher Jewish populated

localities and those of lower income are more conservative; the effect of AgeGroup on the locality level is too low to have any consequential implications. However, the effects of exposure to rocket attacks remain significant and large on both the individual and locality level for voting behavior. At the individual level, a person in range is likely to shift further right by a coefficient of 0.414 (on a scale of 1 to 7 for the most popular parties/pre-election coalitions). With the unrestricted sample size of voting on the locality level, localities that are in range, in comparison to those that are not, tend to have 32.6 percent more right-wing votes, and with a maximum of 48.6 percent for those in their third election in range. When restricted, the confidence levels and coefficients of InRange(_cum) are reduced but nevertheless remain relatively significant and large.

A caveat is that localities nearer to the Gazan perimeter may already have high right-vote shares prior to being in range of rocket attacks. However, as shown by Figure 9 of Appendix B, this does not appear to be so; although there are right-wing districts close to the perimeter of Gaza Strip, in general, most of the districts near Gaza lean more towards the center/center-left party, Kadima. Additionally, the cumulative version of the InRange and the Year variables already take into account the shift in share of right votes in localities over time. It can thus be plausibly said that the exposure to rocket attacks by being in range, as illustrated by these two tables, significantly impacts the voting behavior of individuals and localities by further shifting the electorate to more conservative positions.

The fact that these election studies were taken weeks before parliamentary elections illustrates even larger implications; we see not only changes in public opinion, which may not necessarily be sustained, but changes in voting behavior at the time of elections. Simply put, exposure to rocket attacks can translate into more votes for right-wing parties and thus long-lasting policy outcomes, with increasing effects of InRange(_cum) after each election period.

2009 Specific

Similar to territorial swaps in Jerusalem, Table 5.1 suggests that localities with a large proportion of Jewish and low-income households tend to be more conservative and prefer to retain settlement blocs, regardless of size. The significance and effects are very large, but could mainly be due to the fact that settlement blocs are largely composed of Jewish and low-income families in the first place. Yet even after controlling for existing settlement bloc composition, we see that being in range still has a noticeable impact; the relatively small coefficients of InRange(_cum) cannot be said to be inconsequential, especially when the dependent variable is on a scale of 1 to 3, and again when taking into account the nature of the InRange(_cum) variable.

When then comparing the two variables in Tables 5.2 and 5.3, we see another example illustrative of how individuals in range are more likely to hold increasingly militaristic attitudes, especially in response to threats of rocket attacks. After restricting the observational set in Table 5.3, we see an even more pronounced effect, particularly with InRange_cum, showing the variability of the coefficient. However, as can be seen in the previous table, being in range has no ascertainable effect on one's attitude towards the success of military operations by theIsrael Defense Forces. Therefore, although individuals in range may be more militaristic compared to those out of range, they may not necessarily have trust (or lack thereof) in the IDF. The dependent variables used in this category have further highlighted the overall shifts in attitudes caused by being in range of rocket attacks from Gaza Strip.

Conclusion

While it appears that the demographic controls, namely a locality's share of Jewish population, had greater significant effects than exposure to rocket fire in determining changes in public opinion, it should be noted that the composition of a locality can change over time, whereas localities can only become in range, and not "get out" of range. Additionally, the number of elections in which a locality experiences in range of rocket fire accumulates over time; it can only increase. Although the time frame of the data is limited, the characteristics of the InRange(_cum) variable should nevertheless emphasize the significance of its implications, even when the coefficients are lower than that of the demographic controls.

The ideological positioning of large Jewish populated localities and low-income individuals are clear throughout the results of this and previous variables; they are generally more conservative. The fact that the effect of being in range can at times match the coefficients of these controls should further indicate the greater consequences of rocket attacks. An expansion of the dataset to include the most recent rocket fire data and election study – of 2012 and 2013 respectively – would likely show more pronounced effects compared to what has been shown here in this paper.

That being said, regardless of the reasons for continued and improved rocket fire from Gaza Strip into Israel, be it for retaliation or for limited political gains against Israel and/or other Palestinian factions, such attacks are counter-productive to the progression of the peace process between Israelis and Palestinians. Literature on the effects of terrorism on Israeli public opinion and its trends shows that these conservative shifts are subject to reversals and not necessarily permanent or sustained. However, with continued periodic rocket attacks, especially prior to Knesset elections, these threats from Gaza Strip will not only further push the Israeli public opinion to the right, but also produce tangible votes for parties on more conservative platforms, leading to a more right-wing Israeli government, and, ultimately, more hawkish policy outcomes. It could also be strategically beneficial for right-wing parties to call for elections after experiencing a period of increased rocket attacks, or possibly even provoke such a barrage.

The effect on both public opinion and actual voting behavior thus provides a channel in which changes in public opinion can translate into changes in government policies that have larger and longer lasting consequences. The implications of such shifts to more conservative positions are that diplomatic channels of reconciliation, such as the peace process, would be abandoned for more militaristic approaches to retaliate against attacks from Gaza, as well as other security focused policies; what these policies are and how they will be implemented remains to be seen. The overall changes in this, however, are relatively small given that general trends in public opinion show that the majority of Israelis remain for the peace process. But that is not to say that positions cannot begin to move against such trends; it should be remembered that rocket attacks have only recently become a serious Israeli national security concern, whereas the trends identified typically begin from the al-Aqsa Intifada.

Even as the peace process continues, a shift to a more conservative position on specific issues of contention would lead to greater inflexibility and stall negotiations; Israelis would be less likely to approve of land-for-peace deals in regards to Arab neighborhoods in Jerusalem and in the evacuation of settlements. At the time of such conflicts, hope for achievable peace agreements, and the Two-State solution too, will diminish. Similar to the trends, the perception of Arabs both in and outside of Israel will also deteriorate, which is likely to lead to a greater deficit of trust in Israeli-Palestinian/Arab interactions on all levels, as well as increasing discrimination and threat perception towards Arabs. Much of the negative attitudes

are also directed specifically to factions in Gaza Strip, which will make any prospects of peace from the conciliation between Hamas and Fatah increasingly difficult.

Still, interestingly, individuals in range are more optimistic towards both Israel's current and future national security situation. They become more security orientated in terms of what issues most influence their vote, and more militaristic in their responses to attacks from Gaza, and yet, as the lack of correlation between InRange(_cum) and opinion on the success of Operation Cast Lead shows, there is not necessarily trust in the IDF's ability to provide sufficient security. It therefore appears that the state's capabilities in military operations are not the only cause for hope among Israelis; this is also supported by the trends of increasing public confidence in the Israeli political echelon (Meir, Bagno-Moldavsky 2010). Although the effects are, for the most part, relatively small, they are highly significant and will only increase over time if rocket attacks are to continue. Under the data of just two elections three years apart, one can already see the effects increasing dramatically over the long run. The results of this paper show that these effects are generally aligned with the literature on terrorism and some negative public opinion trends, even to the extent of continuing them. What is more worrying, are the positive public opinion trends opposed by the effects of rocket attack exposure. As these effects increase over time, it is possible to see the reversal of trends to a point where individuals would be less supportive of the peace process, the two-state solution, settlement evacuation, and the like.

As rocket attacks increasingly become the mode of terror by Palestinian factions, more in-depth studies will be needed to accurately illustrate their effects on the Israeli – and the Palestinian – populace, especially as there are vital differences between the characteristics of rocket attacks and terrorist acts. The changing dynamics of rocket attacks also remain to be seen; how will the effective performance of the Iron Dome rocket defense system change the overall effects of rocket exposure on Israeli public opinion, and how will rocket attack strategies and their effects change when their range covers all of Israel? The purpose of this paper is to serve as a preliminary report on the effects of such attacks on Israeli public opinion, and expand the literature by providing an alternative analysis of the effects of Palestinian threats. Hopefully, the focus of academic work will begin to turn towards this issue as data becomes more readily available to the public.

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Regression Tables & Appendices

Tables – National Situation

NS_Situation
In your opinion, what is the country's situation nowadays from a national security perspective?
Worst Situation   1 2 3 4 5 6 7 8 9   Best Situation
NS_Plus5
5 Years from now, what will be the country's situation from a national security perspective?
Worst Situation   1 2 3 4 5 6 7 8 9   Best Situation

Table 1.1 – Perspective on Current and Future Security Situation of Israel					
	(1)	(2)		(3)	(4)
	NS_Situation	NS_Situation		NS_Plus5	NS_Plus5
Year	0.103	0.111		0.0874	0.0791
	(0.168)	(0.173)		(0.222)	(0.225)
Male	0.542***	0.553***		-0.0557	-0.0447
	(0.161)	(0.160)		(0.230)	(0.229)
AgeGroup	0.0560	0.0553		0.0252	0.0238
	(0.0486)	(0.0489)		(0.0619)	(0.0623)
Consumption	-0.105*	-0.108*		-0.201**	-0.204**
	(0.0615)	(0.0618)		(0.0927)	(0.0929)
%Jews	0.117	0.100		1.004***	0.967***
	(0.240)	(0.259)		(0.277)	(0.283)
InRange	0.399**			0.611**	
	(0.179)			(0.261)	
InRange_cum		0.171			0.380*
		(0.118)			(0.223)
Constant	3.799***	3.841***		4.289***	4.351***
	(0.375)	(0.381)		(0.481)	(0.484)
Number of Obs	722	722		574	574
Standard errors clustered at locality level in parentheses					
="* p<0.10	** p<0.05	*** p<0.01"			

Note: The variable NS_Minus5 for perspectives on Israel's previous national security situation was also computed, but lack of significant results made it irrelevant for the purposes of this paper's analysis.

GenSituation
In your opinion, what is the general situation of Israel?
1. Very Good   2. Good   3. So-So   4. Bad   5. Very Bad

Table 1.2 – Perspective on the General Situation of Israel					
	(1)	(2)		(3)	(4)
	GenSituation	GenSituation		GenSituation	GenSituation
Year	-0.140*	-0.140*		-0.109	-0.107
	-0.0838	-0.0836		-0.12	-0.119
Male	0.043	0.0439		0.107	0.108
	-0.0537	-0.0538		-0.0908	-0.0907
AgeGroup	-0.0449***	-0.0449***		-0.0261	-0.0261
	-0.0139	-0.0139		-0.023	-0.023
Consumption	0.101***	0.100***		0.110***	0.110***
	-0.0176	-0.0175		-0.0284	-0.0286
%Jews	-0.257***	-0.259***		-0.369**	-0.371**
	-0.0967	-0.0943		-0.148	-0.146
InRange	0.0366			0.0548	
	-0.0613			-0.0923	
InRange_cum		0.0339			0.0274
		-0.0402			-0.0635
Constant	3.258***	3.258***		3.142***	3.146***
	-0.132	-0.128		-0.237	-0.235
Number of Obs	2191	2191		719	719
Standard errors clustered at locality level in parentheses					
="* p<0.10	** p<0.05	*** p<0.01"			

Tables – The Peace Process

AchievePce

In your opinion is it possible to reach a peace agreement with the Palestinians?

1. Definitely   2. I Think So   3. I Think Not   4. Definitely Not

Table 2.1 – Prospect of Achieving Peace with the Palestinians					
	(1)	(2)		(3)	(4)
	AchievePce	AchievePce		AchievePce	AchievePce
Year	0.334***	0.331***		0.241***	0.247***
	(0.0703)	(0.0731)		(0.0876)	(0.0894)
Male	-0.0209	-0.0197		-0.120*	-0.116
	(0.0409)	(0.0410)		(0.0709)	(0.0712)
AgeGroup	-0.0203*	-0.0203*		-0.000409	-0.000832
	(0.0121)	(0.0119)		(0.0179)	(0.0179)
Consumption	0.00488	0.00311		0.0123	0.0113
	(0.0224)	(0.0226)		(0.0290)	(0.0292)
%Jews	0.452***	0.430***		0.600***	0.595***
	(0.131)	(0.155)		(0.142)	(0.153)
InRange	0.182*			0.167*	
	(0.101)			(0.0937)	
InRange_cum		0.0858			0.0615
		(0.0627)			(0.0598)
Constant	2.221***	2.257***		2.102***	2.119***
	(0.168)	(0.195)		(0.200)	(0.209)
Number of Obs	2185	2185		717	717
Standard errors clustered at locality level in parentheses					
="* p<0.10	** p<0.05	*** p<0.01"			

Note: Regressions (3) and (4), as shown by the number of observations, are of the restricted version of the AchievePce variable.

PceEndConflict
If we reach a peace agreement with the Palestinians and with the Arabs states, in your opinion, will this end the Arab-Israeli conflict or not?
1. Certainly   2. I Think So   3. I Think Not   4. Certainly Not

Table 2.2 – Will a Peace Agreement end Conflict?		
	(1)	(2)
	PceEndConflict	PceEndConflict
Year	0.194**	0.196**
	(0.0908)	(0.0907)
Male	-0.0612	-0.0596
	(0.0755)	(0.0756)
AgeGroup	0.00493	0.00477
	(0.0216)	(0.0216)
Consumption	-0.0149	-0.0152
	(0.0294)	(0.0294)
%Jews	0.249	0.248
	(0.160)	(0.160)
InRange	0.0577	
	(0.105)	
InRange_cum		0.0197
		(0.0611)
Constant	2.595***	2.600***
	(0.183)	(0.181)
Number of Obs	721	721
Standard errors clustered at locality level in parentheses		
="* p<0.10	** p<0.05	*** p<0.01"

StopPP
To what extent do you agree with the following statements?
- "The peace process should be stopped even at the risk of another war"
1. Definitely Do Not Agree   2. Do Not Agree   3. Agree   4. Definitely Agree

Table 2.3 – Should the Peace Process be Stopped?					
	(1)	(2)		(3)	(4)
	StopPP	StopPP		StopPP	StopPP
Year	0.0686	0.0651		0.0667	0.0629
	(0.0547)	(0.0564)		(0.0685)	(0.0701)
Male	0.0472	0.0480		0.0172	0.0228
	(0.0447)	(0.0448)		(0.0599)	(0.0596)
AgeGroup	-0.0429***	-0.0431***		0.0518***	0.0517***
	(0.0125)	(0.0125)		(0.0183)	(0.0184)
Consumption	0.0283	0.0273		0.0474*	0.0450*
	(0.0191)	(0.0191)		(0.0252)	(0.0251)
%Jews	0.223**	0.183*		0.383***	0.369***
	(0.0871)	(0.0993)		(0.113)	(0.126)
InRange	0.194***			0.242***	
	(0.0703)			(0.0929)	
InRange_cum		0.110**			0.155***
		(0.0434)			(0.0559)
Constant	1.761***	1.807***		1.606***	1.628***
	(0.110)	(0.113)		(0.141)	(0.149)
Number of Obs	1482	1482		709	709
Standard errors clustered at locality level in parentheses					
="* p<0.10	** p<0.05	*** p<0.01"			

Note: Regressions (3) and (4), as shown by the number of observations, are of the restricted version of the StopPP variable.

LandForPce
To what extent do you agree with the following statements?
- "Territories should be exchanged for peace"
1. Definitely Do Not Agree   2. Do Not Agree   3. Agree   4. Definitely Agree

Table 2.4 - Should Territories Be Exchanged for Peace?					
	(1)	(2)		(3)	(4)
	LandForPeace	LandForPeace		LandForPeace	LandForPeace
Year	-0.209***	-0.201***		-0.282***	-0.273***
	(0.0761)	(0.0757)		(0.0893)	(0.0892)
Male	0.0333	0.0335		0.0452	0.0419
	(0.0534)	(0.0533)		(0.0815)	(0.0812)
AgeGroup	0.00803	0.00771		0.0217	0.0214
	(0.0144)	(0.0144)		(0.0215)	(0.0215)
Consumption	-0.0683**	-0.0673**		-0.0973***	-0.0954***
	(0.0276)	(0.0275)		(0.0310)	(0.0307)
%Jews	-0.279**	-0.274**		-0.653***	-0.641***
	(0.133)	(0.120)		(0.166)	(0.167)
InRange	-0.115			-0.146	
	(0.108)			(0.115)	
InRange_cum		-0.111			-0.126*
		(0.0718)			(0.0684)
Constant	3.073***	3.070***		3.506***	3.492***
	(0.188)	(0.179)		(0.236)	(0.236)
Number of Obs	1474	1474		698	698
Standard errors clustered at locality level in parentheses					
="* p<0.10	** p<0.05	*** p<0.01"			

Note: Regressions (3) and (4), as shown by the number of observations, are of the restricted version of the LandForPce variable.

Jerusalem
As part of peace agreement should Israel be prepared to return Arab neighborhoods of Jerusalem or should it continue to retain them, even at the price of preventing a permanent agreement?
1. Definitely Return   2. Should Return   3. Should Retain   4. Definitely Retain

Table 2.5 – Return or Retain Arab Neighborhoods in Jerusalem		
	(1)	(2)
	Jerusalem	Jerusalem
Year	0.195*	0.195*
	(0.100)	(0.105)
Male	-0.153**	-0.143*
	(0.0769)	(0.0779)
AgeGroup	-0.0264	-0.0264
	(0.0244)	(0.0245)
Consumption	0.0754**	0.0725*
	(0.0374)	(0.0380)
%Jews	0.706***	0.686***
	(0.190)	(0.215)
InRange	0.356***	
	(0.124)	
InRange_cum		0.188**
		(0.0774)
Constant	1.725***	1.762***
	(0.253)	(0.278)
Number of Obs	702	702
Standard errors clustered at locality level in parentheses		
="* p<0.10	** p<0.05	*** p<0.01"

TwoState

In your opinion, should Israel agree or not agree to the establishment of a Palestinian state in Judea, Samaria, and the Gaza Strip as part of a permanent peace agreement?

1. Definitely   2. Think So   3. Think Not   4. Definitely Not

	(1)	(2)		(3)	(4)
	TwoState	TwoState		TwoState	TwoState
Year	0.272***	0.268***		0.194*	0.190*
	(0.0784)	(0.0808)		(0.103)	(0.104)
Male	-0.144***	-0.143***		-0.175**	-0.172**
	(0.0464)	(0.0466)		(0.0719)	(0.0720)
AgeGroup	-0.0770***	-0.0768***		-0.0606***	-0.0603***
	(0.0135)	(0.0136)		(0.0229)	(0.0229)
Consumption	0.0353	0.0334		0.0513	0.0497
	(0.0225)	(0.0230)		(0.0332)	(0.0331)
%Jews	0.572***	0.549***		0.494***	0.486**
	(0.139)	(0.161)		(0.183)	(0.187)
InRange	0.204**			0.146	
	(0.100)			(0.106)	
InRange_cum		0.109*			0.100
		(0.0606)			(0.0623)
Constant	1.868***	1.904***		1.840***	1.853***
	(0.178)	(0.199)		(0.237)	(0.239)
Number of Obs	2132	2132		702	702
Standard errors clustered at locality level in parentheses					
="* $p<0.10$	** $p<0.05$	*** $p<0.01$"			

Table 2.6 – The Establishment of a Palestinian State

Note: Regressions (3) and (4), as shown by the number of observations, are of the restricted version of the TwoState variable.

Tables – Perception of Arabs

EmigrateArabs
To what extent do you agree with the following statements?
- "The government should encourage the emigration of Arabs from the country"
1. Definitely Do Not Agree   2. Do Not Agree   3. Agree   4. Definitely Agree

Table 3.1 – Government Encouragement of Arab Emigration		
	(1)	(2)
	EmigrateArabs	EmigrateArabs
Year	-0.0478	-0.0420
	(0.0893)	(0.0896)
Male	-0.0537	-0.0450
	(0.0863)	(0.0866)
AgeGroup	-0.0535**	-0.0529**
	(0.0213)	(0.0213)
Consumption	0.0867***	0.0833***
	(0.0282)	(0.0286)
%Jews	0.158	0.0924
	(0.188)	(0.188)
InRange	0.310***	
	(0.0992)	
InRange_cum		0.183***
		(0.0578)
Constant	2.603***	2.673***
	(0.213)	(0.214)
Number of Obs	570	570
Standard errors clustered at locality level in parentheses		
="* p<0.10	** p<0.05	*** p<0.01"

Note: Although the number of observations is high, there were many who decided not to respond to the question due to its sensitive nature.

ArabInjure
To what extent are you worried or not worried that you or your family members may be injured by Arabs in your daily lives?

| 1. Very Worried | 2. Worried | 3. Not Worried | 4. Not At All Worried |

Table 3.2 – Perceived Threat of Arabs					
	(1)	(2)		(3)	(4)
	ArabInjure	ArabInjure		ArabInjure	ArabInjure
Year	0.187***	0.192***		0.269***	0.275***
	(0.0431)	(0.0431)		(0.0752)	(0.0751)
Male	0.290***	0.288***		0.426***	0.420***
	(0.0479)	(0.0481)		(0.0724)	(0.0728)
AgeGroup	-0.0280**	-0.0281**		-0.0335*	-0.0339*
	(0.0119)	(0.0119)		(0.0191)	(0.0190)
Consumption	-0.0509***	-0.0492***		-0.0467*	-0.0439*
	(0.0162)	(0.0162)		(0.0246)	(0.0245)
%Jews	-0.109	-0.0873		-0.122	-0.105
	(0.0781)	(0.0746)		(0.126)	(0.122)
InRange	-0.223***			-0.279***	
	(0.0480)			(0.103)	
InRange_cum		-0.149***			-0.190***
		(0.0366)			(0.0633)
Constant	2.336***	2.307***		2.189***	2.163***
	(0.0914)	(0.0912)		(0.163)	(0.158)
Number of Obs	2188	2188		716	716
Standard errors clustered at locality level in parentheses					
="* $p<0.10$	** $p<0.05$	*** $p<0.01$"			

Note: Regressions (3) and (4), as shown by the number of observations, are of the restricted version of the ArabInjure variable.

ArabGoal
In your opinion, what is the Arabs' final goal?
1. Get back some territories from 1967 war
2. Get back all territories from 1967 war
3. Conquer the state of Israel
4. Conquer the state of Israel and eliminate a significant part of the Jewish population in Israel

Table 3.3 – The Perceived Intentions of Arabs					
	(1)	(2)		(3)	(4)
	ArabGoal	ArabGoal		ArabGoal	ArabGoal
Year	0.365***	0.358***		0.378***	0.378***
	(0.0965)	(0.101)		(0.111)	(0.113)
Male	-0.0131	-0.0103		0.0381	0.0460
	(0.0480)	(0.0480)		(0.0884)	(0.0888)
AgeGroup	0.0354**	0.0355**		0.0377	0.0375
	(0.0143)	(0.0143)		(0.0255)	(0.0256)
Consumption	0.0395	0.0363		0.0261	0.0235
	(0.0243)	(0.0253)		(0.0375)	(0.0374)
%Jews	0.639***	0.600**		0.570***	0.555**
	(0.200)	(0.236)		(0.219)	(0.235)
InRange	0.369***			0.298**	
	(0.141)			(0.127)	
InRange_cum		0.225**			0.167*
		(0.0872)			(0.0860)
Constant	1.750***	1.806***		1.761***	1.791***
	(0.225)	(0.266)		(0.266)	(0.276)
Number of Obs	2117	2117		697	697
Standard errors clustered at locality level in parentheses					
="* p<0.10	** p<0.05	*** p<0.01"			

Note: Regressions (3) and (4), as shown by the number of observations, are of the restricted version of the ArabGoal variable.

Tables – Voting Behavior

Of the following issues, which will have the greatest influence on your vote in the upcoming elections?
*Both have been converted into dummy variables

SecurityVote   PeaceVote
The Security Situation   The peace process with Palestinians and with Syria

Table 4.1 – Are these Issues Most Influential for Your Vote					
	(1)	(2)		(3)	(4)
	SecurityVote	SecurityVote		PeaceVote	PeaceVote
Year	0.0541	0.0496		-0.0315	-0.0309
	(0.0397)	(0.0393)		(0.0282)	(0.0286)
Male	-0.0614*	-0.0576		0.00183	0.000487
	(0.0360)	(0.0358)		(0.0238)	(0.0238)
AgeGroup	0.0137	0.0142		0.000348	0.000252
	(0.0118)	(0.0117)		(0.00714)	(0.00713)
Consumption	0.0185	0.0169		-0.0300***	-0.0296***
	(0.0141)	(0.0140)		(0.00978)	(0.00989)
%Jews	0.112**	0.103*		-0.155***	-0.152***
	(0.0528)	(0.0539)		(0.0532)	(0.0560)
InRange	0.138***			-0.0500	
	(0.0517)			(0.0343)	
InRange_cum		0.100***			-0.0307*
		(0.0379)			(0.0175)
Constant	0.115	0.127		0.379***	0.374***
	(0.0795)	(0.0811)		(0.0697)	(0.0729)
Number of Obs	684	684		684	684
Standard errors clustered at locality level in parentheses					
=”* p<0.10	** p<0.05	*** p<0.01”			

<u>FavorParty</u>
In sum, which of these parties do you favor/support the most?

*This is a generated variable. Parties are ordered from 1, the most accepting of Palestinian sovereignty, to 7, the least accepting. In other words, parties of higher numerical value are more conservative. However, this variable should be taken with a grain of salt as the difference between each integer is not equivalent to the difference in party ideology.

1. Meretz   2. Kadima   3. Labor   4. Shas   5. Yisrael Beitenu   6. Likud   7. The Jewish Home

Table 4.2 – Most Favored Party		
	(1)	(2)
	FavorParty	FavorParty
Year	0.558***	0.552***
	(0.122)	(0.124)
Male	0.0847	0.0906
	(0.0917)	(0.0920)
AgeGroup	-0.0614**	-0.0611**
	(0.0270)	(0.0270)
Consumption	0.0716*	0.0687*
	(0.0379)	(0.0383)
%Jews	1.011***	0.955***
	(0.175)	(0.202)
InRange	0.414***	
	(0.135)	
InRange_cum		0.224**
		(0.0899)
Constant	2.398***	2.475***
	(0.213)	(0.237)
Number of Obs	1386	1386
Standard errors clustered at locality level in parentheses		
="* p<0.10	** p<0.05	*** p<0.01"

Note: Due to the dynamic nature of Israeli elections, many parties are specific to 2006 and 2009 elections for various reasons. Thus, only parties with significant number of votes are included. Ideological positioning of parties is based on their platforms, which can be found below: www.israelvotes.com/platforms.php

RightVote
*This is a non-survey dependent variable from the Getmansky-Zeitzoff dataset. The variable measures the percentage of right-wing votes in a locality for elections. In general, right-wing parties are based on the Shamir and Arian (1999) classification of Israeli parties.

Table 4.3 – Locality's Share of Votes for Right-Wing Parties						
	(1)	(2)		(3)	(4)	
	RightVote	RightVote		RightVote	RightVote	
Year	0.247***	0.243***		0.234***	0.239***	
	(0.0573)	(0.0661)		(0.0592)	(0.0638)	
Male	-0.00127	0.00124		-0.0219	-0.0156	
	(0.0102)	(0.0106)		(0.0160)	(0.0162)	
AgeGroup	-0.00930**	-0.00925*		-0.00668	-0.00715	
	(0.00454)	(0.00486)		(0.00578)	(0.00609)	
Consumption	-0.000153	-0.00311		-0.00438	-0.00585	
	(0.00557)	(0.00726)		(0.00850)	(0.00953)	
%Jews	0.134	0.0948		0.203	0.194	
	(0.144)	(0.192)		(0.142)	(0.171)	
InRange	0.326***			0.239**		
	(0.106)			(0.0943)		
InRange_cum		0.162**			0.103*	
		(0.0651)			(0.0528)	
Constant	0.151	0.211		0.125	0.149	
	(0.150)	(0.207)		(0.157)	(0.193)	
Number of Obs	2202	2202		718	718	
Standard errors clustered at locality level in parentheses						
="* p<0.10	** p<0.05	*** p<0.01"				

Note: Regressions (3) and (4), as shown by the number of observations, are of the restricted version of the RightVote variable.

Tables – 2009 Specific

SettlementEvac
What is your position on the evacuation of Jewish settlements in Judea, Samaria, and Gaza, as part of permanent agreement?
1) They should not be evacuated under any circumstances
2) Willing to evacuate small and isolated settlements
3) Willing to evacuate all settlements including large blocs

Table 5.1 – Evacuation of Settlement Blocs as Part of Peace Agreement		
	(1)	(2)
	SettlementEvac	SettlementEvac
Male	0.245***	0.236***
	-0.0713	-0.0726
AgeGroup	0.0424**	0.0424**
	-0.0175	-0.0177
Consumption	-0.0842***	-0.0829***
	-0.025	-0.0248
%Jews	-0.830***	-0.846***
	-0.119	-0.118
InRange	-0.166**	
	-0.0769	
InRange_cum		-0.0753*
		-0.0449
Constant	2.546***	2.548***
	-0.151	-0.152
Number of Obs	346	346
Standard errors clustered at locality level in parentheses		
="* p<0.10	** p<0.05	*** p<0.01"

CastLead
In your opinion, was the IDF's operation "Cast Lead" in Gaza Strip successful or not?
1. Very Successful   2. Rather Successful   3. Not So Successful   4. Not At All Successful

Table 5.2 – The Success of IDF Operation Cast Lead in 2008					
	(1)	(2)		(3)	(4)
	CastLead	CastLead		CastLead	CastLead
Male	0.0257	0.0254		0.0279	0.0284
	-0.0552	-0.0555		-0.0782	-0.0785
AgeGroup	-0.00232	-0.00229		-0.012	-0.0119
	-0.0153	-0.0153		-0.0239	-0.024
Consumption	-0.00866	-0.00854		-0.00733	-0.00809
	-0.022	-0.0219		-0.036	-0.0358
%Jews	-1.257***	-1.263***		-1.218***	-1.224***
	-0.113	-0.112		-0.163	-0.162
InRange	-0.0195			0.0219	
	-0.0869			-0.116	
InRange_cum		0.00408			0.0268
		-0.0476			-0.0828
Constant	3.305***	3.305***		3.275***	3.277***
	-0.141	-0.141		-0.212	-0.212
Number of Obs	1026	1026		341	341
Standard errors clustered at locality level in parentheses					
="* p<0.10	** p<0.05	*** p<0.01"			

Note: Regressions (3) and (4) are models restricted to the observational set of the variable SettlementEvac.

FireReaction
How in your opinion should Israel react if the firing from Gaza Strip on Israeli settlement continues?
1) Conquer all of Gaza Strip anew and stay there
2) Initiate one-time operations against firings without staying there
3) Act mainly through diplomatic moves and not by military force

Table 5.3 – Reaction to Continued Rocket Fire from Gaza Strip					
	(1)	(2)		(3)	(4)
	FireReaction	FireReaction		FireReaction	FireReaction
Male	-0.0136	-0.0183		0.00691	-0.00464
	-0.0365	-0.0368		-0.06	-0.06
AgeGroup	0.0746***	0.0748***		0.0583***	0.0582***
	-0.00929	-0.00926		-0.0161	-0.0161
Consumption	-0.0314*	-0.0301*		-0.0318	-0.0293
	-0.0163	-0.0164		-0.0206	-0.0209
%Jews	-1.030***	-1.048***		-0.966***	-0.977***
	-0.0523	-0.0526		-0.0889	-0.0891
InRange	-0.168***			-0.215**	
	-0.0539			-0.0953	
InRange_cum		-0.0655**			-0.118***
		-0.0317			-0.036
Constant	2.673***	2.673***		2.672***	2.672***
	-0.0791	-0.0793		-0.113	-0.113
Number of Obs	1026	1026		344	344
Standard errors clustered at locality level in parentheses					
="* p<0.10	** p<0.05	*** p<0.01"			

Note: Regressions (3) and (4) are models restricted to the observational set of the variable SettlementEvac.

Appendix A

Figure 1 – Summary of Independent Variables

Independent Variables					
Variable	Obs	Mean	Std. Dev.	Min	Max
InRange	2416	0.147765	0.35494	0	1
InRange_cum	2416	0.192053	0.519949	0	3
Year	3129	0.386705	0.487073	0	1
Male	3129	0.479067	0.499642	0	1
AgeGroup	3092	3.967982	1.878881	1	8
IncomeGroup	2874	3.187891	1.282366	1	5
%Jews	2554	0.849067	0.302546	0	1

Figure 2 – Summary of National Situation Variable

National Situation					
Variable	Obs	Mean	Std. Dev.	Min	Max
NS_Situation	1021	4.169442	2.106406	0	8
NS_Plus5	812	4.730296	2.485949	0	8
GenSituation	3109	3.190737	1.116146	1	5

Note: NS_Situation and NS_Plus5 are ranged from 1 to 9 in the survey, but 0 to 8 correspondingly in the dataset.

Figure 3 – Summary of Peace Process Variables

The Peace Process					
Variable	Obs	Mean	Std. Dev.	Min	Max
AchievePce	3090	2.75178	0.989524	1	4
PceEndConflict	1023	2.876833	0.952122	1	4
StopPP	2277	1.985068	0.926445	1	4
LandForPce	2268	2.554233	1.062313	1	4
Jerusalem	995	2.566834	1.087845	1	4
TwoState	3033	2.293439	1.088565	1	4

Figure 4 – Summary of Arab Perception Variables

Perception of Arabs					
Variable	Obs	Mean	Std. Dev.	Min	Max
EmigrateArabs	858	2.786713	1.011006	1	4
ArabInjure	3110	2.154019	0.958989	1	4
ArabGoal	3009	2.799269	1.16103	1	4

Figure 5 – Summary of Voting Behavior Variables

Voting Behavior					
Variable	Obs	Mean	Std. Dev.	Min	Max
SecurityVote	964	0.338174	0.473334	0	1
PeaceVote	964	0.124481	0.330301	0	1
FavorParty	1923	3.641186	1.868243	1	7
RightVote	2413	0.393391	0.303705	0.003887	0.998379

Figure 6 – Summary of 2009 Specific Variables

2009 Specific					
Variable	Obs	Mean	Std. Dev.	Min	Max
SettlementEvac	382	1.829843	0.749348	1	3
CastLead	1168	2.22089	0.975716	1	4
FireReaction	1169	1.976048	0.716327	1	3

Appendix B

Figure 7 – Map of Rocket Ranges Prior to Elections in Israel

| InRange_cum	1999	2003	2006	2009
0	1166	1103	1051	920
1	0	63	52	131
2	0	0	63	52
3	0	0	0	63
Total	1166	1166	1166	1166

2003 Range   2009 Range
2006 Range   2012 Range
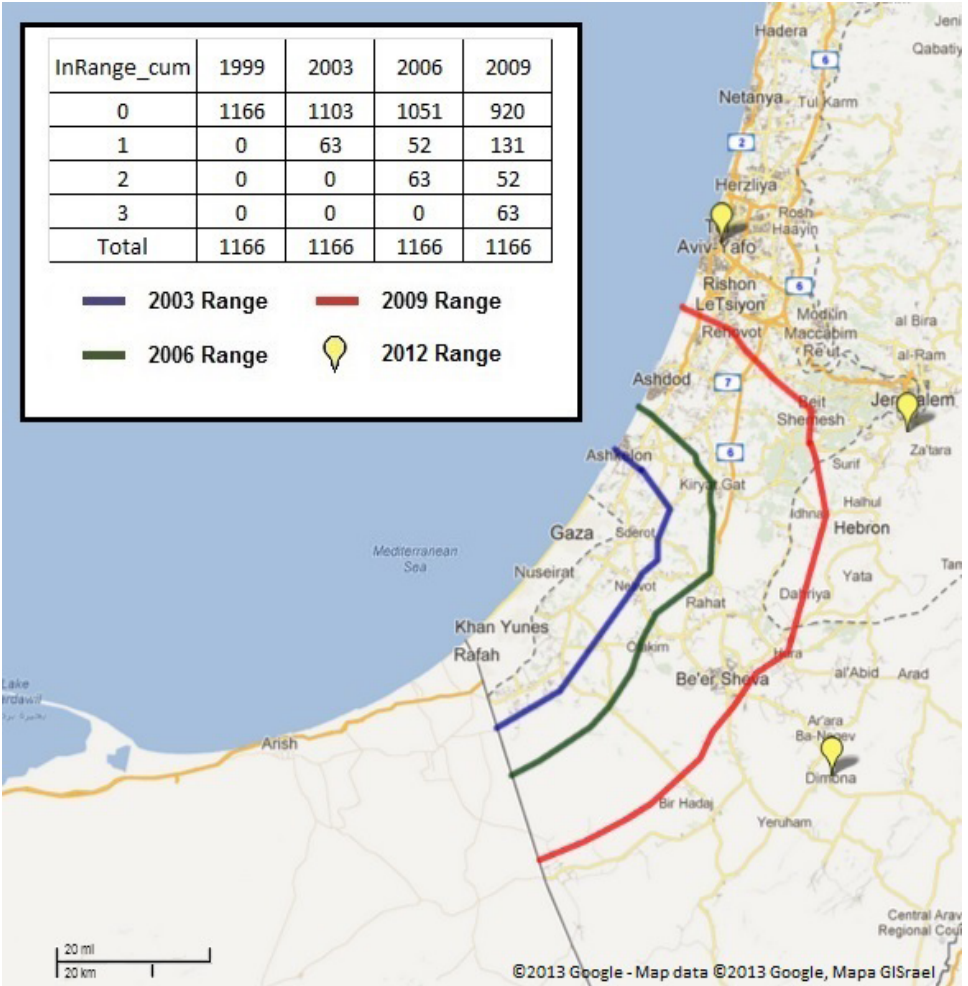
Note: There is a variety of rockets used by factions in Gaza Strip, each with their own range limit that changes with technological improvements. The InRange(_cum) variable is based on the maximum range in which these factions can fire. Range lines are roughly created based on example localities present in my data. The actual max range at each point will thus be a little further. Since 2012, rocket ranges have extended past Tel Aviv, Jerusalem, and Dimona.

Figure 8 – Scatterplots of Percent Jews Variable
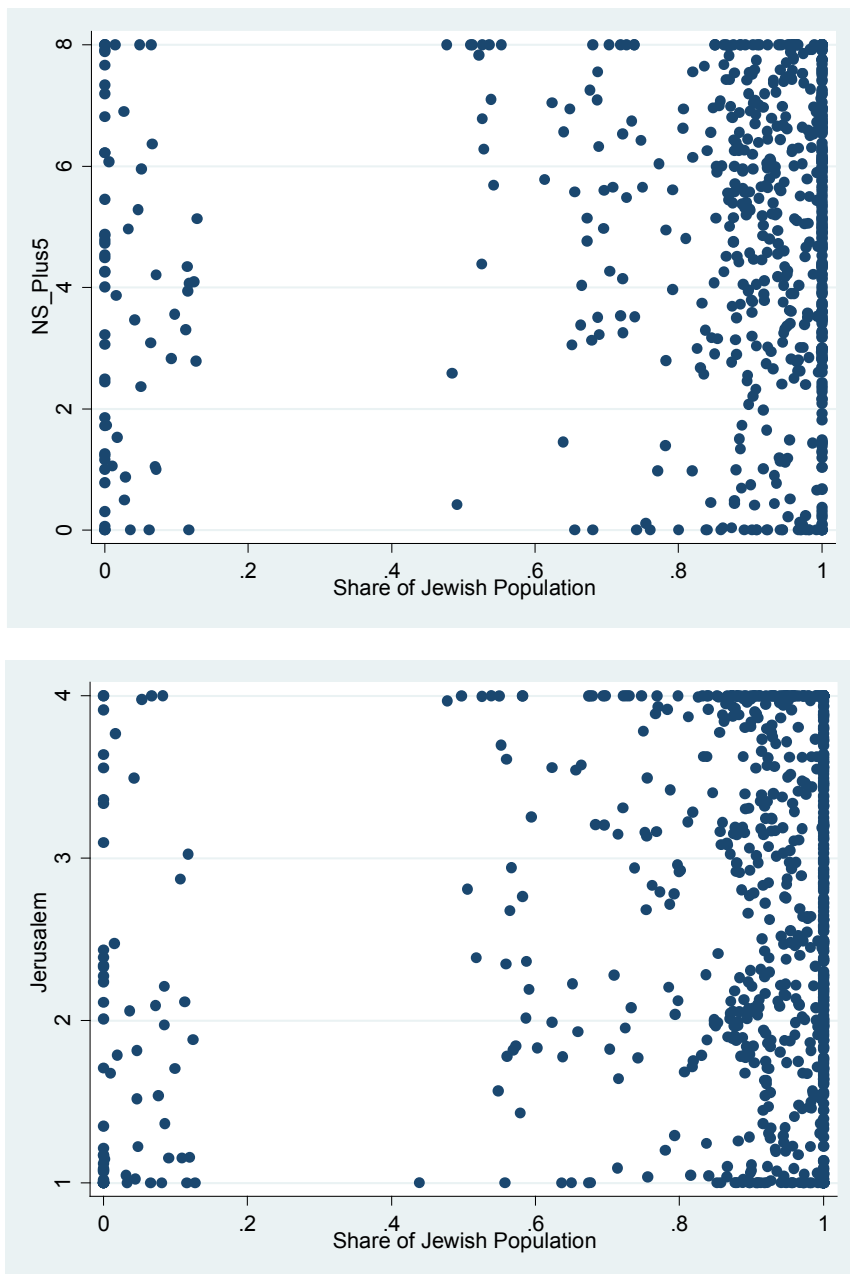
Note: The scatter plots have been created to test for possible outliers affecting coefficient results for the variable %Jews.

Figure 9 – Map of Israeli Electoral Demographics (2009)

Source: http://uselectionatlas.org/FORUM/index.php?topic=145133.0
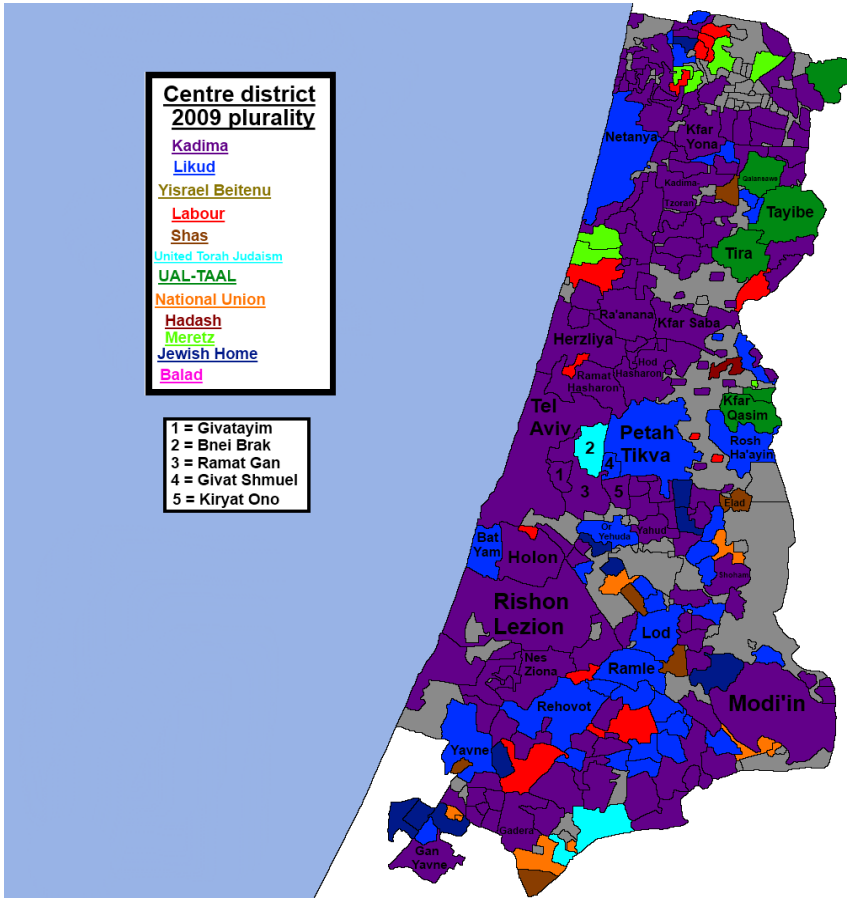
Joint Water Management Among Israel and her Neighbors: Challenges and Prospects

Ariela Garvett

This research analyzes the current state of affairs in joint water management, primarily between co-riparian parties Israel and the Palestinian Authority. The goal is to outline options for effective cooperation in this case of resource sharing whose situation is fundamentally altered by the presence of two unequal powers. Examination of the current flawed administrative structure reveals that disregard for international water law creates and exacerbates ecological and health hazards, regional instability, and mutual mistrust in both Israel and the Occupied Territories. Through adding to an ongoing debate, in which politicians and water experts agree the status quo is unsustainable, this paper critiques proposed solutions, and questions claims that water issues should be deferred to final status negotiations in the Israeli-Palestinian conflict. Historically and when applied to the conditions of this conflict, water proves to be an area in which compromise is not only possible, but can also lead to future diplomatic solutions, larger policy coordination, and settlements of key issues.

Since its creation over six decades ago, Israel has been increasingly sensitive to fragile water conditions in the Middle East. Resource policies, whether piecemeal or sweeping, in cooperation with neighbors or conducted unilaterally have been proposed and implemented with particular attention to water's agricultural, domestic, and industrial uses, and threats to sustainability. The region's geography (Figure 1) and climate make water sharing and joint management difficult among neighboring states, consequently exacerbating political and economic instability. This pattern of negative engagement can be rectified in order to help foster peace in other water disputes both in the Middle East and across the globe.

Groundwater is a particular challenge to share between any set of riparian states - those states which, in accordance with international law, share either territorial borders or a river source and therefore have rightful claims to certain bodies of water. Israel and Palestine's groundwater situation is unique, as one party occupies the other. However, lessons from nearby water sources can serve as universal models. For example, Jordan and Saudi Arabia share the Disi Aquifer, and portions of the Northeast African Aquifer lie within Chad, Egypt, Libya, and Sudan, yet coordination exists amongst these states.[1]

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1 Brooks, David B., and Julie Trottier. "An Agreement to Share Water between Israelis and Palestinians: The FoEME Proposal." (2012), 43.

Figure 1

Despite tensions among those states' governments, and disputes over other water resources (like the highly contested Nile River, which flows through ten nations), the parties have reached generally effective systems of joint management. Implementing water sharing agreements for aquifers can be especially complicated when the recharge and outflow areas are separated by national borders. By following standard international water law and precedents of practice, Israel and the Palestinian Authority (PA), should be able to resolve the challenge presented by all of their shared water sources. If the PA's claims to the Jordan River are recognized, mutual action that benefits both parties, as well as Jordan, can occur.

Along with co-riparian nations such as Lebanon, Syria, Jordan, and the PA in the West Bank, Israel retains a legal claim to the Jordan River. Issues of recognition of rights, sufficient accessibility to

potable water, and sustainable joint management extend to other shared resources, such as aquifers. This geographical reality is complicated further by Israel's tense political relationship with many of those bordering states.

The Jordan River originates at Mount Hermon in the Golan Heights and flows to the Dead Sea. A critical water source for the region, its three main tributaries course through Lebanon (Hasbani), Israel (Dan), and the territory disputed between Israel and Syria (Banias).[2] Before it reaches the Sea of Galilee (also the Kinneret or Lake Tiberias), the Jordan River runs along the border of Jordan through Israel's Hula Valley to recharge in the Hula freshwater lake. The river then continues along the West Bank's pre-1967 border with Jordan, under control of the Israeli Civil Administration. Finally, it runs along Israel's border with Jordan, emptying into the Dead Sea[3] —the lowest area in the Great Rift Valley. Israel's Mountain and Coastal Aquifers, shared with the West Bank and Gaza respectively, are equally significant to its water conflict with the Palestinian Authority.[4] Although these sources are both diverse and valuable, they are also highly susceptible to pollution and depletion, and thus, effective joint management must be a regional priority.

Where water sources trace international borders, self-interested parties are forced to acknowledge their interdependent relationships. Israel's circumstances are not unique in that regard, but its position as an occupying power fundamentally alters its method of engagement with fellow riparian states. This reality makes ensuring political, social, and environmental prosperity in the region problematic.

Various public and private bodies, institutions, and non-governmental organizations have a stake in resolving water issues among Israel, Jordan, and Palestine. Jordan, which has a peace treaty with Israel, and the PA, which in theory operates autonomously in certain parts of the pre-1967 borders and is under Israeli control in others, are direct riparians to some of Israel's most important water resources. The current situation puts the Palestinian people at a disadvantage, for Israel does not fully recognize Palestinian sovereignty, and thus, the nation's water rights. Israel is thereby relatively more secure in its quantity and quality of resources.

While Israel's desalination technology shifts state dependence away from local transboundary hydrological resources,[5] much of its domestic and industrial water still continues to rely on effective joint management with co-riparian states. Innovative plans could increase supplies and accessibility in the Levant. However, some proposed solutions would not benefit all parties absolutely, may not protect ecological systems, lack the quality of resources to meet World Health Organization standards, and fail to respond to present shortage needs. Local water issues must also be managed in consideration of the parties' economies, histories, and populations, because water, as an instrument for peace, can ensure commitment to sustainable resource sharing.

In the interim period, both sides acknowledge that many Palestinians receive inadequate water resources per capita. Though various interested groups argue over how this shortage should be corrected,

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2 Isaac, J., and Hillel I. Shuval. Water and Peace in the Middle East: Proceedings of the First Israeli-Palestinian
        International Academic Conference on Water, Zurich, Switzerland, 10-13 December 1992. Amsterdam:
        Elsevier, 1994, 124.
3 "Read Dead Canal." Friends of the Earth Middle East.
4 Brooks, 31.
5 Garb, Yaakov. "Desalination in Israel: Status, Prospects, and Contexts." Paper at Conference on Water Wisdom
        (2008), 1.

and whether that should occur immediately or in a final settlement, both Israel and Palestine accept that increasing flow and reducing extraction from shared resources to a safe level are important parts of that process. The achievement of those goals is dependent upon a combination of factors: reduction of leakages, desalination, treatment and reuse of effluents, and refining processes for improving water quality and sanitation infrastructure.[6]

All riparian nations recognize that in many areas the state of Palestine suffers from low quality and quantity of water, despite the availability of an adequate water supply. These accessibility issues are correctable through proper joint management. Close cooperation between Israel's national water company Mekorot and the Palestinian Water Authority (PWA) is paramount, because resources in the West Bank are governed by a Joint Water Committee (JWC) of Israelis and Palestinians. The Oslo peace process created the JWC as a five-year interim management body, but almost two decades later, it continues to operate in a dysfunctional and unaccountable manner. Reforming the modus operandi is especially important given that collaboration, albeit weak, exists only regarding the portions of the Mountain Aquifer lying within the West Bank, as the JWC does not have any jurisdiction over the Coastal Aquifer shared by Gaza and Israel, or the Jordan River.

The power-sharing structure of the JWC favors Israel by granting control over Palestinian resources through its committee position, without any reciprocal Palestinian oversight within territorial Israel or illegal West Bank settlements. These geographical restrictions encourage the propagation of a failed system, and consequently Palestinian access to clean reliable water is severely and unjustly limited. In response to this urgent need, several proposed solutions are currently circulating—some more successful than others in gaining public and political support—to approach the region's basic water issues administratively, environmentally, and politically.

Many water experts and environmental advocates believe a solution to these issues is both possible and easier than reaching a settlement in the other core issues of the Israeli-Palestinian conflict. They suggest that fixing water systems and coordinating policy will lead to greater collaboration in other key areas under dispute by building mutual trust and confidence in the negotiating process. History shows water rarely causes war, but rather is more often a factor in resolving conflict. In the Arab-Israeli case:

> Amidst what is often a very violent conflict that has little to do with water one witnesses – simultaneously – the extensive destruction of water infrastructure, a relatively cooperative water professional community, and loudly-contested views about who controls water. [7]

Israelis on the political right and left both believe resolution of the water issue is attainable, because room for compromise exists and is crucial to ensuring the socioeconomic survival of both players. Increased technical cooperation and the general improvement of relations is necessary to achieve this shared goal.

Overcoming present stalemates can potentially model effective cooperation, so comprehensive

6 Rabbo, Alfred Abed, and Alon Tal. "Water Wisdom: Preparing the Groundwork for Cooperative and Sustainable Water Management in the Middle East." (2010), 1-2.
7 Zeitoun, Mark. "The Conflict vs. Cooperation Paradox: Fighting Over or Sharing of Palestinian-Israeli Groundwater?" Water International 32.1 (2007), 106.

water negotiations should not delay until final status negotiations if productivity can be achieved in the meantime. In his paper presented at a conference on water and the Arab-Israeli conflict, geography professor Tony Allan raised hope in his prediction for water:

> [Water] is the one issue which has been shown to be technically and economically addressable. Water shortages have not impeded the economic development of Israel … The emulation of this experience by its neighbors, preferably with Israel's active participation, has the potential to ameliorate the impact of the water shortages of Jordan and Palestine.[8]

To repair political relationships, facts on the ground must change alongside overhauls to the current failed agencies and procedures. Therefore, asymmetrical power structures between co-riparian states should be adjusted to better suit the socioeconomic and ecological needs of all parties. Essentially, the unequal power-sharing structure of the JWC should be mitigated.

Environmental policy researcher Dr. Mark Zeitoun notes that the PWA has actual control over only about seven percent of water produced in the West Bank:

> Less than one-quarter of the land within the Palestinian political boundary of the West Bank is subject to equal Palestinian-Israeli joint management, with the rest subject to an approval mechanism that would – and does – prioritize Israeli military objectives over Palestinian developmental or environmental objectives.[9]

According to international water law, equitable access among riparian nations is a right. Israel does not recognize Palestinian claims to the portion of the polluted Jordan River that follows its effective border with Jordan. The West Bank is therefore forced to depend completely upon the Mountain Aquifer. This aquifer is the only shared Israeli-Palestinian source to which Palestine is the upstream riparian, and that is why Israel has pursued one-sided policies to control, divert, and over-extract.

Like many other shared resources of the region, the Mountain Aquifer's Eastern Basin has become increasingly polluted through failures in joint management. This important source is governed by an agreement that essentially considers it immobile and stable, similar to territory that can be divided into shares by riparian states.[10] Unreasoned and untenable, this structure contributes to the flawed procedures and operations of the JWC. Unsustainable practices regarding the Mountain Aquifer are possible because this approach theoretically caps the volume of water allocated to Palestine, when in fact the aquifer cannot endure constant natural and manmade changes.

The portions of the Mountain Aquifer within the West Bank are the only major sources over which Israel and the PA coordinate. Established by the Oslo II regime, this system was designed by the Israeli government to maintain the status quo of water management implemented in 1967. Israel defines

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8 Allan, Tony. "Israel and Water in the Framework of the Arab-Israeli Conflict." Occasional Paper 15: SOAS Water
        Issues Group (1999), 6.
9 Zeitoun, 112.
10 Brooks, 14.

the scope and operations of the JWC, granting approval for water and sanitation projects gradually and through a cumbersome process. Larger structural problems are attributed to a high absence of cooperation, supposedly the intent of this expired committee, as evidenced in this case study of the JWC:

> There has been no policy coordination over the territory that needs it most, Gaza, or over the Jordan River, to which the Palestinians claim a rightful share. Conversely, there has been continuous and truly Kafkaesque micro-coordination over West Bank water resources and supplies, reflecting Israel's interests in limiting Palestinian abstraction from the Mountain Aquifer and extending its territorial presence within the West Bank, whilst 'subcontracting' responsibility for local water management.[11]

In Area C of the West Bank, Palestinian projects require both JWC and Israeli Civil Administration approval. This process often takes years to complete, especially with plans of Israeli settlers being approved at significantly higher rates. Further, whereas the JWC mandates that each side enforce their responsibilities in areas under their control, Palestinian authorities cannot ensure committee measures like proper waste management are carried out in Area C, which constitutes the majority of West Bank territory including all Israeli settlements. The process for introducing important water infrastructure thereby repeatedly outweighs mutually beneficial projects, because occupation and an asymmetrical power structure allow sources like the Mountain Aquifer to be continuously and needlessly degraded.

One essential political problem, beyond disruptions in management owing to the division of the West Bank into unequal Areas A, B, and C, is that Israeli settlers do not fall under the JWC's jurisdiction. Mekorot, Israel's national water company, only seeks approval for inter-settlement projects. In practice, Palestinians have been coerced into implicitly recognizing Israeli settlements so that their own water projects will receive JWC approval, on which Israel has an effective veto power because the body requires consensus.[12] Unsanctioned Israeli and Palestinian projects often worsen the poor conditions of the Mountain Aquifer by drilling too deep into its basins, making it more susceptible to pollution, increasing its salinity, and over-extracting from this source that is naturally slow to recharge. The result disadvantages Palestinians by stalling their projects. Many then resort to drilling unsanctioned wells, entirely circumventing the authority of the sole joint water body between them and the settlers whose own tolerated drilling activities are also unsustainable.

Palestine's asymmetrical power relationship with Israel is also evident in the lack of progress on cross-border streams flowing from the West Bank across the Green Line into Israel (Figure 2). A connection of streams coursing from Nablus into the Mediterranean provides a critical example of failure due to lack of policy coordination. Untreated sewage and industrial effluent from the West Bank flow into Israel via the Zomar-Alexander Basin, posing health hazards to communities and endangering local ecology. Where proper measures for implementation and willingness for compromise are absent, ineffective, one-sided "solutions" have inadequately addressed this case, even though the lack of established borders does not

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11 Selby, Jan. "Cooperation, Domination, and Colonisation: The Israeli-Palestinian Joint Water Committee." Water
    Alternatives 6.1 (2013), 18.
12 Selby, 7.

prevent collaboration on wastewater treatment projects. The JWC is so poorly managed that it cannot solve circumstances detrimental to both sides.

Current failures in administrative oversight and joint management have caused half the wastewater flowing through the Alexander Stream to percolate into the ground before treatment, further polluting the vulnerable basins of the Mountain Aquifer.[13] Both states recognize the critical need for large-scale wastewater treatment, especially around Area C where most industrial saw mills operate. In response, Israel constructed a plant just over the Green Line. While this treatment center stems the spread of toxic contamination, it is only a temporary, partial solution, and in no way improves water conditions in Palestinian villages.

In international conflict, water issues are generally considered easier to resolve than territorial questions. Yet much disagreement still exists regarding the portions of transboundary sources to which Palestinians have valid claims, how large a role desalinization should play in addressing shortages, the water usage of Israeli settlements, and the PWA's effectiveness in implementing any future accord in best serving its population. There is also dispute over how to best share water based on "rights" or "needs" of a people.[14] Conventional international law and common ethics assert that water should be shared in a way that is "economically efficient, socially equitable, ecologically sustainable, and practically implementable."[15]

Some believe an agreement that fairly includes these parameters is impossible, because although settlement of this issue is achievable, each side will need to make difficult sacrifices that conflict with their political principles. In a 1999 presentation, Professor Tony Allan argued that water claims would not be completely satisfied, but that quantity of water per Palestinian would increase after a peace accord, which he predicted would occur within a decade.[16] That reality has failed to materialize, so nongovernmental sources have stepped in and produced independent answers to the region's key water issues.
A report by Friends of the Earth Middle East (FoEME) outlines four primary objectives for a successful accord between Israel and the state of Palestine: a water management agreement must be 1) economically efficient, 2) socially and politically equitable, 3) ecologically sustainable, and 4) practical and implementable. The current system has clearly been unsuccessful in those parameters.[17] Many politicians and water experts are attracted to innovative technological solutions, promising to fulfil the above tenets without renegotiating the administrative structure.

The Red Sea-Dead Sea Conduit offers a novel physical approach to achieving reasonable—but not necessarily equitable—utilization, without directly addressing the political problems of water sharing among Israel, Palestine, and Jordan. Discussed for many years, in December 2013 an agreement was finally signed in Washington D.C. to build a canal between these two diverse bodies of water. The project's aim is to prevent the rapid decline of the Dead Sea by transporting water from the Red Sea. Changing elevation will generate electricity that will be partly used for desalination and pumping potable water to Amman.[18]

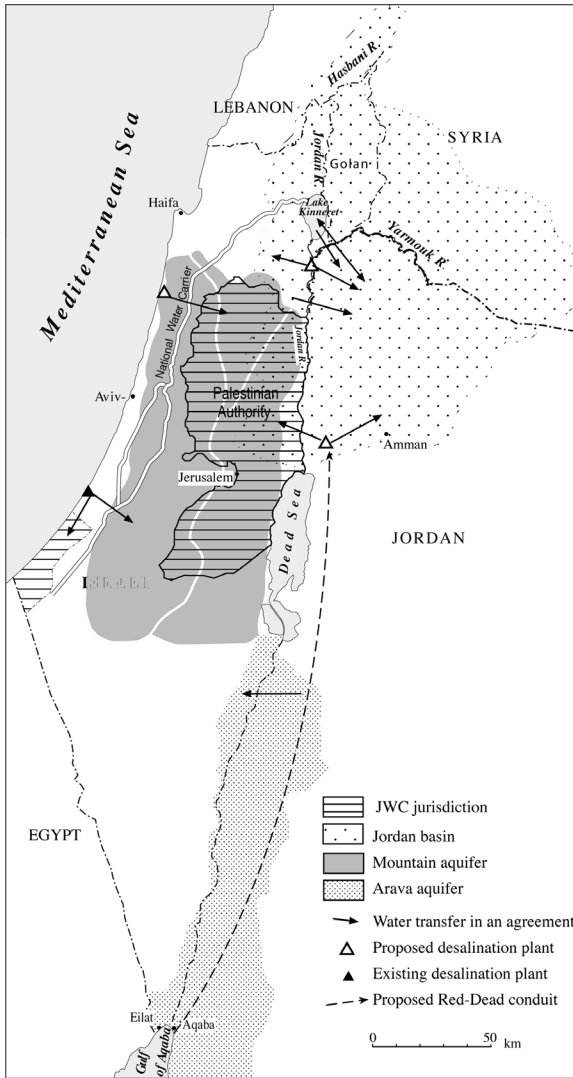13 Rabbo, 6.
14 Rabbo, 2-3.
15 Brooks, 22.
16 Allan, 2.
17 Brooks, 70-73.
18 Garb, 5.

Figure 2

Several environmental groups have raised concerns about this plan, especially as its creation is nearing reality. FoEME believes the Red-Dead Canal requires further independent study beyond that of the existing World Bank-approved local teams. This NGO also notes that the project could take up to twenty years to complete, and would therefore fail to address the immediate needs of the Dead Sea, which

is currently shrinking at a rate of one meter per year.[19] In the scientific opinion of the FoEME, propositions such as changing the chemical composition of the Dead Sea to curtail its falling levels are misguided. The FoEME believes that the issue would be better resolved by increasing flow from the Jordan River through more sustainable, collaborative measures..

Additionally, it is important to consider that this plan, while innovative and multi-purposed, does not revise the water sharing system that fundamentally disadvantages the state of Palestine. The PWA acknowledges the many benefits of desalination in reducing regional water shortages. Nevertheless, because Israel rejects Palestinian claims to the Jordan River and other portions of the Mountain Aquifer whose ecological vulnerabilities are being aggravated by illegal settlements and Israel proper, the Palestinian government is wary of committing to a desalination solution in favor of conceding water rights. Although Israel is a pioneer in this technology and could assist its neighbors in building such infrastructure, desalination is expensive and not without significant environmental costs. This option may be carefully considered, but other fundamental changes to the power structure must occur to achieve fair and effective joint water management.

"Hydro-peace" is necessary to ensure equitable access in sharing secure water and responsible environmental management. The conditions of available water in this region of the Middle East are deteriorating rapidly, and could create a humanitarian crisis if left unresolved. Although it is a crucial transboundary resource, water's place in the Arab-Israeli conflict has been unnecessarily deferred to final status negotiations. As it continues to be diverted, polluted, and mismanaged, resolutions to this problem are being held hostage by politicians, despite the fact that the issue requires timely action, and can be addressed along the lines of more just proposals like that of FoEME.

According to international water law, and the principles of the FoEME management proposal, an agreement must provide reasonable utilization, avoidance of significant harm to other users or nations, advance notification, consultation on projects by fellow riparian states, exchange of information between the sides, and peaceful settlements of disputes.[20] The current system has failed to meet any of those seven standards. For that reason, there is an immediate need to codify a new method of cooperation, based on equitable joint management and input of relevant, qualified people and/or institutions, regardless of the status of talks in the larger peace process.

Water encourages interdependency, despite the instinctual desire of riparian states to pursue their own self-interests. Specifically in the Israeli-Jordanian-Palestinian case, Israel has previously demonstrated its ability to sharply cut water usage since 1986.[21] As the decidedly advantaged and more technologically experienced side, Israel can demonstrate a willingness to cooperate by assisting its counterparts in achieving a sustainable future, via a just agreement. Desalination is one of many viable options. This strategy has worked before in improving relations among riparian nations around the world. Such an accord between Israel and Palestine, with respect to Jordan, makes sense ecologically, geographically, and politically—based on interim borders—and has the power to embolden political leaders in their pursuit of other final status negotiations.

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19 "Red Dead Canal."
20 Brooks, 42.
21 Allan, 6.

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Party Ideology, Elections, and the Exchange Rate: A Regression Discontinuity Design

Thomas Hasenzagl

I examine whether partisan political differences have effects on real and nominal effective exchange rates using a new panel data set of parliamentary elections in 31 countries. Specifically, I argue that a left-wing victory will lead to currency depreciation and a right-wing victory will lead to a currency appreciation. Applying a regression discontinuity design to deal with the endogeneity of elections, I do not find a significant effect of partisanship on the exchange rate. This could be due to the absence of an effect, or to the small amount of usable data in the regression discontinuity design.

1. Introduction

This paper investigates whether the level of the exchange rate responds to victories of left or right-wing parties. Based on the Rational-Partisan Theory, it is hypothesized that a left-wing victory would lead to currency depreciation while a right-wing victory would lead to a currency appreciation. Using data from 31 parliamentary democracies from 1970 to 2010, this paper estimates the effect of election outcomes on the level of a country's exchange rate using a regression discontinuity design (RDD).

The exchange rate is an important variable since it links a country to the global market and affects the value of exports and imports to and from countries. Furthermore, financial integration and the relaxation of capital controls have made the currency market the biggest financial market in the world in which over a trillion U.S. dollars worth of transactions are created daily. There is a large body of empirical literature on the economic determinants of the exchange rate, but when it comes to political factors, especially party control, studies are inconclusive. One problem is that researchers trying to estimate party effects on the economy face an identification problem. A correlation between political parties and the level of the exchange rate does not necessarily imply causation since governments are not selected randomly. Specifically, two kinds of endogeneity problems may arise: (1) a causality bias and (2) an omitted variable bias. Since both of these problems can cause a correlation between a variable and the error term, the results of an ordinary least squares (OLS) estimation might be biased.

A causality problem occurs when a factor that determines one variable depends on that same variable. In this case, an election outcome may appear to have influenced exchange rates, when in fact the election outcome was itself caused by the exchange rate. The omitted variable bias occurs when important variables are left out of a model. Since it is impossible to account for all variables that affect voter preferences, omitted variable bias is likely to occur in any model that is concerned with election outcomes.

Alternatively, an unknown variable can potentially influence both election outcomes and exchange rates.

Ideally, these problems could be solved by randomly assigning left and right-wing parties to office while holding everything else constant. Obviously, this is neither possible nor would it be in the best interest of a country's citizens. A more feasible alternative is to simulate a randomized experiment using a RDD.

The general idea of RDD is that in close elections, the winner will be nearly randomly assigned, assuming no manipulation of outcomes. Therefore, countries in which a party barely won the election are ex ante comparable to countries in which a party barely lost an election. Democratic election systems have the property that party control changes around the 50 percent mark. Parties falling just above this mark are comparable in all of their characteristics except for the treatment. In other words, when party control is randomly assigned around a cutoff (i.e. the 50 percent mark) it will be possible to estimate an effect of a treatment (i.e. a left-wing victory) on an outcome (i.e. the exchange rate). This way, despite the absence of an experiment RDD can identify the causal effects of a treatment.

2. Literature Review

The theoretical framework of this paper is based on the political business cycle theory. Nordhaus [1975] proposed that politicians want to create the best economic conditions right before elections in order to appeal to voters, even though those policies might be costly after the election. His main assumption was that politicians are identical and opportunistic. Their only objective is to stay in office, which gives them an incentive to choose polices that strengthen their chances of being reelected. In his model, political ideology does not influence policy choice. Nordhaus also assumed that "myopic," or retrospective voting behavior, occurs when voters elect incumbent parties due to positive existing economic conditions. Therefore, in order to improve their chances of being reelected, incumbent politicians will lower unemployment through expansionary monetary policy shortly before an election, even though the policy might lead to higher inflation in the long run.

Nordhaus's model has often been criticized for its unrealistic assumption of opportunistic leadership. Hibbs [1977] relaxed these assumptions in his partisan theory. While keeping the idea of myopic voting behavior, he included partisan preferences into his model. Specifically, he assumed that politicians want to deliver benefits to their constituencies. Therefore, left-wing governments try to appeal to lower middle class voters by decreasing unemployment while right-wing governments try to appeal to upper middle class voters by lowering inflation.

Alesina [1987] challenges this model with his rational-partisan model. He replaces myopic voting with rational voting and, using an expectations augmented version of the Phillips Curve, concludes that only unexpected changes in inflation influence output. Specifically, he argued that if workers have full information about the expected inflation rates under left and right-wing governments, they will update their wage contracts prior to elections, taking the respective probability of a left or right-wing victory into account.

My paper is interested in party effects on the exchange rate. The connection between elections and the exchange rate has been made in the past. The effects of exchange rates on different interest groups and their subsequent effect on elections have been treated intensely by Frieden [1991], Frieden et al. [2009] and Broz and Frieden [2001]. Other studies show that currency depreciation can be politically costly since it signals that a government has a low commitment to the exchange rate and is weak on the economy. Not

surprisingly, Bernhard [2002] finds that currency devaluations have a negative effect on a government's approval ratings.

Bernhard and Leblang [2000] used a sample of elections from 16 parliamentary democracies from 1970 to 1995 and found that a leftward shift increases the probability of a speculative attack since it raises doubts about the government's commitment to the exchange rate. Bernhard and Leblang [2002] argue that as political uncertainty increases, the exchange rate risk increases, contributing to an exchange rate premium. Bachman [1992] investigated a political explanation for the forward exchange bias: the observation that forward exchange rates are biased in their predictions of future exchange rates. About half of the elections in the study had a significant impact on the forward exchange bias.

All of these studies stress the importance of uncertainty in elections. Uncertainty is important for two reasons. First, currency traders anticipate government changes long before an election. If the outcome is widely anticipated, the elections will have little effect on the markets. Second, uncertainty before elections allows for observation of how market actors adjust to new information after elections. Naturally, the closer an election, the more uncertainty it creates.

Many of these studies rely on OLS models and face causality and endogeneity problems. First, there is the problem of reverse causation: with the arrow of causality pointing both directions, we can never be sure if results show the impact of elections on exchange rates or vice versa. One way to deal with this problem was proposed by Bernhard and Leblang [2006]. They used opinion poll data from Great Britain to examine both the effects of unexpected drops in public support for the government on the currency and the effects of unexpected currency depreciations on public opinion. They found that political competition influences exchange rates, while at the same time exchange rate movements influence government popularity. The second problem is that of omitted variable bias. The complexity of financial markets and the interactions between political events and markets make it easy to exclude important explanatory variables. Especially when modeling voter preferences, it is nearly impossible to avoid omitted variable bias. In addition, other factors such as oil price shocks or natural disasters will affect exchange rates and election outcomes. Since it is impossible to control for all of these factors, omitted variables bias is likely to remain.

This paper uses a different method, namely an RDD. In the past, RDD analysis has been used to study elections, mostly at the local level. Lee [2008] pioneered the use of RDD for studying elections in a study on the incumbency advantage in the U.S. House of Representatives. Other studies on the incumbency advantage face an identification problem: namely, the fact that an incumbent already won a previous election may show that he is a competent candidate and therefore more likely to win another election. Lee [2008] resolved this causality problem by using RDD. Pettersson-Lidbom [2008] studied the effect of partisanship on taxes and unemployment by applying RDD to close elections in Swedish local governments. He concluded that the victory of a left-wing party had a strong positive effect on taxes and a negative effect on unemployment, mainly because left-wing governments tended to increase the number of government employees. It seems natural to apply these ideas to financial markets. However, my approach is different in that it does not test the effects of policy changes after an election, but rather the reaction of market actors to an election outcome. While policies are implemented directly by the government, currency traders are independent of the government and act in anticipation of future policies.

3. Theoretical Framework

3.1. The Political Business Cycle

The early Political Business Cycle Theory was based on the Phillips Curve, the historical inverse relationship between inflation and unemployment. The idea behind the Phillips Curve was that in a situation with low unemployment, employers need to raise wages in order to attract labor. As a result, wage inflation will rise when unemployment remains low. However, due to theoretical critiques in combination with the historical breakdown of the inverse relationship between inflation and unemployment in the 1970s, economists have proposed modified versions of the Phillips Curve. The "New Keynesian Phillips Curve," or the "expectations-augmented Phillips Curve," imply that the inverse relationship still holds in the short run. The modified versions of the Phillips Curve have important implications for policymakers. In the short run, policymakers can reduce the unemployment rate by conducting expansionary monetary policy. In the long run, expectations for inflation will rise and unemployment will return to its natural rate while inflation remains high.

Ideally, policymakers would aim for both low inflation and low unemployment. However, since this is not possible, they need to make a choice between those two options. How do policy makers decide between policies that lower inflation and those that lower unemployment? Alesina [1987] assumes parties have distinct preferences towards economic policies because different policies benefit different groups in the electorate. Traditionally, left-wing parties are supported by labor and right-wing parties are supported by capital. Hibbs [1977] shows that the income of low income earners increases in periods of low unemployment, high inflation, and high GDP growth. The reverse is true for high income earners during periods of high unemployment, low inflation, and low GDP growth. This suggests that labor prefers periods of higher economic activity to periods of low inflation. Since labor constitutes the core constituency of left-wing parties, left-wing parties assign a higher cost to lower economic activity than to lower unemployment. Alternatively, right-wing parties, which are mostly supported by capital, will prefer lower inflation to lower unemployment.

It follows from this discussion that left-wing parties are more likely to use expansionary fiscal and monetary policy in order to boost the economy, lower unemployment, and decrease the disposable income of workers. Right-wing parties are less likely to use policies that might lead to higher inflation since they are more concerned with price stability. Therefore, when a left-wing government comes to power, inflation is expected to increase.

This idea becomes especially interesting around elections. If an election is approaching, expectations about future policies need to take potential election outcomes into account. Inflation expectations become a weighted average of inflation expectations under a left or right-wing government, with the weights being the probabilities of a left or right-wing victory. More formally this can be stated as:

$$\pi_t^e = p\pi_t^L + (1-p)\pi_t^R$$

(1)

where p is the probability that the left-wing party wins, (1-p) is the probability that the right-wing party wins, and π_t^L and π_t^R the inflation expectations for a left or right-wing government, respectively. After the election, expectations will adjust to the party in power and unemployment will return to its natural rate.

It follows that when a party is expected to win an election by a large margin, inflation expectations

will incorporate these expectations, and the expected inflation before the election will almost certainly be equivalent to the expected inflation after the election. For closer elections, predicting the election outcome becomes more difficult and there is greater uncertainty about future policies. Once an election is so close that either party is expected to win with a probability of 50 percent, predicting the winner becomes the equivalent of tossing a coin. The expected inflation prior to the election will be the average of π_t^L and π_t^R. Therefore, an unexpected left-wing victory will always lead to an increase in inflation expectations since $\pi_t^L > \pi_t^e$.

Does the partisan nature of the government prior to the election matter for the post-election outcome? In other words, can we expect a larger effect after an election in which the political affiliation of the government switches than in an election in which it remains the same? As shown in equation (1) inflation expectations after an election only depend on the uncertainty about the election outcome and not on the inflation rate prior to the election. That means that for elections that are sufficiently close, inflation expectations will differ from the rate of inflation prior to the election since they take the probability of either party winning into account. After the election outcome becomes known, inflation expectations will change by $\pi_t^L - \pi_t^e$ or $\pi_t^R - \pi_t^e$ for a left or right-wing victory respectively. Therefore, even if the actual rate of inflation does not change because the same party was reelected, inflation expectations do change.

3.2. Rational Partisan Theory and the Exchange Rate

In pegged exchange rate systems, the exchange rate is set directly by the government. In floating exchange rate systems, exchange rates are determined by supply and demand. Rational Partisan Theory suggests that a left-wing victory in an election causes inflation expectations to increase. A long run relationship between inflation and exchange rates is given by relative purchasing power parity. In general, Relative Purchasing Power Parity (RPPP) implies that countries with relatively higher inflation rates will have a devalued currency. Specifically, it states that the percentage change in the exchange rate between two countries over any period is equal to the difference between the change in their national price levels, or

$$\% \Delta XR = \pi - \pi^*$$
(2)

It is important to notice this only applies to the nominal exchange rate. If RPPP holds, the real exchange rate is a constant in the long run. RPPP is based on the Law of One Price, which claims that identical goods must be sold at the same price in different countries if their prices are expressed in the same currency. This implies that the exchange rate between two countries' currencies equals the ratio of their price levels so that the purchasing power in both countries is the same. This idea, the absolute PPP, tends not to hold in practice, mainly due to transportation costs. However, RPPP, which states that prices in countries differ by the same rate while allowing that the same products in different countries have different prices, tends to hold.

Consider Great Britain an example. It is assumed that Great Britain uses a floating exchange rate and that the inflation rate in the country is high relative to the inflation rate of its trading partners. If inflation is on the rise, the purchasing power of the pound sterling is decreasing. Thus investing in the pound becomes less attractive. The demand for pounds decreases and the currency depreciates.

What are the predicted effects of a left-wing victory on the exchange rate? Rational Partisan

Theory suggests that an unexpected victory of a left-wing party will lead to an increase in expected inflation. Since the exchange rate is a function of the inflation rate, an increase in the expected inflation rate will lead investors to expect a currency depreciation in the future. Assuming rational expectations, investors will rush to sell their holdings of the currency and the depreciation will occur immediately after the election rather than in the more distant future. In other words, the current exchange rate between two currencies depends on the expected inflation differentials in the respective countries.

3.3. The Inference Problem

Estimating partisan effects on the economy is challenging since parties are elected rather than randomly assigned to governing positions. Researchers face the possibility of (1) a causality bias and (2) an omitted variable bias. To deal with these problems, this paper uses a regression discontinuity design similar to the one proposed by Lee [2008]. Despite the absence of an experimental design, RDD establishes causal effects of one variable on another variable. Lee [2008] argues that RDD analysis takes advantage of "natural" or "quasi experiments," providing causal inferences with credibility comparable to a random experiment even though an actual random experiment is infeasible. The analysis makes use the randomness of close elections. In an election that is not close, expectations about election outcomes might cause market participants to behave in certain ways that affect exchange rates and may influence the election. When looking at close elections, expectations cannot drive both exchange rates and elections but exchange rates can still influence the election. Therefore, RDD does not fully eliminate the possibility of reverse causality but it eliminates the possibility of expectations influencing both election outcomes and exchange rates.

4. Empirical Framework

4.1. Regression Discontinuity

In a classical randomized experiment, experimental units are randomly allocated across treatment groups. Usually, a unit is randomly drawn from a population and is assigned to a treatment with a certain probability. Then the outcomes of the treatment can be measured. However, an experimental design is not always possible. In these cases, assignment to treatment is generally not randomized and researchers rely on correlational studies or comparative research. Here, the treatment status in a sample is self-selected rather than randomized. However, it is possible to approximate the results of a randomized experiment with a quasi-experimental design such as RDD. This discussion of RDD is based on the work of Lee [2008], Lee and Lemieux [2010], Imbens and Lemieux [2008], and Angrist and Pischke [2009]. The basic idea of RDD is to compare the outcomes for observations associated with an observed target covariate that lies close to a certain threshold. It is assumed that the treatment status is as good as randomly assigned in the close neighborhood of the threshold. In this paper, the target covariate is the left-wing vote share V. There are two general settings, the Sharp Regression Discontinuity Design and the Fuzzy Regression Discontinuity Design. In the sharp RDD, which is used in this study, treatment status is a deterministic function of the covariate. Suppose that in

$$I_{it} = \begin{cases} 1 \ if \ v_{it} > v_0 \\ 0 \ if \ v_{it} < v_0 \end{cases} \tag{3}$$

where v_it is the left-wing vote share for a particular country and v_0 is the threshold value. The variable I_it takes the value of 1 if a left-wing government won a plurality of seats and 0 if a right-wing government won a plurality of seats. This is a deterministic relationship: All observations for which $v\_it > v\_0$ are part of the treatment group while all the observations for which $v\_it < v\_0$ are part of the control group. The observations that were barely treated should be the same as the observations that barely were not treated so that the only difference between them is their (randomly assigned) treatment status.

Why is it reasonable to believe that the treatment status is randomly assigned in the neighborhood of $v\_it = v\_0$? Lee [2008] show that it is reasonable to believe that there is an element of chance that determines the outcome of an election. Let's assume that V depends on the predictable component Z and a stochastic component e such that V=Z+e. If there was no random component e, V could be perfectly predicted by Z since Z is known. This is often unrealistic because unpredictable exogenous factors can always influence election outcomes. With this reasoning, elections are random if it is believed that the random component e is large enough to change the election outcome. This is likely to be the case in the neighborhood of v_0 or in other words, when the election is close. However, if agents are able to perfectly manipulate the assignment variable V (i.e. vote share), the RDD becomes invalid. Even thought this is unlikely in democratic countries, the assumption will be tested using a density test proposed by McCrary [2008].

RDD tests the effect of a treatment on an outcome. In this particular case, the outcome variable Y_it is the exchange rate and the treatment is the electoral success of a left-wing party. Y_it can either be exposed to the treatment or not. If it is exposed to the treatment it is denoted by Y_it (1) and if it is not exposed to the treatment it is denoted by Y_it (0). Formally, the outcome Y_it can be written as:

$$= Y_{it}(0) \cdot (1 - I_{it}) + Y_{it}(1) \cdot I_{it} = \begin{cases} Y_{it}(0) \ if \ I_{it} = 0 \\ Y_{i,}(1) \ if \ I_{i,} = 1 \end{cases} \tag{4}$$

The goal is to compare Y_it (0) with Y_it (1) at the discontinuity point $v\_it = v\_0$ in order to estimate the causal effect of the treatment. The average causal effect is expressed in equation (5), which shows the difference in the conditional expectations given the covariate v:

$$\lim_{v_{it} \to + v_0} E(Y_{it} \mid v_{it} = v) - \lim_{v_{it} \to - v_0} E(Y_{it} \mid v_{it} = v) \tag{5}$$

3.2. Model Specification

Parametric and nonparametric approaches can be used to estimate a RDD. These approaches have both advantages and disadvantages. The parametric approach involves fitting a polynomial. The success of this approach depends on whether the polynomial is correctly specified and adequately describes the function. In the case of misspecification, what might look like a discontinuity could really be nonlinearity in the regression. Furthermore, the parametric approach often involves the use of a control function. The control function needs to be correctly specified otherwise the results will be biased. This seems like a setback since RDD is often chosen to avoid exactly such a bias. However, in many cases a lower order polynomial is a good approximation and there is little to no bias.

As an alternative to the parametric approach, a nonparametric approach can be used. The nonparametric procedure most commonly used in RDD is called local linear regression. Local linear

regression estimates the results in a small neighborhood around the treatment cutoff so that the estimate of the treatment effect does not depend on the true functional form. In some cases, a local linear regression will lead to superior results. However, it does not represent a solution to the functional form issue and can also lead to biased results. As Lee and Lemieux [2010] point out, it is impossible to know which approach produces the smaller bias without knowing the true functional form. Therefore, the local linear regression should be seen as a compliment, rather than as an alternative, to parametric estimation.

The parametric model is specified as follows:

$$\Delta XR_{it+1} = \alpha_{it} + \beta_{it} + \sum_{z=0}^{z} \gamma(v_{it})^z + \delta X_{it} + \varepsilon_{it}$$

(6)

The election is taking place at time t. The independent variable ΔXR_{it+1} is the change in the effective exchange rate in the period after the election. I_{it} was defined in equation (3). It is a dummy variable that takes the value of 1 if a left-wing party wins the majority of seats and 0 if a right-wing government wins the majority of seats. The coefficient β_{it} reflects the party effect and is the coefficient of interest. v_{it} is the vote share of the left-wing party as used in the previous discussion. The vote share variable was in constructed the following manner:

$$v_{it} = \left(\frac{Left\ Wing\ Seats}{Two\ Party\ Total}\right) - \frac{1}{2}$$

(7)

v_{it} was defined such that $v_{it}=0$ at the cutoff, where both parties win an equal number of seats. It will be $0<v_{it}<0.5$ when a left-wing government won the election and $-0.5<v_{it}<0$ when a right-wing government won the election. γ is the coefficient of the vote share variable. Since vote share is allowed to be related to the error term γ cannot be interpreted in the final results.

X_{it} is a vector of exchange rate determinants including exchange rate regime, interest rates, the balance of payment, and foreign reserves. The exchange rate regime variable was taken from Rogoff and Reinhart [2004]. Log transformed values were used for all continuous control variables. Furthermore, all control variables are lagged by one period to limit simultaneity problems.

5. Data Issues

5.1. Close Elections and Bandwidth Choice

The dataset includes parliamentary elections from 31 countries between 1970 and 2010. The election results and party ideology data was taken from Dring and Manow [2012] and the economic data was taken from the International Moneytary Fund's International Financial Statistics (IFS) or, if it was not available through the IFS, from the individual country's central banks. When only quarterly data was available, linear interpolation was used to create monthly estimates. Table 1 shows the summary statistics.

To my knowledge, a dataset of cross-country close elections does not exist. To construct the dataset, the following three conditions were used. First, the closeness of an election was based on the percentage difference of seats in the parliament between the two largest parties. Since this paper focuses on parliamentary elections the closeness of an election was determined by seats rather than by vote percentage. For example, using a bandwidth of 0.1, only elections would be used for which the seat difference between

the winning party and the closest party is less than ten percent so that a five percent swing in seats would have reversed the winner. This turned out to be useful when looking at different countries with different election systems in which it would not have been possible to look at party vote share alone. Examples include systems that award bonus seats to the party that wins a plurality of votes or systems that elect their parliaments through a combination of national and local elections. Since the final composition of the parliament is what constitutes the "outcome" of a parliamentary election, it makes more sense to look at the number of seats rather than the votes.

Second, the first party and the second party cannot share the same ideology. For example, the Belgian election in 1999 was a very close election with the Flemish Liberals and Democrats winning 23 seats while the Christian People's party won 22 seats. Both of those parties are center right parties and while they are not in a coalition with each other it seems clear that this election was won by the right-wing since the next strongest left-wing party only won 19 seats. Since this paper aims to compare the differences in right and left-wing governments around a cutoff, elections in which the two largest parties held the same ideology were left out.

Third, in some elections, there exist coalitions established before the election took place. Most importantly, this applies to party unions like the Christian Democratic Union/Christian Social Union in Germany or the Liberal/National Coalition in Australia. Since voters who vote for either party know that they are giving their vote to a coalition rather than to an individual party, coalitions that were established before the election are counted as a single party. Coalitions that were unknown before the election should not influence voting behavior and were not taken into account.

An important choice was that of bandwidth, that is the distance from the election to the cutoff. Obviously there is a bias when using data far away from the cutoff to estimate the discontinuity at the cutoff. Therefore, lower bandwidths produce a smaller bias. However, with a finite sample using smaller bandwidths will also reduce the size of the dataset and estimates will be less precise. In this paper, estimates for various bandwidths will be reported.

5.2. Limitations in the Data

There are three limitations to the data. First, the most obvious weakness is the size of the dataset, as there have only been 335 elections in the included countries between 1970 to 2010. Given the above conditions this number becomes even lower. When the bandwidth gets smaller the number of elections decreases rapidly. While there is enough data to apply the RDD, an ideal dataset would be much larger. Second, since panel data is drawn from 31 different countries over a time period of 60 years, the dataset is not homogenous. All of these countries have different institutions and different political frameworks. This might be the main reason why RDD has mostly been used on local elections within countries. However, homogeneity can be an issue in all cross-country studies. Third, nearly all of the countries have multiparty systems and in order to apply the RDD approach they need to be treated as bipartisan. This means that only the parties with the largest and the second to largest seat share are considered in the analysis. While this is necessary, it is true that it ignores smaller parties that might have gotten a substantial amount of votes. However, after most parliamentary elections the winning party receives the mandate to form a government and third parties are at best potential coalition partners and should not influence the party effect.

6. Results

6.1. Nonparametric Estimates

Figures 1 through 4 show the graphs of the local linear regression. Figures 1 and 2 illustrate the regression discontinuity design of the nominal and real exchange rates on all available data. Figure 2 and 3 illustrate the regression discontinuity using only data from elections close to the cutoff (5 percent of vote share on either side). All four figures plot the change of the exchange rates in the period after the election as a function of the vote share v_it. The cutoff is at v_it=0, the point at which the left and right-wing parties have the same number of seats. All data points to the right of the cutoff represent elections that were won by left-wing parties and all data points to the left of the cutoff represent elections that were won by right-wing parties.

All four figures show discontinuous jumps at the 0 point. However, the jumps are small and occur in opposite of the expected direction. In Figures 3 and 4, where only close elections are displayed, the jumps are more distinct than in the other two figures. In addition, those two figures show that the number of elections close to the cutoff is very small. Therefore the local linear estimate close to the cutoff might be disproportionally influenced by only a few elections and might not show the true party effect.

Table 6 shows the estimates of the local linear regression. Ideal bandwidths were calculated using a method established by Imbens and Kalyanaraman [2009]. The numbers 50 and 200 are multiples for bandwidths in percentage form. That means that local wald 50 estimates were calculated using half of the ideal bandwidth and local wald 200 estimates were calculated using double the ideal bandwidth. As shown in the figures, the positive signs of the local wald estimates indicate a jump in opposite of the expected direction. However, estimates are statistically insignificant for all bandwidths which suggests that there is no discontinuity at the point v_it=0.

6.2. Parametric Estimates

Tables 2 through 5 report the estimates from regressions of the real and nominal effective exchange rate on party control. Every regression was run twice, once with the control function X_it and once without the control function X_it. The numbers in the table are the values of the party effect coefficient β_it, as introduced in equation (6), and the corresponding t-statistics. The estimates were obtained using different bandwidths and polynomial orders. A major concern in RDD is whether the polynomial is correctly specified. To deal with this problem, the Akaike information criterion was used to measure the goodness of fit for each specification and estimate the optimal order of the polynomial.

The results from the parametric regressions paint a similar picture to the results from the local linear regression. The existence of a party effect is only suggested in regressions using a large bandwidth. However, those regressions are very prone to bias and might not show the true effect. Significance decreases occur when the bandwidth decreases, which could either be due to a smaller sample size or the absence of a party effect. However, the fact that the direction and size of the coefficient also change suggests that it is due to the decreasing sample size.

6.3. Density Test

One of the important assumptions of RDD is that the political parties have imprecise control over the assignment variable; in this case, the vote share. This assumption cannot be tested directly but following McCrary [2008] it can be tested whether there is a discontinuity in the density of the assignment

variable. If there is a discontinuity in the density at the theshold, this may suggest that politicians were able to perfectly manipulate the treatment status. Figure 5 shows the McCrary [2008] density test of the vote share variable. The figure shows that there is no jump in density of observations at or near the cut-off point, and therefore there is no evidence of a manipulation of the assignment variable.

7. Discussion and Conclusion

This paper cannot identify a party effect on the exchange rate using RDD. The expected jump in the regression at the cutoff point could not be identified. It it not clear whether this is due to limitations in the data or due to the absence of an effect.

While issues in the data are likely, the possibly of the absence of an effect must be considered. The absence of an effect would have two important implications for the politicy preferences of both traders and politicians. First, it might be true that traders do not care about the outcome of an election. That means that a change in government might not change the demand for a country's currency. While proponents of the rational expectation theory believe that new and unexpected information about partisanship will affect market behavior, no evidence of this could be found in the exchange rate market. Second, the results might change the understanding of party competition in general. They cast doubt on the idea that different parties have different policy preferences and suggests that parties prefer similar policy outcomes, as suggested by the median voter model.

While these theoretical discussions are interesting, it is more likely that the results were due to limitations in the data. It is especially likely that the number of elections around the cutoff is too small to make accurate predictions. The small number of close elections limits the flexibility of the RDD method. However, this does not make RDD inapplicable to cross-country studies. On the contrary, this method of estimating casual relationships might prove to be more fruitful in the future, especially since the number of close national elections has been increasing continuously. Other approaches could include the incorporation of presidential and other electoral systems into the dataset to increase the sample size.

To conclude, this paper cannot provide evidence that party control has an effect on the level of the exchange rate. This failure to provide evidence can be due to data issues or to the absence of an effect. Hopefully future research, perhaps using a larger dataset, will be able to produce clearer results regarding a party effect on the exchange rate.

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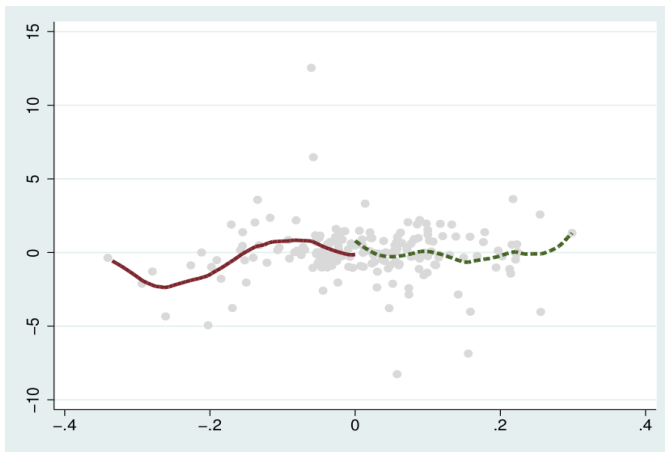
Appendix

Figure 1: Nominal Effective Exchange Rate
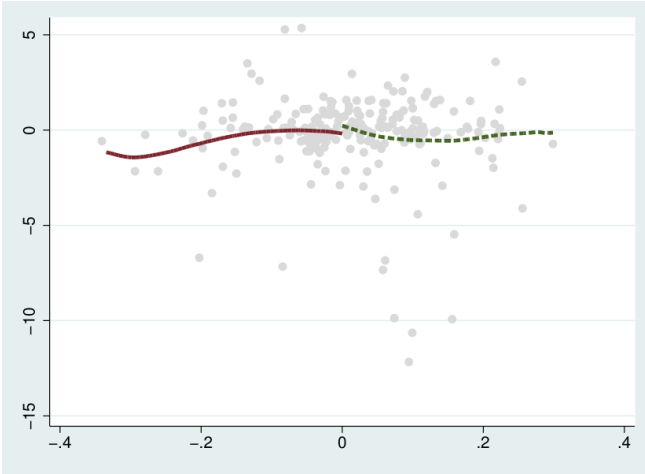
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

This figure shows the local linear estimates for the nominal effective exchange rate using a bandwidth of 1. The left-wing vote share is on the horizontal axis and the change in the exchange rate is on the vertical axis. All observations to the right of the 0 point are elections that were won by a left-wing party. All observations to the right of the 0 point are elections that were won by a right-wing party.
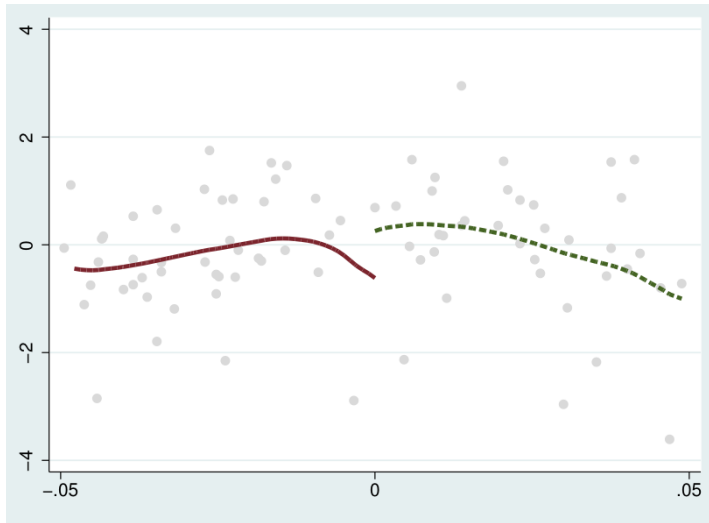
Figure 2: Real Effective Exchange Rate

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

This figure shows the local linear estimates for the real effective exchange rate using a bandwidth of 1. The left-wing vote share is on the horizontal axis and the change in the exchange rate is on the vertical axis. All observations to the right of the 0 point are elections that were won by a left-wing party. All observations to the right of the 0 point are elections that were won by a right-wing party.

Figure 3: Nominal Effective Exchange Rate for Close Elections

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

This figure shows the local linear estimates for the nominal effective exchange rate using a bandwidth of 0.1. The left-wing vote share is on the horizontal axis and the change in the exchange rate is on the vertical axis. All observations to the right of the 0 point are elections that were won by a left-wing party. All observations to the right of the 0 point are elections that were won by a right-wing party.
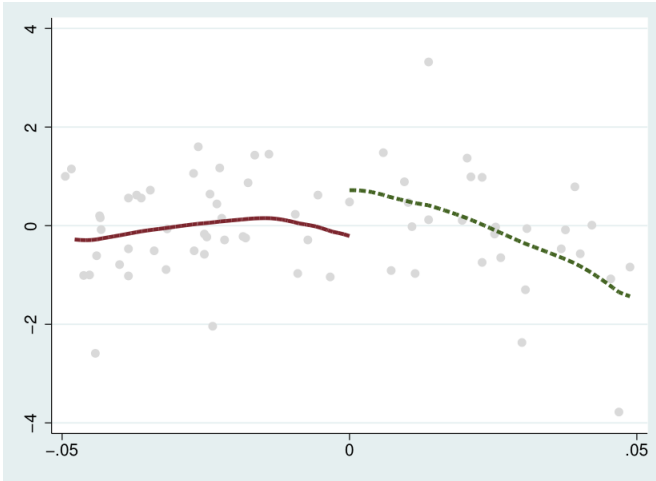
Figure 4: Real Effective Exchange Rate for Close Elections

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001

This figure shows the local linear estimates for the real effective exchange rate using a bandwidth of 0.1. The left-wing vote share is on the horizontal axis and the change in the exchange rate is on the vertical axis. All observations to the right of the 0 point are elections that were won by a left-wing party. All observations to the right of the 0 point are elections that were won by a right-wing party.

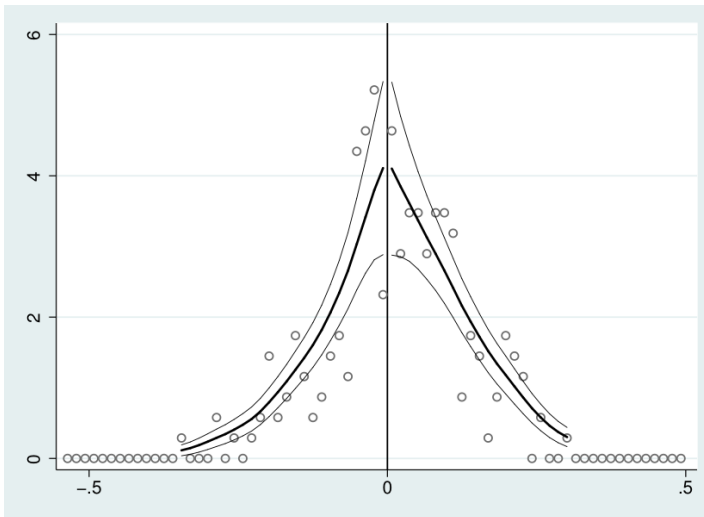*Figure 5: McCrary [2008] density test*

Table 1: Summary Statistics

Variable	Observation	Units	Mean	Standard Deviations	Minimum	Maximum
REER	262	Index, 2005=100	-0.006	1.73	-8.26	12.54
NEER	311	Index, 2005=100	-0.78	5.52	-46.53	29.51
Vote Share	277	Percentage	0.009	0.11	-0.34	0.34
Foreign Reserves	319	SDRs	1.58×10^{10}	5.64×10^{10}	0	6.36×10^{11}
Discount Rate	251	Percentage	8.91	8.65	0.1	74.4
Balance of Payments	246	US Dollars	6.6×10^{8}	8.51×10^{9}	8.51×10^{9}	1.25×10^{11}
US Dollar NEER	333In	Index, 2005=100	73.08	29.14	29.14	117.76

Table 2: RD Estimates of the Real Exchange Rate with Controls

Bandwidth	1.00	0.50	0.25	0.10	0.05
Order of Polynomial					
Zero	-0.026 (-0.07)	-0.13 (-0.33)	-0.4 (-0.96)	-0.27 (-0.98)	0.2 (1.46)
First	-1.37* (-2.53)	1.14* (-2.11)	-0.55 (-0.76)	0.68 (1.14)	0.21 (1.61)
Second	-1.35* (-2.56)	-1.25* (-2.32)	-0.09 (-0.53)	0.87 (1.49)	0.23+ (1.75)
Third	-0.89 (-1.28)	-0.76 (-1.03)	-0.08 (-0.08)	0.64 (0.79)	0.23 (1.67)
Forth	-0.93 (-1.29)	-0.7 (-0.96)	0.87 (0.82)	0.64 (0.77)	0.23 (1.65)
Optimal order	2	2	4	4	2

+ p< 0.10, * p< 0.05, ** p< 0.01, *** p< 0.001

This table reports the coefficient of the party ideology variable of the RDD for the real effective exchange rate. Values are reported for different bandwidths and polynomial orders. The optimal order of the polynomial was chosen using the Akaike information criterion. T-statistics are in parentheses.

Table 3: RD Estimates of the Real Exchange Rate without Controls

Bandwidth	1.00	0.50	0.25	0.10	0.05
Order of Polynomial					
Zero	-0.65 (-0.64)	-0.236 (-0.91)	-0.249 (-0.86)	-0.0958 (-0.36)	0.310 (0.87)
First	-0.780+ (-1.74)	-0.623 (-1.34)	-0.178 (-0.30)	0.711 (1.18)	0.520 (0.58)
Second	-0.625 (-1.55)	-0.665 (-1.42)	-0.086 (-0.15)	0.857 (1.51)	0.515 (0.56)
Third	-0.458 (-0.82)	0.173 (0.28)	0.960 (1.17)	0.594 (0.71)	1.316 (0.94)
Forth	-0.279 (-0.47)	0.224 (0.36)	0.999 (1.21)	0.599 (0.71)	1.068 (0.77)
Optimal order	2	3	3	2	1

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

This table reports the coefficient of the party ideology variable of the RDD for the real effective exchange rate without the use of controls. Values are reported for different bandwidths and polynomial orders. The optimal order of the polynomial was chosen using the Akaike information criterion. T-statistics are in parentheses.

Table 4: RD Estimates of the Nominal Exchange Rate with Controls

Bandwidth	1.00	0.50	0.25	0.10	0.05
Order of Polynomial					
Zero	1.44+ (1.93)	1.37+ (1.73)	1.41 (1.54)	0.03 (0.11)	0.06 (0.14)
First	-0.033 (-0.02)	-0.18 (-0.09)	0.75 (0.32)	0.79 (0.80)	-1.27 (-1.09)
Second	-0.023 (-0.01)	-0.27 (-0.13)	0.41 (0.18)	0.68 (0.79)	-1.5 (-1.20)
Third	-1.82 (-0.71)	-2.09 (-0.77)	2.25 (0.71)	-1.29 (1.10)	-1.68 (-0.69)
Forth	-2.11 (-0.80)	-2.03 (-0.74)	1.16 (0.33)	-1.23 (-1.03)	-3.17 (-1.21)
Optimal order	1	1	1	3	1

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
This table reports the coeffcient of the party ideology variable of the RDD for
the nominal effective exchange rate. Values are reported for different bandwidths and
polynomial orders. The optimal order of the polynomial was chosen using the Akaike
information criterion. T-statistics are in parentheses..

Table 5: RD Estimates of the Nominal Exchange Rate without Controls

Bandwidth	1.00	0.50	0.25	0.10	0.05
Order of Polynomial					
Zero	1.61 (1.93)	1.57 (1.73)	0.72 (1.54)	0.05 (0.11)	0.4 (0.14)
First	-0.06 (-0.06)	-0.17 (-0.17)	-0.1 (-0.09)	0.61 (1.09)	0.13 (0.16)
Second	-0.04 (-0.05)	-0.21 (-0.21)	-0.39 (-0.33)	0.55 (1.01)	0.18 (0.21)
Third	-0.46 (-0.39)	-0.4 (-0.3)	0.23 (0.14)	0.21 (0.27)	1.59 (1.25)
Forth	-0.38 (-0.31)	-0.5 (-0.37)	-0.17 (-0.11)	0.22 (0.27)	1.67 (1.39)
Optimal order	1	1	1	2	4

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

This table reports the coeffcient of the party ideology variable of the RDD for
the nominal effective exchange rate without the use of controls. Values are reported for
different bandwidths and polynomial orders. The optimal order of the polynomial was
chosen using the Akaike information criterion. T-statistics are in parentheses.

Table 6: Local Linear Estimates

	Bandwidth	REER
local wald	0.0711	0.999 (1.76)
local wald50	0.0355	0.929 (1.44)
local wald200	0.142	0.253 (0.65)
	Bandwidth	NEER
local wald	0.0491	0.465 (0.59)
local wald50	0.0245	1.314 (1.02)
local wald200	0.0981	0.143 (0.21)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

This table shows local wald estimates for di_erent bandwidths. They were obtained in STATA by using the -rd- command from Nichols [2011].

T-statistics are in parentheses.

The Experiment and the Exception: Legalization and Regulation of Marijuana in Uruguay

Clarissa Lehne

The essay attempts to answer the following questions: What economic, social and political factors have led to the prospective legalization and government regulation of marijuana production and consumption in Uruguay? Is this new approach likely to gain traction throughout the Latin American region?

Uruguay is poised to become the first country in the world to legalize and regulate the cultivation, distribution, and consumption of marijuana. The Senate passed a bill intended to inhibit trafficking of the drug on December 10, 2013 (BBC 2013b). This bold legislative overhaul is emblematic of a regional shift in opinion, away from the prohibitionist and ineffectual 'war on drugs,' in favor of a more progressive policy frame (Baum 1996; Armenta, Metaal, and Jelsma 2012). In January of this year, José Miguel Insulza, Secretary General of the Organization of American States (OAS), published a statement asserting that, "the drug problem is one of the most important challenges facing the hemisphere, […], that the current approach [...] has not been successful and is not working well enough […]" as well as calling for "new and better alternatives," (Organization of American States 2013, 9).

Uruguay's "new and better alternatives" are unlike any other previously proposed or implemented models. The bill outlines a system of permits and regulatory mechanisms. It provides four avenues of public access to marijuana:

1. Medical, through the Ministry of Public Health
2. Domestic cultivation of up to six plants with a maximum annual yield of 480g
3. Membership of cannabis clubs, with up to 45 members and 99 plants in total
4. Licensed sale in pharmacies, up to 40g a month per person (Ramsey 2013, 4; Hetzer 2013; Regulación Responsable 2013)

Regarding large-scale production, the bill empowers the government to authorize facilities to produce hemp (which can be used in textiles and paper production) and marijuana for personal medicinal use (Regulación Responsable 2013). The market, as the bill dictates, will be subject to four principal regulatory measures:

1. Prohibition of sale to minors
2. Penalties for those who drive under the influence of the substance
3. Penalties for those who produce marijuana without authorization
4. Prohibition of advertising (as with cigarettes) (Hetzer 2013; Regulación Responsable 2013)

While decriminalization of personal possession is increasingly common worldwide (Rosmarin and Eastwood 2012), the Uruguayan proposal aims to establish a far more ambitious system of production and consumption within a stringent supervisory framework. As evidenced by the preceding brief overview of the bill, the intended change does not signal liberalization of drug policy, but rather introduces "strict government control into a marketplace where currently there is little or none" (Rolles and Murkin 2013, 27). It is crucial to note that Uruguay never criminalized the possession of drugs for personal use (Jelsma 2009, 1). This stance was affirmed in 1974, by Law-Decree N° 14.294, Article 31, updated in 1998 by Law 17,016, which stipulates:

> Whoever is in possession of a reasonable quantity exclusively destined for personal consumption-- as morally determined by the Judge, who would have to include his reasoning for such ruling in the sentence-- will be exempted from punishment. (El Senado y la Cámara de Representantes de la República Oriental del Uruguay 1998; translation from: Jelsma 2009, 1)

As such, Uruguay already has a more progressive drug policy than any other country in Latin America and, indeed, than most countries in the world.

Uruguay has not, as of yet, diverged so far from the norm as to authorize the supply of illicit substances. The production of "any manner raw materials or substances […] capable of producing psychological or physical dependency" is punishable with "20 months to 10 years in prison" according to Article 30 of the current law (El Senado y la Cámara de Representantes de la República Oriental del Uruguay 1998; translation from: Garibotto 2010, 81). This leads to an unfortunate contradiction whereby two people possessing the same amount of a substance intended for personal use are judged differently in the eyes of the law, and by nature of the manner in which they procured that amount of illicit substance. The individual who produced the narcotic independently is a criminal, while the person who purchased it through the black market has not committed a crime (Garibotto 2010, 81–82). This inconsistency undermines the legitimacy of Uruguay's current narcotics legislation.

Uruguay's problematic Article 30 is, unsurprisingly, in accordance with international law. The three United Nations drug conventions of 1961, 1971, and 1978 have played a vital role in molding the global prevalence of proscription. Spurred by the UN's patently myopic goal of "a drug-free world" (United Nations 1998), "every country criminalizes the production and sale of cannabis, cocaine and opiates (except for limited medical use) [and] most countries also criminalize simple possession of small amounts of the prohibited substances" (Levine 2003, 145). Some say the United States (US) has "exploited its hegemonic status" (D. R. Bewley-Taylor 2003, 174) to defend this restrictive global policy regime. The country's staunch support for restrictive policy, coupled with the inflexibility of existing treaties, has made it extremely difficult for countries to experiment with alternative approaches to substance law (Bewley-Taylor

2003).

The Uruguayan government's current efforts have been met with "concern," "regret," and calls for review by several UN bodies (United Nations News Service Section 2013b). In response to the Senate's recent decision, the President of the International Narcotics Control Board (INCB), Raymond Yans, expressed surprise that the country had "'knowingly decided to break the universally agreed and internationally endorsed legal provisions of the treaty [of 1961]'" (Dahl 2013). Nevertheless, UN members are increasingly pushing back against the antiquated international conventions. A document detailing member states' policy recommendations that leaked from the United Nations Office on Drugs and Crime (UNODC) in December of this year confirmed that "discontent is growing among national governments and in the corridors of New York and Vienna" (Oakford 2013). In response to this discord, a Special Session of the UN General Assembly focused on the drug problem is scheduled for 2016 (United Nations News Service Section 2013a).

This stagnant international context has had immeasurable influence on Latin American drug policy. These governments cannot set strategy within a national, or even regional, vacuum because the drug trade is a international in scope (Stares 1996). As a result, Latin American countries have long embraced a position that is arguably working to their detriment. Academics and activists alike have charged drug prohibition with contributing to corruption of politicians and law enforcement officials (Weyland 1998; Millard 1997), overburdening these countries' penitential systems (D. Bewley-Taylor, Hallam, and Allen 2009, 6), aggravating both drug-related and non-drug-related violence (Miron and Zwiebel 1995, 177–178), and being economically unsound (Miron and Zwiebel 1995). These harmful effects are only gradually beginning to sway Latin American governments towards policy revision.

Over the past decade, Mexico, Argentina, Chile, and Colombia have all decriminalized the possession of marijuana for personal use to various degrees (Transnational Institute 2013a; Nadelmann 2012). Brazil and Ecuador appear likely to follow suit (Transnational Institute 2013a). However, this apparent trend is rife with ambiguities, necessitating cautious interpretation. Colombia, for example, has suffered an ongoing stalemate, because of the contradictory positions of its executive and judicial bodies (Drug Policy Alliance 2012). The 2009 Mexican Ley de Narcumenudeo (the Small-Scale Drug Dealing Law) sets maximum-quantity thresholds that are so low, "they will potentially label more drug users as traffickers than before decriminalization and will subject them to harsher penalties" (Rosmarin and Eastwood 2012, 27). Chile's Law 20.000, passed in 2005 and revised in 2007, decriminalizes the possession of drugs for immediate personal use in a private setting, but specifies no threshold quantities, leaving the measures of legality entirely at the discretion of the presiding judge (Transnational Institute 2013c).

The simplicity, directness, and reach of the Uruguayan approach are laudable in comparison with the ill-defined and tentative legal developments occurring in neighboring states. That being said, the concerns that fueled its adoption are equally salient, if not more so, in these other countries. As such, Uruguay's unprecedented actions may be those of a pioneer as opposed to an outlier. What follows is a brief explanation of the motivations behind this legislative overhaul.

In May 2012, in response to a survey conducted by Corporación Latinobarómetro, 40 percent of Uruguayans identified citizens' security as the biggest issue facing the country (Ramsey 2013, 12). 84 percent felt that the incidence of crime had increased over the previous two months (Ramsey 2013, 12). There is some truth to this view. Homicide rates hit a record high of 6.36 per 100,000 inhabitants in 2012,

which is up from 5.89 in 2011, but below 6.76 in 2009 (Castro 2012). Robberies have doubled over the past decade (Ramsey 2013, 13). Consistent with this upswing, consumption and transnational smuggling of drugs have increased (Haughton 2011, 9; Cave 2012; CIA World Factbook; Padgett 2012). Unfortunately, the introduction of cheap "cocaine paste," or "pasta base", to the Uruguayan market in the early 2000s benefitted from a spike in unemployment caused by the 2002 economic crisis (Ramsey 2013, 12). The country is also an "emerging problem state for […] transshipment and money laundering," providing a convenient point of embarkation for Europe-bound cargo (Haughton 2011, 9).

The link between illegal drug trafficking and violence is a well-established one (Goldstein et al. 1989; Miron 2004). The argument follows that, "because participants in the illegal drug trade cannot use the legal and judicial system, the marginal benefits to using violence to resolve disputes increases" (Miron and Zwiebel 1995, 177). Proponents of drug control have long maintained that drug use and crime are correlated, a conjecture that lacks substantial evidence (Stevens, Trace, and Bewley-Taylor 2005; Miron and Zwiebel 1995, 178). The Uruguayan government appears to be subscribing to the former perspective. In a recent interview, President José Mujica explained, "We are not so much worried about the drugs. What really worries us is drug trafficking" (BBC 2013a).

The aim of this proposed policy is, by this logic, to undercut the largely transnational drug-trafficking market by providing a cheaper, safer alternate provider (Ramsey 2013, 6). This is absolutely feasible. The current market price of 25g of marijuana in Montevideo is $100-$125 (Ramsey 2013, 8; Price of Weed 2013). Drug chief Julio Calzada told the Uruguayan newspaper El País in October that marijuana sales would start at a price of $1 per gram (the Guardian 2013; Heraldo 2013). His claim is not unrealistic. The National Organization for the Reform of Marijuana Laws posits that "[i]n a totally unregulated market, the price of marijuana would presumably drop as low as that of other legal herbs such as tea or tobacco" (Geiringer 2009). Caulkins et al. (2012) estimate the following:

> […] if cannabis could be farmed outdoors like other crops, we calculate that production costs would be less than $20 per pound [less than 5 cents per gram] […] even if production were confined to grow houses, a small, low-tech business could produce sinsemilla for about $400–450 per pound [approx. $1 per g] (Caulkins et al. 2012, 107).

To enhance the deterrent effect of cheaper legal marijuana on black market dealing, Uruguay could supplement the initial introduction of the legislation with increased police operations targeting gang activity (Ramsey 2013, 16).

The rise in drug-related crime has not only led to an escalation in violence, but has also seriously strained Uruguay's penal apparatus. In 2009, the country's prisons were 38 percent over full capacity (Garibotto 2010, 83). In a 2012 interview, President Mujica revealed that a third of Uruguay's 9,000 inmates were serving sentences on charges related to drug trafficking (Mujica 2012). That proportion is largely made up of "youths, and other vulnerable sectors of society, situated at the lowest levels of the drug-trafficking chain" and arrested for possession of minimal amounts of an illicit substance (Garibotto 2010, 81). This represents a serious misallocation of law enforcement resources. Moreover, the emphasis on imprisonment as the primary recourse has failed to reduce crime and recidivism (Nowak 2009, 2).

In short, the current correctional system is congested with individuals that do not represent the chief threat to Uruguay's security and gain little from their needlessly severe punishment. Its efficacy could be dramatically improved by trimming that burden.

Proponents of the newly approved Uruguayan bill have cited these, and other compelling arguments, in favor of legalization. Nonetheless, a majority of the country's population remains in opposition to the idea. A recent poll conducted by Equipos Consultores revealed that 58 percent of Uruguayans are against the measure (Castaldi 2013). This does notably reflect movement towards the government's stance from the 68 percent rate of disapproval determined by a previous survey in June (Castaldi 2013). Opponents argue that marijuana consumption leads to abuse of other, more dangerous narcotics and that the bill may pave the way for drug tourism (Romero 2013). Senator Alfredo Solari, one of the 13 senators who voted against the motion (16 approved the bill), voiced his concerns as the following:

> This project envisages a social engineering experiment and respects none of the ethic safeguards of experimentation on human beings, and these are important in the case of a substance like marijuana, which causes damage to human beings […] (BBC 2013b).

The bill contains provisions to mitigate some of these concerns. The 180,000 Uruguayans (5.5 percent of the population) who currently describe themselves as consumers (Mallén 2013) could be joined by an indeterminate number of new consumers if Uruguayans respond to lower market prices and reduced social stigma (Caulkins et al. 2012, 107). The legislative proposal does, however, limit this pool of potential newcomers to Uruguayan citizens over the age of 18 (Romero 2013). The conjecture that cannabis functions as a gateway drug has been repeatedly debunked (see for example: Morral, McCaffrey, and Paddock 2002; Tarter et al. 2006; Cleveland and Wiebe 2008). Finally, it is absolutely true that Uruguay will be seen as an experiment, and rightly so. If this shift in policy proves successful, it would be shortsighted of other countries in the region not to follow suit.

Across Latin America, countries are struggling to deal with many of the same challenges that Uruguay is now confronting. In fact, drug-related crises are arguably more acute in these other states. Peruvian prisons, for example, are 62 percent over full capacity, with its largest facility, Lurigancho, reporting an overcrowding index of 607 percent in 2006. 23.8 percent of the total incarcerated population is in prison on drug-related charges (Soberón Garrido 2010, 75–76). In 2011, the rate of intentional homicide was at 23.7 percent in Mexico, 33.2 percent in Colombia, down from 71.8 percent in 1996, and 91.6 percent in Honduras, which also has the most congested penitential system in the Americas (UNODC 2013; BBC 2005). Uruguay's figures are paltry by comparison. Lastly, political corruption and specifically 'narco-corruption' is much more widespread in countries like Mexico, Bolivia, Argentina, Colombia and Paraguay, with Chile and Uruguay consistently registering lower corruption perception indices than the rest of the region (Andreas 1998; Canache and Allison 2005; Transparency International 2013).

It is crucial to note that while the drug war has had some success at the national level, noting Colombia's decline in homicides, this national effect is always negated by its international context. Coca leaf production, for instance, has simply shifted back and forth between Colombia, Peru and Bolivia in response to the stringency of the respective governments' drug policies (Bagley 2012, 5–6). Consequently,

drug policy should ideally be harmonized at the continental, regional or even hemispheric level, in order to exhaustively eradicate drug trafficking and its corollaries.

Political opinion across the hemisphere is beginning to converge on legalization of marijuana. Several former and current leaders, including Juan Manuel Santos and Cesar Gaviria of Colombia, Otto Perez Molina of Guatemala, Vicente Fox and Ernesto Zedillo of Mexico, and Fernando Henrique Cardoso of Brazil, have come out in favor of legalization of marijuana (CMI 2012; CNN 2012; Castañeda and Gómez Mont 2013; Hetzer 2013). Public opinion throughout the region remains vehemently in favor of prohibition, but Ethan Nadelmann of the Drug Policy Alliance predicts, "[i]n the same way that Colorado and Washington had an impact on public opinion, I think the step Uruguay is taking can have an analogous impact in the regional and, to some extent, international context" (Serrano 2013).

The United States' popular and political shift in position regarding this issue has alleviated international pressure on Latin American governments (Keefe 2013). As late as 2004, evidence suggests that then-President Vicente Fox withdrew executive support from a law decriminalizing possession of small amounts of illicit substances as a result of the public objection of the Bush Administration (D. R. Bewley-Taylor 2012, 171). The actions of Colorado and Washington have made such objection to decriminalization almost impossible, freeing Latin American countries to finally enact strategies tailored to meet their own needs rather than those of their powerful northern neighbor. These strategies are likely to diverge considerably from the current Uruguayan experiment, whose extrapolative value is limited by the small size of the country.

Ultimately, Uruguay is both the experiment and the exception. The country has been a "model democracy" for most of the past 180 years, and boasts a degree of political stability commensurate with this record that is unrivaled throughout the rest of Latin America ("Uruguay: Justice of Democracy?"). Its remarkable leading coalition, the Frente Amplio (FA), gained an almost 20 percent lead in support over the National Party, in the most recent elections in 2009 ("Corte Electoral: Republica Oriental Del Uruguay" 2013). This margin gives the FA the benefit of a strong mandate that few other Latin American leaders can match, and that it has made sure not to waste, recently legalizing same-sex marriage and abortion. Hopefully, the experiment will be a successful one and marijuana legalization will soon seem as sensible as these two previous actions.

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Chinese Infrastructure Aid and Natural Resources in Sub-Saharan Africa: Aid to Secure Access to Natural Resources

Fionnuala Seiferth

This paper examines the relationship between Chinese infrastructure aid and natural resources in Sub-Saharan Africa. In the last two decades, China's demand for natural resources has rapidly outgrown its domestic supply, and it has begun to look outward to resource rich countries, primarily in the developing world, to secure long-term access to natural resources. Complementing this trend, the last two decades have seen a rising portion of Chinese aid directed toward the building infrastructure of in developing nations, which could facilitate the extraction and export of natural resources. In consideration of these trends, this paper offers evidence that China considers its natural resource interests when allocating infrastructure aid to countries in Sub-Saharan Africa.

I. Introduction

In recent years, there has been a large influx of aid into Sub-Saharan Africa from non-traditional donors; China in particular. Though there is ample literature on aid from the Organization for Economic Co-Operation and Development, which typically flows north to south, in the last decade there has been a notable rise in south to south development assistance. This form of aid is distinct in design, determinants and impact from traditional aid flows. Emerging as the major player in this field is China, which directs aid primarily into productive infrastructure projects through state agencies whose explicit mandates are for the expansion of market access and trade as opposed to development (Brautigam 2008).

There is abundant speculation of the strategic drivers behind Chinese development assistance into Africa. However, there is very little quantitative literature on the subject. (Alden 2005, Brautigam 2010, Davies 2007, Naim 2007, Lanchaster 2007, Tull 2007). The quantitative literature that has emerged examines the strategic drivers of various components of Chinese aid, but has yet to specifically consider infrastructure aid, which is one of the primary aid flows from China to Africa (Foster et al. 2008). The study of infrastructure aid is instrumental to understanding the relationship between infrastructure aid and natural resources. This channel of aid has the capacity to address economic bottlenecks, enhance market access, and enhance export capabilities of recipient countries, thereby facilitating China's access to natural resources in the recipient country (Suwa-Eisenmann & Verdier, 2007).

This study uses Chinese infrastructure aid data compiled by the World Bank to examine the relationship between China's infrastructure aid, and natural resources in Sub-Saharan Africa between 2001 and 2007. Notably, this study suggests that China does not have purely altruistic motives when it allocates infrastructure aid, as it gives less infrastructure aid to countries with lower existing levels of

infrastructure. The study finds that China gives more infrastructure aid to countries with higher levels of oil reserves, but gives less infrastructure aid when a country is already exporting high levels of oil. In addition, Chinese infrastructure aid to African countries rises with the price of oil on the world market, suggesting a long-term orientation of China's aid and interest in the continent.

II. Literature Review

There is extensive literature on the determinants of foreign aid allocation by traditional donors, which can be used as a basis for examining Chinese aid allocation behavior. Foreign aid literature has focused on examining the determinants and effects of OECD official development assistance (ODA), which is defined by the International Development Association as "...flows to developing countries, provided by official agencies, which have a clear development purpose and are at least partially concessional in nature, with a grant element of at least 25%, at a 10% discount rate"(OECD 2012). The authoritative paper on aid is Alesina and Dollar (2000), the findings of which were reasserted by Mascarenhas and Sandler (2006).

Alesina and Dollar (2000) concluded that aid is driven primarily by the strategic interests of the donor country as opposed to the needs of the recipient nation. Moreover, they found that there are major differences between the aid allocation of donor countries based on their individual strategic political interests, economic interests, and previous ties with the recipient nation. Further evidence of a relationship between donor's aid allocation decisions and political interests was ascertained by Kuziemko and Werker (2006), who found that the United States and United Nations aid allocation is positively correlated with the rotation of a country into the Security Council. Pertinent to this study, a donor's economic interests are thus a significant determinant of its aid allocation decisions.

Schraeder et al. (1998) conducted a comparative study of traditional donor's aid behavior and found that economic factors, particularly trade, were the main predictor of a donor's aid allocation behavior. The evidence that aid is driven by the unique strategic, economic, and political interests of a donor country in the literature on ODA is the basis for the emerging literature on the determinants of Chinese aid.

Chinese Aid: The Literature

Until recently Chinese aid flows were unexamined in quantitative literature due to a lack of data and transparency in the Chinese aid program. However, a small body of literature has emerged on the subject.

Lum et al. (2009) at the Congressional Research Service (CRS) studied determinants of Chinese aid in Southeast Asia, Africa, and Latin America, and found that aid in Africa is driven primarily by China's need for natural resources, and secondarily by its diplomatic objectives.

Though this study examines natural resources as a determinant of Chinese aid, the definition of the dependent variable □Chinese aid□ limits the scope of the study's results for understanding the drivers of Chinese aid. The dependent variable of aid in the CRS's study includes investments by state-owned companies overseas. Many Chinese companies and banks are state-owned, and though they are casually associated with the government, their investments abroad are explicitly Foreign Direct Investment (FDI) and should not be qualified as aid. Due to the inclusion of these investments in CRS's dataset, the significant relationship between aid and natural resources in this study may be the result of confounding

variables that capture the determinants of FDI rather than aid.

Sanfilippo (2010) examined the economic motivations of Chinese aid and found a significant correlation between Chinese FDI and Chinese aid levels in Africa. However, this study was also limited by its definition of aid, as it proxies aid by "economic cooperation" figures, which include Chinese contractor contracts with external financers, such as other countries and multilateral aid donors, all of which which are outside of the mandate of Chinese aid institutions.

Dreher et al. (2011) conducted a comprehensive study of strategic drivers of Chinese aid and found no relationship between oil production, a key independent variable in my hypothesis, and Chinese aid allocation. However, Dreher et al. (2010) excluded concessional financing from his dependent variable of Chinese aid, so that he could compare China to OECD donors, whose definition of aid explicitly excludes concessional funding from Exim Banks (OECD).

Though this was appropriate for a comparative study, concessional financial flows from China's Exim Bank are a key component of China's aid program. To fully understand the strategies and drivers of Chinese aid, a study of these flows must be added to the literature. My study builds upon this gap in the existing literature by examining the relationship between infrastructure aid flows and the natural resource motivations of Chinese aid in Africa.

The World Bank database created by Foster et al. in the 2008 report Building Bridges: China's Growing Role as an Infrastructure Financier is the first attempt to create a dataset on Chinese infrastructure financing. This dataset covers the time period of 2001–2007, which is instrumental for Chinese economic policy as it corresponds with the "going-out policy," encouraging Chinese businesses to invest abroad, and with the rapid expansion of the Chinese aid program. This dataset provides an opportunity to assess the relationship between infrastructure aid and natural resources.

Chinese Aid: The Evidence

The Chinese aid mandate advocates that its decisions for aid allocation should feature political equality, mutual trust, and the facilitation of economic "win-win" cooperation between China and the recipient country (China Foreign Aid White Paper 2011). The aid system is run through a variety of interrelated state branches and takes three major forms: grant aid/ technical assistance, concessional financing, and interest-free loans (China Foreign Aid White Paper 2011). Infrastructure projects make up 92 percent of concessional financing, which is solely managed by the China Exim Bank (Foster et al. 2008). Unique from traditional aid bodies, the China Exim Bank is not a development agency, but rather is designed to facilitate the financial flows from China's Exim Bank. Aid from the China Exim Bank accounts for 92 percent of the recorded Chinese infrastructure finance commitments in Sub-Saharan Africa, one of the most common forms of Chinese aid in Africa (Foster et al. 2008). These infrastructure finance commitments include the exportation and importation of Chinese products, the assistance of Chinese companies with comparative advantages in their offshore contract projects and outbound investment, and the promotion of international economic and trade cooperation through aid (China Exim Bank).

As mentioned previously, the bulk of Chinese aid into Africa is infrastructure-based (Brautigam 2008). These infrastructure projects are primarily in productive infrastructure and about half of the aid projects are in the energy or transport sector (Foster 2008). As indicated in Figure 1, there is a clear pattern in the share of natural resource commitments to China and the share of infrastructure aid from China

into Sub-Saharan African countries, indicating a possible relationship between China's infrastructure aid allocation decisions and its natural resource interests.

Figure 1: Country Shares of Chinese Natural Resource Investment and Finance Commitments into Power and Transport in Sub-Saharan Africa, 2001–2007
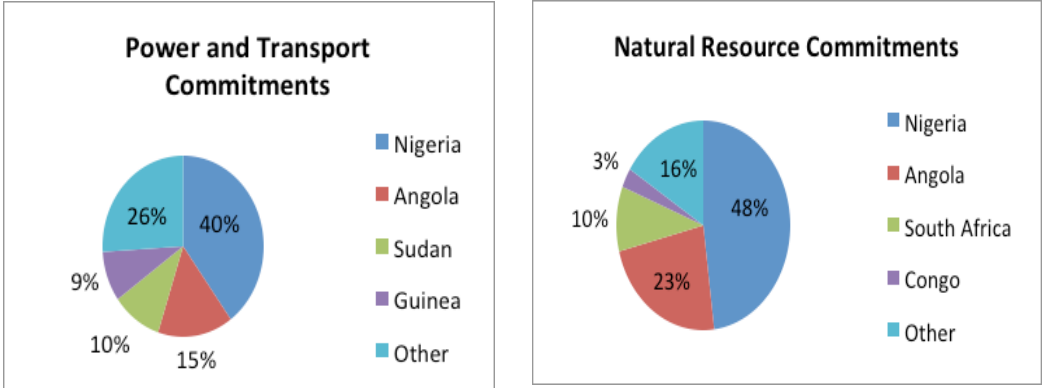
Source: World Bank–Chinese Projects Database (2008).

III. China's Demand for Natural Resources

As demonstrated by the literature on aid, China will allocate aid in a fashion that maximizes the utility of its own constituents and its strategic interests. Long-term access to Africa's underexploited resources has become a key component of China's foreign policy agenda (Alden 2005, Council on Foreign Relations 2006). China's rapidly growing domestic economy has placed steady upward pressure on the country's demand for global energy since the early 1990s, and currently China is unable to provide for half of its domestic oil needs (Alden 2006).

Historically, the Middle East has made up the majority of China's oil import portfolio. In order to reduce risk in the case of global supply disruptions and to buffer against the volatility of Middle East politics, a key part of China's energy supply security policy has been to diversify its sources of oil imports, particularly by expanding its import flows from African countries (EIA 2011). In 2009, China became the world's largest energy consumer and the second largest consumer of oil behind the United States, accounting for 31 percent of the growth in the world's oil demand (Koning 2007; Foster et al. 2008; EIA 2011). China is projected to import 75 percent of its crude oil by 2035, and even with modest rates of growth in demand, will place a huge burden on the world market (EIA 2011).

Africa's Resource Capacity

Regionally, Africa possesses eight percent of the world's oil reserves and has the fastest growth rate in identified oil reserves, which have doubled in the past two decades (BP Statistical Review of World Energy 2012, Alden 2009). The BP Statistical Review of World Energy 2012 denotes Africa's reserve to

production ratio as 41.2 years, the third largest ratio regionally (BP Statistical Review of World Energy, 2012). China is a latecomer to oil exploration and extraction in Africa. However, the level of natural resource imports from Africa into China has grown rapidly since early 2000. Natural resources now capture large shares of Sino-African trade, with oil accounting for 80 percent of imports, followed by iron ore (5 percent), timber (5 percent), manganese, cobalt, copper and chromium (all 0.5–1 percent) (Foster et al. 2008). Africa is now China's second largest regional oil supplier after the Middle East, and China is the second major destination of oil exports from Sub-Saharan Africa after the United States (Alden 2009). Moreover, Chinese natural resource imports from Africa have had the fastest growth rate of any regional importer in the last decade (Alden 2009).

Infrastructure and Natural Resources

Due to the lack of infrastructure capacity, natural resource trade and exploration costs are significantly higher in developing countries. However, financial and technical assistance in infrastructure have been shown to improve the market access and export capabilities of developing countries (Suwa-Eisenmann et al. 2007). Sub-Saharan Africa's infrastructure levels lag behind every other region of the world, on almost every indicator of infrastructural capacity (World Bank 2012). According to the African Development Bank, shortages of roads, housing, water, sanitation, and electricity have reduced Sub-Saharan Africa's output by about 40 percent (The Economist 2011). These infrastructure shortages create economic bottlenecks for the extraction and export of natural resources. As a strategic actor, China wants to reduce the costs of resource extraction and exploration in countries from which it is interested in importing natural resources. In order to reduce trade costs, facilitate trade, and maximize access to natural resources, China is expected to allocate infrastructure aid to developing countries in order to enhance the infrastructural capacity for resource extraction and export.

Therefore, I hypothesize that the incentive for China to allocate infrastructural aid to African countries is to facilitate and ease access to natural resources within the recipient countries in Sub-Saharan Africa. I theorize that when allocating its infrastructure aid to developing countries, China will allocate more to countries who have a higher capacity for natural resource production.

IV. Hypotheses

The central platform of my hypothesis is that China allocates infrastructure aid to facilitate relationships for access to and extraction of natural resources in Sub-Saharan Africa. Thus the base of this hypothesis is that China will allocate more aid to countries with higher reserves of natural resources. I first test the basis for this relationship by examining the correlation between a lagged measure of China's infrastructure financing, and the level of natural resource reserves in the recipient country. If infrastructure aid is targeted towards access to natural resources, we should see a positive correlation between inflows of infrastructure aid and proven reserves of natural resources in the recipient countries.

H1O: Chinese infrastructural aid has no relationship with natural resource reserves in the host country.
H1A: Chinese infrastructural aid into African countries is positively correlated with natural resource reserves in the host country.

I will then look at the interaction of proven oil reserves with the recipient country's oil exports. I expect that there will be a positive relationship in the interaction with the lagged variable of Chinese infrastructure aid levels.

H20: Chinese infrastructural aid into Africa has no relationship with the interaction of oil reserves and total oil exports of the host country.
H2A: Chinese infrastructural aid has a positive relationship with the interaction of oil reserves and total oil exports of the host country.

After establishing this relationship, I will look at the core of my hypothesis, which is that China strategically allocates infrastructural aid in order to access natural resources. I will examine whether aid levels are adjusted based on the projected value of natural resource commodities on the world market, using oil prices as a point of reference. If China is allocating infrastructure aid based on long-term strategic interest in accessing natural resources, I posit that a positive relationship between a projected rise in oil prices and China's allocation of infrastructure aid will be observed.

H30: There is no relationship between price of oil on the world market and Chinese infrastructural aid.
H3A: There is a positive relationship between price of oil on the world market and Chinese infrastructural aid.

Lastly, I will test the relationship between the recipient countries infrastructural needs and China's allocation of infrastructure aid. This test is not central to my hypothesis, but it is of interest to know whether China's infrastructural commitments are directed towards need, which would indicate altruistic motives, or if another indicator is a more important determinant of the receipt of infrastructure aid from China. This correlation could work in two possible ways. China may allocate more infrastructure aid to countries with lower levels of infrastructure, because the lower the current levels of infrastructure, the more is needed to enable access and extraction of natural resources. Alternatively, China may direct more infrastructure aid to those with greater need because of altruistic motives, or because the confounding factor that countries with natural resources may already have more highly developed infrastructure to facilitate access and export.

H60: There is no relationship between Chinese infrastructure aid and the infrastructural needs of recipient countries.
H6A: There is a relationship between Chinese infrastructure aid and the infrastructural needs of recipient countries.

V. Research Design
I will test the relationship between Chinese aid and natural resources using a Poisson Regression model with fixed effects and robust standard errors. Though financial figures are provided for about half of the points in the dataset, there is a debate in the aid sector about the transparency and accuracy of Chinese reporting on financial aid commitments. In addition to analyzing the dataset based on financial figures,

dropping the data points without financial figures would severely limit the dataset and conclusiveness of the study's results.

I will use an ordinal discrete measure of project counts per year for the independent aid variable. The use of counts is appropriate despite differences in project size, because the distribution of the project size is relatively normal. For each project a country will receive a count of one. Thus, if a country has eight projects in a year it will have an eight count for the data point in that year. A country that has received no Chinese infrastructure aid projects will be denoted with a zero. This study is a cross-sectional analysis of 46 Sub-Saharan African countries over the period from 2001 to 2007.

Estimation Equation

A dataset including all the information above was created to run a Poisson Regression, using STATA to test for the hypothesis identified previously. To account for missing values, a multiple imputation was carried out in R with the program Amelia II, and the five imputed datasets were imported into STATA.

Variables Defined

A dataset including all the information above was created to run a Poisson Regression, utilizing STATA to test for the hypothesis (as identified in the "Hypotheses" section of the paper). To account for missing values, a multiple imputation was carried out in R with the program Amelia II and the five imputed datasets were imported into STATA.

Independent Variables	
AID = Count of Chinese Infrastructure Aid	
Dependent Variables POR=Proven Oil Reserves	POR_EXOIL=Interaction proven oil reserves and exports oil
EIALOW = Low Projection of EIA Prices	WTR = % of Population with Water Access
EIAHIGH = High Projection of EIA Prices	TL = Telephone Lines per 100 people
EXOIL = Exports Oil	
Control Variables	
GDPCAP = GDP per Capita	CPI = Corruption Perceptions Index
ODA = Total ODA and Aid received	FDI = Total Foreign Direct Investment
FDI = Total Foreign Direct Investment	CPIA = CPIA Score
ASS = Affinity S-Score	RGM = Regime
	rt = recipient country, year

VI. Data Description

All data used in the dataset was collected from official international statistical databases for the specific purpose of this study.

Dependent Variables
i. Chinese Aid Infrastructure Financing
The data for this dependent variable was compiled for a World Bank study, Building Bridges: China's Growing Role As Infrastructure Financier For Sub-Saharan Africa (Foster et al. 2008). The study used the World Bank Public Private Infrastructure Advisory Facility to compile a database of Chinese infrastructure aid commitments between the years of 2001 to 2007. There are 124 data points in this dataset, with observations from 37 countries in Sub-Saharan Africa. The data was compiled based on press reports of committed Chinese aid in Africa, cross-checked with World Bank staff, the World Bank Debtor Database, Chinese government databases, and official sources. Again, it should be noted that although financial figures are provided for about half of the points in the dataset, many continue to dispute the transparency and accuracy of Chinese reporting on financial aid commitments.

In addition, analyzing the dataset based on financial figures and dropping the data points without financial figures would severely limit the dataset and the conclusiveness of the study's results. Each project included in the dataset has been validated as occurring by the World Bank research team, and thus project counts are reliable measures of Chinese infrastructure aid levels.

Independent Variables
Hypothesis A
To test Hypothesis A, I use a database of proven oil reserves in Sub-Saharan African countries. These datasets were compiled by the International Energy Statistics database (IEA Statistics).

ii. Proven Oil Reserves EIA Data
The EIA is an independent branch of the U.S. Department of Energy that compiles data on world energy prices, reserves, and production. This dataset comes from the International Energy Statistics Database and has available data on proven oil reserves, in terms of billions of barrels, for 51 African countries between 1970 and 2012.

iii. Total Oil Exports
The dataset for total oil exports is measured in thousands of barrels per day, in addition to measuring the export of refined petroleum products. This dataset was compiled from the United States Energy Information Administration for 51 African countries between 2000 and 2008.

Hypothesis B
Hypothesis B is tested using various measures of international oil prices to gauge annual world market prices for crude oil. There are a few major indexes used to gauge the price of crude oil on the world market that have all been included in the dataset.

iv. EIA 1999 Projections Oil Prices
This dataset is based on the EIA's high and low oil price projections that project every year from 1999 to 2020, from the EIA 1999 Annual Energy Outlook. All figures were reported in 1997 dollars and have been converted to US 2012 dollars for comparison. This data was compiled from the EIA database.

v. Brent Spot Price Per Barrel
The Brent Spot Price database gauges the spot price of a blended crude stream produced in the North Sea region, which serves as a reference or "marker" for pricing a number of other crude streams. This data was compiled from the EIA database.

vi. WTI-Cushing West Texas Intermediate Spot Price Per Barrel
The West Texas Intermediate spot price is based on the crude stream produced in Texas and southern Oklahoma, which serves as a reference or "marker" for pricing a number of other crude streams. This data was compiled from the EIA database.

vii. Nigerian Forcados
The Nigerian Forcados spot price is based on the crude stream of Nigeria, which serves as a reference or "marker" for pricing a number of other crude streams. This data was compiled from the BP Statistical Energy Survey, June 2012 Edition.

viii. OPEC Reference Basket
The OPEC Reference Basket is created by taking the weighted averages of prices of petroleum blends produced by OPEC countries. It is currently made up of the following: Saharan Blend (Algeria), Girassol (Angola), Oriente (Ecuador), Iran Heavy (Islamic Republic of Iran), Basra Light (Iraq), Kuwait Export (Kuwait), Es Sider (Libya), Bonny Light (Nigeria), Qatar Marine (Qatar), Arab Light (Saudi Arabia), Murban (UAE) and Merey (Venezuela). This data was compiled from the EIA database.

Hypothesis C
Hypothesis C is tested using the independent variable of telephone lines per 100 people, and the percentage of the population with water access as measurements of infrastructural need. The level of telephone lines in comparison to population is an assessment of the communication infrastructure in place in the given country, and water access acts as a measurement of general infrastructure and development levels.

ix. Telephone Lines per 100 people
The data for telephone lines and telephone lines per 100 people are compiled from the World Bank Development Indicators database and contain observations for all countries in the dataset for the period of study.

x. Improved Water Source (% of population with access)
Access to an improved water source refers to the percentage of the population with reasonable access to an adequate amount of water from an improved source, such as a household connection, public standpipe, borehole, protected well or spring, and rainwater collection. The data for improved water source are compiled from the World Bank Development Indicators database and contain observations for all countries in the dataset for the period of study.

Control Variables
i. Control Variables - Economic Controls
GDP Per Capita
GDP per capita is expected to have a relationship with levels of Chinese aid into a
recipient country, and is generally a good indicator of levels of prosperity in a country. The GDP data is collected from the World Bank Development Index and missing data points are supplemented with the data from UNdata. Data is measured in 2012 U.S. Dollars.

FDI Net Inflows
Foreign direct investment is the net inflow of investment to acquire a lasting
management interest (10 percent or more of voting stock) in an enterprise operating in an
economy other than that of the investor. This series shows net inflows (new investment inflows, less disinvestment) in the reporting economy from foreign investors. FDI is driven towards commodities in which investors have interest, including natural resources. If the hypothesis that aid is driven by access to natural resources holds, countries with higher levels of aid should also receive higher FDI net inflows. Data is measured in 2012 U.S. Dollars.

Net ODA and Official Aid Received (WB Development Index)
Net official development assistance (ODA) consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions, and by non-DAC countries to promote economic development and welfare in countries and territories in the DAC list of ODA recipients. It includes loans with a grant element of at least 25 percent (calculated at a rate of discount of 10 percent).

I will control for Net ODA and Official Aid received to determine whether the recipients of Chinese aid differ from the primary recipients of aid in general. Data is measured in 2012 U.S. Dollars.

ii. Control Variables - Governance Controls
CPIA Transparency, Accountability and Corruption Index (WB Development Index)
The CPIA index assesses the extent to which the executive can be held accountable for its use of funds and for the results of its actions by the electorate, the legislature, and the judiciary, along with the extent to which public employees within the executive are required to account for administrative decisions, use of resources, and results obtained. The three main dimensions assessed are the accountability of the executive to oversight institutions and of public employees for their performance, access of civil society to information on public affairs, and state capture by narrow vested interests. This index is on a scale of 1 to 6; 1 = low to 6 = high.

CPI Index (Transparency International Dataset)
The Corruption Perception Index was created by Transparency International. The index is based on surveys that ask businessmen and analysts, both inside and outside the countries they analyze, their perception of the prevalence of corruption within a nation. Data for the full period of analysis is available

from this database. This index ranks countries on a scale of 0 to 10, 0 corresponding to a very corrupt country and 10 to a country without corruption.

Regime Type (Polity IV Dataset)
The Polity IV dataset ranks countries on a spectrum of democratic and autocratic authority in governing institutions, rather than discreet and mutually exclusive forms of governance. The dataset envisions a spectrum of governing authority that spans from fully institutionalized autocracies through mixed, or incoherent, authority regimes (termed "anocracies"), to fully institutionalized democracies. The "Polity Score" captures this regime authority spectrum on a 21-point scale ranging from -10, hereditary monarchy, to +10, consolidated democracy. The Polity scores can also be converted to regime categories, with the categorization of "autocracies" (-10 to -6), "anocracies" (-5 to +5, and the three special values: -66, -77, and -88), and "democracies" (+6 to +10). The Polity IV dataset covers all major, independent states in the global system (i.e. states with total population of 500,000 or more in the most recent year; currently 164 countries) through the years of 1800 to 2010.

Affinity S-Score Data (Gartzke 2)
The Affinity of Nations index was developed by Erik Gartzke and provides a metric that reflects the similarity of state preferences based on voting positions of pairs of countries (dyads) in the United Nations General Assembly. Values for the Affinity data range from −1 (least similar interests) to 1 (most similar interests). The values in this study show the affinity between China's interests and that of the recipient country. This is intended to act as a measure of the political ties between China and the recipient nation.

Estimation Equations
Estimation Equations: Oil Reserves and Production

$$\log(AID_{rt(t-1)}) = \alpha + \beta_1 POR_{rt} + \beta_2 RGM_{rt} + \beta_3 ASS_{rt} + \beta_4 GDPCAP_{rt} + \beta_5 ODA_{rt} + \beta_6 FDI_{rt} + \beta_7 CPI_{rt} + \beta_8 CPIA_{rt} + \varepsilon_{rt}$$

$$\log(AID_{rt(t-1)}) = \alpha + \beta_1 POR\_EXOIL_{rt} + \beta_2 POR_{rt} + \beta_3 EXOIL_{rt} + \beta_4 RGM_{rt} + \beta5 ASS_{rt} + \beta_6 GDPCAP_{rt} + \beta_7 ODA_{rt} + \beta_8 FDI_{rt} + \beta_9 CPI_{rt} + \beta_{10} CPIA_{rt} + \varepsilon_{rt}$$

$$\log(AID_{rt(t-1)}) = \alpha + \beta_1 PRICE_{rt} + \beta_2 RGM_{rt} + \beta_3 ASS_{rt} + \beta_4 GDPCAP_{rt} + \beta_5 ODA_{rt} + \beta_6 FDI_{rt} + \beta_7 CPI_{rt} + \beta_8 CPIA_{rt} + \varepsilon_{rt}$$

Estimation Equations: Infrastructure Levels

$$\log(AID_{rt(t-1)}) = \alpha + \beta_1 WTR_{rt} + \beta_2 RGM_{rt} + \beta_3 ASS_{rt} + \beta_4 GDPCAP_{rt} + \beta_5 ODA_{rt} + \beta_6 FDI_{rt} + \beta_7 CPI_{rt} + \beta_8 CPIA_{rt} + \beta_9 POR + \varepsilon_{rt}$$

$$\log(AID_{rt(t-1)}) = \alpha + \beta_1 TL_{rt} + \beta_2 RGM_{rt} + \beta_3 ASS_{rt} + \beta_4 GDPCAP_{rt} + \beta_5 ODA_{rt} + \beta_6 FDI_{rt} + \beta_7 CPI_{rt} + \beta_8 CPIA_{rt} + \beta_9 POR + \varepsilon_{rt}$$

IX. **Analysis of Results**
The results of this study provide a preliminary basis to assess the relationship between China's

infrastructure aid allocation behavior and natural resources in Africa. The results indicate that China gives more infrastructure aid to countries with proven oil reserves, as well as to countries in which it expects the price of oil on the world market to rise. China also gives more infrastructure aid to countries with a higher existing infrastructure level suggesting that its aid is not purely altruistic in nature. This study may act as a basis for future studies in Chinese aid allocation as more accurate and extensive data become available to disseminate aid data by sector.

Hypothesis A

As predicted there is a significant positive relationship between the lagged variable of Chinese infrastructure aid and proven oil reserves in the recipient country at the 10 percent level, holding for the control variables (Table 1). On average, for every one billion barrels of increased proven oil reserves, the log of the expected counts of Chinese infrastructure aid is predicted to increase by 0.182 projects in the following year, ceteris paribus. There is a wide spread of the observed magnitude of effect which may be due to the skewed spread of proven oil reserves data, and the lack of reliability of figures on exploration in some African nations (Table 6).

Table 1: The Relationship between Proven Oil Reserves and Chinese Infrastructure Aid

Variable	Chinese Infrastructure Aid (1)
Proven Oil Reserves	0.182** (.091)
Regime	9.991e-3 (1.384e-2)
Affinity S-Score	-2.729 (2.295)
Per Capita GDP	-1.087e-4 (.000)
Total ODA and Aid Received	-9.17e-11 (1.06e-11)
FDI	2.49e-13 (1.49e-10)
CPI Index	0.395 (0.509)
CPIA Index	-0.559 (0.335)
Observations	272

To further examine the relationship between China's natural resource interests and its infrastructure aid allocation, the oil reserve variable was compared with total oil exports of the recipient country. There is a significant negative relationship between the interaction of proven oil reserves and total oil exports with Chinese infrastructure aid in the following year at the 10 percent level. The magnitude of the effect for this variable is small, and thus while current exports of oil are influential to China's infrastructure aid decisions, the country's existing oil exports do not have a large effect on China's aid

decisions. Holding all other variables at their mean values,, a one unit increase in proven oil reserves compared with total exports oil corresponds to a predicted 2.22 unit decrease in the log of the total Chinese aid project count. The margins plot of this interaction can be found in (Table 7) in the Appendix.

The differing directions of coefficients of proven oil reserves and the interaction of proven oil reserves with proven exports is interesting to examine, as it indicates that China invests more in countries that have higher levels of natural resources, but export less of these resources. There are a few possible explanations for this result which correspond with our theory. The first explanation is that China directs infrastructure aid towards countries that have oil reserves, but not the infrastructure capacity to export these resources, thus addressing the economic bottlenecks. Alternatively, China may allocate more aid to countries that export less of their reserves in the given time period and thus have more capacity to become long-term trading partners with China. This holds with the dominant theory in qualitative literature that China is attempting to create alternative partnerships and spheres of influence.

Table 2: The Relationship of the Interaction Terms of Oil Exports and Proven Oil Reserves with Chinese Infrastructure Aid

Variable	Chinese Infrastructure Aid (2)
Proven Oil Reserves_Exports Oil	-.009** (4.434e-3)
Regime	.014 (0.016)
Affinity S-Score	-3.10 (2.333)
Per Capita GDP	-1.048e-4 (1.571e-4)
Total ODA and Aid Received	4.17e-10* (2.44e-10)
FDI	-2.05e-10 (1.69e-10)
CPI Index	0.466 (0.524)
CPIA	-0.567* (4.17e-10)
Proven Oil Reserves	0.358*** (0.136)
Total Exports Oil	0.034 (0.036)
Observations	272

Hypothesis B

Hypothesis B is a study of the relationship between China's natural resource interests and its allocation of infrastructure aid. All indexes of price projection were found to have a positive and highly significant correlation with the lagged count of Chinese infrastructure aid, keeping the control variables constant. The magnitude of the effect of the EIA projections of oil prices were largest: the EIA high

projections coefficient was 0.390 and the EIA low projections coefficient was 0.723, while the coefficient of the other price projection indexes were all roughly 0.04 (Table 4). Holding all other variables at their mean values, on average, at its mean for a one-dollar increase in EIA High Projected price, the log of the expected count of Chinese aid is predicted to increase by 9.79, *ceteris paribus*. Moreover, holding all other variables at their mean values on average, at its mean for a one dollar increase in EIA Low Projected price of oil, the log of the expected count of Chinese aid is predicted to increase by 11.82, *ceteris paribus*. Graphs showing the relationship between both variables and Chinese infrastructure aid can be found in the appendix.

The higher effect of the EIA price projections is interesting, as the EIA price projection data was obtained from a 1999 dataset of future projections, whereas the other indexes report the spot price of oil measured in the given year. It is also of interest that the magnitude of the EIA low projection is largest as it proxies the lower estimates of the expected future price increases. This suggests that China has a long-term view in its aid allocation decisions and may invest more when it projects oil prices to be low but rising, because the cost of investment and access are lower in this forecasted model. As the projections were made previous to the actual time period in question, the EIA low price projection model also may more closely fit the actual price trends in oil than the EIA high price projection, and thus has a higher magnitude of effect in the Chinese infrastructure project count.

Table 3: The Relationship of Oil Prices on Chinese Infrastructure Aid

Variable	Chinese Infrastructure Aid (4)	Chinese Infrastructure Aid (5)	Chinese Infrastructure Aid (6)	Chinese Infrastructure Aid (7)	Chinese Infrastructure Aid (8)	Chinese Infrastructure Aid (9)
EIA Projections High	0.390*** (0. 090)	---------	---------	---------	---------	---------
EIA Projections Low	---------	0.723*** (0.213)	---------	---------	---------	---------
Brent Spot Price	---------	---------	0.045*** (0.010)	---------	---------	---------
Cushingokwti Oil Price Index	---------	---------	---------	0.048*** (0.010)	---------	---------
Nigerian Forcados Oil Price Index	---------	---------	---------	---------	0.042*** (0.009)	---------
OPEC Reference Basket Oil price Index	---------	---------	---------	---------	---------	0.0477*** (0.011)
Regime	-5.61e-3 (0.015)	6.245e-4 (0.015)	-5.622e-3 (0.015)	-5.81e-2 (.015)	-5.52e-2 (0.015)	-5.557e-3 (0.015)
Affinity S-Score	-4.409 (2.847)	-3.182 (2.595)	-4.226 (2.817)	-4.197 (2.819)	-4.21 (2.813)	-4.298 (2.822)
GDP per/cap	-6.454e-4** (2.702e-4)	-4.396e-4** (2.435e-4)	-5.76e-4** (2.544e-4)	-5.904e-4** (2.577e-4)	-5.69e-3** (2.544e-4)	-5.75e-4** (2.544e-4)
FDI	-2.05e-11 (1.52e-10)	1.88e-11 (1.50e-10)	9.63e-12 (1.52e-10)	1.15e-11 (1.52e-10)	1.02e-11 (1.52e-10)	3.60e-12 (1.52e-10)
CPI Index	0.682 (0. 588)	0.580 (0.586)	0.678 (0.570)	0.682 (0.574)	0.675 (0.569)	0.678 (0.570)
CPIA	-.0516 (0.461)	-0.101 (0.407)	-0.194 0.451)	-0.162 (0.457)	-0.205 (0.450)	-0.201 (0.448)
Proven Oil Reserves	0.034 (.099)	0.120 (0.100)	0.013 (0.099)	0.015 (0.099)	0.014 (0.099)	9.23e-2 (0.099)
ODA and Aid	-9.93e-11 (1.08e-10)	-1.490e-10 (1.17e-10)	-8.16e-11 (1.07e-10)	-8.87e-11 (1.08e-10)	-8.21e-11 (1.07e-10)	-7.27e-11 (1.06e-10)

Hypothesis C

Telephone lines per 100 people and the percentage of population with water access are used as estimates of existing infrastructure levels in a country. Though these are not ideal measures, the absence of data on power and transport infrastructure for many African countries limits the study. There is a significant positive relationship between the percentage of the population with water access, and the level of infrastructure aid China allocates to a country at the 5 percent level (Table 4). On average, for every one-percentage increase in water access, the log of the expected counts of Chinese infrastructure aid is predicted to increase by 0.307 projects in the following year, ceteris paribus. Holding all other variables at their mean values, at its mean, for every one unit increase in the percentage of the population with water access the log of the total Chinese aid project count is expected to increase by 11.83 projects. Thus, China is expected to give more aid to countries with higher existing infrastructure levels, holding for the control variables.

The variable of telephone lines per 100 people also has a positive relationship with Chinese infrastructure aid, however it fails to merit significance. These relationships are surprising because we would expect that China would give more infrastructure aid to countries that have lower levels of infrastructure if aid is purposed to be altruistic, or to address economic and infrastructural bottlenecks. This relationship indicates that China's use of infrastructure aid has motivations beyond its altruistic intentions, such as fostering good relations with recipient nations through the visibility of infrastructural projects.

China's use of infrastructure aid may also address infrastructure capacity not captured through our independent variables. The two main sectors that receive Chinese infrastructure aid are power and transport, and thus through our choice of variables, we may be missing the relationship between Chinese infrastructure aid and infrastructure need. In further analysis of this hypothesis, indexes to measure infrastructure that more closely align with the transport and power sectors would be appropriate as data become available. The sample size is not sufficient to use the infrastructure sector project counts as reliable dependent variables to gauge the impact of existing infrastructure on China's sectorial decisions of infrastructure aid allocation, despite having infrastructure aid project counts disaggregated by sector, the sample size is not sufficient to use the infrastructure sector project counts as reliable dependent variables to gauge the impact of existing infrastructure on China's sectoral decisions on infrastructure aid allocation.

Table 4: Relationship between Infrastructure Levels and Chinese Infrastructure Aid

VARIABLE	Chinese Infrastructure Aid(10)	Chinese Infrastructure Aid (11)
Telephone lines	0.357 (0.363)	
Percentage of Population with Water Access		0.307** (0.414)
Regime	9.454e-3 (0.010)	6.209e-3 0.014
Affinity S-Score	-2.493 (2.331)	-3.392 (2.298)
GDP per/cap	-9.35e-5 1,472e-4	-2.085e-4 (1.45e-4)
FDI	8.31e-12 (1.47e-10)	8.97e-11 (1.58e-10)
CPI Index	0.335 (0.396)	0.588 (0.604)
CPIA	-0.528* (0.380)	-0.659* (0.372)
ODA and Aid	-9.44e-11 (1.07e-10)	-6.57e-11 (1.08e-10)
Proven Oil Reserves	0.188* (0.124)	0.129 (0.100)
Observations	272	272

Control Variables

The use of count data for the Poisson model made it difficult to disentangle consistent patterns in the control variables, however there are a few control variables worth consideration.

i. Per Capita GDP

The Per Capita GDP of the country receiving aid has a negative relationship with Chinese infrastructure aid. This relationship is significant for all equations that control for the price projection indexes. This means that controlling for the change in the world price of oil, China will invest more infrastructure aid into countries with lower per capita GDP levels, holding constant all other control variables. This relationship is interesting, as per capita GDP is a traditional measure of economic and social development of a country, thus suggesting that China invests more infrastructure aid into poorer nations, controlling for its response to the changing price of oil on the world market.

ii. CPIA (Country Policy and Institutional Assessment) Score

There is a significant negative relationship between a country's CPIA score and Chinese infrastructure aid, controlling for proven oil reserves. The CPIA index variable assesses the extent to which the executive of a country can be held accountable for his or her use of funds and for the results of his or her actions by the electorate, legislature, and judiciary, along with the extent to which public employees within the executive are required to account for administrative decisions, use of resources, and results obtained. The significant negative relationship between the CPIA index and Chinese infrastructure aid suggests that when the natural resource interests of China are held constant, China is predicted to invest more in countries where the state is less accountable to the public. This conforms with the predominate quantitative theory that China invests more in countries where government is less accountable to the people, *ceteris paribus*.

X. Conclusion

The primary purpose of this study is to examine the relationship between China's allocation of infrastructure aid in Africa, and its interest in natural resources on the continent. The study tackled the question through the use of the World Bank Dataset on Chinese infrastructural aid, compiled by Foster et al. in 2008 for the report Building Bridges: China's Growing Role As An Infrastructure Financier For Sub-Saharan Africa. The report found that Chinese infrastructure aid does in fact have a significant positive relationship with natural resource indicators in the recipient country. The results suggest that China has a long-term view of natural resources in Africa, with aid levels rising in coordination with increases in price projections.

The results of this study raise a number of questions to be examined in further studies on south-to-south aid and Chinese aid, and in follow up studies on the implications of this established relationship on African development. As most other major southern donors also allocate aid through Exim Banks, it is of interest to examine the relationship between the aid allocation of other south-to-south donors and natural resources, to develop a more comprehensive view on these emerging aid channels. The conclusions of this study should be further examined with the emergence of a more transparent and comprehensive dataset on Chinese infrastructure aid. As this data becomes available it is pertinent to examine the financial commitments and sectorial allocation of Chinese infrastructure aid to better understand the macro patterns of Chinese aid behavior and the unique characteristics of infrastructural aid allocated into the various sectors.

With the further development of data, the study should also take into account volatility in the Middle East to matrix whether China's aid allocation in Africa responds to changes in the volatility of access to the commodity from other major resource suppliers. As resource exploration continues to grow in Sub-Saharan Africa, it will also be of value to observe changes in China's infrastructure aid allocation in response to the discovery and changes in proven oil reserve levels. The model should also be tested on other matrices of natural resources, including minerals, which make up a growing share of Africa's exports to China, in order to further understand the motivations of China in its allocation of infrastructure aid.

Based on the results of this study, it may also be of interest to conduct further studies that examine the impact of Chinese infrastructure aid on development indicators in recipient countries, due to the established relationships of aid and natural resource extraction with development. This will provide a

basis on which to assess the impact of the new south-south aid flows versus traditional OECD aid on the development and long term well being of recipient countries in Africa.

XI. Appendix
Tables
Table 5: Summary Statistics

| Variable	Obs	Mean	Std. Dev.	Min	Max
Total Chinese Projects	1974	.319	.726	0	5
Water Access	1932	64.67	16.950	22	99
Telephone Lines per 100	1970	2.972	5.769	-9.539	28.445
Proven Oil Reserves	1974	.877	4.343	0	36.22
Brent Spot Price	1974	44.104	18.42	24.46	72.44
Cushing OKWTI	1974	45.683	17.911	25.98	72.34
Nigerian Forcados	1974	44.757	19.33	24.23	74.48
OPEC Reference Basket	1974	41.776	17.192	23.12	69.08
EIA Projection High	1974	31.543	2.949	26.48	35.22
EIA Projection Low	1974	18.534	1.547748	15.56	19.77
GDP Current US	1967	1.22e+10	3.37e+10	-1.44e+10	2.86e+11
FDI	1974	3.62e+08	9.16e+08	-1.30e+09	7.27e+09
ODA and Aid	1974	6.57e+08	1.03e+09	-1.87e+07	1.24e+10
CPI Index	1854	2.857	1.011377	-.039	6.4
CPIA	1799	3.063	.898	.336	2.350e5
Energy Production	1972	1.425e4	4.299e5	-4.7816e4	1
Regime	1865	-4.316	23.104	-88	175.623
Affinity S-Score	1967	.862	.0838	0	1.14e+10
Fuel Exports	1865	13.412	25.159	-57.953	175.623
Total Exports Oil	1974	6.123	23.476	0	263.993

Table 6: Proven Oil Reserves
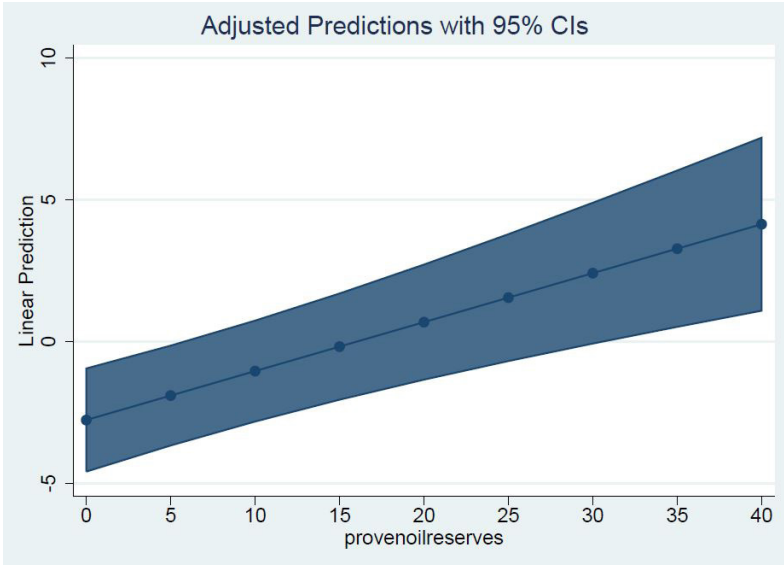
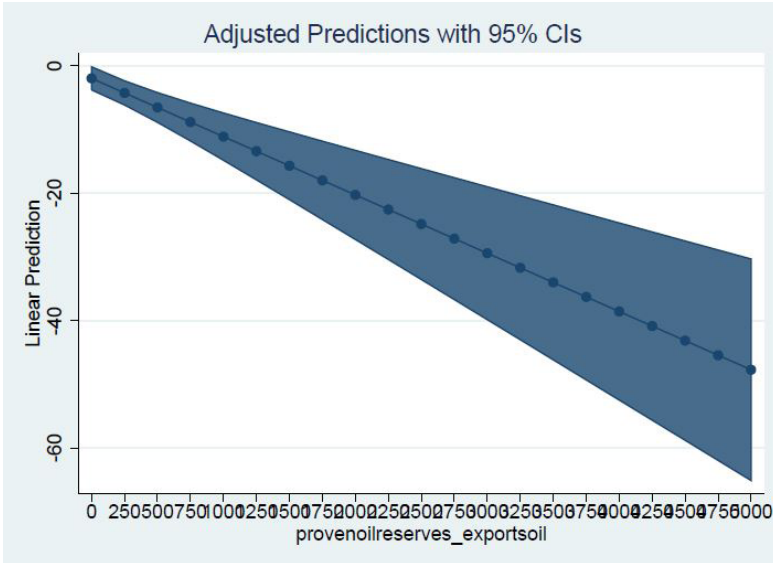**Table 7: Proven Oil Reserves Interacted with Exports of Oil**
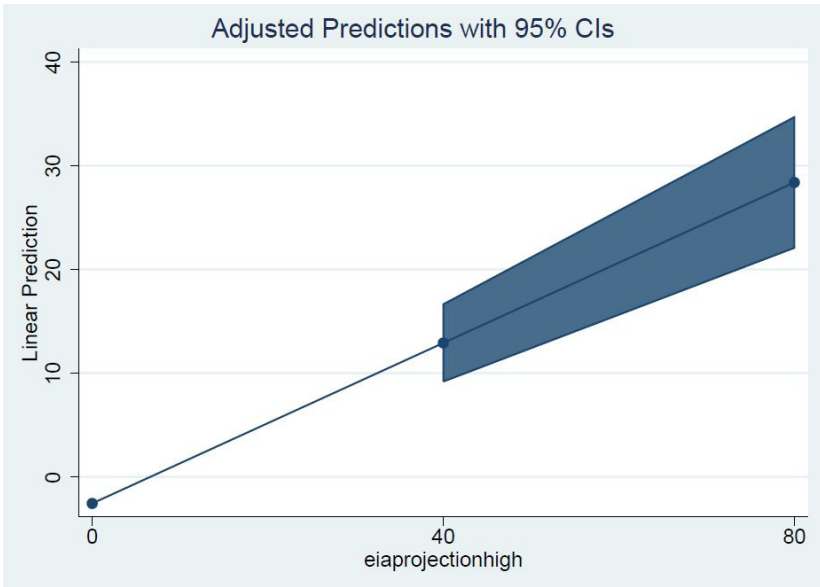
Table 8: EIA High Price Projection

Adjusted Predictions with 95% CIs

Table 9: EIA Low Price Projection
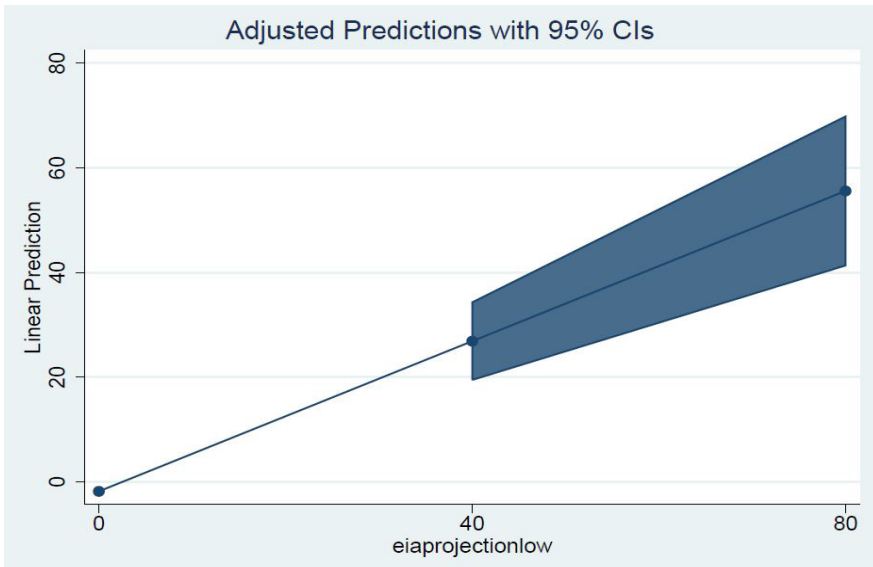

Adjusted Predictions with 95% CIs
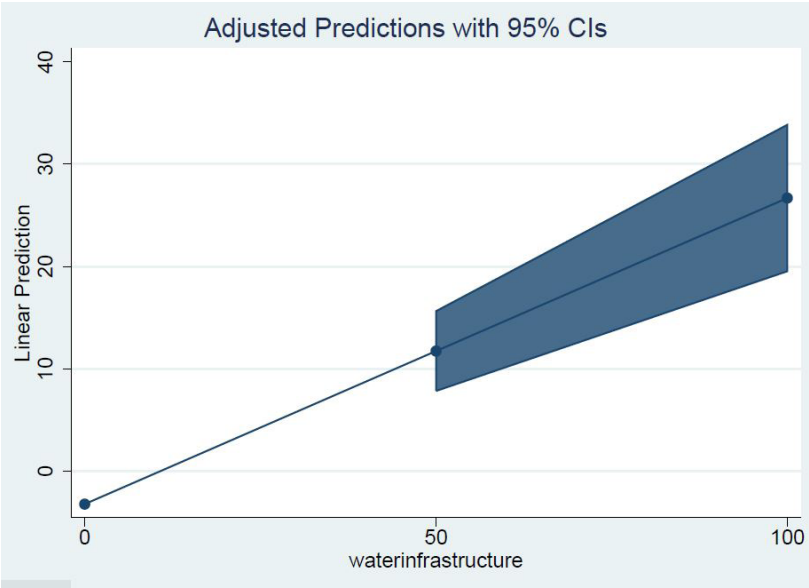
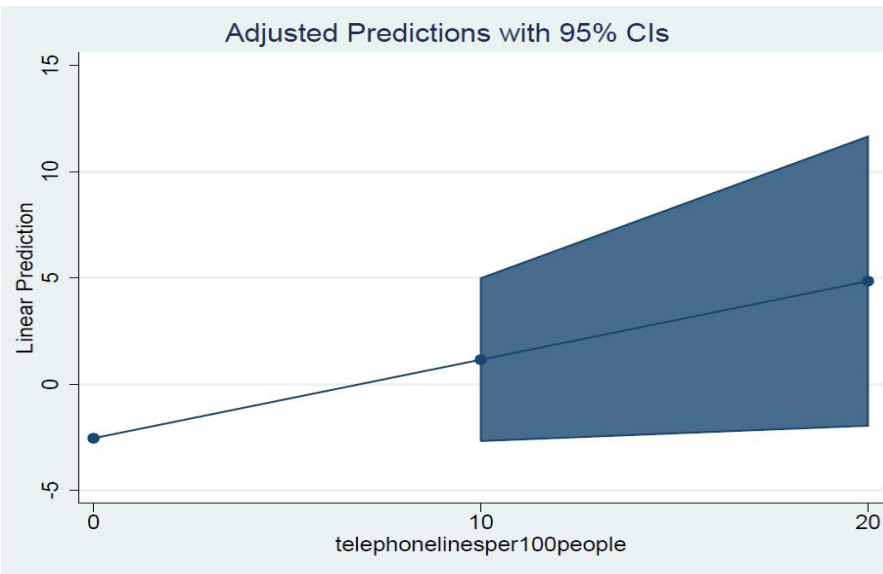**Table 10: Water Infrastructure**

Table 11: Telephone Lines per 100 People

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