Theory and Empirics of Civil War

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Abstract

This paper seeks a general understanding of the causes of civil wars in the developing world. It first presents a theoretical framework that attempts to capture the macroeconomical, ideological, and tactical aspects of a potential rebel leader’s decision to start an armed conflict. The main goals of this framework are comprehensiveness, simplicity, and testability. This model aims to explain the known stylized facts of civil war and inform the search for new ones as well as yield a general understanding of the relationship between characteristics of a state and the likelihood of civil war. Additionally, this paper attempts to provide a theoretical explanation for the pattern of rebel behavior described in Herbst (2000). Recounting many civil wars that took place in Sub-Saharan Africa, Herbst (2000) notes that in weaker states, the rebels tend to pillage more resources. The model in this paper tries to account for this pattern as well as make predictions about five other variables. The predictions derived from the model are then tested against the current data in a standard pooled binary logit setting. Special attention is paid to duration dependence, which, as Beck, Katz and Tucker (1998) formally show, is a particular danger for this type of binary time series cross-sectional analysis. The results indicate that four out of five predictions are supported by the data. The main contributions of this paper are a theoretical model of civil war onset that also explains Herbst (2000) and the statistical test of certain important explanatory variables with an updated dataset and accounting for duration dependence.
1 Motivation

The enormous damage civil war inflicts on the economies of the developing countries places it squarely in the field of development economics. Even the most sensible economic policies are doomed to fail if their adoption is followed by a civil war that destroys the infrastructure and wastes great amounts of resources. Fearon and Laitin (2003) point out that between 1945 and 1999 there have been five times as many civil wars as interstate wars, causing five times as many battle-related deaths. Moreover, a well-established fact in the current literature is that poverty is correlated with the presence of civil warfare or, in other words, “civil war is the problem of the poor” (Sambanis, 2002). Clearly, civil war is a source of great economic difficulty and human suffering in the developing world and its study deserves the attention paid to other development problems.

An issue that comes up frequently in econometric analyses of civil war onset is the uncertainty around certain statistically significant variables, especially macroeconomic ones that are correlated to many different factors. For example, while the level of income is repeatedly found to be highly and negatively correlated to the onset of civil wars, the link of causality is rather controversial. Collier, Hoeffler and Rohner (2009) remark that while they, among others, interpret level of income as proxying for the opportunity cost of rebel recruitment, others such as Fearon and Laitin (2003) see it as an indicator of the effectiveness of the state. Djankov and Reynal-Querol (2010), on the other hand, argue that the relationship between the level of income and onset of civil wars is spurious, showing that once country fixed effects are included, the statistical significance of income fades away. This divergence in results highlights the value of having a mathematical, theoretical model at hand before getting absorbed into empirical analysis. If the econometric specification is formulated according to theory, it will be much easier to make sense of the results.

Thus, one purpose of this paper is to put together a theoretical model for the onset of civil wars. This model is intended to be very simple and comprehensive, aiming to be a tool for the categorization of significant variables rather than a precise instrument for prediction. Such a theoretical framework can both help assimilate newly found significant variables into the theory of civil war and also inform the search for new variables that may be important in starting civil wars. The simplicity and generality of the model is necessitated by the pervasiveness of the object of study. It would not be realistic to impose precise conditions on a model that will be expected to explain the presence or absence of civil wars in every country in the world. Furthermore, a correct precise model, while interesting in its own right, would still be of limited empirical use because the measurement errors and faulty data collecting in war-ridden regions dilute the credibility of any mathematical analysis. An additional goal is to make the theoretical model testable. Blattman and Miguel (2010) point out that a shortcoming of the current theoretical literature is the lack of testable predictions that would establish the validity of the models. This paper makes a few concrete predictions about the factors affecting the likelihood of civil wars and these predictions are then tested against an updated dataset covering 161 countries and the time period from 1945 to 2007.

Economists have already made progress in creating a viable theory of civil war in the last few decades. The oldest theoretical devices used in civil war research are the contest models. These models view civil war as a competition for resources between two sides; relative military power determines the probability of victory for each side, which, in turn, serves as an incentive for one side to start an armed conflict. Garfinkel and Skaperdas (2007) give a survey of the use of contest models in a general equilibrium framework where appropriation is an alternative to production for the two groups. Grossman (1991), on the other hand, takes a different approach and sets up a
framework where every citizen decides between producing and predating. While contest models serve well in relating relative military power to the probability of victory in concrete terms, they have the disadvantage of being a little too simplistic for the task of describing the dynamics of civil war. Furthermore, Blattman and Miguel (2010) note that contest models always have some level of fighting at the equilibrium level, which is incompatible with reality. Although they cannot completely explain all the characteristics of civil wars, contest models are valuable mathematical machinery that can be embedded in other models. This paper, for example, uses a contest model equation to resolve the probability of rebel victory.

Another strand of civil war research attempts to explain why civil wars, as Pareto-inefficient outcomes, exist in the first place. After all, both of the warring parties could very well be better off if they could divide up the pie according to the distribution of power without a lengthy conflict which reduces the size of the pie. The inability to reach an agreement is commonly known as a bargaining breakdown. Fearon (1995) argues that, under the assumption of rationality, a bargaining breakdown can have only three reasons: information asymmetry, commitment problems, or issue indivisibilities. Most of the research has been centered around the first two reasons. The term information asymmetry refers to cases where at least one side is ignorant of the military strength of the other and initiates conflict that would, under perfect information, would not be initiated. Fearon (1995) notes, however, that if both parties prefer a peaceful solution, they will find it beneficial to reveal truthfully their military strength and gain information about the other side. Furthermore, Fearon (2004) and Powell (2006) conclude that information asymmetry is a poor explanation for war onset because many wars last long and any uncertainty regarding relative military strength should disappear shortly after the war begins.

The commitment problem explanation, on the other hand, warrants no immediate objections and it has become the most popular approach to rationalizing civil war. According to this view, civil wars take place in the absence of an institutional background that offers an opportunity for the sides to commit credibly. When the non-state party cannot be assured that the government will not renege on its promises once the rebels disarm, they find it more beneficial to start an armed conflict. Powell (2006) formally shows that commitment problems lead to a bargaining breakdown between two parties if a change in the distribution of power is looming in the near future. In such cases, the stronger party finds it profitable to attack immediately while it is still stronger. Current theoretical literature mostly examines the game-theoretic dynamics of commitment problems or, in the case of theoretical papers with testable applications, focuses on the impact of a single variable on the occurrence of civil wars. For example, Dal Bó and Dal Bó (2004) devise a two-sector model of the macroeconomy to explain the effect of GDP shocks on civil war occurrence and Dube and Vargas (2007) focus on the impact of international commodity prices on the wars in Colombia. This paper attempts to reach a general understanding of civil war that enables a more comprehensive look at potential factors; therefore, more than one variable will be of interest in the empiric section. This paper most closely resembles Besley, Persson and Street (2008) in purpose, but the implementation is very different. With a model much more complicated than this one, Besley, Persson and Street (2008) set up a framework in which payments made by the incumbent side to the non-incumbent side may provoke an armed conflict if they are too low. Their focus on transfers to the non-incumbent side reveals a key difference in the understanding of civil wars: Besley, Persson and Street (2008) view civil war as basically a competition for resources between two sides whereas this paper assumes a predatory state and a potential rebel leader, as the sole starter of the conflict, who wants to recruit citizens with material and ideological incentives in order to capture the revenue of the state. In this paper the value of the public payments do not matter directly since the rebel leader is only
interested in capturing the state and not in the welfare of a population group.

One last purpose of the theory contained in this paper is to explain theoretically the behavioral pattern of rebels described in Herbst (2000). While examining the methods with which rebel leaders motivate their followers in Sub-Saharan Africa, Herbst (2000) notes that in stronger states the rebels have to become “viable armies,” whereas in weaker states the rebel leaders can afford to pursue economic goals and coerce their followers at the expense of alienating the general population. All rebel leaders use a combination of pecuniary and non-pecuniary incentives to recruit citizens to their cause, but in the weaker states, we should expect to see more pillaging and coercion. The model designed in this paper offers a theoretical foundation for this pattern of behavior.

The model in this paper is made up of several components. I first describe the macroeconomy with a standard Cobb-Douglas production equation, which leads to a prediction about education, and then give an overview of the tradeoff associated with extortion and ideological propaganda, which leads to predictions about polarization, geography and rural population ratio. All of these components lead to the optimization problem for the rebel leader, which, among other things, enables the model to make a prediction about the effect of democracy and checks on executive power on civil war occurrence. The predictions are then tested with the data in a standard binary logit setting in the country-year space. I find that the predictions about polarization, uneven geography, education and democracy are confirmed by the data whereas the ratio of rural population does not appear to be significant.

2 Theory

We begin by making a couple of assumptions. We assume that the institutional background is such that credible commitment is problematic and that state does not have monopoly on the use of force. The main operating assumption of this model is that all else equal, profitability of a rebellion is positively related to the likelihood that a rebel leader will arise. This statement is parallel to the fundamental axiom of economics that posits that people respond to incentives.

2.1 The Macroeconomy

The initial macroeconomy is modeled with a standard Cobb-Douglas production equation augmented with natural resources. In keeping with the usual notation, let \( Y, K, L, \) and \( R \) denote the GDP, capital, labor, and natural resources respectively. Then the production equation is

\[
Y = K^\alpha L^\beta R^{1-\alpha-\beta}
\]

where \( 0 \leq \alpha \leq 1, \ 0 \leq \beta \leq 1, \ 0 \leq \alpha + \beta \leq 1. \)

Now let \( t \) be the tax rate, \( r \) rate of return of capital, \( w \) wage, \( p_R \) the prevailing international price of the natural resources, and \( G_0 \) the state military expenditure. We assume the rulers of the state are self-interested; they want to minimize the public expenditures and keep the rest of the state revenues to themselves. In other words, the rulers of the state want to maximize the government surplus, \( S. \) It follows from the definitions that

\[
S = t(rK + wL) + Rp_R - G_0
\]
2.2 The Line of Popular Support

The ideological aspect of civil war can be described by borrowing a framework often used in political science to model the behavior of voters. Assume that all $N$ citizens of the polity are dispersed in a not necessarily uniform fashion on a line from 0 to 1. 0 denotes the center of the state whereas 1 denotes the periphery or the rebel leader. Let the function $F : [0, 1] \to [0, 1]$ be the cdf of the distribution; that is, let $F(x)$ give the ratio of the number of citizens who are placed in the interval $[0, x]$ and the total population. The place of an individual in the interval indicates his or her susceptibility to the ideological influence of the sides. For example, we would expect to place a citizen who is of the same ethnicity and religion with the current rulers of the state closer to 0 whereas a citizen of different ethnicity would be more susceptible to the propaganda of the rebel leader. We postulate that geography and ethnic polarization are two elements that help determine the placement of a citizen on the line. Rural areas, being comparatively less rigorously controlled by the government, present a more accessible setting for the rebel leader’s recruitment efforts and, in a similar vein, mountainous areas are usually more remote and they offer a higher probability of the rebel efforts going unchecked. We will shortly see that the government and the rebel leader share the citizens between themselves by splitting the line at a point $\gamma$, $0 \leq \gamma \leq 1$. Thus, we will have $F(\gamma)N$ people supporting the state and $(1 - F(\gamma))N$ supporting the rebels.

2.3 The Rebel Leader

Since we assume that the rebel leader is only interested in material gain, there can be many potential rebel leaders in a country. Considering that starting a rebellion requires some initial influence and capital, we might think of wealthy landlords or other people of power as potential rebel leaders. In order to be able to describe the decisions such an individual faces, we define a few variables and functions. Let $G_1$ stand for the military expenditures of the rebel leader. Let $e(\lambda)$ be the extortion function. We understand this function as yielding the income from extortion ("taxes," theft, pillaging, etc.), causing an ideological alienation level $\lambda$, $0 \leq \lambda \leq 1$, on the line of popular support in the process. Thus, in the model the rebel leader chooses the level of public disfavor he can risk in return for the direct material gain of extortion. We assume that $e$ is a nondecreasing, continuously differentiable and quasiconcave function. We also define a function $c(\delta)$ that yields the cost of ideological indoctrination of rebel supporters. The rationale is that the rebel movements usually have ideological teachings that the rebel leader may find beneficial to spread so that his following increases in size. We assume that the rebel leader chooses an ideological indoctrination level, $\delta$, $0 \leq \delta \leq 1$, that operates on the line of popular support like its counterpart $\lambda$. We assume that $c$ is convex and continuously differentiable. Additionally, we define $\pi$ as the payoff that the rebel leader promises to its recruits in the event of victory and $d$ as the probability of rebel leader capturing political power through democratic and peaceful means. We expect that if $d$ is sufficiently high, the rebel leader must prefer the democratic process and, for example, run for president in an election.

Both the rebel leader and the government have their own spheres of influence and they split the line of popular support at a limit point $\gamma$. At point $\gamma$, the individual should be indifferent between the government and the rebel leader. From the point of view of a regular citizen, the choice is between the material and ideological influence the rebel leader yields as modified by the citizen’s susceptibility to rebel influence as given by his place on the line and the usual wage that can be
earned by not participating in the rebellion. Thus, we must have
\[ F(\gamma)H(\delta, \lambda, p_1, \pi) = w \]
\[ \gamma = F^{-1}\left( \frac{w}{H(\delta, \lambda, p_1, \pi)} \right) \]
where the function \( H \) yields the pecuniary and non-pecuniary influence the rebel leader has on the population as a function of his choices and \( p_1 \) is the probability of rebel victory, described below. Note that the function combines the ideological influence of the rebel leader with the expected value of payoff in the event of victory. We assume \( H \) is increasing in \( \delta \), \( p_1 \), and \( \pi \) and decreasing in \( \lambda \).

To gain insight into the probability of rebel victory, \( p_1 \), and the conflict technology, we use a standard weighted contest model where weights are proportions of popular support the parties have. We had defined \( G_0 \) and \( G_1 \) as the government and rebel military expenditures respectively. Then the probability of rebel victory can be characterized as
\[ p_1(G_0, G_1) = \frac{[1 - F(\gamma)]f(G_1)}{F(\gamma)f(G_0) + [1 - F(\gamma)]f(G_1)} \]
where \( f \) is a nondecreasing, nonnegative function on \( \mathbb{R} \).

### 2.4 The Optimization Problem for the Rebel Leader

The rebel leader solves a slightly complicated optimization problem to maximize his gains. He wants to extort enough money during the war, minimize military expenditures and the payoffs to his recruits in the event of victory but still have large enough a following to have a good chance of winning the war and, by extension, capturing the surplus of the state, \( S \). Additionally, he has to consider at all times if the gain from following the democratic route is greater. Assuming the rebel leader is risk-neutral, his expected utility is given by the solution to the following problem:
\[ \max_{G_1, \lambda, \delta, \pi} e(\lambda) - G_1 - c(\delta) + p_1(S - (1 - F(\gamma))N\pi) \]
such that
\[ \begin{align*}
    d & \leq p_1 \\
    G_1, \lambda, \delta, \pi & \geq 0
\end{align*} \]

Note that the objective function is differentiably quasiconcave and the constraints are linear. The constraint set is either nontrivially compact or empty. Also note that some variables unambiguously increase the objective function. Following the initial assumption that profitability of a rebellion is positively related to the likelihood that a rebel leader will arise, we expect the variables that unambiguously increase the objective function to be statistically significant in the data.

### 2.5 Predictions

1. Polarization should increase the likelihood of civil war. With higher polarization, the function \( F \) places more citizens close to the endpoint of rebels. Since we have \( F(\gamma)H(\delta, \lambda, p_1, \pi) = w \), for any \( w \), \( \gamma \) should take a higher value and the rebel leader should have a larger following. Clearly, this helps the rebel leader in his optimization problem.
2. Uneven geography and rural population ratio should be predictors. These are the other factors that we had assumed to be affecting the distribution \( F \). For the same reason stated above, we expect to see that countries with more mountainous areas or with higher rural population ratios to be under a higher risk of civil war, all else equal. In the empirical section percentage of mountainous areas and the urban population ratio variables are used in order to capture these effects.

3. Education makes civil war less likely through its effect on wages, \( w \). Generally, higher education levels bring a higher \( w \). \[ S = t(rK + wL) + R_{PR} - G_0 \] and \( t < 1 \) together imply that the increase in wages is not reflected completely to the surplus, \( S \). The competitive offer the rebel leader has to make to citizens to recruit them increases more than \( S \) does.

4. The level of democracy, especially the independent judiciary aspect, should be negatively related to the likelihood of civil war. The foundation of this model is the credible commitment problem, which takes place in the absence of institutions such as judiciary that enforce agreements. Furthermore, in the model a higher \( d \) makes the constraint in the maximization problem harder to satisfy.

5. When a state is weak, extortion by the rebels should be higher. The rebel leader can afford the ideological alienation cost \( \lambda \) that extortion brings because he does not need to recruit as many soldiers to fight effectively against the weak government. This prediction will not be tested in the empirical section due to the difficulty of finding reliable information about extortion; however, Herbst (2000) offers evidence about this pattern of rebel behavior during the civil wars in Sub-Saharan Africa. Thus, this model suggests a theoretical underpinning for the phenomenon discussed in Herbst (2000).

3 Empirics

3.1 Data

The data used in this paper pertains to 161 countries from 1945 to 2007. The basic dataset is adopted from Fearon and Laitin (2003), some variables are added and then the dataset is updated. Below are descriptions of the variables used in the statistical analysis.

Civil War Onsets The onset variable is taken from the Correlates of War (COW) Intra-State War Data Version 4 which was compiled in Sarkees and Wayman (2010). The COW project defines intra-state wars as wars that “involve sustained combat, involving organized armed forces, resulting in a minimum of 1,000 battle-related combatant fatalities within a twelve month period.” To distinguish civil wars from one-sided massacres, COW requires “effective resistance:” either both sides must be prepared for armed conflict or the stronger side should bear at least five percent of the total deaths due to war. The onset variable is the dependent variable in this paper. It is a binary variable that takes 1 if a war starts in that period and 0 if there is peace; if there is an ongoing war, the onset variable is recorded as missing.

Ethnic Polarization The model in this paper predicts that higher ethnic polarization will enhance the influence of a rebel leader. Ethnic polarization is characterized in the data by the polarization index measure, RQ, proposed in Reynal-Querol (2002). This index measures the
deviation from the bimodal distribution, which is considered to have the highest polarization. If there are $N$ ethnic groups in a country and $\pi_i$ denotes the proportion of population belonging to the ethnic group $i$, the polarization index of the country is given by

$$RQ = 1 - \sum_{i=1}^{N} \left(\frac{0.5 - \pi_i}{0.5}\right)^2 \pi_i$$

This index was calculated for various countries in Reynal-Querol (2002) and Reynal-Querol and Montalvo (2005) and it is used in this paper.

**Uneven Geography** To measure how mountainous a country is, I follow the lead of Fearon and Laitin (2003) and consider the estimated percentage of mountainous terrain. The data for this variable are taken from their dataset.

**Urban Population** The model predicts that the ratio of rural population should be positively correlated with civil war onset. It follows that the ratio of urban population should be negatively correlated with war onset. The data for this variable are taken from the fourth and most current version of the National Material Capabilities dataset of the COW project, first compiled in Singer, Bremer and Stuckey (1972) and then expanded in Singer (1987).

**Education** Since males tend to be recruited for civil wars rather than females, a variable that captures the effect of education in the civil war context is the male enrollment in secondary school. The data for this variable are taken from Sambanis and Hegre (2006).

**Democracy** This paper refers to a specific aspect of democracy, that is, the independence of judiciary and checks on executive power. The variable used in the statistical analysis is the “xconst” variable of the Polity IV dataset, which characterizes the level of executive constraints in every country. The data for this variable are taken from Marshall, Jaggers and Gurr (2002).

EUGene software program\(^1\) was also used in the compilation of this dataset.

The caveats associated with a cross-country statistical study about civil wars must be noted. Cross-country regressions do not tend to give the most robust results due to the variance in data-collection practices across countries. The focus of this paper is on less developed countries liable to experience civil wars such as those in Sub-Saharan Africa and data collection is even more unreliable in these countries. Additionally, there is understandably significant uncertainty associated with the data collected from war zones. Therefore, the empirical results from a cross-country study such as this one and many others in the literature should be taken to only suggest conclusions and not prove them. A cross-country empirical study cannot disprove completely a theoretical model of civil war due to the unreliability of the data.

### 3.2 Estimation

Econometrics of civil war onsets presents certain subtle challenges. First of all, the dependent variable is binary and the marginal effects at the level of poor countries, as opposed to at world mean, are of interest, so using a linear specification is out of the question. A logit model will be

\(^1\)See Bennett and Stam (2001)
used in this paper as has become customary in the literature. However, one issue that is almost never addressed explicitly in the literature is that what we have is not panel data but rather time-series-cross-section. The difference is that panel data have more cross-sectional units and a small $T$ whereas time-series-cross-section data (hereafter TSCS) have a reasonably large $T$ in comparison to $N$. The asymptotics in panels are in $N$ while asymptotics in TSCS are in $T$. Each type has its own set of advantages and problems associated with it; here one does not have to worry about the incidental parameters problems of the panel data, but temporal correlation, often called duration dependence in this case, is now a more serious issue. It is a very likely case that as a country spends more and more years in peace, it will be less likely to plunge into civil war. A country that has experienced civil war, on the other hand, is more likely to experience it again. Collier (2007) has a discussion of the civil war trap. I follow the advice of Beck, Katz and Tucker (1998), who explicitly study the duration dependence problem in a binary TSCS setting. They recommend using temporal dummies for every year or, in order to save degrees of freedom, approximate the temporal dummies using natural cubic splines. Using the script written by Richard Tucker\footnote{This script generates the natural cubic splines, dummies and counter variables as described in Beck, Katz and Tucker (1998). See Tucker (1999).} I generate three cubic splines and use a likelihood ratio test to determine if they are needed. Even though Beck, Katz and Tucker (1998) forcefully argue for the necessity of dealing with duration dependence and show how the results of a paper are rendered insignificant when duration dependence is taken into account, the most-cited research papers in the literature such as Fearon and Laitin (2003), Collier and Hoeffler (2004), and Collier, Hoeffler and Rohner (2009) do not take the recommended precaution. The attention paid to these details in this paper hopefully makes the results more robust.

This is a pooled, binary logit regression in the country-year space estimated with the maximum likelihood estimator. The econometric specification is

\[
    cw_{it} = \beta_0 + \beta_1 Pol_{it} + \beta_2 Mount_{it} + \beta_3 Urb_{it} + \beta_4 Edu_{it} + \beta_5 Democ_{it} + \zeta Spl_{it} + \epsilon_{it}
\]

where $Pol$ refers to the ethnic polarization index, $Mount$ the percentage of mountainous terrain, $Urb$ the ratio of urban population, $Edu$ the male enrollment in secondary school, and $Democ$ the executive constraints index. The dependent variable $cw_{it}$ is a dummy indicating civil war onset for country $i$ and period $t$. $Spl$ is a vector that contains the three generated natural cubic splines along with a counter variable for peace years. Due to the fact that different observations are missing for different variables, I have also regressed the dependent variable on explanatory variables one by one so that their significance can also be evaluated with as much data as possible. The results of these regressions as well as the full regression are shown in the next page. We see that all of the explanatory variables are significant at $\alpha = 0.05$ with the expected signs except the urban population ratio which is not statistically significant. A table showing the average of marginal effects of explanatory variables is shown below.
Average Marginal Effects

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<tr>
<td>Urban Population</td>
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<tr>
<td>Executive Constraints</td>
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<td>Male Secondary School Enrollment</td>
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<td>Constant</td>
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p-values are in parentheses.

The insignificance of rural population can be accommodated within the framework presented in this paper. One can argue that being in a rural village alone does not make a person more susceptible to rebel propaganda and that the modern, rapid expansion of cities implies that government control is weakened also on the outskirts and ghettos. Since the model is flexible and not dependent on an interpretation of the rural population ratio, the statistical result does not present an important setback. The more challenging issue is that of endogeneity. Some degree of endogeneity is almost inevitable with higher-level variables. In this study, the most conceivable source of endogeneity is the executive constraints variable that represents a democratic aspect of a country. One could argue that while unchecked executive power makes civil war more likely, it is also the case that countries in risk of war also find it beneficial to expand the powers of the executive branch of the government. The fact that most empirical studies on civil war, including Fearon and Laitin (2003), Collier and Hoeffler (2004), and Collier, Hoeffler and Rohner (2009), suffer from this possible endogeneity suggests that a solution to this problem is difficult to find. An idea for future research is to instrument democracy with another variable, possibly the settler mortality rates in 1500s.

4 Conclusion

This paper presents a theoretical model for civil war onset. The macroeconomical, ideological, and tactical aspects of civil war as modeled in this paper yield predictions about the impact of ethnic polarization, urban population ratio, uneven geography, education and the level of executive constraints. In the empirical section these predictions were found to be supported by the data, except for the prediction about the urban population. This paper also offers a theoretical explanation for the pattern of extortion by rebels described in Herbst (2000). While this paper attempted to reach a general understanding of intra-state conflicts, it is clear that it has only scratched the surface of the complex phenomenon of civil wars. Future research on this topic would benefit a lot from
### Logit Civil War Onset Regression

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</table>

The p-values are in the parentheses. A variable counting peace years and the three generated splines are included in all regressions.
in-depth examination of conflicts taken one at a time and an investigation into the dynamics of group cohesion in rebel organizations. Such an approach would avoid the endogeneity problems found in cross-country studies and yield valuable insight into the exact details of a rebel movement. Institutional analysis of the rebel organizations is also an interesting possibility for future research. Armed with a general understanding of civil wars, the next step should be to focus on individual conflicts for more robust results.
References


