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Poverty as an Underlying Cause of Civil War

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Abstract: Civil wars occur overwhelmingly in poor countries. The existing theoretical and empirical literature on the causes of civil war assumes that poverty causes conflict; however, this assumption should be challenged because the literature has failed to establish a conclusive relationship between poverty and civil war. This paper uses statistical testing to examine poverty, as both a social and economic phenomenon, in the context of the causation of civil war. The implications that poverty, when measured by social indicators, causes conflict are far reaching and should influence the imperative of wealthy countries to assist poor countries in their development.

I. Introduction

Armed, violent struggles for independence, dominance, or regime change play important roles in determining the course of history and politics. These struggles, known as civil wars, rebellions, insurgencies, or revolutions, are not confined to history books but continue to play a role in the political landscape of the global south. Most theorists point out that civil wars are the most deadly conflicts plaguing the world and that these wars produce long-lasting and far-reaching economic, political, and social effects such as refugee movements and disruption of the economy¹.

With disease epidemics, natural disasters, corruption, and the like hindering development, the last thing a poor country wishes for is a civil war. However, the majority of civil wars occur in the poorest countries in the world. There exists a great necessity of understanding why these countries face conflict in addition to the vast array of problems they face in their economic development. The complex political, social, and economic causes and consequences of civil war require in depth analysis of when, where, and why civil wars will erupt. Although the motives vary across space and time, groups of scholars have attempted to explain the causation of civil wars using theories, case studies, and empirical models; however, many questions remain in explaining these complex political events.

The fact that modern civil wars tend to occur in low income countries has not escaped many theorists; however, this statement of empirical fact has not been fully explored or explained in the current theories and models of onset. While many explanations exist as to why more civil wars occur in poor countries, the idea that poverty may cause civil war has only briefly been touched upon in the literature even though the most basic understanding of low income per capita is that there is a high prevalence of very poor people living in a particular country. The popular explanations for the negative relationship between income per capita and high probability of civil war onset ignore poverty as a social

¹"Between 1945 and 1999... there were roughly 127 civil wars that killed at least 1,000, 25 of which were ongoing in 1999. A conservative estimate of the total dead as a direct result of these conflicts is 16.2 million, five times the interstate toll. These civil wars occurred in 73 states—more than a third of the United Nations system—and had a median duration of roughly six years" (Fearon and Laitin, 2004: 75).

phenomenon and focus on economics-based explanations such as opportunity costs and greed or state strength.

The existing theoretical and empirical literature on the causes of civil war assumes that poverty causes conflict; however, this assumption should be challenged because the literature has failed to establish a conclusive relationship between poverty and civil war. In order to verify the claims that poverty causes civil war, new empirical tests must be performed that include more appropriate measures of poverty. The current tests use variables that have multiple interpretations and therefore competing explanations for the causes of civil war exist. By using a definition of poverty that reflects deprivation, a model of civil war onset will emerge that distinguishes between greed, grievance, and state strength explanations.

Civil War

A civil war is a conflict between two entities within a single state in which 1,000 battle deaths occur with at least ten percent of those deaths on each side of the conflict. The ten percent figure distinguishes these conflicts from genocide. The definition reflects the requirements used by the Correlates of War (COW) project (www.correlatesofwar.org), which is used by many theorists². The COW definition also requires organized military action and effective resistance against an involved government (as cited in Collier and Hoeffler, 2007: 7).

Poverty

In the context of this examination of civil war onset, poverty should be understood as the condition of extreme economic, social, and political deprivation. This definition of poverty sets this paper apart from the current literature by employing a social, rather than purely economic definition of poverty. The definition provided by the United Nations Committee on Economic, Social and Cultural Rights reflects the magnitude and complexity of poverty as "a human condition characterized by the

² Fearon and Laitin (2003); Collier and Hoeffler (2007) cite COW, but use Nils Petter Gleditsch et al.'s "Armed Conflict Data" (2002) set instead; Buhaug (2006) uses Fearon and Laitin's data and therefore the COW definition.

sustained or chronic deprivation of the resources, capabilities, choices, security and power necessary for the enjoyment of an adequate standard of living and other civil, cultural, economic, political and social rights." ([E/C.12/2001/10](#))³. Acknowledging that poverty is more than just low income sets a baseline for examining the multiplicity of effects poverty can have on the onset of civil war and also allows the recognition that poverty is a potential grievance and motivator for rebellion.

The implications of poverty causing the onset of civil war reach across internal boundaries and affect the entire world system. Following the institution of the Millennium Development Goals, the world community has focused on helping less developed countries in a partnership for development. In the context of poverty causing violence, Amartya Sen points out that "the straightforward thesis linking poverty with violence has significant appeal: it is available for use in the humane political and moral advocacy of concerted public action to end poverty" (2008: 7). The appeal of ending poverty because it fosters violence has a more pointed impact than the moral imperative to help those less fortunate, because it creates a sense of urgency and fear. If we determine that poverty affects the onset of civil conflict that implies an even greater imperative for states to reach out and assist in the development process. Often civil wars encroach upon neighboring states by either morphing into an interstate war or by producing massive waves of refugees. For that fact alone, the world community has a stake in the prevention of civil wars, but if poverty proves to be a significant factor in onset, the world community must work with governments to strengthen basic needs provision, opportunities, and state institutions. It is important to examine the condition of life within the poorest countries, and this paper seeks to examine whether those conditions of poverty affect the likelihood that a civil war will erupt.

This paper will address the necessity of discussing poverty, as a social and economic phenomenon, in the context of the causes of civil war. A review of the literature will establish the lack of both theoretical and empirical discussions of poverty in the current understanding of civil war onset.

³ <http://www.unhcr.ch/tbs/doc.nsf/%28Symbol%29/E.C.12.2001.10.En?Opendocument>
<http://www.unhcr.ch/development/poverty-02.html>

Following the review of the literature, the specific roles poverty can play in civil war onset will be addressed as well as additional shortcomings of the literature. Finally, replications of the Fearon and Laitin empirical model will test the idea that inclusion of a proxy for poverty in the model will improve and clarify the theory of civil war onset.

I. Review of the Literature

There are several models of *economic* causes of civil war onset. Many of these models can be attributed to scholars within a group that worked together on a project for the World Bank and also work together at the International Peace Research Institute in Oslo (PRIO); these scholars include Paul Collier, Anke Hoeffler, Nicholas Sambanis, Havard Hegre, and Halvard Buhaug. Their arguments are similar and tend to involve considerations of opportunity costs, greed, and relative capabilities. The other major grouping of scholars focuses on the correlation between economic inequality and political conflict. The primary focus of my research was the greed versus grievance dichotomy and those explanations that involve considerations of poverty. During my research I kept the following question in mind: do the current theories of civil war improve upon the statement of empirical fact that civil war is more common in poor countries than in rich ones?

Collier and Hoeffler: Greed vs. Grievance

Where civil war is feasible, it will occur. This is the premise of the Collier-Hoeffler model of civil war onset. They theorize that civil war will arise whenever an opportunity for profit presents itself. In so doing, they align themselves with the “greed” interpretation of civil war, and implicitly reject its theoretical rival, the “grievance” explanation. They contend that groups are enticed to rebel against a government by the opportunity for private economic gains, not by broader political and social grievances. On the basis of their statistical analysis Collier and Hoeffler reject grievances as a cause of civil war, though, for reasons I elaborate below, I question whether that inference is valid.

Collier and Hoeffler's model focuses on the greed of rebel leaders, which makes the opportunity costs of rebellion in various circumstances the largest determinant of civil war onset. Collier says "factors which account for this difference between failure and success are to be found not in the 'causes' which these two rebel organizations claimed to espouse, but in their radically different opportunities to raise revenue" (2006: 1). We can assume Collier is talking about the justifications for going to war. Regardless of the justification, he ultimately believes that in order for civil war to actually start there must be financial capabilities. So we can draw a simple diagram of Collier's (and Hoeffler's) mechanism to war: "Cause" → Financial Capabilities → Civil War. The CH model only concerns itself with the highlighted portion that depicts the effect of financial capabilities on war. Instead of concentrating on an explanation for what prompts a group to seek out the manpower and financial support necessary to combat the government, the CH model attributes this to greed and dismisses the possibility of underlying grievances. In Collier's 2006 piece "The Economic Causes of Civil War," he attempted to distinguish between the view of the public and the view of economists on the causes of civil war. The economists tend to view civil war as "the ultimate form of organized crime" instead of the "ultimate form of protest" and in this sense they believe that civil war is a form of predation on the productive resources of a society (Collier, 2006:2). The rebels use the language of protest in order to gain support from society for their activities, which allows them to adopt grievances as their slogan, even though their motivations are actually greed based. Collier goes on to argue that "in the economist's view of conflict, grievance will turn out to be neither a cause of conflict, nor an accidental by-product of it" (2006:3). This argument determines the course of Collier's model, that grievances are irrelevant as a cause of civil war.

Opportunity to Collier and Hoeffler means that it is feasible for rebels to engage in conflict: financing and manpower must be available to the rebel leadership to give them a chance against the government. Manpower will be available to rebel organizations only when young men lack other

economic options, that is, when the opportunity cost of joining the rebel forces is low. To test this claim statistically, Collier and Hoeffler (2001, 2004), Collier and Sambanis (2005), and Collier, Hoeffler, and Rohner (2007) identify several proxies for the opportunities that make rebellion feasible. These include the availability of financing for the rebels and low opportunity costs for rebel recruits.

An important source of financing is natural resource extraction, especially those that are easily lootable, like diamonds. The Collier-Hoeffler studies, and many others, generally employ primary commodity exports/GDP as a predictor of civil war onset in their regression equations. Natural resources attract rebel leaders because resource rents can finance and sustain the conflict, yet they are more easily controlled than other sources of economic wealth. However, treating natural resource extraction solely as a funding source for rebels risks ignoring a common interpretation of the effects of natural resources on a state. It is widely acknowledged in the political economy literature that in natural resource economies the state has a distinctive character which is likely to affect the incidence of grievance. It is ordinarily distant from the population since it does not need to tax, and is usually unresponsive to citizen demands, generating the statistical pattern of having unusually low indicators of citizen welfare. Recognition of those patterns indicates that primary product exports cause both grievances and opportunity costs – and thus can hardly be used to adjudicate “greed” vs. “grievance” theoretical claims.

Two additional measures of financial support for a rebellion were used in the CH model, only to be statistically rejected. In addition to primary commodity exports, a potential source of financing can be donations from diasporas measured by the number of immigrants in U.S. divided by the total population of the home country. This measure does not support their opportunity cost hypothesis, but does support the idea that conflict breeds more conflict, as the measure of diaspora size was correlated to recurring conflict. Finally, Collier and Hoeffler believe the tensions between the superpowers of the Cold War led to financing from hostile foreign governments so they included a measure to indicate the

pre-1990 period (to indicate financing that may have come from either the Soviet Union or the U.S. during the Cold War). The previous three measures indicate the feasibility of civil war by the presence of adequate financial support. However, primary commodity exports were the only significant measure of financial capabilities of the rebels; however as mentioned previously the interpretation of primary commodity exports significance can be contested.

The CH model also examines opportunity cost for rebel recruits in the form of income foregone by joining the rebel forces. They measure it in several ways, the most important of which is gross domestic product (GDP) per capita. In the Collier-Hoeffler econometric test, the conflict episodes occurred when the per capita income was half that of the peace episodes; however they admit that GDP per capita can be interpreted to mean other things (2004:569). Another measure of opportunity cost is male secondary enrollment, which proxies for education as an alternative to joining the rebel force in recognition of the fact that rebel armies recruit heavily from this age group. Finally, the CH model uses GDP growth over the previous five years to stand for new economic opportunities and potential job creation⁴. According to Collier et al. (2007:11), “growth implies job creation which reduces the pool of labor likely to be targeted by rebels”. Education and job opportunities represent the costs for rebels to join the army in a civil war. Along with financial capabilities, opportunity cost is the mechanism through which these variables cause civil war to start, in the view of Collier and Hoeffler. If the costs of rebelling are low enough (i.e. GDP per capita is low, rebels are able to finance themselves through donations and looting), a civil war will ensue. Of course, the absence of educational and job opportunities can be equally plausibly regarded as the basis for grievances against the government.

Collier and Hoeffler’s latest work marks a distinct turn from their previous formulations, but it still does not improve the fit between their theory and the statistical model of it. In their 2007 article,

⁴ Christopher Cramer, in Civil War Is Not a Stupid Thing (2007), believes that GDP growth over the past five years is a grievance under the CH model (129). That was not the impression I had from my reading of Collier and Hoeffler’s work.

they find that “feasibility” best describes the situation in which civil war will start, but they claim that feasibility is different from their previous discussion of motivations, which they contend included both “greed” and “grievance.” Collier et al. (2007) now claim that “the feasibility hypothesis proposes that where rebellion is feasible it will occur: motivation is indeterminate, being supplied by whatever agenda happens to be adopted by the first social entrepreneur to occupy the viable niche” (2007:21). Thus, they appear to have backed away from their earlier emphasis on “greed” to the exclusion of “grievances”, but the theoretical distinction between “greed”-motivated civil war and “feasibility” is so slight that the statistical model barely changes in its latest incarnation. They retain both the empirical claim that feasibility alone explains where and when civil war will be initiated and the measurement strategy of interpreting the above variables as indicators of feasibility and nothing else.

State Strength: Fearon and Laitin

Similarly, in Fearon and Laitin’s (2003) model of civil war onset, grievances are not useful predictors of civil war, but the feasibility of insurgency⁵ is. They are explicit in accepting that grievances are involved in the process, but contend that grievances are “too common to distinguish the cases where civil war breaks out” because while grievances often motivate rebels, a broad range of motivations can explain insurgency (2003:76). They share Collier’s identification of feasibility, but define it differently, with less emphasis on rebel capacities and more on the state’s capability to resist them. In Fearon and Laitin’s formulation, insurgency is the primary path that leads to civil war, and state capabilities determine whether or not insurgency will progress to a full out civil war. The state can either deter or invite civil war; if the state is weak financially, politically, and institutionally, rebellion will be more attractive – in their language, “feasible “ – because the state will not be able to respond adequately (2003:75). Fearon and Laitin’s statistical model incorporates many of the same measures as

⁵ “Insurgency is a technology of military conflict characterized by small, lightly armed bands practicing guerrilla warfare from rural base areas. As a form of warfare insurgency can be harnessed to diverse political agendas, motivations, and grievances” (Fearon and Laitin, 2003: 75).

the CH model, but they are interpreted to represent quite different mechanisms and causal pathways. FL cite three explanations for why GDP per capita is significant in the FL estimator. First, GDP per capita measures government financial, military, and political strength, which would enable the state to prevail in a conflict and which thus will deter rebels. Second, higher GDP per capita causes improvements such as roads and allows the government to reach out into the rural areas making it more difficult for those regions to rebel. Third, they accept the opportunity cost argument that higher income per capita provides fewer incentives for young men to join rebel forces (Fearon and Laitin, 2003:80). While the three explanations of GDP per capita's role in onset complement each other, the overall theme of state strength differs significantly from the representation of GDP per capita found in other prominent models. Fearon and Laitin also had very different statistical results in their tests of civil war onset and often discounted variables that the CH model found were significant.

Fearon and Laitin achieved statistical results that contradicted earlier findings and supported some controversial results such as the rejection of ethnic and religious diversity as causes of civil war onset. The supplement to Fearon and Laitin's 2003 paper included a wide variety of tests of civil war onset, including specific tests for ethnic conflict, which has often been separated in the literature as having very different causes than non-ethnic based wars⁶. In their additional tests, Fearon and Laitin find that ethnic and religious diversity does not predict civil war, and neither does democracy and political freedom. Although not the first to reject ethnic and religious diversity and democracy, these results confirm what appears to be a major blow to traditional views and the basis for democracy. However, proponents of theories of that involve more traditional grievance based explanations continue to assert that there are other factors that must be taken into account in conjunction with ethnicity, religious differences, and certainly democracy before completely dismissing their relevance in explaining

⁶ See Kaufmann's (1996) "Possible and Impossible Solutions to Ethnic Civil Wars" for an in-depth analysis of the differences between ethnic and ideological civil wars. This paper treats all civil wars and does not distinguish between ethnic and ideological war.

violence and civil war onset. In the case of democracy's insignificance in the FL model, one could argue that the sample may not capture or adequately explain the effects of freedom of speech, civic opportunities, or political participation, those aspects of democracy that one would expect would limit or even promote civil war. Additionally, a bias inherent in almost every model is that all countries are included, even those that have already completed the process of development. It is not responsible to declare that democracy does not improve the chances against a civil war despite the results of the FL and CH models. The FL tests reject traditional grievance based causes of civil war in accordance with Collier and Hoeffler. Although Fearon and Laitin took great care to eliminate grievance explanations of civil war, they neglected to clarify how their inclusion of GDP per capita was different from other models' inclusions of GDP per capita. The FL model settled on GDP per capita as the indicator that best represented state strength, but failed to test any other measure that represented state strength such as tax revenues⁷, military capacity, or government expenditures.

Grievances: Relative Deprivation and Economic Inequality-Political Conflict Nexus

For several decades, the idea of a link between economic inequality and political conflict was a popular explanation for intrastate conflict. The tradition in the literature on the EI-PC nexus is that relative levels of deprivation and equality paired with views on whether groups are willing to risk violence determines the incidence of violent conflict. The major difference between relative deprivation and inequality is the level of experience. Relative deprivation is an internal calculation of the difference between personal expectations and reality. Inequality is a judgment of one's own reality as compared to the reality of others in society. So relative deprivation is an individual situation, but inequality is a societal level situation (Norton and Regan, 2005:321).

⁷ The ability to collect taxes is seen as one of the foremost indicators of a legitimate government, therefore one would expect that a legitimate government would be serving the people's needs adequately and would not be subject to rebellion.

T.R. Gurr examines relative deprivation as a causal factor of civil strife. The relative deprivation theory states that gaps in realities and expectations produce discontent and conflict. From the perspective of economic causes we can imagine that discrepancies between economic realities and expectations would produce strife, and in fact Gurr includes an economic discrimination index in his model. The model distinguishes between persistent and short-term deprivation. Gurr believes that the wider discontent is spread the greater the magnitude of the strife and also that the “innate response to perceived deprivation is discontent or anger,” meaning violence will follow deprivation (1968:1104). Relative deprivation can be classified as a grievance.

Lichbach conducted a review in 1989 of approximately 40 studies related to the economic inequality-political conflict nexus only to find that the studies fail to establish a strong correlation between EI and PC. The results of decades of statistical models, formal models, and theories of EI-PC have produced such diverse results as positive, negative, and negligible relationships between inequality and political conflict (Lichbach, 1989:440). The statistical models all use different measures of inequality because a common definition of inequality does not exist and because inequality can mean inequality of land or income.⁸ One study Lichbach examined, that of Zimmerman, argued that the reason for a lack of relationship between inequality and political conflict is due to the effect of level of development (445). The effects of inequality must be examined along with some measure of the level of development (Lichbach and Zimmerman seem to think GDP per capita will suffice). Lichbach also discusses the rational versus deprived actor approach taken in the EI-PC nexus. The assumption is that absolute poverty and organization are the conditions necessary for actors to rebel, because absolute poverty creates behavioral dissent and collective action is necessary when actors are poor and have limited resources (Lichbach, 1989: 462). The idea of collective action uses a rational actor approach to

⁸ Inequality is measured by the “Gini Index, several stochastic distributions, size of various income shares (e.g. the upper quintile), ratios of poverty to affluence, and minimum welfare and “basic needs” (e.g. percentage below the poverty line, percentage with substandard health, food, shelter, clothing)” (Kang Hoon Park cited in Lichbach, 1989: 441).

determine how actors engage in civic activity, be it forming community councils or forming rebel armies. Organization ought to play a key role in determining whether and how the grievances, in this case inequality, are addressed. Lichbach claims that neither case studies nor quantitative studies provide satisfactory results in establishing a clear and robust relationship between economic inequality and political conflict.

One other test of the EI-PC nexus seems to come in the form of Bernhard, Reenock, and Sobek's model of socioeconomic inequality as a cause for democratic break down. It includes "level of development," although this is measured by GDP per capita. Bernhard et al. use the term "regressive socioeconomic distribution" to describe the phenomenon of a country developing economically, but failing to fulfill the basic needs of the population (2007:678). Absolute distribution of resources corresponds to basic needs satisfaction, and measures deprivation better than income inequality in the view of Bernhard et al. They "believe that basic needs satisfaction better captures the conditions that motivate political actors to press for radical redistributive measures and other actors to resist" (Bernhard et al, 2007:680). The Bernhard et al. study can expand to include all forms of government, since regardless of the form of government the state should be responsible for providing for the basic needs of the people. In any situation of deprivation, the people will react.

II. The Neglected Question: How is Poverty Related to Civil War?

If we assume that poverty causes civil war, as many scholars do, we must ask: what are the mechanisms by which it could lead to civil war? In order to determine the relationship between poverty and civil war we must take into consideration the various explanations of causal pathways. The possible explanations for how poverty causes civil war include grievances, greed, and state capacity. We must be careful to consider the uncertain relationship between poverty and GDP per capita, not least because GDP per capita can indicate so many different theoretical forces.

Before examining civil war specific theories, it is useful to point out that several theories indicate a relationship between poverty and violence. From sociology and psychology to economics, scholars have attempted to determine why and how poverty causes violence. The idea that poverty causes violence remains a fundamental assumption of theorists despite a lack of robust empirical evidence. Although the empirical evidence may suggest otherwise, a strong reason to study poverty's role in civil war is reflected in a statement by Amartya Sen, "Given the co-existence of violence and poverty, it is not at all unnatural to ask whether poverty kills twice – first through *economic privation*, and second through *political carnage*" (Sen, 2008: 7). The effects of poverty spill over first to private life and then to political life in Sen's view. Political or community forces could potentially harness the type of violent behavior associated with poverty into the formation of a rebellion, and that indicates the necessity of studying poverty as an underlying factor in the onset of civil war.

Poverty is a condition that ought to cause grievances; extreme poverty places people in desperate situations. It is not unreasonable to assume that the combination of destitution and desperation would cause people to fight for the redress of their grievances. Sen points out that "poverty can certainly make a person outraged and desperate, and a sense of injustice, related particularly to gross inequality, can be a good ground for rebellion – even bloody rebellion" (2008: 7). The injustices of poverty influence the propensity for violent conflict, especially in the presence of inequality, a point which the economic inequality-political conflict nexus discusses. Although the EI-PC focuses on inequality, the situation of inequality is not always the same as the situation of poverty. Poverty can be accompanied by inequality, and often inequality exacerbates the effects of poverty, but inequality alone cannot explain all the effects poverty may have on the onset of civil war. Discrimination also links poverty to conflict. The economic inequality-political conflict nexus assumes that inequality will lead people to rebel. In Huntington's view, "Where the conditions of land-ownership are equitable and provide a viable living for the peasant, revolution is unlikely. Where they are inequitable and where

the peasant lives in poverty and suffering, revolution is likely, if not inevitable, unless the government takes prompt measures to remedy these conditions” (Huntington in Lichbach, 1989: 445). If people experience discrimination in situations of inequality, a very likely scenario, the EI-PC nexus and Gurr warn that civil conflict will ensue.

The definition of poverty employed in this paper highlights the aspect of “powerlessness” that poverty imposes upon its victims. Poverty implies that civic society is ill-equipped to solve the problems facing people and that people do not have a community that can take action to assuage their discontent. Without the capacity to address grievances in a peaceful forum, the expectation is that people will resort to other means to solve their problems, including taking up arms.

The other explanations linking poverty to civil war are much less direct than grievances. The greed argument, as found in the Collier-Hoeffler and Buhaug models, is that the opportunity cost of rebelling is much lower if people already live in poverty. The same desperation that leads to grievances forces young men to abandon their families in search of higher paying “jobs” with the rebel army. Low individual income levels allow the rebel armies to attract recruits with much greater ease. However, most poor countries experience a dearth of well-paying, quality jobs in the formal sector, but not all poor countries experience civil war. The argument for the greed explanation fails to account for the other effects of poverty that would lead a young man to join a rebellion, such as grievances against the government or another group of people.

Fearon and Laitin’s state capacity argument described above and echoed in several other articles on the onset of civil conflict describes a situation in which the government either does not have the capabilities to counteract the rebels or the government causes problems by failing to supply adequate public goods to the population. To Gurr for example, systemic poverty means limited state capacity (1970:359). The opportunities for taxation of the population are constrained by a very poor population and therefore the budgets for defense, education, health care, etc. are all constrained.

Poverty at the societal level undermines the strength of the state, not only to defeat an insurgency but to provide the goods and services necessary to satisfy the populace. The state has a responsibility to provide for its citizens; however the poorest states often fail to satisfy and protect their citizens. The inaction of governments in creating a good quality of life will result in grievances and often exacerbates the effects of poverty. A civil war will break out if the rebels deem their capabilities an adequate match to the government or if the society has grievances against the government.

Unfortunately, while the potential explanations for how poverty causes civil war exist in the literature, those explanations are buried in theories and assumptions. Do the theoretical twists and causal mechanisms obscure the true connection between civil war and poverty? Most authors move past poverty to their own explanations, and even if poverty underlies their theories we only discover this by reading between the lines in some cases.

Other Shortcomings of the Models

The literature fails to answer the question of how poverty causes civil war, but it also fails to adequately address economic grievances and actors motivations. A full examination of grievance based causes of civil war ought to consider economic grievances- inequality, unemployment, etc. A better way to measure grievances would be to include social indicators, especially indicators of basic needs⁹ satisfaction in the models to determine whether poverty affects conflict onset, because these measures reflect the underlying conditions within a country. In most cases, measurement issues cause further problems with interpreting the results of the econometric models and theories. The inclusion of GDP per capita in all models with different interpretations in each creates confusion as to the actual causal mechanisms responsible for the onset of civil war. GDP per capita can represent many different aspects of the economy and the conditions within a country, but this means that there must be an alternative measure of poverty in order to make the claim that poverty causes civil war.

⁹ Basic needs are, “those minimally required to sustain life at a decent material level... defined in terms of adequate food, water, health care, shelter, and minimum education” (Moon 1991:5).

Based on the review of the literature, it is possible to note that the empirical models often do not match up with very well with the theories put forth by the various schools of thought.¹⁰ The imperfect correlation between models and theories points to the fact that many of the variables could be improved or clarified in hopes of creating a better match to the theory. In particular, GDP per capita represents a multitude of different and competing explanations within the various theories and while it always represents a significant factor in the causation of civil war, there is disagreement as to what that means. In 2004(a), Sambanis said that the alternative explanations of GDP per capita's negative relationship to civil war make it difficult to determine the actual mechanism responsible for the relationship (264). He says that both the CH and FL model provide plausible explanations, but that there are more direct variables that could be substituted for GDP per capita that would fit the causal pathway better. It is widely held among (non-Modernization/Liberal) development theorists that GDP per capita is not the best measure of poverty, and in fact GDP per capita has so many interpretations that Sambanis' claim that more direct variables exist seems to be true. Clarifying the role of income per capita, whether it represents poverty, opportunity cost, or state strength, will improve the model of civil war onset.

The best way to clarify GDP per capita would be to include poverty in the model of civil war onset. By separating the effect of poverty on civil war from the effects of income, at least one possible role of GDP per capita disappears. Although most theorists have discounted grievances as an explanation of civil war in favor of opportunity cost or state strength arguments, a true discussion of poverty does not exist in the current literature which points to a hole in the theoretical argument.

¹⁰ This is a sentiment echoed by Sambanis in "Poverty and the Organization of Political Violence," he points out that, "there is not a very good fit between the empirical results and all aspects of rationalist theory" (2004: 3).

IV. Method

The majority of the literature on civil war uses either empirical tests or case studies to examine and analyze the theory of onset. This paper takes the approach of statistical testing based on the assumption that the current tests leave out an important discussion of poverty. While case studies may be better able to indicate the specific role of poverty in civil war onset, often propaganda and rhetoric make it difficult to establish the true motivations of the actors. Additionally, those analyzing the cases often disregard the effects of poverty in accordance with the current empirical tests that disregard poverty. Statistical tests were chosen as the most appropriate method for this thesis to determine whether the current models correctly leave out discussions of poverty, as defined previously.

In depth descriptions of the tests follow in this section, however the major models used to test the hypothesis that poverty causes civil war are as follows:

- A replication of the Fearon and Laitin (2003) Model with an added poverty proxy to test the significance of a social indicator of poverty and to test the interpretation of income per capita.
- Replications of the Fearon and Laitin (2003) Model with only countries that had a GDP per capita below \$10,000 and below \$5,000 (poverty proxy included) to remove the bias of wealthy countries.
- A replication of the Fearon and Laitin (2003) Model with an alternative measure of state strength to check Fearon and Laitin's state strength argument.

Replication tests were performed to test the idea that inclusion of more accurate representations of poverty in models of civil war onset would improve the models and clarify the theories of civil war onset. Due to availability of data, Fearon and Laitin's model of onset was used to represent the baseline model of civil war. As noted previously, Fearon and Laitin argue that a strong

state, as measured by GDP per capita, inhibits the ability of rebels to mount a successful insurgency. By using Fearon and Laitin's model, the test became not only an indication of whether poverty was significant, but also whether the state strength argument had credibility when tested with poverty. The goal was to separate the effects of poverty from the effects of income per capita, which has several meanings in the context of civil war onset.

A combined data set was created using the data from Fearon and Laitin's 2003 paper and Sambanis and Hegre's 2005 sensitivity analysis. Several logit regression analyses were performed, since that was the econometric model employed by Fearon and Laitin as well as Collier and Hoeffler¹¹. Each test included a constant set of variables to control for effects of: population, prior war, polity, new statehood, instability, and Oil exporting. Including the control variables meant that each test kept Fearon and Laitin's model intact and highlighted the effects of the poverty variable. The goal was to examine the effect poverty had on the income per capita variable, so for each new variable the test was executed with three variations. First, the test only included GDP per capita and the number of observations was held constant in order to have a comparison for the tests that had the poverty variable. The second test was executed with both GDP per capita and new variable to compare the effect of poverty on GDP per capita. Finally, the third test included only the new variable to determine the effect it had on the other variables in the model without the presence of income. The new variable represents some social indicator of quality of life that serves as a proxy for poverty.

The Fearon and Laitin Model

Fearon and Laitin's model of civil war onset provided a starting point for this paper and a solid foundation on which to test the theory that poverty causes civil war. Their model includes several key variables, and although the variables often must be understood in the context of insurgency, they have clear interpretations- with the exception of GDP per capita. The variables kept in place for the

¹¹ The logit model is used in situations of binary choice, ie. civil war occurred (1) or civil war did not occur (0).

replication tests represent the variables that were significant in the majority of their tests. Income per capita is the primary variable that serves as a proxy for their theory of state strength; it measures among other things the capacity of the state to combat insurgency both financially and militarily. The assumption that a history of war or a recent war would increase the chances of another civil war is quite intuitive and therefore Fearon and Laitin put a measure of prior war, represented by the lagged dependent variable, in the model. They include the logarithm of the population (lagged one period) to represent the idea that a larger population favors insurgency and provides more recruits. A measure representing mountainous terrain represented one hypothesis about the nature of insurgency, “The presence of rough terrain, poorly served by roads, at a distance from the centers of state power, should favor insurgency and civil war” (Fearon and Laitin, 2003: 80). Instability and new statehood¹² are included in the model and increase the chances of civil war because the additional turmoil favors separatist movements or rebellions and new states often have “untested militaries” (2003: 81). Finally, oil rich states are proxied in the model to capture the “Dutch disease” effects that Fearon and Laitin claim oil has on government capacity¹³. In addition to the significant variables, Fearon and Laitin included variables representing ethnic fractionalization, religious fractionalization, and democracy; however, the replication tests do not include those variables in order to avoid misspecification of the model since those variables were not significant in the FL model. The general format for their tests was to do a logit regression, however they also performed a Poisson regression to capture years in which more than one war started, but the results were consistent with the logit regressions (Fearon and Laitin, 2003b: 5). Table 1 gives the results from the original Fearon and Laitin test in column 1 and the results from their test without the insignificant democracy, ethnic and religious fractionalization variables.

¹² “For [new states] we mark countries in their first and second years of independence; for [political instability] we use a dummy variable indicating whether the country had a three-or greater change on the Polity IV regime index in any of the three years prior to the country-year in question” (Fearon and Laitin, 2003: 81).

¹³ “Oil producers tend to have weaker state apparatuses than one would expect given their level of income because the rulers have less need for a socially intrusive and elaborate bureaucratic system to raise revenue” (Fearon and Laitin, 2003: 81).

Table 1.

	1	2
<i>Fearon and Laitin Replication</i>		
Prior War	-0.954 (0.314)	-0.904 (0.31)
Per capita income	-0.344 (0.072)	-0.330 (0.066)
log(population)	0.263 (0.073)	0.276 (0.071)
log(mountainous)	0.219 (0.085)	0.222 (0.084)
Noncontiguous state	0.443 (0.274)	0.477 (0.267)
Oil exporter	0.858 (0.279)	0.806 (0.265)
New state	1.709 (0.339)	1.705 (0.334)
Instability	0.618 (0.235)	0.664 (0.232)
Democracy	0.021 (0.017)	
Ethnic Fractionalization	0.166 (0.373)	
Religious fractionalization	0.285 -0.509	
Constant	-6.731	-6.773
<i>N (observations)</i>	6327	6340
<i>R</i> ²	0.1095	0.1075
<i>p</i> <.10		
<i>p</i> <.05		
<i>p</i> <.001		
(Standard Deviations)		

The coding of the onset dependent variable differs from model to model; in the replication tests performed for this paper, Fearon and Laitin’s coding scheme is used. Fearon and Laitin code “onset as ‘1’ for all country-years in which a civil war started and ‘0’ for all others,” but do not code as ones the

years in which the war continues (2003: 82). A debate over the coding of onset variables exists in the literature, especially over the question of whether or not to code new wars started during a current civil war or whether to code ongoing war years as ones. In this particular instance, I follow Fearon and Laitin's model for two reasons. The first reason was that Fearon and Laitin's data was easily accessible and had a clear dependent variable. The second reason to use the FL coding scheme was to exclude the effects that an ongoing war would have on the poverty level within a country. It is well established in the literature that wars of any kind cause increased poverty as the wartime economy inevitably declines due to destruction of resources and diversion of both labor and finances to the war. It is appropriate to exclude ongoing war country years to avoid causality problems that arise from the feedback loop effect of civil war on poverty levels.

The variables chosen to represent poverty reflect the conditions that poverty inflicts upon people- low life expectancy, high infant mortality rates, and high levels of illiteracy. While these measures all often coincide with low income levels, they capture significant effects of quality of life. Income per capita can explain so many different things, whereas life expectancy, infant mortality, and illiteracy have narrower explanatory power.

Life Expectancy

Life Expectancy provides a good general statistic in regards to quality of life. Countries with high life expectancies generally have access to the basic needs of survival, health care, adequate nutrition, and education. The natural progression of economic development shows that as countries provide for their citizens and people become wealthier both birth and death rates decline. Life expectancy serves as a good proxy for poverty, because with high levels of poverty we expect low life expectancy rates. Also, life expectancy captures the effects of poverty in a way that income per capita can not, especially given

that high GDP per capita often does not automatically guarantee a long life¹⁴. A final argument for including life expectancy is that it captures longer term poverty because it does not fluctuate greatly from year to year, so it captures the kind of deprivation that grinds away at people until they take action to end it. However, in some cases life expectancy responds quickly as in the case of the Rwandan civil war and genocide,¹⁵ but that is a very limited number of cases. In the model of civil war onset, we expect life expectancy to be negatively correlated with onset.

Infant Mortality

High infant mortality rates indicate high poverty levels. Poverty results in inadequate health care, sanitation, and nutrition for both the mother and child, leading to early deaths. Infant mortality rates really only explain the state of health care within a country and the country's quality of life, very few other explanations exist for infant mortality and therefore if it is significant the interpretation will be limited in scope. Avoiding interpretation issues helps to clarify the mechanisms by which the variable relates to the overall regression and to the overall theory. In the model of civil war onset, a positive correlation between infant mortality and onset should exist.

Illiteracy

Illiteracy, although not an ideal proxy for poverty, can also represent an alternative variable for opportunity. One explanation is that GDP per capita represents the opportunity cost of civil war, so if we include another variable that represents opportunity costs, perhaps the effects of GDP per capita can be separated. If high illiteracy rates persist, especially among men, a greater proportion of the male population would be likely to join a rebel movement if Collier and Hoeffler's line of thinking is

¹⁴ An example is South Africa, a country with one of the highest GDP per capita rates in Africa, but with a life expectancy of only 50 years, which is lower than many countries that have lower income levels (WHO).

¹⁵ The life expectancy in Rwanda dropped in 1994 from about 42 years to 23 years (World Bank).

followed¹⁶. Illiteracy also indicates poverty in the sense that poor countries with ill-equipped education systems lead to poor people who do not have the skills to bring themselves out of poverty.

*Additional Variables*¹⁷

Although the tests including life expectancy, infant mortality, and illiteracy are the only results reported in this paper, tests with several other variables were attempted. The purpose of the additional tests was to find better proxies for poverty and to improve the measures of some of Fearon and Laitin and Collier and Hoeffler's theories. However, in addition to low numbers of observations and insignificance of the new variables, the results of most of the tests suggested collinearity problems. Birth rate, malnourishment, poverty headcount ratios and gaps at \$1 and \$2 per day, and income share of lowest 10% and 20% were all used to represent poverty. However, in addition to low numbers of observations and insignificance of the new variables, the results of most of the tests suggested collinearity problems. A variable measuring government tax revenues, if it had been more readily available, could have improved upon the Fearon and Laitin state strength argument. The ability of the state to collect taxes from its citizens reflects the overall strength of the state in terms of finances and in terms of credibility with the populace. However, like the other variables, tax revenue did not provide a noteworthy result, due to lack of data and statistical failure. In another attempt to clarify the state strength argument produced results that question whether the state strength argument holds up. A measure of government final expenditures on goods and services as a percentage of GDP was not significant and those results will be discussed further in the analysis section. Collier and Hoeffler stress opportunity costs and feasibility in their models and in 2007 included a variable for young males in their model. As noted previously, this paper used male illiteracy to test this variable once, but a variable

¹⁶ In Collier, Hoeffler, and Rohner's 2007 article, they include the proportion of young men as a significant variable in civil war onset. The logic is that young men are more prone to violence and aggression, so a greater population of young men would mean more available recruits. Here, male illiteracy is included to represent not only young men but poor young men with few opportunities.

¹⁷ Descriptions of the variables follow in Appendix B.

representing unemployment among males aged 15-24 was included in one model. The data on unemployment was not consistently available and in fact was not available for any of the country years in which civil wars occurred. As the additional tests proved, testing for poverty with the type of data that best indicates poverty levels will not provide significant results until the data is available.

Residuals Tests

A collinearity problem inevitably developed in the tests that included both GDP per capita and the poverty proxy. In order to sort out the problem, a multiple regression of GDP per capita and year was performed on each of the poverty proxies. The residuals are the difference between what the regression explains and does not explain- the difference between each data point and the regression line. In the example of life expectancy, the residual represents the aspect of life expectancy that is not explained by GDP per capita and year. A more direct interpretation of the residual is of the underperformance (or over-performance) of the economy or society in providing the basic necessities that would determine the appropriate life expectancy for that GDP per capita level. If basic needs are not at the level experienced by the average country, life expectancy will be lower. This indicates to citizens how well their country is doing relative to the average and in some cases indicates inequality. The residuals from the regressions of GDP per capita on life expectancy and infant mortality were later added to the baseline model. The idea behind adding the residuals stems from the necessity to separate the effects of income on the condition of poverty, in this case measured by life expectancy, infant mortality, and illiteracy.

From the regression analyses used in the creation of the auxiliary variables, it is clear that GDP per capita significantly affects the life expectancy and infant mortality rate of most countries. In both regressions, GDP per capita proved to significantly impact the equation, as evidenced by very high t-scores ($t=50.7$ for life expectancy and $t=-48.01$ for infant mortality). The R-squared on both equations hovered just over 0.40 which indicates high correlation between the poverty proxies and GDP per capita

and year data. These results neither surprised nor contradicted expectations, and proved to be very useful in the overall test.

Additional Test

In order to avoid the selection bias of including wealthy countries that already experienced the growing pains of democratization and capitalism some tests excluded wealthier countries. Cramer laments in his book, "Civil War Is Not a Stupid Thing," that in the Collier and Hoeffler model, "it is worth asking how legitimate it is in this kind of exercise to load the sample with relatively rich countries with a long history of having earlier worked through civil war, institutional change, the establishment of capitalism and prolonged economic growth and structural change" (2007:135). The Fearon and Laitin model also included wealthy countries and therefore the model was slightly biased. To remove the bias, two tests were performed capping the GDP per capita variable at \$10,000 in the first and at \$5,000 in the second test. Table 3 displays the results of these tests.

V. Analysis and Discussion of Test Results

The test results indicate that poverty, as separate from income level, is related to civil war onset. As distinct from previous tests, when proxies for poverty are included in the model of onset the effects of poverty and the effects of GDP per capita separate. Ideally a better measure of poverty would be used in the model, however as discussed previously the data is not consistently available. Even with imperfect proxies, the tests show that poverty matters in the causation of civil war.

Table 2.

	1	2	3	4
<i>Life Expectancy Tests</i>				
Prior War	-0.953	-0.980	-0.845	-1.055
	0.336	(0.337)	(0.330)	(0.339)
Per capita income	-0.312	-0.230		-0.231
	0.070	(0.086)		(0.068)
log(population)	0.274	0.298	0.342	0.319
	0.082	(0.085)	(0.087)	(0.087)
log(mountainous)	0.229	0.244	0.264	0.260
	0.092	(0.092)	(0.091)	(0.092)
Noncontiguous state	0.521	0.542	0.370	<u>0.597</u>
	0.322	(0.325)	(0.326)	(0.33)
Oil exporter	0.808	0.777	0.640	0.723
	0.299	(0.300)	(0.292)	(0.302)
New state	2.011	1.932	1.945	1.943
	0.424	(0.428)	(0.429)	(0.427)
Instability	0.678	0.680	0.764	0.660
	0.263	(0.263)	(0.264)	(0.264)
<i>Social Indicator</i>				
Life expectancy		-0.022	-0.056	
		(0.015)	(0.011)	
<i>Residual</i>				
Life expectancy and GDP per capita				-0.375
				(0.16)
Constant	-6.688	-5.915	-5.029	-7.396
<i>N (observations)</i>	4711	4711	4711	4711
<i>R</i> ²	0.1085	0.111	0.0983	0.1155
<i>p</i> <.10				
<i>p</i> <.05				
<i>p</i><.001				
(Standard Deviations)				

The tests in which life expectancy was the proxy for poverty provided the strongest confirmation of the claim that poverty causes civil war. Table 2 reports the results of the life expectancy tests.

Column 1 represents the base Fearon and Laitin model with a control for the number of observations. In

column 2 the first effects of life expectancy on GDP per capita can be seen. Although life expectancy was not significant, the income per capita coefficient moved from -0.312 to -0.23. Income per capita lost some significance in the second test as it was no longer significant at the $p < 0.001$ level. However, suspicions of collinearity between life expectancy and GDP per capita were later confirmed after a regression showed a high correlation and z-value, a result that is analyzed later. The third test only included life expectancy in order to see if a pure poverty explanation affected the remaining control variables. In general the control variables changed slightly, but maintained their significance level. However, the variables that shifted by the greatest degree were prior war, oil producer, and instability, which are all variables that potentially absorb the effects of or are heightened by poverty. The poverty proxy takes away from the effect of a prior war, because prior wars cause increased poverty and with the inclusion of poverty in the model those effects of prior war will now be captured by the life expectancy coefficient. The test with the life expectancy- GDP per capita residual allowed for the separation of the effects of GDP per capita on the poverty proxy, and when the residual was added to the logit analysis it provided even better results than the variable did on its own. The residual was significant at the 95% level and had an actual p-value of 0.019. Of all the tests, the results from the equation with the residual for life expectancy best supported the hypothesis that poverty causes civil war, because the residual allowed for the separation of the effects of poverty from GDP per capita and was a significant variable in the model. As mentioned previously, the residual is the gap between the expectation of what life expectancy should be at a certain income level and the actual life expectancy of a country and therefore captures the extraneous factors like deprivation and lack of basic needs that contribute to poverty and a low life expectancy.

Appendix B reports the results of the additional results from the tests that included infant mortality and illiteracy as poverty proxies. While neither measure completely supported the hypothesis that poverty causes civil war, both cases provided some support for the idea that GDP per capita was

not accurately portrayed in the Fearon and Laitin model. When income per capita was not included in the model, both illiteracy and infant mortality were highly significant at the 99% level. From that result, an inference can be made that measures of deprivation do affect the likelihood of civil war onset. When a comparison is made to the additional test for state strength in which the new variable for state strength was highly insignificant when income was removed from the model, it becomes clear that GDP per capita must be clarified and most likely represents something other than state strength and closer to poverty.

Table 3.

	GDP/cap <= 10	GDP/cap <= 10	GDP/cap <= 5	GDP/cap <= 5
<i>Replications with Limited GDP per capita</i>				
Prior War	-0.943 (0.337)	-1.049 (0.339)	-1.011 (0.348)	-1.132 (0.351)
Per capita income	-0.286 (0.076)	-0.158 (0.084)	-0.297 (0.117)	-0.049 (0.145)
log(population)	0.275 (0.082)	0.331 (0.088)	0.253 (0.084)	0.318 (0.092)
log(mountainous)	0.227 (0.092)	0.261 (0.092)	0.222 (0.093)	0.256 (0.093)
Noncontiguous state	0.532 (0.321)	0.616 (0.329)	0.578 (0.340)	0.698 (0.349)
Oil exporter	0.782 (0.3)	0.64 (0.308)	0.674 (0.329)	0.493 (0.34)
New state	2.016 (0.423)	0.945 (0.428)	2.001 (0.425)	1.925 (0.429)
Instability	0.675 (0.262)	0.649 (0.263)	0.699 (0.27)	0.678 (0.27)
<i>Residual</i>				
Life expectancy and GDP per capita		-0.451 (0.172)		-0.496 (0.193)
Constant	-6.73	-7.645	-6.479	-7.652
<i>N (observations)</i>	4150	4150	3485	3485
<i>R</i> ²	0.0868	0.096	0.0751	0.0848
<i>p</i> <.10	P<.001			
<i>p</i> <.05	(Standard Deviations)			

The tests that capped GDP per capita provided interesting results and insight into the complex nature of GDP per capita in the models of civil war onset. The results reported in Table 3 do not include democracy, ethnic or religious fractionalization in keeping with the fact that none of those variables were significant in the original model. This round of tests included the residual from the life expectancy-GDP per capita regression because that was the best proxy for poverty in the other tests. The most important result from the capped GDP per capita tests was that in both tests the GDP per capita variable dropped sharply in significance from previous tests. The test for GDP per capita less than \$5,000 proved that GDP per capita was not significant at all, with a p-value of 0.736. However, in the lowest income level test, the life expectancy residual was significant at a p-value of 0.01. An inference can be made that at low levels of income, conditions of “poverty” are more important to the causes of civil war than pure income regardless of what income represents.

An additional result that is not reported in Table 3 shows that the polity variable for democracy was significant with a p-value of 0.04 for GDP per capita less than \$5,000 from previous tests that included democracy, ethnic and religious fractionalization. While a significant democracy variable is an important result for the fact that democracy was not significant in the models that included wealthier countries, in this particular test the variable had a positive sign. Therefore, contrary to expectations, democracy would increase the likelihood of civil war onset. Democracies that have multiple parties, parties drawn on sectarian or ethnic lines, or that do not adequately provide for their citizens could explain this unexpected result. However, a positive sign on the democracy variable in this test should not be a sign that democracy harms poor countries, as the positive benefits of democratic systems highly outweigh the result of this single test.

Table 4.

	1	2
<i>Government Expenditures Tests</i>		
Prior War	<u>-1.091</u> (0.594)	-0.482 (0.568)
Per capita income	<u>-0.342</u> (0.11)	
log(population)	<u>0.248</u> (0.12)	<u>0.234</u> (0.133)
log(mountainous)	<u>0.406</u> (0.184)	<u>0.365</u> (0.187)
Noncontiguous state	<u>0.806</u> (0.468)	0.363 (0.461)
Oil exporter	0.601 (0.538)	0.224 (0.511)
New state	1.212 (0.834)	<u>1.925</u> (0.804)
Instability	0.565 (0.448)	<u>0.961</u> (0.439)
Government Expenditures	0.035 (0.038)	-0.005 (0.039)
Constant		
	-7.478	-7.757
<i>N (observations)</i>	1934	1934
R^2	0.1264	0.0678
<u>p<.10</u>		
<u>p<.05</u>		
p<.001		
(Standard Deviations)		

A noteworthy result in contrast to the Fearon and Laitin state strength argument was that a variable representing government expenditures was not even close to being significant (see Table 4). In order to test the claim of state strength, the government expenditures variable was entered into the model; however, regardless of the variation of the model, government expenditures remained highly insignificant with very high p-values. In the test that included both GDP per capita and government expenditures, the p-value on expenditures was 0.350. When only government expenditures were

included the p-value shot up to 0.905 and the z-score was -0.12, which signifies that government expenditures should be rejected as a variable in the model. The test with only government expenditures also indicates that perhaps the state strength argument does not hold up, because an alternative measure of state strength was not significant in the model without income per capita. From that result, questions also arise as to whether income per capita really serves to proxy state strength or something else entirely.

The most significant result from this series of tests and analysis is that even without the ideal variables the representations of poverty affected the logit tests and improved the R-squared in the cases of life expectancy and the residuals. If more appropriate and adequate measures of poverty were consistently available pre-2000 and the institution of the Millennium Development Goals¹⁸, the analysis might improve to the point where a distinct conclusion could be drawn that poverty should be taken into account when analyzing the causes of civil war. The availability, or lack thereof, of social indicators represents the clear focus of development economics on Liberal and Neoliberal indicators of development success- GDP per capita, savings rates, investment rates, etc. Without examining the quality of life at the most basic levels in society, the experience of poverty cannot fully be explained. In the case of civil war, GDP per capita alone cannot account for why people might join a rebellion, but social indicators might shed light on those issues. Unfortunately, before the institution of the Millennium Development Campaign many countries and organizations did not focus on collecting the types of data that truly paint the picture of poverty within a country. While life expectancy, infant mortality rates, and illiteracy provide some insight into the level of poverty, measures such as percent of the population living below the poverty line, rural-urban inequality, percent of the population living on

¹⁸ In 2000, the Millennium Development Goals were instituted to quantify and track the development progress of less developed countries. The MDGs measure progress in eradicating poverty and hunger, improving health, improving education, protecting the environment, and establishing a global partnership for development. Some of the measures explicitly track such things as percent of population living under \$1 per day (PPP), a measure of poverty that would improve this model.

\$1 per day (PPP), and undernourishment give a better sense of the most extreme conditions which may cause people to fight. As previously stated, these measures are inconsistently available for most of the poorest countries and as indicated in the literature on civil war, those are the countries that experience the most conflict.

VI. Further Questions

Establishing the importance of separating poverty from GDP per capita does not necessarily clarify the causal pathway from poverty to civil war. While the mechanism can be inferred, the data do not support any single conclusion, as there still exist alternative explanations of income per capita and the poverty proxy is still not the ideal representation of poverty. However, the fact that a proxy for poverty significantly affected the model of civil war onset when separated from GDP per capita indicates that a) GDP per capita does not necessarily represent poverty in the model, b) the condition of being poor factors into the causes of civil war, and c) the FL model was not perfect. Questions about the relationship between poverty and civil war still exist, but these results point out that those questions can no longer be neglected in the attempts to explain the reasons for which civil war begins.

The questions remaining about the link between poverty and civil war will require further analysis of causal pathways, which could lead to a focus on actor-based explanations of onset. Future examinations of the causes of civil war onset should take into account the differences between the motivations of actors in the war- rebels, rebel leaders, greater society, and the state- to distinguish between the micro-causes of civil war. After establishing that poverty matters in the onset of civil war, the causal pathways must be clarified, and a discussion of micro-causes could explain the connection between poverty, the motivations of specific actors, and onset.

Additionally, further clarification of the role GDP per capita plays in the onset of civil war would improve upon the theories of onset. Now that poverty exists as a separate variable in the causes of civil

war, a greater focus on income per capita's specific causal pathway can occur. Using government expenditures to test the state strength argument produced a result that state strength may no longer be a viable explanation of income per capita's role in onset. A further attempt to distinguish between state strength, using tax revenue data, did not produce satisfactory results due to limited availability of tax revenue data. There may still be a better proxy for state strength, that more accurately describes the role of the state in discouraging rebellion. For example, the argument about the role of natural resource wealth in conflict onset has been made, but a new debate over natural resource wealth's influence on the institutions of the state may point to a new way to measure state strength. The strength of the institutions of the state might prove to be more of a deterrent to a civil war. Additionally, the theory behind state strength revolves around the state's ability to control the monopoly of violence and its ability to put down rebellions, so measures of military or police strength could better describe this than GDP per capita. The other causal pathway put forth for income per capita was opportunity cost; however, using youth male unemployment rates failed to produce a better proxy for opportunity cost. Establishing the motivations of actors may clarify the opportunity cost argument and therefore release income per capita as the measure used to indicate opportunity.

Clarifying the causal pathway of poverty to civil war onset, understanding actor-based motivations, and improving the explanation of income per capita's role in onset would vastly improve the model of civil war onset. This paper has pointed out the necessity of continuing to research poverty in the context of civil war onset. Although this thesis did not provide answers to all of the questions surrounding poverty and civil war, it reopened the discussion in a way that brought poverty back into the picture after a decade of greed based explanations and a dismissal of grievances.

VII. Conclusion

This paper raised the question of the role poverty plays in causing civil wars, which had been dismissed in favor of greed and state strength explanations. The results of statistical tests indicate that including a proxy for poverty in the model significantly affects the likelihood that a civil war will occur. Although the residual of life expectancy does not provide the ideal proxy for poverty, it serves as a good representation of the wide range of effects of poverty on quality of life in poor countries. The residual also represents the important gap of expectations between income per capita and life expectancy, a gap that ought to be considered a grievance. In addition to reopening the discussion of poverty in the causation of civil war, this paper calls into question the interpretation of GDP per capita as a proxy for state strength. Fearon and Laitin's model did not hold up when an alternative measure of state strength was tested in place of GDP per capita. From the test results and analysis, it is clear that poverty causes civil war, however the precise causal pathway must still be determined. Clarifying GDP per capita's exact role and examining the microcauses of civil war may be the key to unlocking the true role of poverty in civil war. Poverty does not exist in a vacuum, but interacts with cultural and historical elements to produce the effects that may lead to civil war and therefore those elements must also be considered. While purely statistical tests allowed for a renewed discussion of poverty, a broader discussion of poverty would ultimately improve upon the understanding of how poverty causes civil war.

Sen asserts the necessity of involving discussions of culture and history along with economics to determine the causes of violence, "we must try to understand the different interconnections that work together, and often kill together. We need some investigative sophistication to understand what part is played by the economic components in the larger structure of interactions here" (2008: 11). In order to create a better understanding of why both violence and civil war occur, we need a more complex understanding of economic, historical, and cultural elements. The same can be said about

understanding the role of poverty in the onset of civil war, other external and internal elements that increase poverty and the deprivation felt in poor countries must be considered.

Although there are still many questions to answer in clarifying how and why poverty causes civil war, this paper has established the importance and relevance of asking those questions. Poverty, as a social as well as economic phenomenon, causes civil war, and that has important implications for economic development institutions and developed countries. To decrease violence and the chances of civil war, progress in development must occur and especially in satisfying the basic needs of people, providing an education, and establishing state capacity to improve the quality of life for their citizens. Although, democracy and even state strength may no longer hold up as elements in the causation of civil war, democratic institutions and legitimate, competent governments will encourage commitment and accountability to achieving development. Development has the potential to decrease violence and civil war, and regardless of how poverty causes civil war, there is a moral and practical imperative to end deprivation in poor countries to improve the global security situation.

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Appendix A: List of Civil Wars¹⁹

Country War	Years	Case name
Western Europe		
1 BELGIUM	1956-61	Rwandan revolution
2 FRANCE	1945-54	Vietnam
3 FRANCE	1947-48	Madagascar
4 FRANCE	1952-54	Tunisia
5 FRANCE	1953-56	Morocco
6 FRANCE	1954-61	Algeria
7 FRANCE	1955-60	Cameroon
8 GREECE	1945-49	DSE
9 NETHERLANDS	1945-46	IPA
10 PORTUGAL	1961-75	Angola
11 PORTUGAL	1962-74	Guinea-Bissau
12 PORTUGAL	1964-74	Mozambique
13 UK	1950-56	CPM (Emergency)
14 UK	1952-56	Mau Mau
15 UK	1969-99	IRA
Eastern Europe		
16 AZERBAIJAN	1992-94	Nagorno-Karabagh
17 BOSNIA	1992-95	Rep. Srpska/Croats
18 CROATIA	1992-95	Krajina
19 GEORGIA	1992-94	Abkhazia
20 MOLDOVA	1992-92	Dniestr Rep.
21 RUSSIA	1946-48	Lithuania/BDPS
22 RUSSIA	1946-50	Ukraine/UPA
23 RUSSIA	1946-47	Latvia/LTSPA, etc.
24 RUSSIA	1946-48	Estonia/Forest Brthers
25 RUSSIA	1994-96	Chechnya
26 RUSSIA	1999-	Chechnya II
27 TAJIKISTAN	1992-97	UTO
28 YUGOSLAVIA	1991-91	Croatia/Krajina
Asia		
29 AFGHANISTAN	1978-92	Mujahideen
30 AFGHANISTAN	1992- v.	Taliban
31 BANGLADESH	1976-97	Chittagong Hills/Shanti Bahini
32 BURMA	1948-	CPB, Karens, etc.
33 CAMBODIA	1970-75	FUNK
34 CAMBODIA	1978-92	Khmer Rouge, FUNCINPEC, etc
35 CHINA	1946-50	PLA
36 CHINA	1950-51	Tibet
37 CHINA	1956-59	Tibet
38 CHINA	1991-	Xinjiang
39 INDIA	1952-	N.East rebels
40 INDIA	1982-93	Sikhs
41 INDIA	1989-	Kashmir
42 INDONESIA	1950-50	Rep. S. Moluccas
43 INDONESIA	1953-53	Darul Islam
44 INDONESIA	1958-60	Darul Islam, PRRI, Permesta
45 INDONESIA	1965-	OPM (West Papua)

¹⁹ From Fearon and Laitin 2003.

46 INDONESIA	1975-99	E. Timor
47 INDONESIA	1991-	GAM (Aceh)
48 KOREA, S.	1949-50	v. Rhee
49 LAOS	1960-73	Pathet Lao
50 NEPAL	1997-	CPN-M/UPF (Maoists)
51 PAKISTAN	1971-71	Bangladesh
52 PAKISTAN	1973-77	Baluchistan
53 PAKISTAN	1993-99	MQM: Sindhis v. Mohajirs
54 PAPUA N.G.	1988-98	BRA (Bougainville)
55 PHILIPPINES	1946-52	Huks
56 PHILIPPINES	1968-	MNLF, MILF
57 PHILIPPINES	1972-94	NPA
58 SRI LANKA	1971-71	JVP
59 SRI LANKA	1983-	LTTE, etc.
60 SRI LANKA	1987-89	JVP II
61 VIETNAM, S.	1960-75	NLF
North Africa/Middle East		
62 ALGERIA	1962-63	Kabylie
63 ALGERIA	1992-	FIS
64 CYPRUS	1974-74	Cypriots, Turkey
65 IRAN	1978-79	Khomeini
66 IRAN	1979-93	KDPI (Kurds)
67 IRAQ	1959-59	Shammar
68 IRAQ	1961-74	KDP, PUK (Kurds)
69 JORDAN	1970-70	Fedeyeen/Syria v. govt
70 LEBANON	1958-58	Nasserites v. Chamoun
71 LEBANON	1975-90	various militias
72 MOROCCO	1975-88	Polisario
73 TURKEY	1977-80	Militia-ized party politics
74 TURKEY	1984-99	PKK
75 YEMEN	1994-94	South Yemen
76 YEMEN ARAB REP.	1948-48	Opp. coalition
77 YEMEN ARAB REP.	1962-69	Royalists
78 YEMEN PEOP. REP.	1986-87	Faction of Socialist Party
Sub-Saharan Africa		
79 ANGOLA	1975-	UNITA
80 ANGOLA	1992-	FLEC (Cabinda)
81 BURUNDI	1972-72	Hutu uprising
82 BURUNDI	1988-88	Org. massacres on both sides
83 BURUNDI	1993-	Hutu groups v. govt
84 CENTRAL AFRICAN REP.	1996-97	Factional fighting
85 CHAD	1965-	FROLINAT, various ...
86 CHAD	1994-98	Rebels in South
87 CONGO	1998-99	Factional fighting
88 DEM. REP. CONGO	1960-65	Katanga, Kasai, CNL
89 DEM. REP. CONGO	1977-78	FLNC
90 DEM. REP. CONGO	1996-97	AFDL (Kabila)
91 DEM. REP. CONGO	1998-	RCD, etc v. govt
92 DJIBOUTI	1993-94	FRUD
93 ETHIOPIA	1974-92	Eritrea, Tigray, etc.
94 ETHIOPIA	1997-	ALF, ARDUF (Afars)
95 GUINEA BISSAU	1998-99	Mil. faction
96 LIBERIA	1989-96	NPFL (Taylor), INPFL (Johnson)
97 MALI	1989-94	Tuaregs
98 MOZAMBIQUE	1976-95	RENAMO

99 NIGERIA	1967-70	Biafra
100 RWANDA	1962-65	Post-rev strife
101 RWANDA	1990-	RPF, genocide
102 SENEGAL	1989-	MFDC (Casamance)
103 SIERRA LEONE	1991-	RUF, AFRC, etc.
104 SOMALIA	1981-91	SSDF, SNM (Isaaqs)
105 SOMALIA	1991-	post-Barre war
106 SOUTH AFRICA	1983-94	ANC, PAC, Azapo
107 SUDAN	1963-72	Anya Nya
108 SUDAN	1983-	SPLA, etc.
109 UGANDA	1981-87	NRA, etc.
110 UGANDA	1993-	LRA, West Nile, etc.
111 ZIMBABWE	1972-79	ZANU, ZAPU
112 ZIMBABWE	1983-87	Ndebele guer's
Central and South America		
113 ARGENTINA	1955-55	Mil. coup
114 ARGENTINA	1973-77	ERP/Montoneros
115 BOLIVIA	1952-52	MNR
116 COLOMBIA	1948-62	La Violencia
117 COLOMBIA	1963-	FARC, ELN, etc
118 COSTARICA	1948-48	NLA
119 CUBA	1958-59	Castro
120 DOMINICAN REP.	1965-65	Mil. coup
121 EL SALVADOR	1979-92	FMLN
122 GUATEMALA	1968-96	URNG, various
123 HAITI	1991-95	Mil. coup
124 NICARAGUA	1978-79	FSLN
125 NICARAGUA	1981-88	Contras
126 PARAGUAY	1947-47	Febreristas, Libs, Comms
127 PERU	1981-95	Sendero Luminoso

Appendix B: Additional Results Tables

Table 5.

	1	2	3	4
<i>Infant Mortality Tests</i>				
Prior War	-1.051 (0.361)	-1.073 (0.363)	-0.807 (0.348)	-1.134 (0.368)
Per capita income	-0.321 (0.074)	-0.286 (0.086)		-0.281 (0.073)
log(population)	0.300 (0.083)	0.312 (0.085)	0.353 (0.088)	0.327 (0.086)
log(mountainous)	0.220 (0.096)	0.219 (0.096)	0.209 (0.095)	0.219 (0.095)
Noncontiguous state	0.605 (0.355)	0.632 (0.36)	0.322 (0.354)	0.692 (0.367)
Oil exporter	0.591 (0.326)	0.572 (0.328)	0.381 (0.317)	0.526 (0.329)
New state	2.588 (0.512)	2.567 (0.515)	2.675 (0.514)	2.555 (0.519)
Instability	0.755 (0.273)	0.768 (0.273)	0.914 (0.274)	0.767 (0.273)
<i>Social Indicator</i>				
Infant mortality		0.002 (0.003)	0.010 (0.002)	
<i>Residual</i>				
Infant Mortality and GDP per capita				0.224 (0.149)
Constant	-6.827	-7.238	-9.040	-7.183
<i>N (observations)</i>	4153	4153	4153	4153
<i>R</i> ²	0.1176	0.1183	0.0946	0.1207
<i>p</i> <.10				
<i>p</i> <.05				
<i>p</i> <.001				
(Standard Deviations)				

Table 6.

	11	12	13	15
<i>Illiteracy Tests</i>				
Prior War	-1.102 (0.396)	-1.104 (0.394)	-0.932 (0.378)	-1.123 (0.395)
Per capita income	-0.346 (0.097)	-0.275 (0.113)		-0.297 (0.103)
log(population)	0.295 (0.089)	0.305 (0.091)	0.339 (0.092)	0.303 (0.091)
log(mountainous)	0.238 (0.105)	0.248 (0.104)	0.252 (0.104)	0.251 (0.104)
Noncontiguous state	0.648 (0.432)	0.678 (0.435)	0.365 (0.416)	0.705 (0.438)
Oil exporter	0.318 (0.404)	0.259 (0.41)	-0.125 (0.392)	0.260 (0.41)
New state	2.875 (0.726)	2.859 (0.735)	2.800 (0.718)	2.860 (0.736)
Instability	0.745 (0.295)	0.759 (0.296)	0.808 (0.296)	0.749 (0.297)
<i>Social Indicator</i>				
Illiteracy		0.007 (0.007)	0.018 (0.005)	
<i>Residual</i>				
Illiteracy and GDP per capita				0.177 (0.164)
Constant	-6.654	-7.225	-8.563	-6.870
<i>N (observations)</i>	3012	3012	3012	3012
R^2	0.096	0.0981	0.0845	
$p < .10$				
$p < .05$				
$p < .001$				
(Standard Deviations)				

Appendix C: Descriptions of Variables

Per Capita Income- Fearon and Laitin used data from the Penn World Tables 5.6 for real per capita income, chain index in 1985 U.S. dollars. To complete the set, they used the World Development Indicators and the growth rate of income to extend the data set forward and backward.

Life Expectancy- average expectancy of life from birth

Illiteracy- percent of adult population that is illiterate, from the World Development Indicators (Sambanis and Hegre, 2005).

Infant Mortality- from WDI, used in Sambanis and Hegre (2005).

Unemployment of youth males (% of male labor force ages 15-24) from the World Development Indicators

Tax Revenues (% of GDP) from WDI

Final Government Expenditures (% GDP)- From the WDI, includes spending on goods and services as well as salaries for government workers. It also includes most expenditure on national defense and security, except for military expenditures that are part of government capital formation.

New State- countries in their first or second year of independence (Fearon and Laitin, 2003: 81)

Instability- Fearon and Laitin “use a dummy variable indicating whether the country had a three-or greater change on the Polity IV regime index in any of the three years prior to the country-year in question” (2003:

Log (Mountainous)- Fearon and Laitin use the proportion of the country that is mountainous as coded by geographer A.J. Gerard (2003: 81).

Population- the logarithm of population, lagged one year (Fearon and Laitin 2003).

Non-Contiguous Territory- Countries with territory holding at least 10,000 people and separated from the land area containing the capital city either by land or by 100 km of water were coded as “noncontiguous.” Ignoring the colonial empires, 25 of our 161 countries meet this criterion at some time since 1945 (Fearon and Laitin, 2003: 81).

Oil- country-years in which fuel exports exceeded one-third of export revenues, using World Bank data (Fearon and Laitin, 2003: 81).