Inequality, Economic Development and Democracy

by

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For my Wife, Annick, and my Parents, Diane and Michel.
The author was born in Hull, Quebec, Canada on October 1st, 1978. He attended Laval University and the University of Montreal from 1998 to 2002, and graduated with a Bachelor of Arts degree in 2002. He attended Queen’s University from 2002 to 2004, and graduated with a Master of Arts in Economics in 2004. He came to the University of Rochester in the Fall of 2005 and began graduate studies in Political Science. He received scholarships from the Social Sciences and Humanities Research Council of Canada (SSHRC) and the Fonds Quebecois de la Recherche sur la Societe et la Culture (FQRSC) from 2006 to 2010. He pursued his research in comparative politics under the direction of Professor Kayser until he left for the Hertie School of Governance, Germany, in 2009 and then under the direction of Professor Gretchen Helmke and Professor Randall Stone. He received the Master of Arts degree from the University of Rochester in 2008.
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Abstract

Under what conditions do democracies emerge and consolidate? Recent theories suggest that inequality is among the leading determinants of both democratization and consolidation. By contrast, the first chapter of the dissertation argues that inequality harms consolidation but has no net effect on democratization. The author shows that the existing theories that link inequality to democratization suffer from serious limitations: (1) they are useful only for understanding transitions from below and thus do not apply to many transitions (that is, those from above); (2) even for democratization from below, their predictions are unlikely to hold, since inequality actually has two opposite effects; and (3) they ignore collective action problems, which reduces their explanatory power. However, these objections do not affect the relationship between inequality and consolidation. In particular, while inequality has two opposite effects on the probability of transition to democracy, it unambiguously increases the probability of transition away from democracy. This chapter conducts the most comprehensive empirical test of the relationship between inequality and democracy to date. It finds no support for the main democratization theories. Contrary to what they predict, estimation suggests neither a monotonic negative nor an inverted U-shaped relationship. Yet inequality increases the probability of backsliding from democracy to dictatorship. In addition, this chapter offers the first explanation of why inequality has more influence on the consolidation of democratic regimes than on their creation.

The second chapter of the dissertation further addresses the questions of what are the economic conditions most favorable to democratization. Although multiple theories have argued that the economic conditions under which a
country finds itself are somehow related to its chances of democratization, so far these claims have received little empirical support. In particular, empirical studies have failed to find any systematic relationship between economic development, on the one hand, and the likelihood of democratization, on the other hand. Similarly, in Chapter 1 I show that economic inequality has no effect on transition to democratization. Building on the argument proposed in the first chapter, I argue that the reason why previous theories have been unable to uncover the true effect of inequality and development on democratization is that they have assumed that both of these factors affect democratization independently of one another. Yet, income distribution has different meanings and consequences at different income levels, and vice versa. In this chapter, I combine, for the first time, modernization and inequality theories of democratization and show that inequality affects democratization differently at different levels of development. In middle income countries inequality fosters democratization; in poor and rich countries, however, it inhibits democratization. Extensive cross-national analysis strongly suggests that the effect of inequality on transition to democracy depends on economic development. This chapter contributes to the literature notably by proposing and testing a new economic theory of democratization.

While the first chapter found that inter-class inequality destabilizes democracy, it also found that some democracies with equal income distribution, such as Niger and Uganda, have nonetheless collapsed. Most of these exceptions are African countries that are ethnically diverse. The third chapter addresses questions about the relationship between class and ethnic cleavages. For example, is inequality more harmful when it reinforces other cleavages? Does the effect of inequality between ethnic groups somehow depend on the level of inequal-


ity within ethnic groups, and vice versa? This chapter answers these questions by solving a formal model that distinguishes between intra- and inter-ethnic inequality. I argue that democracy is most unstable when either intra-ethnic inequality is high and inter-ethnic inequality is low, or when intra-ethnic inequality is low and inter-ethnic inequality is high. When ethnicity is salient, what matters most is not the absolute level of inequality but the relative levels of intra- and inter-ethnic inequality. I conduct the very first cross-national test of the effect of inequality between and within ethnic groups on democratic consolidation. Using an original data set on ethnic inequality in 26 African democracies between 1980 and 2005, I find strong evidence supporting my hypothesis. Among other things, these findings suggest that the reason why some democracies have been unstable despite having low inter-class inequality is that their levels of inter-ethnic inequality were high.
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Foreword

Chapters 1 and 2 use data on capital shares that were provided to me by Francisco Rodriguez and Arjun Jayadev.
Chapter 1

Inequality and Democracy: Why Inequality Harms Consolidation but Does Not Affect Democratization

“[P]olitical and social processes are neither symmetric nor reversible. What brings down a democracy is not the inverse of those factors that bring down an authoritarian regime.”


1.1 Introduction

Why do some autocracies democratize while others do not? Why do some democracies endure and consolidate while others backslide to dictatorship? Until recently, most political scientists believed that economic development drives both the emergence and consolidation of democracies. Przeworski et al. (2000) revolutionized the field of comparative politics by showing that wealth has no effect on democratization, but promotes consolidation. Since then, scholars have shifted their focus away from wealth level, toward wealth distribution, raising the question of the effect of inequality on democracy. Two schools of thought have been particularly influential. The first, advanced no-
ably by Boix (2003), argues that inequality harms both democratization and consolidation. The second, proposed by Acemoglu and Robinson (2006), agrees with the first that inequality inhibits consolidation, but predicts that it relates to democratization through an inverted U-shaped curve.

Although these ideas are well-developed theoretically, they have yet to find strong empirical support. Acemoglu and Robinson (2006) do not perform statistical analysis, but only present four case studies: Singapore, Britain, Argentina and South Africa. To my knowledge, there is no published paper testing a non-linear relationship between inequality and democratization in a cross-national setting to date.\(^1\) Those that test the linear hypotheses, like Boix (2003) and Barro (1999), do not distinguish between democratization and consolidation, and/or rely on databases subject to severe selection bias. For example, the widely used data set of Deininger and Squire (1996) includes less than 11 percent of the country-years during the period covered (1950-1996). The problem is that the available observations are unlikely to be representative of the overall population. For example, while about one third of the observations of Deininger and Squire (1996) are from developed Western countries, less than eight percent are from sub-Saharan Africa.\(^2\) In the whole population, 30 percent of the observations are from sub-Saharan Africa.

\(^1\)One published paper (Burkhart 1997) does test a non-linear relationship between inequality and the level of democracy, but not the probability of democratization. It does not distinguish between democratization and consolidation. Several unpublished papers test this relationship (e.g., Epstein et al. 2004; Papaioannou and Siourounis 2005). Ziblatt (2008) tests for a curvilinear relationship at the subnational level, in Germany.

\(^2\)There are many reasons suggesting that the exclusion of some regions could affect the results. For example, Middle Eastern and African countries tend to have both intermediate levels of inequality and nondemocratic regimes. Their exclusion could lead one to find support for the inverted U-shaped relationship of Acemoglu and Robinson (2006), only because some of the less democratic countries — that also have middle inequality levels — would be omitted from the analysis. The more recent version of the data set of Deininger and Squire (1996), available from the World Bank, is subject to the same problems.
This paper argues and empirically demonstrates that the relationship between inequality and democracy parallels the one between wealth and democracy: inequality harms consolidation but has no net effect on democratization. It first shows that democratization theories suffer from serious limitations, which in turn do not affect theories of consolidation. The paper then bridges the gap between theoretical and empirical literatures by conducting the most comprehensive empirical test to date of the relationship between inequality and democracy. Unlike most other empirical studies, I employ a method — dynamic probit — which enables me to distinguish between the impact of inequality on democratization and on consolidation.

The measure of inequality employed, namely the capital shares database of Ortega and Rodriguez (2006), contains about 3500 observations for the period between 1960 and 2000 in 116 countries. It has more than 67 percent of the possible observations, a substantial increase over the 11 percent of Deininger and Squire (1996). It is also much more representative. For example, 25 percent of its observations are from sub-Saharan Africa. Moreover, contrary to alternative measures of inequality, capital shares are consistent with the theoretical literature, which focuses on inter-class inequality rather than on overall inequality.

I find no support for the two main theories that link inequality to democratization; estimation suggests neither a monotonic negative nor an inverted U-shaped relationship between inequality and the probability of democratization. Yet, consistent with the logic of my argument, inequality increases the probability of backsliding from democracy to dictatorship.

Taken together, these findings have important implications for understanding the conditions that promote democracy. Since World War II, many poor but equal countries, such as Costa Rica, India and Mauritius, have success-
fully established and sustained stable democracies. At the same time, similar but unequal countries, like Nigeria, Peru and Turkey, have oscillated between dictatorship and democracy. The key difference between these two groups of countries is not the inability of the latter to create democratic regimes — they have done so several times — but their inability to maintain them. For instance, between 1946 and 2000, Peru has experienced four democratic breakdowns — and thus several democratizations — in only 23 years of democracy. What characterizes Peru is not its inability to institute but to preserve democracy.

This paper not only contributes to the question of the relationship between inequality and democracy, but also addresses questions about the fundamental differences between transitions to and from democracy. Many authors, like O’Donnell and Schmitter (1986) and Huntington (1991), argue that the factors that influence these two types of transitions are not necessarily the same. In an interesting parallel to the results of Przeworski et al. (2000), this study finds strong evidence that the relationship between inequality and democracy mirrors the one between wealth and democracy. Additionally, it offers the first explanation of why inequality has more influence on the consolidation of democratic regimes than on their creation.

1.2 Inequality, Democratization and Consolidation

1.2.1 Inequality and Democratization

There are two main schools of thought which argue that inequality is associated with the regime type. The first, advanced most recently by Boix (2003),

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3Regime types are taken from the extended data set of Przeworski et al. (2000).
claims that unequal authoritarian countries are less likely to transit to democracy (e.g., Lipset 1959; Dahl 1971; Muller 1995). According to these authors, the elites — who hold political power in dictatorship — are less likely to democratize when inequality is high, because they fear redistribution. Others argue that education promotes democracy, because educated people are less prone to espouse extremist political positions (e.g., Lipset 1959). Because, ceteris paribus, the population in egalitarian countries is typically more educated, inequality also harms the prospect of democracy by inhibiting education. Further, Lipset (1959) argues that a large middle class — and thus a relatively equal income distribution — also promotes democracy, because the middle class rarely supports extremist politics.

The second school of thought is most notably associated with the seminal book of Acemoglu and Robinson (2006). These authors suggest that the relationship between inequality and the probability of democratization follows an inverted U-shaped curve. Equal countries do not democratize because — the potential redistribution and expropriation gains being small — the population does not threaten to revolt. The elites can thus maintain the regime without facing the threat of a revolution. At intermediate levels of inequality, revolution becomes appealing to the population. The elites are unwilling to use repression, because redistribution is relatively inexpensive. Therefore, they democratize. At higher levels of inequality, the cost of redistribution surpasses that of repressing revolts. The elites hence repress the population and there is no democratization. It is thus at intermediate levels of inequality — where the poor are willing to revolt and the elites prefer not to repress — that democrati-

This follows from the model of Meltzer and Richard (1981) according to which unequal democracies redistribute more.
zation is most likely. It is the credible threat of a revolution by the population that ultimately pushes the elites to democratize.

There are at least three problems with the current theories that link inequality to democratization. First, they are only useful to understand transitions from below (see Ziblatt 2006). In these theories, demand for democracy is assumed to always originate within the population. However, in reality, democratization is often driven from above. For example, Collier (1999) and Llavador and Oxoby (2005) show that in many West European and Latin American countries, democracy resulted from intra-elite competition, not inter-class conflicts. There is thus a large group of transitions for which these theories do not apply.

Second, even for transitions from below, their predictions are unlikely to hold. Contrary to what most scholars have claimed, inequality actually has two opposite, potentially offsetting, effects on democratization. On the one hand, inequality makes democracy more costly for the elites by increasing redistribution, thus diminishing the probability of democratization. On the other hand, inequality increases the demand for regime change from the population by increasing potential gains from redistribution or expropriation, thus increasing the probability of democratization. If, as argued by the existing theories, democracy is demanded by the population but requires the elites to acquiesce, the net effect of inequality on democratization is ambiguous.

This objection is most clearly applicable to the first school of thought, which

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5 The empirical literature finds a positive association between inequality and political instability and civil unrest (e.g., Venieris and Gupta 1986; Alesina and Perotti 1996). Papaionannou and Siourounis (2005) make an analogous point by suggesting that "high inequality increases the likelihood of democratization by spurring opposition" (p.30-31). In his criticism of Boix (2003), Ziblatt (2006) makes a similar point.

6 Of course, within a single case, one of these mechanisms may dominate such that inequality affects democratization in that particular instance. However, existing theories provide no ground to expect one mechanism to prevail over the other in general.
argues that inequality decreases the likelihood of democratization. This theory only takes the first mechanism, according to which the elites become more willing to democratize as inequality decreases, into account. However, since people living in these countries are less likely to demand democracy in the first place, the elites also have fewer incentives to concede it. While equality increases the willingness of the elites to democratize, it also decreases that of the population to demand it. Because these authors completely ignore the second mechanism, their predictions are unlikely to hold.

In contrast to the first school of thought, the second set of theories does take both mechanisms into consideration. At low levels of inequality, the elites do not democratize precisely because the population has no incentive to stage a revolution. However, the main finding of Acemoglu and Robinson (2006) — the inverted U-shaped relationship between inequality and democratization — rests on two unnecessary constraints on the cost of repression. One is that, short of a credible threat of socialist revolution, maintaining an autocracy is assumed to have no cost, because the elites do not need to repress at all. This drives the finding that equal dictatorships do not democratize. While the cost of repression is assumed to be zero in equal autocracies, the cost of redistribution is always more than zero, although very low in these countries.

The problem is that in reality, even in very equal autocracies, maintaining the regime always requires some repression. What distinguishes one dictatorship from another is not whether or not it represses, but its level of repression.\footnote{Wintrope (1998) demonstrates that even a perfectly benevolent dictator, that wants to maximize the welfare of his/her population, relies on some (low) level of repression. He illustrates his argument with the example of Marcus Aurelius. Another example is Singapore which, despite being egalitarian, has experienced some social unrest since its independence (Smith 2008).}
Contrary to what Acemoglu and Robinson (2006) assume, the choice of the population is not limited to either staging a socialist revolution or not contesting at all. It can also generate varying levels of social unrest which, by being costly to the elites to repress, push them to democratize. In other words, instead of mobilizing to install a socialist dictatorship, the population can pressure the elites to democratize by increasing the cost of maintaining the regime through, sometimes limited, contestation. Since there is always some amount of social unrest and scarce resources must be spent repressing and limiting it, maintaining autocracy always requires some cost. Then, equal autocracies require less repression than unequal ones, but the elites are also less willing to bear its costs; since democratization implies less redistribution than in countries that are more unequal. This leads to the same inconclusive predictions as above.

The other constraint is that the cost of repressing a revolt is assumed to be independent of its intensity. This assumption leads to the inference that very unequal countries do not democratize. According to Acemoglu and Robinson (2006), the cost of redistribution rises with inequality, such that at a certain point it surpasses the cost of repression. However, in reality not all revolts are equally costly to repress. When inequality is high, the population also has

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8 As shown by Wintrope (1998), repression is best conceived as continuous rather than binary.

6 These costs include the direct cost of repression (e.g., police forces) and its human cost. There are also diverse economic losses related to social unrest and repression, such as capital flight, reduced growth, decreased FDI inflows, international sanctions and reduced foreign aid (Wood 2000; Butkiewicz and Yanikkaya 2005; Campos and Nugent 2003; Meernik, Krueger and Poe 1998). Repression is also likely to lead to divisions within the governing coalition, threatening the regime from within. Finally, to limit contestation, a dictator may also have to engage in patronage, which is costly (see Wintrope 1998).

10 Strictly speaking, according to Acemoglu and Robinson (2006), the cost of repression does depend on inequality, but not because inequality affects the intensity of the revolt. Instead, instability is assumed to destroy a fixed portion of the total economy, implying that repression is more costly to the elites when they own a larger share of the income. The problem is that
stronger incentives to mobilize, thus increasing the required level of repression. In countries that are only moderately unequal, a relatively small subset of the population is likely to mobilize, and those that do sacrifice little resources. Therefore, one cannot say, a priori, that at high levels of inequality, the cost of repression is always lesser than the cost of redistribution, as assumed by Acemoglu and Robinson (2006).

The third issue is that both sets of theories ignore collective action problems. Mobilizing the population to oppose an autocracy poses serious challenges, because revolutions are public goods that cannot be denied to non-participants (Tullock 1971). Moreover, each individual has a very small impact on the likelihood of a revolution being successful, again decreasing the expected benefits of participation. These problems are magnified by the fact that participants face large costs, possibly death. The population is thus unlikely to organize at all. The problem is that the existing theories expect inequality to affect democratization by determining the likelihood of the population rising against the regime. But, if the masses are unable to mobilize, the elites have no incentive to respond to changes in inequality by adopting democracy. Therefore, even if the earlier theories were right about the basic relationship between inequality and democratization — which has been called into question above — their explanatory power would be greatly reduced.

the rate at which the cost of repression increases is implicitly assumed to be lesser than the rate at which the cost of redistribution rises with inequality. This last assumption is the key to driving the results, because it implies that at high levels of inequality the cost of redistribution surpasses that of repression.
1.2.2 Inequality and Consolidation

The authors of both schools of thought discussed above agree that inequality harms consolidation. They argue that the elites are more likely to stage coups in unequal democracies because these are believed to redistribute more, thus making democracy more costly for the elites. One striking observation is that most poor stable democracies turn out to be very equal. Some examples include India, Costa Rica, Uruguay, Jamaica, Mauritius, Papua New Guinea and Mongolia since the fall of the communist regime. Most East European countries are also examples of stable equal democracies. Greskovits (1997) argues that one of the reasons why democracies are more stable in Eastern Europe than in Latin America is that the countries of the former are much more equal. Moreover, Karl (2000) explains the relative stability of democracy in Costa Rica and Uruguay by the fact that they are among the most equal Latin American countries. She further argues that "Inequality’s pernicious undermining of democratic aspirations, institutions, and rules is the greatest threat facing democracy in the Americas today" (p.156, emphasis added).

Do theories linking inequality to consolidation suffer from the same problems as those linking inequality to democratization? No. The distinction lies in the fact that these two types of transitions tend to follow different patterns. Whereas transitions from autocracy to democracy can follow diverse paths, those from democracy to autocracy almost always take a similar one. As discussed above, democratization can be driven either from above or below. Some are the results of intra-elite competition, others of pressure by the population, and still others of the direct seizure of power by the population. Democratic breakdowns, on their part, are almost always driven from above. As argued
by Huntington (1996), "With only one or two possible exceptions, democratic systems have not been ended by popular vote or popular revolt" (p.9). Coups and rebellions against democracies are usually waged by the elites and/or the military, not the population.\footnote{Here, it is not claimed that all democratic breakdowns are alike. In reality, transitions from democracy to autocracy have taken many forms (e.g., see Linz and Stepan 1978). For example, they may result from military coups or executive coups. The argument simply says that they tend to be driven from above, whereas democratization can be driven either from above or below.}

Moreover, democratization (from below) involves more groups of actors than democratic breakdowns. On the one hand, the theoretical literature about the relationship between inequality and democratization has typically conceived democracy as being demanded by the population but ultimately conceded by the elites. According to these theories, democratization is consensual, in the sense that it usually requires the agreement of both the population and the elites.\footnote{In these theories, revolutions are followed by other (socialist) dictatorships, not democracies. In reality, in some rare cases democratization has been imposed by the population without the agreement of the elites (e.g., Nicaragua). However, this observation does not contradict the argument that whereas democratization from below is usually consensual, democratic breakdown rarely is.} In other words, democratization from below is a process that involves both social classes. On the other hand, transitions from democracy to dictatorship do not require the explicit agreement of the population. Coups are often successful even when not supported by the population.\footnote{This claim does not disagree with the fact that, in many instances, the support of the population facilitated the overthrow of democracy (e.g., see Valenzuela 1978). It only says that democratic breakdown is not a process in which the population concedes political power to the elites, but one in which the latter seizes it (with or without opposition) from the former.} In the words of Acemoglu and Robinson (2006), "the move from democracy to dictatorship is almost never consensual" (p.225). There have been instances where coups against democracies have been prevented by popular mobilization. However, mobilization requires the population to solve its collective action problem. There-
fore, while transitions from autocracy to democracy can take diverse paths some of which involve many sets of actors, those from democracy to dictatorship almost always follow the same path, in which only the elites play a major role.¹⁴

The asymmetry between the two transition processes has key implications for the relationship between inequality and consolidation. First of all, as democratic breakdowns follow a single path, theories trying to explain them — contrary to those concerned with democratization — can be applied to almost all cases. Further, whereas inequality has two opposite effects on democratization, it only negatively affects consolidation. The two effects of inequality on democratization come from the fact that democracy is demanded by the population but, in the end, conceded by the elites. In these cases, inequality decreases the willingness of the elites to democratize, but increases the incentives of the population to contest the regime. By contrast, democratic breakdowns result from the direct seizure of power by the elites. Because the agreement of the population is not required, the effect of inequality on its willingness to concede dictatorship has little impact. Inequality mainly affects democratic breakdowns by increasing the cost of redistribution to the elites. Therefore, one should expect that when inequality increases the elites are more likely to wage coups against democracies, as argued by previous theories.

Finally, collective action problems do not significantly reduce the capacity of the elites to mobilize (Weede and Muller 1998). Since the elites form a much smaller group than the population, those involved in coups are more likely to

¹⁴It is important to note that these assumptions are shared by Boix (2003) and Acemoglu and Robinson (2006). Here, it is simply shown that, given their assumptions on transitions from democracy to dictatorship, the objections presented in the previous section do not apply to their theories of consolidation.
receive selective benefits. For example, while those participating in coups often obtain offices in the new regime, those that participate in revolutions rarely receive such benefits. In addition, participants in coups are much more likely to affect its success than those participating in revolts, again reducing collective action problems. An army officer has, for example, more influence on the outcome of a coup than a single peasant on that of a revolution. Thus, the magnitude of the relationship between inequality and consolidation, uncovered by the theoretical literature, should not be significantly reduced by collective action problems. A combination of these arguments suggests that theories about the effects of inequality on democratization should find little empirical support, while those about consolidation are likely to hold.

1.3 Previous Literature

The empirical results on the relationship between inequality and democracy are mixed. Table 1.1 summarizes the main large-N studies. Some authors find strong evidence of a negative linear relationship (e.g., Muller 1988, 1995; Boix and Stokes 2003; Boix 2003), while others find no relationship (e.g., Bollen and Jackman 1985, Midlarsky 1992). One of the major problems with much of this literature is the measure of inequality used. Most recent authors rely on the Gini coefficients of Deininger and Squire (1996) or the World Bank. Unfortunately, these data come from different sources that may not be comparable (Galbraith and Kum 2004; Atkinson and Brandolini 2001). They contain ob-

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15 One could even argue that collective action problems increase the capacity of the elites to stage coups against democracies, since they decrease the likelihood that the population will be able to mobilize to oppose coups.

16 Boix (2003) includes some adjustments suggested by Deininger and Squire (1996) to account for these different data sources, for example by adding Gini points in cases where in-
servations based on expenditure and income, on net and gross income and on household and per capita surveys. These different data sources may significantly affect the inequality measure. For instance, because of income redistribution, the observations based on gross income should systematically indicate more inequality than those based on net income.\textsuperscript{17}

The data sets used by previous authors also contain only a few observations and cover only a small number of countries. Boix (2003), who uses the data of Deininger and Squire (1996), has only 587 observations on all countries for the period 1950 to 1990.\textsuperscript{18} The problem is that the sample of available observations is strongly biased toward rich and democratic countries that have the capacity and willingness to collect such data.\textsuperscript{19} Other authors — who do not use the data set of Deininger and Squire (1996) — also rely on data sets with only a few observations. For example, among cross-country studies, Muller (1995) covers only 64 countries. By contrast, the data set used here includes 116 countries. Equality is underestimated. However, Atkinson and Brandolini (2001) argue that these adjustments do not eliminate the bias.\textsuperscript{17}

He increases the number of observations to about 1000 by using five-year averages.\textsuperscript{18} While the average GDP per capita for the observations included in Deininger and Squire (1996) is 9,260, it is only 6,342 in the full population. By contrast, in the data set used here, the average GDP per capita is 7,099. Similarly, whereas the average polity score in the whole population is -0.74, it is 3.61 for the observations in the data set of Deininger and Squire (1996). In my data set, the average polity score is 1.03.\textsuperscript{19}
<table>
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<tbody>
<tr>
<td>Bollen and Jackman (1985)</td>
<td>Income quintiles</td>
<td>None</td>
<td>Data qual. and quant. No distinction demo./conso.</td>
</tr>
<tr>
<td></td>
<td>(World Bank, N ≤ 60)</td>
<td></td>
<td>No non-linear test Cross-sectional</td>
</tr>
<tr>
<td>Muller (1988)</td>
<td>Income Gini</td>
<td>None (dem.)</td>
<td>Data qual. and quant. One control (econ. dev.)</td>
</tr>
<tr>
<td></td>
<td>Income quintiles</td>
<td></td>
<td>No non-linear test Cross-sectional</td>
</tr>
<tr>
<td></td>
<td>(World Bank, N ≤ 33)</td>
<td>Negative (cons.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agric. density (N ≤ 97)</td>
<td>None (income)</td>
<td>No non-linear test Reverse causation</td>
</tr>
<tr>
<td></td>
<td>Income quintiles</td>
<td></td>
<td>Cross-sectional</td>
</tr>
<tr>
<td></td>
<td>(World Bank, N ≤ 55)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Income quintiles</td>
<td></td>
<td>No non-linear test Cross-sectional</td>
</tr>
<tr>
<td></td>
<td>(World Bank, N ≤ 64)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(World Bank, N ≤ 224)</td>
<td></td>
<td>No non-linear test Cross-sectional</td>
</tr>
<tr>
<td></td>
<td>Income quintiles</td>
<td></td>
<td>No non-linear test</td>
</tr>
<tr>
<td></td>
<td>(D&amp;S, N ≤ 303)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(D&amp;S, N ≤ 1042)*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epstein et al. (2004)*</td>
<td>Infant mortality</td>
<td>Negative (Markov)</td>
<td>Data qual.</td>
</tr>
<tr>
<td></td>
<td>Inverted U (Tobit)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Papaioannou and Siourounis (2005)*</td>
<td>Income Gini</td>
<td>None</td>
<td>Data qual. and quant.</td>
</tr>
<tr>
<td></td>
<td>(World Bank, N ≤ 1570)**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(B&amp;M, N ≤ 4728)**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>% family farms</td>
<td>Negative (land)</td>
<td></td>
</tr>
</tbody>
</table>

Authors testing for an inverted U-shaped relationship also find conflicting results (e.g., Epstein et al. 2004, Papaioannou and Siourounis 2005\textsuperscript{20}). Acemoglu and Robinson (2006) do not run any large-N test but only look at four case studies. Burkhart (1997) — the only published paper testing for a non-linear relationship — finds an inverted U-shaped relationship. However, his analysis contains data on only 56 countries. These observations may not be representative of the full population. For example, Burkhart (1997) has few observations on sub-Saharan Africa and especially, the Middle East. The inclusion of more countries from these regions may have affected the estimated relationship, since they tend to have both intermediate levels of inequality and authoritarian regimes. Further, Burkhart (1997) does not look at the probability of regime transition, but only at the level of democracy measured with Freedom House scores. This does not enable him to differentiate between the effects of inequality on democratization and consolidation.

Using tobit models, Epstein et al. (2004) find an inverted U-shaped relationship between inequality and the overall level of democracy, measured with polity scores. However, when they distinguish between democratization and consolidation, the non-linearity vanishes. Instead, inequality decreases the probability of both democratization and consolidation. They measure inequality as the residual of the regression of infant mortality on variables (assumed to be) unrelated to inequality.\textsuperscript{21} The problem is that even if infant mortality is likely to be affected by inequality, it would make a better measure of poverty;

\textsuperscript{20}An earlier version (2004), cited by Acemoglu and Robinson (2006, p.193), finds an inverted U-shaped relationship. However, once they include new observations, Papaioannou and Siourounis (2005) are unable to find any relationship.

\textsuperscript{21}These are access to safe water, access to health care, health expenditure per capita, total health expenditure, calories per capita per day, a standard of living index, reports of famine, people affected by drought, people affected by earthquakes, people affected by floods, people affected by unnamed storms, and people affected by named storms.
indeed, many poor and equal countries, like India, have high infant mortality rates.\textsuperscript{22} Using this measure would lead us to think that inequality in these countries is actually high.

1.4 Data

1.4.1 Dependent Variable

Regime types are taken from the extended database of Przeworski et al. (2000), which covers most countries from 1950 to 2002. There are two types of regimes: democracies and autocracies. To be defined as democratic, a country must satisfy four conditions: (1) the chief executive must be elected either directly or indirectly by the population; (2) the legislature must be elected directly by the population; (3) there must be more than one party; and (4) there must have been at least one alternation in power due to elections.\textsuperscript{23} Any regime that does not satisfy one of these conditions is authoritarian.

\textsuperscript{22}Child mortality is nearly twice as large in India as in Brazil (World Bank data). However, India is relatively egalitarian, while Brazil is among the most unequal countries. In addition, infant mortality is highest in sub-Saharan Africa, whereas Latin America is by far the most unequal region.

\textsuperscript{23}The last rule is applied retrospectively. For example, in Japan the LDP (Liberal Democratic Party) won all elections until 1993 when it lost and voluntarily relinquished power. Because the LDP respected the electoral results, Japan is coded as democratic during the full period. Malaysia held three elections between 1957 and 1969. The incumbent party won the first two, but not the third. Even so, it refused to cede power. Malaysia and similar cases are autocracies during the whole period. Finally, there are instances, such as Botswana, where the incumbent party never lost elections. As one cannot know whether it would give up power, Przeworski et al. (2000) assume that these countries are not democratic.
1.4.2 Independent Variable

As noted above, the most important obstacle to studying inequality is the lack of reliable data. Problems arise both from the low number of observations and from the poor quality of those that are available. This paper measures inequality with the capital share of the value-added in the industrial sector, assembled by Ortega and Rodriguez (2006). Dunning (2008), Acemoglu and Robinson (2006) and Przeworski et al. (2000) have also recently used capital shares to measure inequality. According to Dunning (2008), “capital shares represent the best available cross-national indicator of private inequality” (p.143). Low capital shares are associated with low inequality, because a great portion of the value-added in production is accruing to the labor class — as opposed to the capital owners. The database has about 3500 observations covering 116 countries between 1960 and 2000, and was constructed from data collected by the United Nations Industrial Development Organization (UNIDO).

Using capital shares to measure inequality has a number of theoretical and empirical advantages. First, it is consistent with the theoretical literature that focuses on inter-group inequality rather than on overall inequality. Most authors believe that it is only inequality across social classes that affects the regime type. For instance, Boix (2003) and Acemoglu and Robinson (2006) look at inequality between the poor and the elites. Capital shares measure the relative income of the elites.\footnote{A second advantage is that capital shares are collected by a single source —}

\footnote{Capital shares are defined as one minus the labor shares, which measure the ratio of compensation of employees to the value-added in production.}

\footnote{For example, Acemoglu and Robinson (2006) define the income of the population and the elites (or rich) respectively as $y^p = \frac{(1-\theta)\overline{y}}{1-\delta}$ and $y^r = \frac{\theta\overline{y}}{\delta}$, where $\overline{y}$ is the average income, $\delta$ the relative size of the elites, and $\theta$ the share of the income accruing to the elites. The capital shares thus directly capture $\theta$.}
the United Nations — that uses the same definitions and method for all countries. Thus, cross-country comparisons are meaningful. The data set of Ortega and Rodriguez (2006) also covers a far larger proportion of the country-years than those employed by previous authors. For example, while the data set of Deininger and Squire (1996) contains only 11 percent of the possible observations, that of Ortega and Rodriguez (2006) contains more than 67 percent. Since many observations are still missing, the robustness of the results is tested by imputing the missing values.\(^{26}\)

### 1.4.3 Control Variables

Diverse economic variables have been shown to affect democracy. Modernization theorists have argued that countries become more likely to install and sustain democracy as they develop (e.g., Lipset 1959). People may be more willing to demand political rights once their basic needs are satisfied. Wealth may also be related to inequality, for instance, through the Kuznets curve. Moreover, many scholars argue that economic performances influence the stability of political regimes (e.g., Gasiorowski 1995). For example, drastic decrease in wealth may destabilize autocracies (Haggard and Kaufman 1995). Growth may also influence inequality, because economic crisis or booms tend to affect diverse segments of the population differently. The structure of the economy also affects democracy. In particular, countries relying heavily on natural resources are less likely to be democratic, notably because the elites are more vulnerable to taxation (Ross 2001; Boix 2003). Additionally, the revenues emanating from natural resources are usually controlled by the state, which can use them to

\(^{26}\)The multiple imputation model is described in Appendix A.
prevent democratization. The analysis thus includes GDP per capita, GDP per capita growth and a dummy variable for large oil exporters.\(^{27}\)

In addition, the social and cultural context can influence democracy. For example, Islam is thought to be particularly harmful, and Protestantism helpful (Huntington 1991; Midlarsky 1998). Religion may also influence the tolerance of the population toward inequality (Milanovic, Gradstein and Ying 2001). Variables measuring the percentages of the population that are Muslim, Catholic and Protestant are included. Moreover, some scholars suggest that divided societies are less likely to establish and maintain democratic institutions (e.g., Dahl 2000). For example, an incumbent may be less willing to leave office if his/her opponent belongs to another ethnic or religious group. Measures of ethnic and religious fractionization are thus added to the analysis. These indicate the probability that two individuals selected randomly are from different ethnic or religious groups.

Further, many political factors affect the regime type. A dummy variable is included here for former British colonies, which are said to have inherited institutions particularly conducive to democracy (e.g., La Porta et al. 1998). Following Przeworski et al. (2000), another dummy variable is added for countries that did not exist in 1945. This captures, for example, the possibility that democracies established by colonizers in new countries are less stable because these countries lack the prerequisites for democracy.

Moreover, I control for the number of transitions from democracy to dictatorship that a country has experienced. Previous studies generally find that this variable increases the likelihood of transition (e.g., Przeworski et al. 2000;\(^{27}\) It takes the value one if the average ratio of fuel exports to total exports in 1984-86 is greater than 50 percent, and zero otherwise.)
Epstein et al. 2006). In fact, countries that have been victims of many coups in the past are more likely to experience coups in future (Londregan and Poole 1990). Also, the interaction between the elites and the population is likely to be different in autocracies that have experienced democracy than in those that did not. For example, the population may find it easier to mobilize and challenge the regime in the former.

Some scholars also argue that presidential democracies are more fragile than other types of democracies (e.g., Linz 1990). Presidential elections are often described as zero-sum games, where the losers have little incentives to accept electoral results. Because the president remains in office for a fixed term, it is difficult to depose an incompetent or unpopular government without destabilizing the regime.\textsuperscript{28} A dummy variable indicating if the regime is presidential is included. Finally, it has recently been suggested that the international political context affects the likelihood of a country being democratic (e.g., Gleditsch and Ward 2006). The analysis thus controls for the proportion of democracies in the world. All the control variables are taken from the extended data set of Przeworski et al. (2000).

\subsection{1.5 Descriptive Statistics}

Before undertaking the statistical analysis, I take a preliminary look at the data. Democratic countries are much more equal than autocracies.\textsuperscript{29} This observation is consistent with several arguments linking inequality and democracy: inequality may harm democratization, it may inhibit consolidation of already

\textsuperscript{28}For a counter-argument see Cheibub (2006).

\textsuperscript{29}The mean capital share is 0.6765 in dictatorships and 0.6093 in democracies.
established democracies, or it may itself be affected by the political regime. It is argued here that the observed association can be accounted for mainly by the second of these possibilities.

Table 1.2: Probability of Regime Transition per Capital Share Tiers

<table>
<thead>
<tr>
<th>Capital Share Tiers</th>
<th># Transitions</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Middle</td>
</tr>
<tr>
<td>(1) Dict. to Dem.</td>
<td>.017 (10)</td>
<td>.024 (14)</td>
</tr>
<tr>
<td>(2)* Dict. to Dem.</td>
<td>.0181 (10)</td>
<td>.0236 (13)</td>
</tr>
<tr>
<td>(3) Dem. to Dict.</td>
<td>.0018 (1)</td>
<td>.009 (5)</td>
</tr>
<tr>
<td>(4)** Dem. to Dict.</td>
<td>.0097 (3)</td>
<td>.026 (8)</td>
</tr>
</tbody>
</table>

Note: *excludes communist countries. **excludes Western countries and Japan. Number of transitions in parentheses.

Table 1.2 presents the probabilities of regime change at low, intermediate and high capital share values, using the non-imputed data set. In each regime type, the observations are divided into three groups (tiers) containing the same number of country-years. The probability of transition and the number of transitions within each group are reported.

The first row looks at the probability of dictatorships transiting toward democracy. According to the first group of authors (e.g., Boix 2003), greater inequality — i.e. larger capital shares — should be associated with smaller probabilities of democratization. As shown by the first row of Table 1.2, this hypothesis is not supported by the data. If anything, inequality fosters democratization. Very unequal countries are more than three times as likely to democratize as very equal ones.

Many authors view communist and non-communist dictatorships as different regime types (e.g., Boix 2003; Acemoglu and Robinson 2006). The former are created by the masses after revolutions to redistribute assets, while the latter

---

30 The results reported below are unchanged when the data set that includes imputed observations is used instead (not reported).
are established and maintained by the elites to prevent redistribution. Communist countries are thus excluded in row 2. The results are unchanged. Therefore, the hypothesis that transitions toward democracy are more likely in egalitarian societies finds no evidence.

The hypothesis of Acemoglu and Robinson (2006) is not supported either. As shown in row 1, there is no clear non-monotonic relationship. Inequality is always associated with higher probability of democratization. These results are unchanged when, in row 2, communist countries are omitted. Thus, there is no evidence for either of the two main theories linking inequality to democratization.

Inequality, however, has a strong positive effect on the probability of a democracy backsliding to dictatorship. As illustrated in row 3 of Table 1.2, democracies that have high capital shares are much more likely to break down. Those with capital shares in the high tier are five times as likely to collapse as those in the middle tier. Moreover, among the low tiers, only one democracy — Niger in 1996 — has ever broken down. One potential problem is that the effect may be driven by rich developed democracies that are both stable and equal. Row 4 thus excludes Western countries and Japan. The results are unchanged. Democracies with high capital shares are still more than five times as likely to break down as those with low capital shares. Therefore, consistent with the argument presented here, inequality does harm consolidation.

1.6 Empirical Results

This section employs dynamic probit models to show that inequality harms consolidation but does not affect democratization. This method has been used
by other authors studying regime transitions, like Przeworski et al. (2000), Boix and Stokes (2003) and Boix (2003). It estimates the probability of countries with a certain regime (in the current period) transiting to a new regime in the next period. This model enables one to distinguish between the effects of different independent variables on democratization and consolidation, and to obtain different estimates for each transition pattern. For example, inequality is allowed to have different effects on transitions from democracy to dictatorship and from dictatorship to democracy. Tables 1.3 and 1.4 present respectively the impact of each independent variable on the probability of democratization, and on the likelihood of stable democracy.\footnote{The results reported in Tables 1.3 and 1.4 are estimated by the same regressions. Dynamic probit models estimate the likelihood of transitions to and from democracy at the same time. The results are reported separately to facilitate interpretation.}

Table 1.3 reports the impact of capital shares on the probability of transition from dictatorship to democracy in both linear and non-linear models. Positive coefficients indicate that the associated independent variables increase the probability of transition to democracy. Model 1 tests the hypothesis of a negative monotonic relationship, advanced notably by Boix (2003). It shows that lower capital shares are actually associated with smaller probability of democratization, though the relationship is not significant. Thus, contrary to what has been argued, inequality does not harm democratization but instead has a weak positive effect.

Model 2 of Table 1.3 estimates the non-linear model by adding capital share squared. The predictions of Acemoglu and Robinson (2006), according to which the relationship is inverted U-shaped, would be supported if the coefficient on capital share is positive and the one on capital share squared negative. As shown in model 2, both coefficients turn out to have the wrong sign, although
Table 1.3: Dynamic Probit Analysis of the Probability of Transition from Dictatorship to Democracy

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td></td>
<td>(.658)</td>
<td>(6.45)</td>
<td>(.725)</td>
<td>(6.746)</td>
</tr>
<tr>
<td>Cap. Share Sq.</td>
<td>3.636</td>
<td>3.345</td>
<td>5.494</td>
<td>4.22</td>
</tr>
<tr>
<td>log GDP pc</td>
<td>-.171</td>
<td>-.154</td>
<td>-.567</td>
<td>-.23</td>
</tr>
<tr>
<td></td>
<td>(.245)</td>
<td>(.247)</td>
<td>(.302)</td>
<td>(.305)</td>
</tr>
<tr>
<td>Growth</td>
<td>-.014</td>
<td>-.014</td>
<td>-.013</td>
<td>-.012</td>
</tr>
<tr>
<td></td>
<td>(.005)**</td>
<td>(.005)**</td>
<td>(.006)**</td>
<td>(.006)</td>
</tr>
<tr>
<td>Oil</td>
<td>-.417</td>
<td>-.47</td>
<td>-.218</td>
<td>-.304</td>
</tr>
<tr>
<td></td>
<td>(.32)</td>
<td>(.33)</td>
<td>(.346)</td>
<td>(.356)</td>
</tr>
<tr>
<td>Muslim</td>
<td>-.003</td>
<td>-.003</td>
<td>-.003</td>
<td>-.008</td>
</tr>
<tr>
<td></td>
<td>(.003)</td>
<td>(.003)</td>
<td>(.004)</td>
<td>(.004)</td>
</tr>
<tr>
<td>Catholic</td>
<td>-.0004</td>
<td>3.49e-06</td>
<td>-.005</td>
<td>-.004</td>
</tr>
<tr>
<td></td>
<td>(.003)</td>
<td>(.003)</td>
<td>(.004)</td>
<td>(.004)</td>
</tr>
<tr>
<td>Protestant</td>
<td>.002</td>
<td>.001</td>
<td>.009</td>
<td>-.002</td>
</tr>
<tr>
<td></td>
<td>(.006)</td>
<td>(.006)</td>
<td>(.007)</td>
<td>(.007)</td>
</tr>
<tr>
<td>Ethnic Frac.</td>
<td>-.001</td>
<td>-.001</td>
<td>-.003</td>
<td>-.002</td>
</tr>
<tr>
<td></td>
<td>(.003)</td>
<td>(.003)</td>
<td>(.004)</td>
<td>(.004)</td>
</tr>
<tr>
<td>Religious Frac.</td>
<td>.006</td>
<td>.005</td>
<td>.01</td>
<td>.011</td>
</tr>
<tr>
<td></td>
<td>(.005)</td>
<td>(.005)</td>
<td>(.006)*</td>
<td>(.006)*</td>
</tr>
<tr>
<td>British Colony</td>
<td>.021</td>
<td>.026</td>
<td>-.057</td>
<td>-.059</td>
</tr>
<tr>
<td></td>
<td>(.173)</td>
<td>(.174)</td>
<td>(.193)</td>
<td>(.193)</td>
</tr>
<tr>
<td>New Country</td>
<td>-.338</td>
<td>-.323</td>
<td>-.159</td>
<td>-.132</td>
</tr>
<tr>
<td></td>
<td>(.201)*</td>
<td>(.201)</td>
<td>(.256)</td>
<td>(.258)</td>
</tr>
<tr>
<td>Past Transitions</td>
<td>.227</td>
<td>.217</td>
<td>.194</td>
<td>.185</td>
</tr>
<tr>
<td></td>
<td>(.072)**</td>
<td>(.073)**</td>
<td>(.076)**</td>
<td>(.077)**</td>
</tr>
<tr>
<td>% Dem.</td>
<td>2.516</td>
<td>2.436</td>
<td>1.7</td>
<td>1.655</td>
</tr>
<tr>
<td></td>
<td>(.622)**</td>
<td>(.633)**</td>
<td>(.686)</td>
<td>(.686)</td>
</tr>
<tr>
<td>Log-Lik.</td>
<td>-310.21</td>
<td>-309.88</td>
<td>-302.47</td>
<td>-302.02</td>
</tr>
<tr>
<td></td>
<td>3439</td>
<td>3439</td>
<td>3439</td>
<td>3355</td>
</tr>
</tbody>
</table>

Note: Columns 3 and 4 include region and decade dummy variables; columns 5 and 6 exclude communist countries; columns 7 and 8 include imputed observations. All independent variables are lagged. Standard errors in parentheses. *** p < .01, ** p < .05 and * p < .1.

none is statistically significant. Figure 1.1 shows the predicted probabilities of democratization estimated in model 2, when other variables are at their mean or median. The relationship between inequality and democratization is clearly not inverted U-shaped. If anything, it is U-shaped.\(^{32}\)

\(^{32}\)However, there are few observations at both extremities of the distribution plotted in Figure 1.1, such that the relationship is largely flat or weakly increasing. In fact, more than 85 percent of the observations have capital shares between 0.45 and 0.8. The generalized additive
Next, models 3 and 4 rerun, respectively, models 1 and 2 with region and decade dummy variables. These are important since inequality and democracy vary substantially across regions and time periods. Latin America is the most unequal region, followed by sub-Saharan Africa and the Middle East. Asian, Western and Eastern European countries are much more equal. The omission of regions and time periods could thus bias the results. For example, model (GAM) estimated below also shows that the relationship is not U-shaped.

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33 The region dummies are Western countries (Western Europe, North America, New Zealand and Australia), Asia, sub-Saharan Africa, Eastern Europe, Latin America and the Middle East. Asia and the 1990s dummy are excluded during the estimation.
ple, Latin American countries are unequal and often politically unstable. By failing to control for regions, we may simply capture the effect of being from Latin America. Another potential problem is that, as discussed above, the predictions of most recent authors do not apply to communist countries, which are included in regressions 1 and 2 of Table 1.3. I replicate these models without communist regimes in columns 5 and 6. Lastly, models 7 and 8 use the data set that includes the imputed observations. In all cases, the results are unchanged.

One problem with the non-linear models estimated in Table 1.3 is that they may be inflexible. Parametric approaches aimed at handling non-linearities, for example by adding polynomials, may not capture more complicate forms of non-linearity (Beck and Jackman 1998). The problem arises from the fact that such methods impose a global solution for the full range of inequality values. One solution is to estimate a generalized additive model (GAM) (see Beck and Jackman 1998). This method enables us to run a non-parametric estimation of the effect of inequality on democratization, while keeping the parametric setup for the control variables. Inequality has an approximate Chi-squared of 1.612 ($p = 0.204$). The estimated degree of freedom is one. Figure 1.1 plots the predicted probabilities of democratization, estimated through GAM. Clearly, the relationship is neither inverted U-shaped nor decreasing. Instead, it is weakly

---

34 The imputed data set includes nine new transitions from autocracy to democracy: Argentina (1963, 1973), Benin (1991), Brazil (1979), Bulgaria (1990), Madagascar (1993), Peru (1963), Romania (1990) and Sudan (1986).

35 GAM does not estimate the coefficient of the smooth term and only calculates an approximative test statistic (here, Chi-squared). The model explains 87 percent of the deviation. The parametric coefficients are the same as in column 1 of Table 1.3, and therefore are not reported. Further detail is available from the author upon request.

36 The analysis has been replicated by fixing (rather than estimating) the number of degrees of freedom. I tried with 2 to 12 degrees of freedom, without ever finding an inverted U-shaped or decreasing relationship. In all cases, the approximative Chi-squared of inequality is not statistically significant (not reported).
increasing.\textsuperscript{37} One advantage of this approach is that, because it gives both the significance and the shape of the relationship, it enables us to test whether inequality has any effect on democratization, without having to limit ourself to two particular theories. This is important because inequality has been argued to affect democratization long before Acemoglu and Robinson (2006) and Boix (2003) raised the issue.

Table 1.4 estimates the impact of capital shares on the stability of democracies. Positive coefficients signify that the associated independent variables decrease the probability of backsliding to dictatorship. Model 1 shows that democracies with high capital shares are far more likely to collapse. Figure 1.2 plots the predicted probabilities of democratic breakdowns estimated in model 1.\textsuperscript{38} The effect is statistically significant (at the one percent level) and substantial. While the probability of breakdown is 1.36 percent in countries with capital shares at the mean (0.6087), it becomes 4.09 percent in countries with capital shares one standard deviation above (0.7408). Further, when the capital share is lower than about 0.62, the predicted probability of collapse is less than 1.5 percent. This is substantial given that 54 percent of the democratic country-years have capital shares of less than 0.62. In the full sample, among the 28 democratic collapses, only two — Niger in 1996 and Uganda in 1985 — occurred in democracies with capital shares under 0.62. As illustrated in Figure 1.2, democracies with sufficiently low levels of inequality are nearly immune from breakdowns.

\textsuperscript{37}In addition, models including up to five polynomials have been estimated. The relationship between inequality and democratization is never inverted U-shaped (not reported).

\textsuperscript{38}These results are unchanged when the semiparametric approach described above is used. The estimated number of degrees of freedom is two and the approximate Chi-squared of inequality is 10.36 ($p = 0.0056$). Since the existing theories do not predict a non-linear relationship between inequality and consolidation, I do not report these results.
Table 1.4: Dynamic Probit Analysis of the Probability of Stable Democracy

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Dec. &amp; Reg.</th>
<th>Excl. Developed</th>
<th>Imputed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td></td>
<td>(1.173)**</td>
<td>(1.224)**</td>
<td>(1.266)**</td>
<td>(1.159)**</td>
</tr>
<tr>
<td>log GDP pc</td>
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<td>1.98</td>
<td>2.283</td>
<td>1.768</td>
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<tr>
<td></td>
<td>(.594)**</td>
<td>(.645)**</td>
<td>(.644)**</td>
<td>(.525)**</td>
</tr>
<tr>
<td>Growth</td>
<td>.02</td>
<td>.025</td>
<td>.024</td>
<td>.009</td>
</tr>
<tr>
<td></td>
<td>(.013)</td>
<td>(.014)*</td>
<td>(.014)*</td>
<td>(.01)</td>
</tr>
<tr>
<td>Oil</td>
<td>.34</td>
<td>.693</td>
<td>5.12</td>
<td>.249</td>
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<td></td>
<td>(5.14)</td>
<td>(5.63)</td>
<td>(5.69)</td>
<td>(4.47)</td>
</tr>
<tr>
<td>Muslim</td>
<td>-.004</td>
<td>-.003</td>
<td>-.004</td>
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</tr>
<tr>
<td></td>
<td>(.005)</td>
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</tr>
<tr>
<td>Catholic</td>
<td>-.0005</td>
<td>-.008</td>
<td>.006</td>
<td>-.0001</td>
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<td></td>
<td>(.006)</td>
<td>(.008)</td>
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<td>(.005)</td>
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<tr>
<td>Protestant</td>
<td>-.0006</td>
<td>.004</td>
<td>.002</td>
<td>.003</td>
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<td></td>
<td>(.011)</td>
<td>(.013)</td>
<td>(.012)</td>
<td>(.009)</td>
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<tr>
<td>Ethnic Frac.</td>
<td>.001</td>
<td>.004</td>
<td>.003</td>
<td>-.002</td>
</tr>
<tr>
<td></td>
<td>(.006)</td>
<td>(.007)</td>
<td>(.007)</td>
<td>(.005)</td>
</tr>
<tr>
<td>Religious Frac.</td>
<td>.008</td>
<td>.016</td>
<td>.01</td>
<td>.006</td>
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<td></td>
<td>(.008)</td>
<td>(.011)</td>
<td>(.009)</td>
<td>(.008)</td>
</tr>
<tr>
<td>British Colony</td>
<td>.724</td>
<td>.627</td>
<td>.918</td>
<td>.537</td>
</tr>
<tr>
<td></td>
<td>(.425)*</td>
<td>(.44)</td>
<td>(.444)**</td>
<td>(.35)</td>
</tr>
<tr>
<td>New Country</td>
<td>.087</td>
<td>.385</td>
<td>.078</td>
<td>-.061</td>
</tr>
<tr>
<td></td>
<td>(.389)</td>
<td>(.48)</td>
<td>(.395)</td>
<td>(.362)</td>
</tr>
<tr>
<td>Past Transitions</td>
<td>-.004</td>
<td>-.101</td>
<td>.013</td>
<td>-.132</td>
</tr>
<tr>
<td></td>
<td>(.144)</td>
<td>(.147)</td>
<td>(.15)</td>
<td>(.106)</td>
</tr>
<tr>
<td>Presidential</td>
<td>.037</td>
<td>.35</td>
<td>-.456</td>
<td>-.078</td>
</tr>
<tr>
<td></td>
<td>(.392)</td>
<td>(.431)</td>
<td>(.446)</td>
<td>(.333)</td>
</tr>
<tr>
<td></td>
<td>(1.139)**</td>
<td>(1.888)**</td>
<td>(1.228)**</td>
<td>(.98)**</td>
</tr>
<tr>
<td>Log-Lik.</td>
<td>-310.22</td>
<td>-302.47</td>
<td>-285.49</td>
<td>-384.5</td>
</tr>
<tr>
<td>N</td>
<td>3439</td>
<td>3439</td>
<td>2622</td>
<td>4029</td>
</tr>
</tbody>
</table>

Note: Column 2 includes region and decade dummy variables; column 3 excludes Western countries and Japan; column 4 includes imputed observations. All independent variables are lagged. Standard errors in parentheses. ***p < .01, **p < .05 and *p < .1.

The magnitude of the relationship is best illustrated with some examples. Consider the case of India, which has been democratic during the full period under study without experiencing a single breakdown. During that period, its average predicted probability of falling was 1.16 percent per year. Now, consider Peru which experienced four breakdowns in only 23 years of democratic rule. While the average capital share in India was only 0.5605, it was 0.8276
in Peru. If inequality were as high in India as in Peru, its yearly probability of falling would have been 9.3 percent, about eight times as large. Interestingly, the average predicted probability of the fall of democracy in Peru was 5.46 percent per year. Thus, apart from inequality, the underlying conditions were more hostile to democracy in India than in Peru. Another case is Nigeria, which had two breakdowns in only 12 years of democracy. With a capital share equal to that of Nigeria (0.8), the probability of the collapse of Indian democracy would have been 7.77 percent, nearly seven times as large as what it was in reality. It thus follows that income distribution is a leading candidate in explaining why some poor democracies, such as India, have been remarkably stable, while others, like Peru and Nigeria, have not been.

Model 2 includes region and decade dummy variables. The effect of inequality on consolidation is slightly reduced, but continues to be substantial and statistically significant at the one percent level. This is surprising since there is only limited variation in inequality within regions. Introducing dummy variables for regions should substantially reduce the effect of inequality. This shows that the estimated relationship is not completely driven by unobserved factors linked to regions or time periods.

Another potential problem is that these results may be driven by rich developed democracies that are very stable and equal. In fact, the average capital share among these countries is 0.5192, and 0.6087 among all democracies. Column 3 redoes model 1 without developed countries, defined as Western countries and Japan. Surprisingly, the effect becomes slightly stronger. Therefore, the relationship is not driven by rich developed democracies. In model 4, column 1 is again replicated, but with the imputed data set. Nine demo-
Unequal democracies are still far more unstable and the relationship remains significant at the one percent level. The probabilities of democratic breakdown predicted with the imputed data are plotted in Figure 1.2.

In most instances, the effect of the control variables is robust across model specifications and consistent with the findings of other empirical studies. As Przeworski et al. (2000), I find that wealth is unrelated to democratization but fosters consolidation. Moreover, autocracies, unlike democracies, are partic-

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ularly fragile when faced with economic crisis. These findings are consistent with those of Epstein et al. (2006), but not of Gasiorowski (1995). Being an oil producer has no effect on democratization or consolidation. This finding may support the argument of Dunning (2008) according to which natural resource wealth has two opposite effects on democracy.

Social and cultural variables fare much worse than economic variables. Once we control for other variables, ethnic and religious fractionization do not matter for democracy. Further, religion does not seem to affect democracy. Gasiorowski (1995) finds similar results. One possible exception is Islam which inhibits consolidation when, in column 3 of Table 1.4, developed countries are excluded. These findings largely echo those of Papaionannou and Siourounis (2008).

Among political factors, being a former British colony does not affect democratization but only consolidation, especially in model 3 of Table 1.4 where developed countries are excluded. Again this result is consistent with the previous findings (e.g., Przeworski et al. 2000). However, whether or not a country existed in 1945 does not affect its likelihood of being a democracy. The number of past regime transitions is a key predictor of democratization but not consolidation. Autocracies that have often switched regime are much more likely to democratize. Epstein et al. (2006) obtain similar results. As suggested by Cheibub (2006), democracies with presidential systems are not significantly more fragile than those with parliamentary or mixed systems. Lastly, as expected, countries are more likely to establish and maintain democracies when many other countries are democratic.
1.7 Conclusion

Much of the recent literature on democracy suggests that inequality is among the leading determinants of democratization and consolidation. However, these theories have yet to be subjected to strong empirical testing. This paper fills this gap. It argues, as anticipated by previous authors, that inequality hurts consolidation; contrary to what they predict, however, inequality has no net effect on democratization. I show that the existing theories that link inequality to democratization suffer from serious limitations: (1) they are only useful to understand transitions from below, and thus do not apply to many transitions (that is, those from above); (2) even for democratization from below, their predictions are unlikely to hold, since inequality actually has two opposite effects; and (3) they ignore collective action problems, which reduces their explanatory power. However, these objections do not affect the relationship between inequality and consolidation. In particular, while inequality has two opposite effects on the probability of transition to democracy, it unambiguously increases the probability of transition away from democracy.

Employing newly available inequality data, as well as multiple imputation to fill the missing values, this paper finds no evidence in favor of the two leading democratization theories. In fact, the results directly contradict their predictions. Inequality does not harm but weakly promotes democratization, though not significantly. Moreover, contrary to the predictions of Acemoglu and Robinson (2006), the relationship between inequality and democratization is not inverted U-shaped, but weakly U-shaped. As expected, however, egalitarian democracies are much more likely to survive. Democracies with sufficiently low levels of inequality are nearly immune from breakdowns.
This paper provides the first description of the fundamental differences between the paths followed during transitions to and from democracy. The empirical findings suggest that not only inequality, but also other variables such as wealth, growth, British colonial heritage and the number of past transitions affect democratization and consolidation differently. In fact, none of the domestic variables included in the analysis affect these two types of transitions in the same way. These results raise the interesting question of why these factors have such different effects on two seemingly similar transition processes.

In particular, the parallel between the results presented here and those of Przeworski et al. (2000) — who show that wealth does not affect democratization but promotes consolidation — is striking. This similitude suggests that the mechanisms linking, on the one hand, wealth level to democracy and, on the other, wealth distribution to democracy may be analogous. Przeworski and Limongi (1997) indeed explain the positive relationship between wealth and consolidation by referring to the competition "over the distribution of income" (p.166). As pointed out by Boix and Stokes (2003), their explanation does not account for why wealth does not influence democratization. However, if, as suggested by Przeworski and Limongi (1997), economic development affects democracy by reducing distributional conflicts, then the arguments developed here may help solve one of the most important puzzles in comparative politics. Whether this is the case or not remains to be explored in the future.
Chapter 2

Inequality, Economic Development and Democratization

“It seems possible, for example, that the political implications of inequality may vary dramatically from impoverished to affluent nations. [...] That is, the likelihood of violence may depend not only on the manner in which wealth is distributed, but also on the amount of wealth available for distribution.”

Lee Sigelman and Miles Simpson 1977, pp.108-09.

2.1 Introduction

What are the economic conditions most favorable to democratization? Although multiple theories have argued that the economic conditions under which a country finds itself are somehow related to its chances of democratization, so far these claims have received little empirical support. Two main sets of theories have used economic variables to explain the emergence of democracy. The first is the modernization theory that argues that political development is driven by economic development (e.g., Deutsch 1971; Lipset 1959). According to these scholars, autocracies become more likely to democratize as they develop and become wealthier. The key variable for this school of thought is thus the level of economic development, usually, if imperfectly, operationalized as
income per capita. The modernization theory largely dominated the literature until the end of the 1990s, when Przeworski and his coauthors showed that, in reality, rich autocracies are not more likely to become democratic (Przeworski and Limongi 1997; Przeworski et al. 2000). Instead, the observed positive correlation between high income levels and democracy is explained by the fact that once, for whatever reason, a rich country democratizes, it is more likely to remain democratic than if it had been poorer.\footnote{Since the publication of Przeworski and Limongi (1997) and Przeworski et al. (2000), many other empirical studies have found little or no evidence of a relationship between development and democratization (e.g., Acemoglu et al. 2008; Mainwaring and Perez-Linan 2003). Even before the studies of Przeworski and his coauthors, a large number of authors had questioned the existence of that relationship (e.g., Huntington 1968; O’Donnell 1973; Moore 1966). It should be noted, however, that the findings of Przeworski and his coauthors have been challenged by a number of authors (e.g., Boix and Stokes 2003; Epstein et al. 2006).}

In other words, economic development promotes the consolidation of existing democracies but does not affect democratization itself.

In response to these findings, a second group of theories has emerged. Instead of focusing on wealth levels, these scholars have looked at wealth distribution, raising the question of the effect of inequality on democracy. Two inequality theories have been particularly influential. The first, advanced notably by Boix (2003), argues that inequality harms democratization. The second, proposed by Acemoglu and Robinson (2006), instead predicts that inequality relates to democratization through an inverted U-shaped curve. Although this literature produced some remarkable theoretical insights, the empirical findings presented in Chapter 1 suggest that, in reality, there is no systematic relationship between inequality and democratization. Echoing the findings of Przeworski et al. (2000) on development, I shown that inequality harms consolidation but does not affect democratization.\footnote{A number of other empirical studies also fail to find support for existing inequality theories. Ansell and Samuels (2008), for example, find that while land inequality harms democracy,
demonstrate that neither inequality nor development cause democratization, they do not tell us what does. At this point, we have no economic theory of democratization that is supported by strong empirical evidence. Is it possible that economic conditions, which deeply affect just about every aspect of people’s life, have no effect whatsoever on democratization?

In this paper, I argue that inequality and development actually do affect democratization. The reason why previous theories have been unable to uncover their true effect is that they have assumed that both of these variables affect democratization independently of one another. Surprisingly, while modernization and inequality theories have dominated the literature, to the best of my knowledge no author has ever looked at how the interaction between inequality and development affects democratization.\footnote{One partial exception is Reenock, Bernhard and Sobek (2007) who show that needs deprivation only destabilizes middle-income democracies. However, this study looks at coups against democracies, not democratization, and focuses on needs deprivation (measured by average calorie intake), not inequality. Boix (2009) also looks at the effect of development and inequality on democratization. However, he focuses on how development affects inequality which in turn affects democratization. He does not consider how the relationship between inequality (or development) and democratization depends on the development level (inequality level). In other words, in Boix (2009) inequality mediates the relationship between development and democratization. By contrast, in this paper, development conditions the relationship between inequality and democratization.}

A number of scholars, such as Rae (1981), Sigelman and Simpson (1977), Russett (1964) and Zimmerman (1983), have raised the possibility that inequality affects political unrest differently at different levels of development, but no one has extended the argument to the relationship between inequality and democratization.\footnote{Even though this literature is concerned with the effect of inequality on political unrest, rather than regime change, it is still relevant to the question of democratization since, as argued below, one of the mechanisms through which inequality affects democratization is by generating social and political unrest.} Yet, common sense suggests that income distribution has different meanings and consequences: income inequality increases the likelihood of democratization. Kaufman (2009), for his part, provides evidence contradicting the basic assumptions on which theories that link inequality to democracy rest.
sequences at different income levels, and vice versa. The economic conditions of a country are made up of diverse components that have very little meaning when considered in isolation from each other.\(^5\)

Let us consider the examples of Singapore and Sudan, which share almost identical inequality levels.\(^6\) Previous inequality theories would predict that social actors in these two dictatorships have the same preferences and face the same constraints, simply because they happen to live under similar income distributions. Yet, this is almost certainly not the case because Singapore and Sudan find themselves at dramatically different levels of development. In 2000, the former had a GDP per capita nearly 23 times as large as the latter.\(^7\) Inequality has very different implications in these two societies, both for the preferences of the different social classes over the regime type and for their capacity to impose these preferences. For example, in a very poor country like Sudan, inequality often means that the population cannot afford to invest resources to contest the regime. By contrast, in richer autocracies, like Singapore, the population is less constrained by its lack of resources. Moreover, if, as argued for example by Reenock, Bernhard and Sobek (2007), it is deprivation not inequality \textit{per se} that matters for the population, then, inequality may not lead to as much social unrest in wealthy countries as in those at other levels of develop-

\(^5\)Here, one can draw an analogy between economic conditions and political institutions. For example, the effect of electoral institutions on democratic consolidation largely depends on whether a country has a presidential or parliamentary system of government. Combining proportional representation (PR) with presidentialism is often thought to be particularly harmful, whereas PR is not as destabilizing under a parliamentary system. Thus, studying the political implications of electoral institutions without accounting for the system of government (and vice versa) would be misleading. I argue that examining the political implications of the distribution of wealth without considering the total amount of wealth available is similarly problematical.

\(^6\)In 2000, the capital share of Singapore was 0.6963 and that of Sudan 0.7004. The capital share of the value added is the measure of inequality employed here. It gives the proportion of the value created that is accruing to the capital class.

\(^7\)GDP per capita was $24,938.85 in Singapore and $1,086.08 in Sudan.
ment. Although Singapore and Sudan are at similar inequality levels, poverty is much more widespread in the latter than in the former. In sum, these two countries are likely to have remained authoritarian for very different reasons.

Consider also the cases of Sweden and Niger. These countries have nearly the exact same, very low, level of inter-class inequality. But, contrary to what previous inequality theories would lead us to believe, we should not expect equality to have the same political implications for both of them. While in Sweden low inequality means that almost all of the population is relatively rich, in Niger it actually means that almost no one is rich. These are two very different — even opposite — socioeconomic realities, which have resulted in dramatically different political outcomes. Sweden is a well-established democracy, whereas the history of Niger has been plagued by long periods of dictatorship interrupted by brief episodes of unstable democracy.

This paper combines, for the first time, modernization and inequality theories and proposes a new economic theory of democratization that is supported by extensive empirical evidence. I show that once the relationship between inequality and democracy is allowed to differ across development levels, inequality does affect democratization. It is only once inequality and develop-

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8Low poverty is one of the reasons why Singapore has often been incorrectly portrayed as an equal autocracy. Although poverty is low in Singapore, inequality is somewhat high. In my sample, among the 35 countries with GDP per capita above $10,000, Singapore is the fourth most unequal (after Qatar, Kuwait and Saudi Arabia). Gini coefficients also suggest that Singapore is unequal, especially given its high level of development (see Ansell and Samuels 2008).

9A similar argument could be made that two countries with similar GDP per capita face very different situations if their inequality levels differ substantially.

10Between 1960 and 2000, the average capital share of Sweden was .54 and that of Niger .5. Both countries are among the 20 percent most equal countries of the sample.

11In fact, as discussed below, in very poor nations perfect equality would imply that everybody is living under the poverty line.

12Although the example of Sweden and Niger is not as relevant to democratization as that of Singapore and Sudan, it still illustrates my point that the political implications of income distribution depend crucially on the income level.
ment are interacted that one can assess: (1) the willingness of each social class to fight over the regime type; (2) the capacity of the population to solve its collective action problem; and (3) the capacity of the state, which is controlled by the ruling elites, to repress uprisings.

The argument developed in this paper is based on a simple observation: if inequality increases the likelihood of democratization, it does so through the generation of social unrest that, in turn, makes maintaining an autocracy costly and risky for the ruling elites. In order to understand where and when inequality promotes (harms) democratization, we must thus first find the conditions under which successful revolutions — and political disorder more generally — are most (least) likely to occur. It is only when conditions are favorable to revolutions that the population can induce the ruling class to democratize through the threat of a revolution. The previous literature on social unrest has found that revolutions and other forms of social unrest (with the exception of civil wars) happen more often at intermediate than at either low or high levels of development. Consequently, among middle-income countries, inequality promotes democratization by generating social unrest, which makes the preservation of autocracy more costly and risky for the ruling elites. Yet, at either low or high levels of development, inequality harms democratization because it increases the cost of adopting democracy for the ruling elites — by raising the benefits of setting redistributive policies — without fostering much social unrest.

To test these predictions, I measure inequality with the capital shares database.

\[13\] See, for example, Bates (2001); Benjamin and Kautsky (1968); Binder et al. (1971); Calhoun (1982); Eckstein (1965); Feierabend et al. (1969); Haas and Stack (1989); Hibbs (1973); Huntington (1968); Minier (2001); Olson (1963); Rostow (1967); Tadjeddin and Murshed (2007); White (1989); and Wolf (1969). The difference between civil wars and other forms of social unrest will be discussed below.
of Ortega and Rodriguez (2006), which contains about 1750 observations for the period between 1960 and 2000 in 79 autocratic countries. Capital shares give the proportion of the value added in production that accrues to the capital class. High capital share values are thus associated with high levels of inequality, since the labor class receives a smaller portion of the wealth that is created. My theoretical argument, as well as that of most previous authors, focuses on inter-class inequality. The capital shares thus represent a better indicator of inequality for my purpose than alternative measures, such as Gini coefficients, that measure the overall inequality level, not inequality between social classes. Acemoglu and Robinson (2006), Dunning (2008) and Przeworski et al. (2000) have recently used the capital shares data set of Ortega and Rodriguez (2006) to measure inter-class inequality.

As I shown in Chapter 1, development and inequality have different effects on transitions to and from democracy. Both poverty and inequality increase the likelihood of democratic breakdowns but have no clear effect on democratization. In order to avoid confounding the effects of inequality on these different transition processes, I focus on how income distribution affects the probability of transition from autocracy to democracy, rather than the level of democracy. I find strong empirical support for my hypothesis. In poor and rich countries, inequality decreases the likelihood of democratization. Yet, consistent with the logic of my argument, it strongly promotes democratization in middle-income autocracies.
2.2 Inequality and Democratization

There are two main theories relating inequality to democratization. The one that is most widespread suggests that inequality reduces the likelihood of democratization (e.g., Boix 2003; Lipset 1959; Muller 1995). Acemoglu and Robinson (2006) have recently proposed an alternative theory, in which, instead, the relationship between inequality and the probability of democratization follows an inverted U-shaped curve. Although these two approaches arrive at different conclusions, they share a similar understanding of the process leading from autocracy to democracy. Both theories argue that inequality exacerbates social conflicts by raising the stakes of holding office — and hence have the opportunity to set redistributive policies — for the lower and upper classes. According to these authors, democracy usually emerges from inter-class conflicts between the excluded groups and the ruling elites.\(^{14}\) Excluded groups trigger the process by generating social unrest. In response, the elites can either maintain the regime through repression or establish a democracy. The ruling class grants democracy if the cost of repression and the risk of being ousted outweigh the cost of democracy. Recently, conflicts between the elites and politically excluded groups have been at the origin of many transitions, notably in South Africa, El Salvador, Peru and Argentina (Collier 1999; Wood 2000).

According to this approach, democracy is a compromise between social classes.\(^{15}\) The population demands regime change, but, in the end, it is the...
ruling class that decides whether to concede it. Democratization is thus consensual, in the sense that it usually requires the agreement of both the elites and the masses. Democracy is, at least, a second-best outcome for all groups of actors. The elites prefer to retain autocracy. However, they would rather live in a democracy in which they share power with the poor and in which their interests are protected by the rule of law than in another (possibly left-wing) dictatorship, from which they are totally excluded. Their opponents within the population, for their part, might like to install a new autocracy in which they dominate, but prefer democracy to the current regime. It is the fear of being overthrown by the population and the cost of preventing it that ultimately push the elites to democratize.\footnote{Here, it is implicitly assumed that, whenever the elites democratize, the population does not try to install a left-wing dictatorship. However, it is possible that in some cases the poor are willing to rebel against democracies. This happened, for example, in Nepal where political unrest caused by a Maoist rebellion led to the collapse of the democratic regime. Nonetheless, such cases are rare. In fact, according to Huntington (1996), "With only one or two possible exceptions, democratic systems have not been ended by popular vote or popular revolt" (p.9).}

As I argue in the first chapter, inequality has two conflicting effects on the probability of democratization. First, as many have suggested, inequality makes the transition to democracy more expensive for the elites by increasing redistribution (e.g., Boix 2003; Lipset 1959). According to Meltzer and Richard (1981), unequal democracies redistribute more than equal ones. Losing control over economic and redistributive policies is more threatening for the elites in unequal societies, making them less willing to democratize. Previous authors, such as Boix (2003), have typically emphasized this mechanism at the expense of the second one.

Second, inequality may also increase the level of repression needed to main-
tain a dictatorship. Because the population has more to gain from regime change in unequal societies, it may increase its level of contestation when inequality rises. The empirical literature indeed finds a positive association between inequality and social instability (e.g., Alesina and Perotti 1996; Landa and Kapstein 2001). Maintaining an autocracy is more costly in such countries because it requires more repression.\footnote{Ziblatt (2006) makes a similar point while criticizing Boix (2003).} Papaionannou and Siourounis (2005) make an analogous point by suggesting that “high inequality increases the likelihood of democratization by spurring opposition” (p.30-31). Combining both mechanisms implies that while inequality decreases the willingness of the elites to democratize, it may also increase that of the population to demand democracy. Its net effect is thus ambiguous. My empirical findings in the first chapter of the dissertation, according to which inequality has no unconditional effect on democratization, are consistent with this argument.

My approach differs from that taken by the previous authors in that it combines both effects of inequality and finds the conditions under which one dominates the other. Previous authors typically focus on only one of these two effects, and pay little attention to the other. Boix (2003) and many others, for example, assume that the demand for regime change from the population does not depend on inequality. According to them, only the willingness of the elites to democratize is affected by inequality. This explains why these authors predict that inequality always harms democratization, because, in their framework, while the cost of democratization increases with inequality, the cost of repression is largely independent from inequality. Acemoglu and Robinson (2006) — which argue that there is an inverted U-shaped relationship between inequality and democratization — do consider both mechanisms. However, as
show in the first chapter, their findings rest on two disputable constraints that they impose on the effect of inequality on the cost of repression. Once these two assumptions are relaxed, inequality increases the incentives of the elites and the population to struggle over the control of the regime, regardless of the initial inequality level; again implying that the effect of inequality on democratization is ambiguous.

2.3 The Role of Economic Development

"[M]odernity breeds stability, but modernization breeds instability."
Samuel Huntington 1968, p.41.

Although the overall relationship between inequality and democratization is ambiguous, it is possible to find conditions under which inequality does affect the likelihood of transition. If the cost of maintaining an autocracy increases more rapidly with inequality than the cost of democratization, then inequality fosters democracy, otherwise it inhibits it. The key issue is whether the effect of inequality on social unrest is so strong that it outweighs its effect on the benefits of controlling redistributive policies.

The argument I develop in this section is based on a simple observation: if we want to understand where and when inequality increases (decreases) the likelihood of democratization through the threat of a revolution, we must first

\footnote{First, in the absence of a credible threat of socialist revolution, maintaining an autocracy is assumed to have no cost at all. This drives the finding that equal dictatorships do not democratize, because while the cost of repression is assumed to be zero, the cost of redistribution is always non-zero. Second, the cost of repressing a revolt is assumed independent of its intensity. This assumption leads to the prediction that very unequal countries do not democratize, because in such countries the cost of redistribution surpasses the cost of repression, which is assumed to be fixed.}
find the conditions under which successful revolutions — and political disorder more generally — are most (least) likely to occur. As argued by Huntington (1968), revolution "is not something which can occur in any type of society at any given period in its history" (p.265). Similarly, other more limited forms of social unrest, such as revolts or general strikes, are more likely under some economic conditions than others. It is only when these conditions are present that the population can force the elites to democratize through the fear of being overthrown and by increasing the cost of preventing it. Under such conditions, inequality promotes democratization by increasing the cost and risk of maintaining an autocracy for the ruling elites. However, in countries that do not meet the preconditions for revolution and political unrest, inequality harms democratization because it increases the stakes of setting redistributive policies without stirring much political disorder.

This raises the following question: under what economic conditions are revolutions most likely? It turns out that overwhelming evidence suggests that revolutions, and political unrest in general, are the most likely and most intense among middle-income countries.19 The case for an inverted U-shaped relationship between economic development and unrest is made particularly forcefully by Huntington in his landmark book *Political Order in Changing Societies*. Among other things, he argues that modernizing societies — as opposed to traditional or modern societies — are the most unstable. In fact, according to him, social revolutions are only possible in modernizing societies.20 He

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19 For a non-exhaustive list of studies finding evidence consistent with an inverted U-shaped relationship between development and political unrest, see Bates (2001); Benjamin and Kautsky (1968); Binder et al. (1971); Calhoun (1982); Eckstein (1965); Feierabend et al. (1969); Haas and Stack (1989); Hibbs (1973); Huntington (1968); Minier (2001); Olson (1963); Rostow (1967); Tadjoeddin and Murshed (2007); White (1989); and Wolf (1969). These studies confirm the existence of that relationship using both cross-national and within-country evidence.

20 Huntington published his work more than 40 years ago. So, one may wonder if his findings
observes that 95 percent of the countries with literacy rates between 25 and 60 percent are experiencing political disturbance, whereas only 50 percent of those with literacy rates below ten percent and only 22 percent of those with literacy rates above 90 percent are unstable.\textsuperscript{21}

What do these findings tell us about the relationship between inequality and democratization? We should expect transitions to democracy that are driven by the threat of being overthrown to be more likely among middle-income countries. It is among these countries that the second effect of inequality — that on the cost of maintaining an autocracy through repression — is strongest. Consequently, inequality should promote democratization in modernizing societies, but harm it in traditional and modern ones. Figure 2.1 gives the expected relationship between inequality and democratization at different development levels. We can explain this relationship by building on the arguments used to explain the relationship between economic development and political unrest.

At low development levels, the population simply lacks the resources necessary to rise up against the regime. As suggested by modernization theorists, people will not invest in political protests unless their income is sufficiently above the subsistence level (e.g., Inglehart and Welzel 2005; Lipset 1959).\textsuperscript{22} The

\footnotesize{\textsuperscript{21}Huntington (1968) uses literacy rate as a proxy for development in that particular instance.\textsuperscript{22}Political rights are luxury goods that the population does not demand unless it is sufficiently well-off economically (Inglehart and Welzel 2005; Minier 2001). One could argue that democracy is not only an intrinsic good but also a means to achieving other purposes — such as income redistribution — and thus that it is not necessarily a luxury good (see Landa and Kapstein 2001). Yet, even if democracy was primarily viewed as an instrumental good, the absence of resources would still limit the options available to the lower class. The poor may expect to have long-term economic prospects that are more favorable under a democracy, but lack the short-term resources necessary to threaten the regime.}
population might want to spend more on contestation, but it is constrained by the necessity of spending a minimum amount of resources on consumption in order to survive. In Huntington’s words, “people who are really poor are too poor for politics and too poor for protest” (1968, p.52).23

Figure 2.1: Expected Effect of Inequality on Democratization At Different Development Levels

<table>
<thead>
<tr>
<th>Inequality</th>
<th>Probability of Democratization</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Intermediate</td>
<td>Intermediate</td>
</tr>
<tr>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

Most importantly, not only are revolutions relatively unlikely in very poor countries, but inequality actually makes them even less likely. By reducing the resources available to the population, inequality further decreases protestation.

23The empirical evidence indeed suggest that the demand for democracy is low when the population is very poor. For example, Minier (2001) shows that the probability that a country experiences pro-democracy movements rises with GDP per capita, until it attains about $5,000.
in poor autocracies. It diminishes both the proportion of the population that can contest, and the resources available to those that do. Therefore, at low development levels, not only does inequality increase the benefits of controlling redistributive policies — as at any level of development — but it also decreases the cost and risk of maintaining an autocracy. Consequently, in very poor countries, I expect inequality to harm democratization.

As noted earlier, there is one form of social unrest which is more common at low than at middling GDP per capita levels: civil wars (Fearon and Laitin 2003). One plausible explanation for this is that civil wars differ from other forms of social unrest in that they are not plagued by the same collective action problems. Joining or initiating a civil war almost always provides private economic gains and/or enhances personal safety. Poverty increases the amount of young people that are willing to fight in order to gain access to resources. This situation is dramatically different from that of other forms of unrest, such as revolutions, whose goals are public goods, from which non-participants can rarely be excluded. In these latter cases, we should expect extreme poverty to actually help stabilize a country, because it prevents the population from solving its collective action problem. For example, Sudan, a very poor autocracy, has been anything but internally stable in the recent past. However, the civil war in Sudan has been aimed at achieving private rather than public goods, such as democratization (Collier 2010).

In other words, the two effects of inequality do not go in opposite directions in poor countries.

Looking at the determinants of participation in the civil war of Sierra Leone, Humphreys and Weinstein (2008) find that variables related to grievance, such as poverty and lack of education opportunity, are equally good at predicting participation in anti- and pro-government forces. This suggests that the recruits of the insurgent group are not motivated by grievance, since poverty increases the likelihood of joining both groups. In fact, only ten percent of the fighters of the Revolutionary United Front (RUF) that were surveyed identified the group’s political goals as a source of motivation.
At the other extreme, among very rich countries, although, under any (realistic) inequality level, the population has enough resources to rise up against the regime, it rarely does so. There are two main reasons for this. First, in rich countries, living conditions tend to be relatively good. The population has vested interests in keeping the country stable and has a lot to lose from destabilizing it. This argument is often raised to explain why Singapore, despite being rich, has remained authoritarian (e.g., Rodan and Jayasuriya 2009; Sing 2004).

Most importantly, in these countries, income distribution has little influence over living standards. In fact, Reenock, Bernhard and Sobek (2007) argue that inequality has its strongest effect on deprivation in intermediate income countries. In very poor countries, living conditions are extremely poor, regardless of inequality.26 In very rich ones, the population can enjoy relatively good living standards even when inequality is high. For example, Reenock, Bernhard and Sobek (2007) show that inequality reduces calorie intake — a popular measure of needs satisfaction — in middle-income countries, but increases calorie intake in rich ones.27 We should expect inequality to be most likely to lead to widespread social unrest — and thus substantially increase the cost of maintaining an autocracy — when it strongly influences the conditions under which the population is living. Although social unrest may increase with inequality in wealthy countries, the relationship should be very weak.

Moreover, not only is the population in rich countries enjoying high living standards...
standards, but in the event of an economic crisis, the state — contrary to those of poorer countries — is able to shield its population from widespread deprivation by using safety nets. Economic crisis is often the immediate cause of transition to democracy (Haggard and Kaufman 1995), but if the ruling elites have enough resources to limit its effect on the masses, it may not breed instability. This is, for example, what happened in Singapore during the late 1990s when it faced its most serious economic crisis since decades. The socioeconomic policies adopted by the People’s Action Party (PAP) prevented widespread popular discontent and largely explains why the regime survived the crisis (Sing 2004).

Second, at very high levels of development, even if the population wanted to overthrow the regime, it would most likely be unable to do so. Political instability can only force the elites to democratize when uprisings are costly to repress and potentially successful. If the state is able to easily and cheaply suppress unrest, inequality does not substantially increase the cost of maintaining the regime. In fact, according to Goodwin (2001), economic deprivation can only lead to successful revolutions when the state is weak. Yet, rich states tend to have strong coercive capacity. The strength of a state’s coercive apparatus mainly depends on its capacity to collect revenues (Englehart 2009).

28The idea that the balance of power between social classes is a key determinant of the likelihood of democratization is not entirely new. For example, Rueschemeyer, Stephens and Stephens (1992) argue that economic development shifts the balance of power away from the agrarian elites toward to urban lower class, which then pressures them to adopt democracy. The main difference here is that the balance of power is a conditional variable that influences the magnitude of the effect of inequality over the cost of maintaining the regime.

29The capacity of the state to repress is one of the main factors explaining the rarity of democratic transitions in the Middle East and North Africa, even among the non-rentier states (Bellin 2004; Najem 2003). Moreover, according to Herbst (2001), the wave of democratization that swept through sub-Saharan Africa during the early 1990s was primarily caused by the incapacity of the states of the region, which had been weakened by years of financial crisis, to repress. Economic crises have preceded democratic transitions in many sub-Saharan African countries, such as Niger, Mali, Benin, the Central African Republic, Madagascar and Guinea-Bissau (Villalon and VonDoepp 2005).

30Government revenues are by no mean the only determinants of state capacity. For example,
any given tax rate, the amount of revenues collected increases with GDP per capita.

Further, according to Wagner’s law, named after the German economist Adolph Wagner, even the size of the government relative to the rest of the economy is larger in rich countries. In other words, the tax rate itself increases as a country develops. Empirical studies indeed find that the ratio of government revenues to total income increases with GDP per capita (e.g., Easterly and Rebelo 1993). When faced with large-scale unrest, rich states are better at repressing their populations, making revolts less successful and less likely to occur in the first place. This argument is consistent with the results of Fearon and Laitin (2003), according to which GDP per capita decreases the likelihood of civil war by improving the ability of the state to repress insurgents.\(^{31}\) Rich states not only have more resources to repress their populations, but they also have more resources to buy off members of the opposition; making the collective action problem more difficult to solve for their opponents. Consequently, in rich autocracies inequality only weakly increases unrest and whatever political instability is generated is easily repressed by the elites. Inequality harms democratization because it increases the stakes of controlling redistributive policies without substantially increasing the cost of maintaining the autocratic regime.\(^{32}\)

\(^{31}\)The argument made above about the difference between civil wars and other types of social unrest does not apply here, because we are looking at how the state can suppress unrest, not at the collective action problem of the population. States that are able to prevent civil wars through repression are also able to prevent or limit other forms of instability.

\(^{32}\)It is important to note that I am not arguing that democratization is necessarily less likely among low and high-income countries. In fact, large-N empirical studies usually find that there
But if poor and especially wealthy autocracies are unlikely to be overthrown regardless of inequality, why would their ruling elites ever adopt democracy? Up to now, our discussion of democratization has focused on transitions driven from below, through inter-class conflicts. Yet, there are alternative paths to democracy. For example, democratization can be driven by intra-elite competition or demands by the middle class for protection against expropriation, rather than by the threat of being overthrown by the lower class.\(^{33}\) Moreover, in some other instances, although the demand for inclusion by the population plays an important role, it is not motivated by economic reasons.\(^{34}\) In all of these cases, while inequality does not influence the demand for democracy by the lower class, it still affects the willingness of the upper and/or middle classes to grant it. Since, everything else being equal, both of these groups are more willing to extend the suffrage to the masses when inequality is low, inequality decreases the likelihood that an autocracy follows one of these alternative paths to democracy. Transition driven from above is more likely when income is distributed equally; hence the positive relationship between equality and democratization.

By contrast, among middle-income — or modernizing — countries inequality promotes democratization. During the early phases of development, the population is freed from the necessity to consume almost all of its income. Similarly to rich countries but contrary to poor ones, in these societies, at any

\(^{33}\)See Collier (1999) for multiple examples.

\(^{34}\)For example, in Taiwan, democracy resulted from the demands by ethnic Taiwanese to be integrated in the political process.
(realistic) level of inequality, a substantial proportion of the population has an income sufficiently above the subsistence level to afford to contest. However, as argued above, unlike wealthy countries, inequality strongly affects living standards in middle-income countries. In the words of Reenock, Bernhard and Sobek (2007), when a country “becomes highly developed, distributional issues become far less dangerous” (p.685). Therefore, inequality should spur much more social unrest in intermediate than in high-income countries.

What about the capacity of the state to repress its population? While middle-income countries may have more developed states than poor ones, they still lack a modern state. In fact, economic development often has a destabilizing effect on the state during its early phases (Huntington 1968). At any given level of contestation, repression is less costly in rich than in middle-income autocracies. Consequently, at intermediate development levels, not only is the population willing and able to challenge the regime, but the state is not yet able to cheaply engage in widespread repression. Inequality thus increases the probability of transition to democracy by generating social unrest, which in turn is costly to repress.36

There is thus a window of opportunity — at middling levels of GDP per capita — where unequal countries are likely to democratize.37 This predic-

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35 This statement by Reenock, Bernhard and Sobek (2007) is primarily directed toward democracies. However, there is nothing in their argument which suggest that it does not apply to other regime types.

36 There are many alternative explanations of the inverted U-shaped relationship between economic development and political order that are not discussed in this section. For example, some scholars argue that the opportunity cost of creating social unrest is first decreasing in GDP per capita, but that above a certain wealth level, it is increasing in GDP per capita (see Tadjoeddin and Murshed 2007). However, what is most important is that, for whatever reason, it is empirically true that political disorder is much more likely at middle than at either low or high-income. From this empirical regularity, we can deduce that inequality can only promote democratization through the threat of a revolution in middle-income countries.

37 An additional prediction of my argument is that among unequal countries, there should be an inverted U-shaped relationship between GDP per capita and democratization.
tion is consistent with the finding among Latin American scholars that the relationship between economic development and democracy within the region is inverted U-shaped (e.g., O’Donnell 1973; Mainwaring and Perez-Linan 2003). Latin America is by far the most unequal region, and so we would expect Latin American countries at middle levels of development to be especially prone to democratization.\textsuperscript{38}

My argument is also consistent with the findings of Reenock, Bernhard and Sobek (2007), who show that needs deprivation — measured with average calorie intake — destabilizes middle-income democracies, but not rich or poor ones. Although these authors are primarily interested in democracies, not autocracies, their findings directly connect to mine, since they imply that distributional issues are most destabilizing at middling GDP per capita levels.

2.4 Data

2.4.1 Dependent Variables

To determine whether a country is democratic or autocratic, I use the regime type data set of Przeworski et al. (2000). These authors define a regime as democratic if it satisfies the four following conditions: (1) the chief executive is elected either directly or indirectly by the population; (2) the legislature is elected directly by the population; (3) there is more than one party; and (4) elections have resulted in at least one alternation in power. A regime that does not satisfy any of these conditions is classified as authoritarian.

\textsuperscript{38}Note that when all countries — including those from other regions — are included in the sample, the inverted U-shaped relationship vanishes (Mainwaring and Perez-Linan 2003), which again is consistent with my argument.
2.4.2 Independent Variables

One of the most important obstacles to studying inequality is the lack of reliable data. In this paper, inequality is measured with the capital share of the value added in the industrial sector. This data set has been assembled by Ortega and Rodriguez (2006) and was constructed from data collected by the United Nations Industrial Development Organization (UNIDO).\textsuperscript{39} Dunning (2008), Acemoglu and Robinson (2006) and Przeworski et al. (2000) have also recently used capital shares to measure inequality.\textsuperscript{40} Low capital shares indicate low levels of inequality, because a large proportion of the value added in production is accruing to the labor class, as opposed to the capital owners. The database has about 1750 observations covering 79 autocratic countries between 1960 and 2000.

Using capital shares to measure inequality has a number of theoretical and empirical advantages. From a theoretical point of view, it is consistent with my argument which focuses on inter-class inequality rather than on the overall level of inequality.\textsuperscript{41} The logic of my argument, and that of most previous authors, only applies to inequality between social classes.\textsuperscript{42} Capital shares thus measure the income of the capital owners relative to the labor class. Using an alternative measure of inequality, such as Gini coefficients, would not capture

\textsuperscript{39}Capital share is calculated as one minus the labor share, which measures the ratio of compensation of employees to the value added in production.

\textsuperscript{40}According to Dunning (2008), “capital shares represent the best available cross-national indicator of private inequality” (p.143).

\textsuperscript{41}Note that the capital share is conceptually similar to the surplus-value most notably used by Karl Marx.

\textsuperscript{42}It is possible that other types of inequality — such as interethnic inequality and inequality between the urban and rural sectors — also affect democracy (see Chapter 3). However, the effect of inequality may vary dramatically across different types of inequality. Consequently, it is important, for both theoretical and empirical reasons, to distinguish them. The effect of these alternative forms of inequality on democratization thus falls outside the scope of this study.
the type of inequality that is relevant to my argument.\footnote{One alternative data set is that of the Estimation of the Household Inequality and Inequity (EHII) constructed by the University of Texas Inequality Project (UTIP). The UTIP uses the UNIDO data set to compute inequality in wage pay, measured with the Theil’s T. It regresses the Gini coefficients of Deininger and Squire (1996) on the Theil’s T. It then uses the predicted values as estimated Gini coefficients. Although very useful in other circumstances, this data set cannot be used to test my argument, because it does not measure inequality between the labor and capital classes, but inequality within the labor class, among wage earners.}

Another advantage of using capital shares is that they are collected using similar definitions and methodology for all countries by the UNIDO, making cross-country comparisons meaningful. Alternative data sets usually contain observations drawn from different sources, which leads to important problems. For example, in some data sets, some observations are based on post-tax income and others on pre-tax income. Depending on the taxation system, we should expect the former to indicate less inequality than the latter, leading to an important source of bias.\footnote{The severity of the problem can be illustrated with the example of the Gini coefficient data set of the United Nations University - World Institute for Development Economics Research (UNU-WIDER). In many instances, it contains several observations for the same country in the same year. Yet, amazingly, often these observations are not even correlated. For example, the Gini coefficients for Belgium in 1992 range from 23 to 45.6, which is a very large difference. Gini coefficients range from 0 to 100. So, an increase of nearly 100 percent is very substantial. Moreover, both of these observations are given the highest quality score. This is by no mean an isolated example. One can find multiple similar cases throughout the UNU-WIDER data set, and for almost all countries. However, the fact that it concerns a wealthy country in a recent year is even more telling.}

The database of Ortega and Rodriguez (2006) also covers a larger proportion of the country-years than most other data sets. For example, while the data set of Deininger and Squire (1996) — which is widely used — contains only 11 percent of the possible observations, that of Ortega and Rodriguez (2006) contains more than 67 percent (See Chapter 1).\footnote{These numbers have been calculated using the observations on both autocratic and democratic countries.} Yet, since, even in the data set of Ortega and Rodriguez (2006), many observations are missing, the robustness...
of the results is tested by imputing the missing values.\textsuperscript{46} To measure economic development, I use GDP per capita taken from the extended data set of Przeworski et al. (2000).

### 2.4.3 Control Variables

Many economic variables, apart from income per capita and inequality, affect democracy. Several scholars, for example, argue that economic performance affects the stability of political regimes (e.g., Gasiorowski 1995; Haggard and Kaufman 1995). Growth can also influence inequality, because it tends to affect diverse segments of the population differently. Further, countries relying heavily on natural resources are often argued to be less likely to be democratic (Ross 2001). One possible explanation is that the elites are more vulnerable to taxation when wealth is immobile (Boix 2003). Additionally, the revenues emanating from natural resources are usually controlled by the state, which increases the resources available for repression or cooption. The analysis thus controls for GDP per capita growth and for being a large oil exporter.\textsuperscript{47}

\textsuperscript{46}The multiple imputation is done with \textit{Amelia II}, which accounts for the time-series cross-sectional structure of the data. Ten data sets are imputed for all countries on which at least one capital share observation is available. Inequality is highly persistent within countries over time. For each country, the available observations are used to impute the missing values. The full data set includes 2224 observations on autocracies, 473 (21.3 percent) of which are imputed. As advised by King et al. (2001), all control variables are included in the imputation. The model also uses three other measures of inequality: alternative capital shares (Jayadev 2007), proportion of farming land that is used by family farms (Vanhanen 1997), and Gini coefficients from the Estimation of the Household Inequality and Inequity (EHII). I also include GDP per capita squared to capture the Kuznets curve, education attainment data from Barro and Lee (2000), the sum of total exports and imports divided by the total GDP, the proportion of the population that are Catholics, the proportion that are Protestants, religious fractionization, a dummy variable for former British colonies, a dummy variable for countries that did not exist in 1945, and the number of democratic breakdowns that a country has experienced. See Appendix A for more detail.

\textsuperscript{47}The latter variable is a dummy variable which takes the value one if the average ratio of fuel exports to total exports in 1984-86 is greater than 50 percent, and zero otherwise.
The social and cultural context has also been argued to influence democracy. Islam is thought to be particularly harmful to both democratization and democratic consolidation (Huntington 1991). Religion can also affect the tolerance of the population toward inequality (Milanovic, Gradstein and Ying 2001). In addition, some scholars suggest that divided societies are less likely to establish and maintain democratic institutions (e.g., Dahl 2000). One potential source of social division is ethnic fractionization. Variables measuring the proportion of the population that is Muslim and ethnic fractionization are thus included. The latter gives the probability that two individuals selected randomly are from different ethnic groups.

Finally, a growing literature argues that the international political context in which a country finds itself affects its chances of being a democracy. In particular, countries are said to be more likely to democratize and to remain democratic when many other countries are democracies. I thus include the proportion of the countries in the world that are democracies. All the control variables are taken from the extended data set of Przeworski et al. (2000).

### 2.5 Empirical Results

This section tests the hypothesis that inequality promotes democratization in middle-income countries, but harms democratization in rich and poor ones. It does so by including five key variables: Capital share; GDP per capita; GDP per capita squared; GDP per capita interacted with capital share; and GDP per capita squared interacted with capital share.\footnote{In the regressions, GDP per capita is logged.} I thus estimate the following probit model:
\[ P(\text{Democracy}_{it} = 1) = F(\beta_0 + \beta_1 \text{Cap.Share}_{it-1} + \beta_2 \text{GDP per capita}_{it-1} + \beta_3 \text{GDP per capita}^2_{it-1} \times \text{Cap.Share}_{it-1} + \beta_4 \text{GDP per capita}^2_{it-1} \times \text{Cap.Share}_{it-1} + \beta_6 X_{it-1}) \]

where \(i\) indicates the country and \(t\) the year, \(F(.)\) is the cdf of the standard normal distribution, \(\text{Democracy}_{it}\) takes the value one if the regime is democratic and zero otherwise, \(\text{Cap.Share}_{it-1}\) is the capital share of the value added in production, \(\text{GDP per capita}_{it-1}\) is logged GDP per capita, \(\text{GDP per capita}^2_{it-1}\) is logged GDP per capita squared, and \(X_{it-1}\) is the set of control variables. All independent variables are lagged. The sample only contains countries that were authoritarian during the last period. The estimates thus give the effect of each independent variable on the probability of transition from dictatorship to democracy within a given year. Positive coefficients indicate that the corresponding independent variable increases the likelihood of democratization.

The hypothesis is supported if the coefficients on \(\text{Capital share and GDP per capita squared interacted with capital share}\) are negative, and the coefficient on \(\text{GDP per capita interacted with capital share}\) is positive. This can be shown formally by finding the marginal effect of inequality on the likelihood of democratization, by taking the partial derivative.\(^{49}\) Intuitively, for inequality to increase the likelihood of democratization at low and high levels of development, and to decrease it at middle levels, the relationship between the marginal effect of inequality and income per capita must be inverted U-shaped (see Figure 2.2)

\(^{49}\)The marginal effect of inequality on the likelihood of democratization is given as follow

\[ \frac{\partial P(\text{Democracy}_{it} = 1)}{\partial \text{Cap.Share}_{it-1}} = [\beta_1 + \beta_2 \text{GDP per capita}_{it-1} + \beta_3 \text{GDP per capita}^2_{it-1} \times \text{Cap.Share}_{it-1} + \beta_6 X_{it-1}] \times f(\beta_0 + \beta_1 \text{Cap.Share}_{it-1} + \beta_2 \text{GDP per capita}_{it-1} + \beta_3 \text{GDP per capita}^2_{it-1} \times \text{Cap.Share}_{it-1} + \beta_6 X_{it-1}) \]

where \(f(.)\) is the pdf of the standard normal distribution. The relationship between the marginal effect of inequality and income per capita is inverted U-shaped if \(\beta_1 < 0, \beta_3 > 0,\) and \(\beta_5 < 0.\)
below).

This specification has the advantage of capturing the idea that development has a nonmonotonic effect on the relationship between inequality and democratization. In particular, the GDP per capita squared interacted with capital share term enables me to test whether inequality has a different effect on democratization at intermediate levels of development than at either extreme. However, using this specification also makes inference and interpretation difficult. Given the large number of interaction variables, there is high potential for multicollinearity.\textsuperscript{50} Moreover, each coefficient by itself has little meaning. It would be difficult, for example, to interpret what a significant GDP per capita squared interacted with capital share means intuitively when considered on its own.

Therefore, in addition to testing the significance of each coefficient, I test my hypothesis by testing the joint significance of the five included variables. In fact, multicollinearity does not affect inference when one tests the global significance of a model specification rather than the statistical significance of each coefficient on its own. I perform likelihood ratio tests of the unrestricted model against eight possible restricted (or nested) models, and show that in each case the former does significantly better than the latter.\textsuperscript{51} The eight restricted models against which my unrestricted model is tested are listed in Table 2.1. The results are interpreted by using predicted probabilities tables and graphs, rather than by looking at each coefficient individually.\textsuperscript{52}

\textsuperscript{50}Multicollinearity inflates standard errors but does not affect coefficients. Therefore, it does not drive the results reported below. If anything, multicollinearity reduces the statistical significance of my results. Moreover, multicollinearity is not a problem when we test the global significance of a regression, which is what the analysis below mainly does.

\textsuperscript{51}These are the only possible restricted (or nested) models.

\textsuperscript{52}The hypothesis could also be tested by splitting the sample into three groups: poor autocracies, middle-income autocracies and rich autocracies. It would be supported if inequality was found to decrease the likelihood of democratization in rich and poor countries, but to increase it in middle-income ones. Although this alternative method is easier to interpret, it also
Table 2.1: Restricted Models Tested Against the Unrestricted Model

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<thead>
<tr>
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<th>Restricted Models</th>
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<tbody>
<tr>
<td>(1)</td>
<td>Controls</td>
</tr>
<tr>
<td>(2)</td>
<td>GDP pc + Controls</td>
</tr>
<tr>
<td>(3)</td>
<td>Cap. Share + Controls</td>
</tr>
<tr>
<td>(4)</td>
<td>GDP pc + Cap. Share + Controls</td>
</tr>
<tr>
<td>(5)</td>
<td>GDP pc + GDP pc squared + Controls</td>
</tr>
<tr>
<td>(6)</td>
<td>Cap. Share + GDP pc + GDP pc squared + Controls</td>
</tr>
<tr>
<td>(7)</td>
<td>Cap. Share + GDP pc + GDP pc * Cap. Share + Controls</td>
</tr>
<tr>
<td>(8)</td>
<td>Cap. Share + GDP pc + GDP pc squared + GDP pc * Cap. Share + Controls</td>
</tr>
</tbody>
</table>

Table 2.2 reports the results of the probit analysis of the effect of inequality on democratization. Model 1 of Table 2.2 tests my hypothesis by using only the nonimputed observations. The coefficients on all three variables of interest are of the expected signs and statistically significant at the one percent level. Moreover, I test the unrestricted model against the eight possible restricted models enumerated in Table 2.1. In all cases, the likelihood ratio test-statistic is statistically significant at the one or five percent level.

The overwhelmingly depends on arbitrary choices about the thresholds between low, intermediate and high-income countries. Moreover, it less accurately tests my argument, because it does not allow the relationship between inequality and democratization to differ with GDP per capita within each income group. Using this approach thus eliminates relevant information. Despite these problems, I did test the robustness of my results by splitting the sample. The results largely support my hypothesis (not reported), and are available from the author upon request.

In addition to the regressions reported in Table 2.2, I ran regressions including additional control variables (not reported). I added the following control variables: the proportion of the population that are Catholics, the proportion that are Protestants, religious fractionization, a dummy variable for former British colonies, a dummy variable for countries that did not exist in 1945, and the number of democratic breakdowns that a country has experienced. All of these data are taken from the extended data set of Przeworski et al. (2000). The results are unchanged when the additional control variables are included. They are available from the author upon request.

In five of the eight cases, the likelihood ratio test-statistic is significant at the one percent
hood ratio test-statistic of the unrestricted model against the restricted model that excludes all five key variables (model 1 of Table 2.1) is given in Table 2.2. It suggests that the included variables are jointly statistically significant at the one percent level. These tests show that my model is a better representation of the data than any of the eight possible nested models.

Table 2.2: Probit Analysis of the Probability of Democratization

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<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>Cap. Share</td>
<td>-177.5</td>
<td>-164.22</td>
<td>-179.46</td>
<td>-173.7</td>
</tr>
<tr>
<td></td>
<td>(57.84)**</td>
<td>(60.39)**</td>
<td>(59.16)**</td>
<td>(53.39)**</td>
</tr>
<tr>
<td>GDP pc</td>
<td>-72.125</td>
<td>-66.657</td>
<td>-72.2</td>
<td>-69.928</td>
</tr>
<tr>
<td></td>
<td>(23.513)***</td>
<td>(24.608)***</td>
<td>(24.019)***</td>
<td>(21.781)***</td>
</tr>
<tr>
<td>GDP pc squared</td>
<td>10.64</td>
<td>9.78</td>
<td>10.617</td>
<td>10.374</td>
</tr>
<tr>
<td></td>
<td>(3.456)***</td>
<td>(3.623)***</td>
<td>(3.533)***</td>
<td>(3.209)***</td>
</tr>
<tr>
<td>GDP pc * Cap. share</td>
<td>107.007</td>
<td>99.078</td>
<td>107.882</td>
<td>104.785</td>
</tr>
<tr>
<td></td>
<td>(34.43)***</td>
<td>(35.968)***</td>
<td>(35.243)***</td>
<td>(31.827)***</td>
</tr>
<tr>
<td></td>
<td>(5.067)***</td>
<td>(5.302)***</td>
<td>(5.193)***</td>
<td>(4.694)***</td>
</tr>
<tr>
<td>Growth</td>
<td>-.013</td>
<td>-.01</td>
<td>-.01</td>
<td>-.011</td>
</tr>
<tr>
<td></td>
<td>(.005)**</td>
<td>(.006)*</td>
<td>(.006)</td>
<td>(.004)**</td>
</tr>
<tr>
<td>Oil</td>
<td>-.372</td>
<td>-.081</td>
<td>-.328</td>
<td>-.43</td>
</tr>
<tr>
<td></td>
<td>(.331)</td>
<td>(.36)</td>
<td>(.335)</td>
<td>(.317)</td>
</tr>
<tr>
<td>Muslim</td>
<td>-.004</td>
<td>-.001</td>
<td>-.005</td>
<td>-.004</td>
</tr>
<tr>
<td></td>
<td>(.001)**</td>
<td>(.002)</td>
<td>(.002)**</td>
<td>(.002)**</td>
</tr>
<tr>
<td>Ethnic frac.</td>
<td>-.002</td>
<td>-.001</td>
<td>-.002</td>
<td>-.002</td>
</tr>
<tr>
<td></td>
<td>(.002)</td>
<td>(.004)</td>
<td>(.002)</td>
<td>(.003)</td>
</tr>
<tr>
<td>% Dem. In World</td>
<td>2.542</td>
<td>1.106</td>
<td>2.571</td>
<td>2.201</td>
</tr>
<tr>
<td></td>
<td>(6.19)***</td>
<td>(1.924)</td>
<td>(6.44)***</td>
<td>(5.56)***</td>
</tr>
<tr>
<td>LR Test</td>
<td>18.99***</td>
<td>15.43***</td>
<td>16.9***</td>
<td>22.29***</td>
</tr>
<tr>
<td>Log-Lik.</td>
<td>-218.54</td>
<td>-206.3</td>
<td>-207.88</td>
<td>-262.77</td>
</tr>
<tr>
<td>N</td>
<td>1751</td>
<td>1751</td>
<td>1667</td>
<td>2224</td>
</tr>
</tbody>
</table>

Note: Column 2 includes region and decade dummy variables; column 3 excludes communist countries; column 4 includes imputed observations. All independent variables are lagged. Standard errors in parentheses. ***p < .01, **p < .05 and *p < .1.

Model 1 of Table 2.2 is also tested against that of Acemoglu and Robinson (2006) using the nonnested test of Vuong (1989). To do so, I test my specification against one that, in addition to control variables (including GDP per capita), level, and in three remaining cases at the five percent level.
includes *Capital share* and *Capital share squared*. Again, my model does significantly better.\(^{55}\) Note that the relationship suggested by Boix (2003) — according to which inequality harms democratization — is the third nested model listed in Table 2.1. My model thus outperforms those of both Acemoglu and Robinson (2006) and Boix (2003). I further perform three nested likelihood ratio tests, in which model 1 of Table 2.2 is the restricted (rather than the unrestricted) model. In addition to the variables included in model 1, these three alternative models include respectively: *Capital share squared*; *Capital share squared + Capital share squared interacted with GDP per capita*; and *Capital share squared interacted with GDP per capita + Capital share squared interacted with GDP per capita squared*. In the three cases, adding the new variables does not improve the fit of the model significantly (p-values are 0.19, 0.42 and 0.62 respectively).

Figure 2.2 gives the marginal effect of inequality on the likelihood of democratization across different GDP per capita values, along with 90 percent confidence intervals, based on the results reported in column 1 of Table 2.2. The results are consistent with my hypothesis. As expected, inequality reduces the probability of democratization in very poor countries. Table 2.3 further gives the predicted probabilities of transition at different inequality and development levels, calculated from model 1 of Table 2.2.\(^{56}\) In very poor countries — those with a GDP per capita around $500 — inequality harms democratization. A poor autocracy with a capital share of 0.5 is more than twice as likely to democratize as one with a capital share of 0.6.\(^{57}\)

\(^{55}\)In fact, as reported in Chapter 1, when estimated using a quadratic model, the relationship between inequality and democratization is not inverted U-shaped but U-shaped, although not statistically significant.

\(^{56}\)All control variables are at their mean or median.

\(^{57}\)Most of sub-Saharan African countries as well as countries of other regions, such as Haiti, Nepal and Afghanistan, fall in the GDP per capita range (below $1,000) where inequality harms democratization.
The magnitude of the relationship is best illustrated with some examples. Consider the case of Ethiopia, which has been authoritarian during the full period under study without experiencing a single transition to democracy. During that period, its average predicted probability of democratization was 1.07 percent per year. Now consider Malawi, another very poor country which, in 1994, democratized, after 30 years of dictatorial rule. While the average capital share in Ethiopia was 0.8087, it was only 0.6339 in Malawi. If inequality were as low in Ethiopia as in Malawi, its yearly probability of democratizing

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58 During the period under study, Ethiopia and Malawi had average GDP per capita of $580.67 and $620.02 respectively.
Table 2.3: Predicted Probabilities of Democratization at Different GDP per capita and Inequality Combinations

<table>
<thead>
<tr>
<th>GDP pc</th>
<th>Capital Share</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.5</td>
</tr>
<tr>
<td>$500</td>
<td>.08</td>
</tr>
<tr>
<td>$1,500</td>
<td>.0049</td>
</tr>
<tr>
<td>$2,500</td>
<td>.0035</td>
</tr>
<tr>
<td>$3,500</td>
<td>.0042</td>
</tr>
<tr>
<td>$4,500</td>
<td>.0061</td>
</tr>
<tr>
<td>$5,500</td>
<td>.0094</td>
</tr>
<tr>
<td>$6,500</td>
<td>.0139</td>
</tr>
<tr>
<td>$7,500</td>
<td>.0215</td>
</tr>
<tr>
<td>$8,500</td>
<td>.0301</td>
</tr>
<tr>
<td>$9,500</td>
<td>.0424</td>
</tr>
<tr>
<td>$10,500</td>
<td>.0562</td>
</tr>
<tr>
<td>$11,500</td>
<td>.0749</td>
</tr>
<tr>
<td>$12,500</td>
<td>.0964</td>
</tr>
<tr>
<td>$13,500</td>
<td>.1213</td>
</tr>
<tr>
<td>$14,500</td>
<td>.1496</td>
</tr>
<tr>
<td>$15,500</td>
<td>.1808</td>
</tr>
</tbody>
</table>

would have been 2.88 percent, nearly three times as large. Figure 2.3 shows the effect of inequality on the probability of democratization at low ($500) levels of development, when other variables are at their mean or median. As expected, these countries are unlikely to democratize unless they are very equal.
As shown in Figure 2.2 and Table 2.3, the relationship between inequality and democratization reverses once a country attains a GDP per capita somewhat under $1,000 (logged GDP per capita of 3).\textsuperscript{59} The relationship is especially strong in those with GDP per capita between $2,000 and $4,000. Consider the cases of Morocco and Peru, two middle-income countries.\textsuperscript{60} Morocco has remained a fairly stable autocracy since its independence and has never democratized. Peru, a highly unequal country, has oscillated continuously between

\textsuperscript{59}Inequality promotes democratization in countries with GDP per capita between $1,000 and $8,000. Most Latin America countries and some Asian and North African countries find themselves within that range.

\textsuperscript{60}The average GDP per capita of Morocco and Peru are $2,837.20 and $4,438.40, respectively.
democracy and dictatorship. Since 1960, it has democratized three times in only 24 years of autocracy. Morocco has a low average capital share (0.5328), and consequently its predicted probability of democratization, between 1960 and 2000, was only 0.33 percent per year. If the average capital share of Morocco were as high as that of Peru (0.8385), its average yearly predicted probability of democratization would have been 6.17 percent instead, nearly nineteen times as large. Over a 40-year period, that difference is very substantial. The probability that Morocco would remain an autocracy during 40 years was 88 percent. However, if Morocco had been as unequal as Peru, its probability of remaining an autocracy during 40 years would only have been 8 percent. The relationship between inequality and the likelihood of democratization at intermediate levels of development ($3,000) is plotted in Figure 2.3.

As shown in Figure 2.2 and Table 2.3, once a country attains a GDP per capita of around $8,000 (logged GDP per capita of 3.9) the relationship reverses again and, as in very poor countries, inequality harms democratization. Figure 2.3 shows the effect of inequality on democratization at very high levels of development ($15,000). Let us compare the examples of Saudi Arabia and Greece, two high-income countries that have been authoritarian during at least a subset of the period under study. While the former remained authoritarian during the full period, the latter democratized after seven years of dictatorial rule. One important distinction between these countries is that the capital share of Saudi Arabia is much larger than that of Greece (0.7526 and 0.6051 respectively). The predicted probability of democratization in Saudi Arabia was only 0.26 percent per year. Yet, if it had been as equal as Greece its probability of de-

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61 Most countries from the Middle East, Western and Eastern Europe as well as some Asian countries, such as Singapore and Taiwan, have GDP per capita above $8,000.
62 The average GDP per capita was $13,042.60 in Saudi Arabia and $10,214.26 in Greece.
mocratization would have been 1.25 percent per year. Although this remains low, it is still nearly five times as large as what it was in reality.\footnote{Apart from inequality, other factors, such as a large Muslim population, also contribute to the low likelihood of democratization in Saudi Arabia.}

Model 2 of Table 2.2 reruns model 1 with decade as well as region dummy variables.\footnote{The region dummies are Western countries (Western Europe, North America, New Zealand and Australia), Asia, sub-Saharan Africa, Eastern Europe, Latin America and the Middle East. The Asian and the 1990s dummy variables are excluded during the estimation.} These are important since inequality and democracy vary widely across time periods and especially regions.\footnote{Latin America is by far the most unequal region, followed by sub-Saharan Africa and the Middle East. Countries from Asia, Western and Eastern Europe are, on average, much more equal.} Omitting regions and time periods could bias the results. For example, Latin American countries are both unequal and often politically unstable. By failing to control for regions, we may simply capture the effect of being from Latin America, rather than that of inequality. Another potential problem is that my predictions, as those of most recent authors, primarily apply to non-communist dictatorships, that are concerned with limiting redistribution to the masses. Yet, regression 1 of Table 2.2 includes both communist and non-communist dictatorships. Model 1 is replicated without communist regimes in column 3. Lastly, model 4 uses the data set that includes both the nonimputed and the imputed observations.\footnote{The imputed data set includes nine new transitions to democracy: Argentina (1963, 1973), Benin (1991), Brazil (1979), Bulgaria (1990), Madagascar (1993), Peru (1963), Romania (1990) and Sudan (1986).}

In all cases, the results are unchanged. Surprisingly, despite the large proportion of missing values (21.3 percent), the results of the model that includes imputed observation (model 4) are almost identical to those of the model that only contains non-missing values (model 1). For all three new models, I test my specification against the eight nested models listed in Table 2.1 using like-
lihood ratio tests. Again, in all 24 possibilities (eight for each of the three regressions) my specification does better than the restricted model. The likelihood ratio test-statistic is always statistically significant at either the one or the five percent level. Table 2.2 reports the likelihood ratio test-statistic of the unrestricted model against the model excluding all five variables on capital shares and GDP per capita (model 1 in Table 2.1). In all three cases, my variables are jointly statistically significant at the one percent level.

As I did for model 1, I further test models 2, 3 and 4 against three models that include new variables. Adding the new variables never improves the fit of the model significantly at either the one or five percent level. I thus run a total of 44 nested and one nonnested likelihood ratio tests of my model. In all cases, the results show that my model is a better representation of the data than any of its alternatives. Moreover, in all four regressions, the three variables of interest are of the correct signs and are individually statistically significant at the one percent level.

The effect of the control variables is usually consistent with the findings

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67In model 4, which includes imputed observations, the likelihood ratio test-statistic is calculated using the method described by Li et al. (1991).

68In addition to the variables included in the main model, these new variables are Capital share squared; Capital share squared interacted with GDP per capita; and Capital share squared interacted with GDP per capita squared.

69In one case, namely when Capital share squared is added to model 3, the fit of the model improves at the ten percent level (p-value of 0.095). But even in that case, the result is very weak. If, for example, one includes region and decade dummy variables and exclude communist regimes at the same time, then adding Capital share squared no longer improves the fit of the model (p-value of 0.24).

70In 32 of them, my model is the unrestricted model, and in the remaining 12 it is the restricted model.

71I did not test models 2, 3 and 4 against the equivalent regressions using the specification of Acemoglu and Robinson (2006). This is because when one includes Capital share and Capital share squared, the relationship between inequality and the probability of democratization is not inverted U-shaped, as predicted by Acemoglu and Robinson (2006), but U-shaped, although not statistically significant.

72The exact likelihood ratio statistics and p-values are available from the author upon request.
of other empirical studies and robust across model specifications. Economic crises often lead to the breakdown of dictatorships. This finding is consistent with those of Epstein et al. (2006), but not those of Gasiorowski (1995). Large oil producers are not significantly less likely to democratize. Once we control for other variables, ethnic fractionization has no statistically significant effect on transition to democracy. As expected, Islam reduces the likelihood of democratization. However, the relationship vanishes once, in column 2 of Table 2.2, region and decade dummy variables are included. Lastly, countries are more likely to establish democracies when many other countries in the world are democratic. Again, however, when, in model 2 of Table 2.2, region and decade dummy variables are added, the relationship disappears.

2.6 Conclusion

The economic conditions under which people are living affect just about every aspect of their lives. In the words of Inglehart and Welzel (2005), ”[w]ether people grow up in a society with an annual per capita income of $300 or $30,000 has more direct impact on their daily lives than whether they grow up in a country that has free elections or not” (p.23). Wealth shapes people’s political preferences as well as their capacity to impose these preferences, for example through collective action. The economy of a country also determines the capacity of its ruling class to remain in power through state coercion or cooption. Yet, despite being clearly relevant to politics, most previous empirical studies have failed to find any relationship between economic conditions — namely, income level and income distribution — and the likelihood of adopting democracy (e.g., Przeworski et al. 2000; Chapter 1 of the dissertation). This paper
has addressed this puzzle by suggesting that although each component of the economic conditions of a country, when considered on its own, has indeed no simple effect, once economic conditions are instead treated as a whole, they do affect democratization.

In this paper, I have combined, for the first time, two of the most prominent sets of theories on democratization — the modernization and the inequality theories — and have argued that inequality affects democratization differently at different levels of economic development. On the one hand, in middle-income countries — which are particularly prone to political disorder — inequality promotes democratization by generating political unrest that, in turn, is costly for the elites to repress. On the other hand, at either low or high levels of development, inequality harms democratization because it increases the cost of democratizing — by raising the benefits of setting redistributive policies — without fostering much social unrest.

Let us now return to the examples of Singapore and Sudan first discussed in the introduction. The argument presented in this paper suggests that, despite sharing similar levels of inequality, these two countries have remained autocratic for very different reasons. Autocracies like Singapore are unlikely to democratize because, despite relatively high inequality, their populations enjoy high living standards. People have a lot to lose and little to gain from destabilizing the country. This argument is often raised to explain why Singapore has remained authoritarian (e.g., Sing 2004; Rodan and Jayasuriya 2009). Moreover, the lower class knows that if faced with large-scale unrest the state can easily use repression, making contestation more costly and reducing its probability of success. This second mechanism seems to be especially important when explaining why wealthy Middle Eastern countries rarely democra-
tize (see Bellin 2004; Najem 2003). By contrast, in countries such as Sudan, low development combined with high inequality means that the income of the poor is only slightly above the subsistence level. The population does not demand democracy, despite high inequality, because it lacks the resources necessary to mobilize against the regime. Many poor autocracies, like Sudan itself, are unstable. However, combatants are usually not fighting for some collective benefit, such as democracy, but for private gains.

These findings have very important implications for policies aimed at promoting democracy. They suggest that the best policies to follow largely depend on the combination of economic development and economic inequality under which a country finds itself. For example, support for the opposition groups within the population may be particularly helpful in middle-income countries that are unequal. It is among these countries that democratization that is driven from below is the most likely. In rich or poor countries that are equal, however, a better approach may be to focus on the interests of different factions of the elites. According to my argument, democratization, in these countries, will most likely be driven from above.
Chapter 3

Consolidating Democracy in Plural Societies: Ethnic Inequality in Sub-Saharan Africa

“A society, therefore, which is ridden by a dozen of oppositions along lines running in every direction may actually be in less danger of being torn with violence or falling to pieces than one split along just one line. For each new cleavage contributes to narrow the cross clefts, so that one might say that society is sewn together by its inner conflict.”

Edward Alsworth Ross, 1920, pp.164-65, emphasis in the original.

3.1 Introduction

The literature on democracy has witnessed a proliferation of studies about the relationship between economic inequality and political regimes. While most authors agree that inequality destabilizes democracy, previous studies typically focus on the overall level of inequality in a society — measured with Gini coefficients — thus ignoring whether inequality reinforces other cleavages, such as ethnicity, or cuts across them (e.g., Boix 2003). In the first chapter of the dissertation I do focus on one type of inequality: inter-class inequality. But, my results do not tell us how inequality between or within alternative groups
affect democracy. For example, is inequality especially harmful when it reinforces other cleavages, such as ethnicity? Could inequality be beneficial when it instead cuts across other cleavages? Does the effect of between-group inequality vary depending on around which cleavage the groups are defined? In other words, does, for example, the effect of inter-ethnic inequality differ from the effect of inter-class inequality?

Many social scientists claim that reinforcing cleavages destabilize democracies, whereas cross-cutting cleavages — meaning that, for example, ethnic groups are themselves broken down by other cleavages — promote the consolidation of democracy (e.g., Ross 1920; Dahl 1971; Lipset 1960; Lipset and Rokkan 1967; Rokkan 1970). When cleavages reinforce each other, the population is divided into two clear groups with homogeneous preferences. The existence of many converging cleavages is argued to further increase animosity between these groups. When cleavages are instead cross-cutting, individuals that are allies on some dimensions find themselves opponents on others, limiting their ability to pose a threat. A number of single country studies confirm the importance of cross-cutting and reinforcing cleavages.\textsuperscript{1} However, the effect of inequality between ethnic groups on democratic consolidation has yet to be tested empirically in a cross-national setting.\textsuperscript{2}

Another related question is whether the effect of inequality between groups

\textsuperscript{1}See, for example, Powell (1976) on Austria, Alesina, Glaeser and Sacerdote (2001) on the United States, and Dunning and Harrison (2010) on Mali.

\textsuperscript{2}Ostby (2008) tests the effect of inter-ethnic inequality on civil conflicts. Yet, civil conflicts are just one of the possible paths away from democracy. Not only does my dependent variable differ from that of Ostby (2008), but she does not include intra-ethnic inequality in her regressions and, as discussed below, her definition of inter-ethnic inequality differs widely from mine. There are also a large number of case studies that look at the effect of inter-ethnic inequality on democratic consolidation. See, for example, Murshed and Gates (2005) on Nepal, Srikandarajah (2003) on Fiji, Srikandarajah (2005) on Sri Lanka, Urdal (2008) on India, and Langer (2008) on Ivory Coast.
— such as ethnic or religious groups — somehow depends on the level of inequality within these groups, and vice versa. Indeed, the capacity of a group to solve its collective action problem may depend on whether its members share similar policy preferences. When this is the case, that group may be able to overthrow the regime and impose its preferred policies. Some studies focusing on a single country have highlighted the importance of within-group inequality in understanding between-group conflicts. Yet, no cross-national empirical study has ever tested the effect of inequality within ethnic groups on democratic consolidation, nor how it interacts with the effect of between-group inequality.

This paper addresses these issues with regard to ethnic cleavages by solving a formal model that distinguishes between intra- and inter-ethnic inequality. I argue that democracy is most unstable when either intra-ethnic inequality is high and inter-ethnic inequality is low, or when intra-ethnic inequality is low and inter-ethnic inequality is high. When ethnicity is salient, what matters most is not the absolute level of inequality but the relative levels of intra- and inter-ethnic inequality. When intra-ethnic inequality is very large relative to inter-ethnic inequality, democracies are likely to experience class-based coups. When instead inter-ethnic inequality is significantly larger than intra-ethnic inequality, instability is likely to be driven by ethnic-based coalitions. In other

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4 OSTBY ET AL. (2009), HOWEVER, DO TEST THE EFFECT OF INEQUALITY WITHIN REGIONS ON CIVIL CONFLICTS IN 21 SUB-SAHARAN AFRICAN COUNTRIES. YET, CONTRARY TO WHAT IS OFTEN CLAIMED, REGIONS IN SUB-SAHARAN AFRICA ARE NOT ALWAYS GOOD PROXIES FOR ETHNICITY. MOREOVER, EVEN IF THEY WERE, ETHNIC GROUPS TYPICALLY SPAN MULTIPLE REGIONS AND THEREBY IT IS NOT CLEAR WHETHER INTRA-REGIONAL INEQUALITY REALLY CAPTURES INTRA-ETHNIC INEQUALITY.
words, both types of inequality harm democratic consolidation when the other type is low. But, as one type of inequality increases, the destabilizing effect of the other type of inequality reduces, and may even reverse. For example, when inequality between ethnic groups is very large, increasing within-group inequality might actually help prevent coups based on ethnicity.

After analyzing the effect of intra- and inter-ethnic inequality, I conduct the very first cross-national empirical test of the relationship between ethnic inequality and democratic consolidation. Using data from the Demographic and Health Surveys (DHS), I construct an original data set on inequality between and within ethnic groups in 26 sub-Saharan African democracies between 1980 and 2005. The data set covers more than 75 percent of all democratic country-years in Africa during that period. I test my hypothesis by looking at the effect of within- and between-group inequality on both the likelihood of an attempted coup against a democracy\(^5\) and on the likelihood of a successful democratic breakdown. I find strong evidence showing that countries with either low intra-ethnic and high inter-ethnic inequality, or high intra-ethnic and low inter-ethnic inequality are the most unstable.

It should be noted that my results only provide partial evidence in favor of the theory on reinforcing and cross-cutting cleavages. If that theory were completely right we would expect countries with low intra- but high inter-ethnic inequality to be much more unstable than those with high intra- and low inter-ethnic inequality. In the first instance class and ethnic cleavages reinforce each other, while in the second ethnicity is simply not politically relevant. However, my findings suggest that inequality, if anything, is actually slightly more threatening when it falls along class than ethnic lines, even in sub-Saharan

\(^5\)Both successful and unsuccessful coups are included.
Africa where ethnicity is usually thought to be the most salient. In that sense, it is not ethnicity itself that is dangerous, but the mere existence of clearly distinct groups around which opponents to a regime can mobilize. Whether these groups are based on class or ethnicity does not seem to matter much. It is the existence of mutually exclusive groups with homogeneous preferences that poses a threat, not reinforcing cleavages *per se*. These results thus also cast doubts on the claim of primordialist theorists, in the ethnic conflict literature, according to which ethnic cleavages — because they are based on ascriptive characteristics that cannot easily be changed — are more dangerous than other cleavages that are more fluid, especially those based on social class (Geertz 1963; Horowitz 1985).

Not only does this paper contribute to the literature on democracy by analyzing and testing the effect of ethnic inequality on democracy, but it also helps to explain why ethnic diversity — despite being shown to be relevant in the case study literature — almost never reaches statistical significance in cross-national studies on civil conflicts and especially on democratic consolidation (Fearon and Laitin 2003; Papaionannou and Siourounis 2008).6 My results suggest that only when between-group inequality is high and within-group inequality low are ethnic groups a significant threat to political stability. In fact, ethnic diversity, when it cuts across social classes, may even help sustain democracy if inter-class inequality is particularly large. In general, these findings support the claims of Bates (1999), among others, according to which the negative impact of ethnicity has been overstated by the previous literature.

This paper also clarifies the relationship between inter-class inequality and democratic breakdowns. In Chapter 1, I found that although inter-class in-

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6See also Chapter 1 of the dissertation.
equality destabilizes democracy, some democracies with equal income distribution, such as Niger and Uganda, have nonetheless collapsed. Interestingly, these exceptions are mostly African countries in which ethnicity is highly salient. The findings reported in this paper suggest that the reason why these democracies have been unstable despite having low inter-class inequality — which can be measured by the overall level of intra-ethnic inequality in a society — is that their levels of inter-ethnic inequality were high, even by African standards. Such socioeconomic conditions are shown to be especially prone to ethnic-based coups, because ethnic groups have homogeneous preferences.

Finally, I contribute to the literature on democracy in sub-Saharan Africa. While a large portion of the recent literature on democracy has focused on the role of income distribution, studies about democratization and democratic consolidation in Africa have largely ignored inequality (e.g., Bratton and Van de Walle 1997; Diamond and Plattner 1999). Ethnicity is usually thought to be much more important than inequality in African politics. Yet, Africa offers a perfect setting for testing the effect of ethnic inequality. As argued by Powell (1976), the political implications of the argument about cross-cutting and reinforcing cleavages are clearer when there are few — ideally only two — salient cleavages. In most African countries, ethnicity is generally the most salient cleavage, while other cleavages, such as religious ones, are far less important politically (Emizet 1999). This paper merges the recent theoretical and cross-national literature on democracy with the literature that focuses on Africa, and

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7 From now on, the terms inter-class or class inequality will refer to intra-ethnic inequality, and the term ethnic inequality to inter-ethnic inequality.

8 One exception is the cleavage between urban and rural areas that is generally thought to be salient in sub-Saharan Africa (Bates 1981). However, the rural/urban dynamic usually reinforces ethnic ties in Africa (see Bates 1999). So, in the context of Africa, the omission of the rural/urban cleavage may not be highly problematic when studying ethnic relations. Also, in some countries, such as Sudan, religion is a salient cleavage (Emizet 1999).
suggests that inequality — notably when it falls along ethnic lines — plays a significant role in African politics.

3.2 Inequality, Ethnicity and Democratic Consolidation

Although there are still controversies about the relationship between inequality and the likelihood of becoming a democracy, most authors agree that inequality destabilizes already established democracies (e.g., Boix 2003; Chapter 1 of this dissertation). Inequality is argued to increase the likelihood of a democratic breakdown because it increases the benefits of setting redistributive policies for both the upper and lower classes. Under the assumption that the median voter is a member of the lower class, high inequality means that the policies adopted in a democracy differ widely from the preferred policies of the upper class (Meltzer and Richard 1981). The latter is thus likely to overthrow the regime and install an autocracy. Notice that this argument applies best to inter-class inequality.

There is also a large literature that relates ethnic diversity to instability and democratic breakdown (e.g., Dahl 1971). Ethnic ties can be used by political entrepreneurs to mobilize support (see Bates 1999). Because ethnicity is largely (thought not totally) ascriptive and unchangeable, it may lead to more serious conflicts than cleavages — such as those based on social classes — that are more fluid (Geertz 1963; Horowitz 1985). Case studies indeed often point to ethnicity as a cause for unrest. Despite its importance in the case study and theoretical literatures, however, most empirical studies find that the mere exis-
tence of ethnic divisions does not destabilize democracies (e.g., Papaionannou and Siourounis 2008; Chapter 1 of this dissertation), nor does it increase the likelihood of civil wars (e.g., Collier and Hoeffler 1998, 2004; Fearon and Laitin 2003).

Table 3.1: Main Predictions

<table>
<thead>
<tr>
<th>Class Inequality</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Ethnic Inequality</td>
<td>Stable Democracy</td>
<td>Unstable Democracy</td>
</tr>
<tr>
<td>High Ethnic Inequality</td>
<td>Unstable Democracy</td>
<td>Semi-Stable Democracy</td>
</tr>
</tbody>
</table>

Combining these literatures raises the question of what is the effect of inequality between and within ethnic groups on the consolidation of democracies. As argued by Emizet (1999), “ethnicity and class must be analyzed separately, cumulatively, and interactively to explain political cleavages” (p. 193). The main predictions of the argument developed in this section are summarized in Table 3.1. Imagine a situation in which there are two ethnic groups, both of which are further divided in two social classes, such that there are four groups: the upper class of the rich ethnic group, the lower class of the rich ethnic group, the upper class of the poor ethnic group and the lower class of the poor ethnic group. Then, intra-ethnic inequality refers to inequality between the lower and upper classes within each ethnic group, and inter-ethnic inequality to inequality between the two ethnic groups. Two of these four groups can

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9Some authors, however, have suggested that the reason why these studies fail to find a link between ethnic diversity and instability is that the measure of ethnic heterogeneity used may be of poor quality, notably because it does not differentiate between ethnic groups that are politically relevant and those that are not.

10Some of the previous literature as referred to inter-ethnic inequality as horizontal inequality, defined by Stewart (2001) as being inequality between two culturally-defined groups.
ally and stage a coup to overthrow a democracy. A single group can also wage a coup on its own, but at a higher cost than if it had formed a coalition.

How do within- and between-group inequality affect the probability that a democracy experiences a coup or a breakdown? There are four possible combinations of class and ethnic inequality levels. First, let us assume that we are in the upper left portion of Table 3.1, where both intra- and inter-ethnic inequality are low. Do the elites of the two ethnic groups have incentives to ally? No. Because within-group inequality is low, the difference between the preferred tax rate of the social class that sets redistributive policies and the social class that does not is small. The gains engendered by controlling redistributive policies would not be sufficient to cover the cost of the coup. Similarly, because inter-ethnic inequality is low, the ethnic group that does not control the regime does not have the incentives to overthrow the regime. One example of such a country is Malawi, where inequality within and between ethnic groups are both very low. Since becoming a democracy in 1995, Malawi has experienced a single (unsuccessful) attempted coup. Democracies with low inter- and intra-ethnic inequality should thus be the most stable.

Second, let us look at the case corresponding to the upper right section of Table 3.1, in which inter-ethnic inequality remains low, but intra-ethnic inequality is high. Now, the population is divided into two clear social classes with homogeneous preferences. The social class that does not control the regime is thus likely to mobilize and stage a class-based coup. It is interesting to notice that when inter-ethnic inequality is sufficiently low or ethnicity is not salient, we obtain the same predictions as the previous literature that has ignored ethnic groups: class inequality destabilizes democratic regimes (e.g., Acemoglu and Robinson 2006; Boix 2003). Comoros is a good example of such a country. In
only 13 years of democracy, Comoros has experienced five attempted coups, two of which were successful.

Third, consider the case where inter-ethnic inequality is high and intra-ethnic inequality is low, as shown in the lower left cell of Table 3.1. Again, the population is divided into two clear groups with homogeneous preferences. The only difference is that now these groups are defined according to ethnicity. Here, ethnic and class cleavages reinforce each other, whereas in the previous case ethnicity was simply not politically relevant. The ethnic group that does not control the regime is likely to stage an ethnic-based coup in order to adopt redistributive policies more in line with its preferences. Niger and Uganda, which have been unstable despite having low class inequality, are good examples of such countries.

Fourth, the last possible combination is when both inter- and intra-ethnic inequality are high. In this situation, different groups will have difficulty forming coalitions since their policy preferences differ widely. This corresponds to the classical cross-cutting cleavages situation, where at the same time class identity divides ethnic groups and ethnic identity divides social classes. However, a single group may attempt to overthrow a democracy, but at a higher cost than if it had formed a coalition with another group. Such democracies should be less stable than those where both forms of inequality are low, but somewhat more stable than those where either type of inequality is high while the other is low. This situation can be illustrated by the case of Mali, which experienced two (failed) coups since the establishment of democracy in 1993.

Interestingly, when between-group inequality is high, within-group inequal-

---

11When the poor ethnic group is majoritarian — and thus controls the regime in a democracy — the threat comes from the rich ethnic group. If instead the rich ethnic group forms the majority of the population, the poor ethnic group is the one that is likely to stage a coup.
ity may stabilize democracy because it reduces the incentives of the elites of each group to ally with the lower class of their ethnic group. As intra-group inequality rises, the members of that ethnic group have more diverse preferences, reducing their ability to solve their collective action problem. Another counterintuitive prediction is that, for similar reasons, when intra-ethnic inequality is high, increasing inter-ethnic inequality can actually be good for democracy. Democracy is thus most unstable when the population can clearly be divided in two mutually exclusive groups, either based on ethnicity or on social class. My argument is similar to that of Alesina, Glaeser and Sacerdote (2001) who explain why the United States redistributes less than Europe, despite being much more unequal. According to them, in the United States the lower class, unlike its European counterpart, has been unable to mobilize and pose a revolutionary threat mainly because it is divided along racial lines.

According to my argument, ethnicity is most likely to destabilize democracy when intra-ethnic inequality is low and inter-ethnic inequality is high. This may explain why although in cross-national studies ethnic diversity is shown to have no effect on civil wars, in Africa — where inter-ethnic inequality is generally thought to be especially high — ethnic heterogeneity does lead to violence (Collier 2010). Case study evidence tends to support the claim that inter-ethnic inequality is harmful. Examples include Nepal (Murshed and Gates 2005; Do and Iyer 2007), Ivory Coast (Azam 2006; Langer 2008), Indonesia (Mancini 2008), the Philippines (Magdalena 1977), Guatemala (Caumartin, Molina and Thorp 2008), Peru (Caumartin, Molina and Thorp 2008), India (Urdal 2008), Nigeria (Azam 2006), Chad (Azam 2006), Rwanda (Manning 1998) and Burundi (Manning 1998).

There are far fewer studies looking at the effect of intra-ethnic inequality on
inter-ethnic conflicts. However, those that exist generally support my hypothesis that intra-ethnic equality fosters ethnically-fueled conflicts. For example, Sriskandarajah (2003) observes that “intra-ethnic [economic] divisions [...] may actually have prevented the formation of more antagonistic ethnic relations in Fiji” (p.321). Moreover, Azam (2006) points out that in particularly unstable West African countries, such as Ivory Coast, Chad and Nigeria, “inequality of income across groups is so important, while within-group inequality does not seem to play any important role” (p.31). Further, the literature also often insists that ethnic conflicts are most likely when both the elites and the non-elites of a given ethnic group are willing to rebel (Ukiwo 2008; Stewart, Brown and Langer 2008). This suggests that both classes need to be living under similar economic conditions, and thus that intra-ethnic inequality is low.

Although inequality has been largely overlooked by the literature on democracy in sub-Saharan Africa, there is some evidence that inequality, especially when it falls along ethnic lines, does play a role in African politics (Emizet 1999; Manning 1998; Young and Turner 1985). In fact, according to Manning (1998) in many cases “what passed for ethnic distinctions reflected class distinctions in reality” (p.129). Several case studies support this statement. For example, drawing on the case of the Democratic Republic of Congo, Emizet (1999) argues that “ethnic cleavages are situational and tend to polarize the society whenever there is some differential access to scarce resources” (p.188), and that “[e]thnicity [...] became entwined with social class formation” (p.196). Likewise, according to a recent report on Kenya entitled Kenya: It’s the Economy, Stupid (Not Just ‘Tribalism’) from the Integrated Regional Information Networks (IRIN) news agency, “[e]thnicity came into play during the [December 2007 presidential] election [...] because of the widespread perception that those who
fared best under Kibaki were his own Kikuyu group." \textsuperscript{12} Similar evidence exists for Ivory Coast (Azam 2006; Langer 2008), Nigeria (Azam 2006), Chad (Azam 2006), Rwanda (Manning 1998), and Burundi (Manning 1998).

An alternative theory about the effect of inequality between and within ethnic groups on stability is offered by Esteban and Ray (2008b). Although these authors focus on civil conflicts — not democratic reversals — their argument can be directly applied to that question. According to them, ethnic conflicts are most likely to break out when inequality between ethnic groups is low while within-group inequality is large. The rationale behind their argument is as follows. When between-group inequality is low, it means that the excluded group has more resources to mobilize; thus increasing the likelihood of conflict.\textsuperscript{13} The second, and according to them most important, part of their argument is that within-group inequality fosters conflicts between ethnic groups. This is because rebellion requires two kinds of assets: financial assets and human assets. According to Esteban and Ray (2008b), intra-group inequality promotes inter-group conflict because it creates both a rich elites that can support the rebellion financially and a large mass of people with a low opportunity cost to mobilization. Esteban and Ray (2008b) do not test their theory empirically. As we will see below, my findings largely contradict their argument.

\textsuperscript{12}The IRIN is a project of the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) and is based in Nairobi, Kenya. The complete report can be found at http://www.irinnews.org/Report.aspx?ReportId=76159.

\textsuperscript{13}Notice that the validity of this argument depends crucially on the assumption that the ethnic group that is excluded from power is the poorest. This is problematic when studying democracies since we should expect the largest group — which is often the poorest — to control the government (e.g., South Africa since 1994). The data set introduced below indeed suggests that the largest ethnic group is usually the one that is in power in democracies.
3.3 Model

3.3.1 Set Up

This section offers a formal analysis of the argument developed in the previous section. I assume that there are two ethnic groups, one of which is rich and the other poor.\footnote{The model presented here builds extensively on that of Acemoglu and Robinson (2006). See, in particular, Chapter 4 section 4.4, Chapter 6 section 9 and Chapter 7 section 5.} Further, within each ethnic group there are two social classes: the elites (or upper class) and the masses (or lower class). So, there are four groups. The masses of the poor ethnic group ($pm$) is the poorest group, and the elites of the rich ethnic group ($re$) the richest. The masses of the rich ethnic group ($rm$) can either be poorer or richer than the elites of the poor ethnic group ($pe$). The income of each group is defined as follows:

\begin{align*}
    y^{re} &= \frac{\theta \delta y}{(1 - \lambda)(1 - \beta)} \\
    y^{rm} &= \frac{(1 - \theta) \delta y}{\lambda(1 - \beta)} \\
    y^{pe} &= \frac{\theta (1 - \delta) y}{(1 - \lambda) \beta} \\
    y^{pm} &= \frac{(1 - \theta)(1 - \delta) y}{\lambda \beta}
\end{align*}

where $\theta$ indicates inequality between the elites and the masses within each ethnic group (intra-ethnic inequality), $\delta$ gives inequality between the poor and the
rich ethnic groups (inter-ethnic inequality), \( \lambda \) is the size of the masses within each ethnic group, and \( \beta \) is the size of the poor ethnic group.

Assume that \( \lambda \in (0.5, 1) \), \( \beta \in (0, 0.5) \), \( \theta \in (1 - \lambda, 1) \) and \( \delta \in (1 - \beta, 1) \), such that the poor ethnic group is a minority\(^{15} \) and the masses are majoritarian within each ethnic group. The preferred tax rate of an agent of group \( i \) is determined as

\[
\tau^i = \arg\max_{\tau \in [0, 1]} [(1 - \tau)y^i + (\tau - \frac{\tau^2 y}{2})y]
\]  

where \( i \in \{re, rm, pe, pm\} \), and \( \frac{\tau^2 y}{2} \) is the deadweight cost to taxation. The regime starts as a democracy. However, two groups can form a coalition and overthrow the regime, after which the tax rate would be determined as a weighted average of the preferred tax rates of each coalition member.\(^{16} \) To overthrow a democracy, members of each coalition group have to pay a cost \( C > 0 \), which is determined by nature before the beginning of the game and is perfectly observed by all actors.

The sequences of the game are as follows:

1. \( C > 0 \) is selected by Nature and is perfectly observed by each group.

2. Each group determines with which group, if any, it is willing to form a coalition and stage a coup.

3. If two groups agree to form a coalition, they stage a coup which is successful with probability 1.

\(^{15}\)Examples of sub-Saharan African countries where the poor ethnic group forms a minority include Niger, Ivory Coast, Benin and Ghana. Section 3.3.3, below, considers the case where the poor ethnic group forms a majority. None of the key results depend on that assumption.

\(^{16}\)In section 3.3.3, I consider the case where each group can stage a coup by itself, under the assumption that waging a coup alone is more costly. The results are largely unchanged.
4. The tax rate is selected. Under a democracy, the median voter selects the tax rate. In an autocracy, the tax rate is a weighted average of the preferred tax rates of each coalition member.

Notice that the masses of the rich ethnic group will never agree to overthrow democracy, because they obtain their preferred tax rate under democracy. Since the rich ethnic group is majoritarian, the median voter is a member of the masses of that ethnic group. Moreover, the elites of the rich ethnic group and the masses of the poor ethnic group will never form a coalition. To see this, notice that for the elites of the rich ethnic group to be willing to stage a coup, the tax rate under the new regime must be lower than in a democracy. At the same time, the masses of the poor ethnic group will only benefit from changing the regime if they obtain a tax rate above the one that would prevail in a democracy.

Thus, there are only two possible coalitions. First, the elites of both ethnic groups may join to establish a class-based autocracy (CA), where the tax rate is determined by \( \tau^{ca} = (1 - \beta)\tau^{re} + \beta\tau^{pe} \). Second, the elites and the masses of the poor ethnic group may join and install an ethnic-based autocracy (EA), in which the tax rate is given by \( \tau^{ea} = (1 - \lambda)\tau^{pe} + \lambda\tau^{pm} \).

The utility of each individual of group \( i \) is given by its net income plus what it receives from redistribution

\[
U^i(R, \tau) = (1 - \tau)y^i + (\tau - \frac{\tau^2}{2})y \tag{3.6}
\]

where \( R \in \{ D, CA, EA \} \), with \( R = D \) indicates democracy, \( R = CA \) class-based autocracy and \( R = EA \) ethnic-based autocracy.
3.3.2 Analysis

The model is solved using backward induction. First, I find the optimal tax rate under each possible regime type, and how they are affected by inter-class and inter-ethnic inequality. These can be found by finding the tax rate of each group, given in equation (3.6), and then combining them to find the tax rate under each regime:

\[ \tau^d = \frac{\lambda(1 - \beta) - \delta(1 - \theta)}{\lambda(1 - \beta)} \]  

(3.7)

with \( \frac{\partial \tau^d}{\partial \theta} \geq 0 \) and \( \frac{\partial \tau^d}{\partial \delta} \leq 0 \). The tax rate under democracy is increasing in inter-class and decreasing in inter-ethnic inequality.

\[ \tau^{ca} = \frac{\beta(1 - \lambda) - \theta(1 - \delta)}{(1 - \lambda)} \]  

(3.8)

with \( \frac{\partial \tau^{ca}}{\partial \theta} \leq 0 \) and \( \frac{\partial \tau^{ca}}{\partial \delta} \geq 0 \).

\[ \tau^{ea} = \frac{\beta + \delta - 1}{\beta} \]  

(3.9)

with \( \frac{\partial \tau^{ea}}{\partial \theta} = 0 \) and \( \frac{\partial \tau^{ea}}{\partial \delta} \geq 0 \).

Next, I find the conditions under which each group would be willing to overthrow the regime. The masses of the poor ethnic group agree to join with the elites of their ethnic group to install an ethnic-based autocracy if

\[ U^{pm}(\tau, D) \leq U^{pm}(\tau, EA) - C \]  

(3.10)

Equation (3.10) simply says that the masses of the poor ethnic group agree to establish an ethnic-based autocracy if the utility they obtain under that regime minus the cost of staging a coup is greater than their utility under a democracy.
Let us denote
\[ C_{pm}(EA) = U_{pm}(\tau, EA) - U_{pm}(\tau, D) \] (3.11)
such that for all \( C \leq C_{pm}(EA) \), the masses of the poor ethnic group agree to stage an ethnic-based coup. The elites of the poor ethnic group, for their part, join with the masses of their ethnic group to install an ethnic-based autocracy if
\[ U_{pe}(\tau, D) \leq U_{pe}(\tau, EA) - C \] (3.12)
Let us define
\[ C_{pe}(EA) = U_{pe}(\tau, EA) - U_{pe}(\tau, D) \] (3.13)
such that for all \( C \leq C_{pe}(EA) \), the upper class of the poor ethnic group agrees to join the lower class of the poor ethnic group and stage a coup. Thus, to have an ethnic-based coup, we must have \( C \leq C_{pm}(EA) \) and \( C \leq C_{pe}(EA) \), i.e. both the masses and the elites of the poor ethnic group must agree to form a coalition. Let us denote \( C^*(EA) = \max\{0, \min\{C_{pm}(EA), C_{pe}(EA)\}\} \) such that for all \( C \leq C^*(EA) \), there will be an ethnic-based coup.

I now look at class-based coups. The upper class of the rich ethnic group agrees to install a class-based autocracy if
\[ U_{re}(\tau, D) \leq U_{re}(\tau, CA) - C \] (3.14)
Define
\[ C_{re}(CA) = U_{re}(\tau, CA) - U_{re}(\tau, D) \] (3.15)
such that for all \( C \leq C_{re}(CA) \), the elites of the rich ethnic group agree to stage
a coup. The elites of the poor ethnic group agree to join them if

\[ U^{pe}(\tau, D) \leq U^{pe}(\tau, CA) - C \]  

(3.16)

Denote

\[ C^{pe}(CA) = U^{pe}(\tau, CA) - U^{pe}(\tau, D) \]  

(3.17)
such that for all \( C \leq C^{pe}(CA) \), they decide to wage a class-based coup. Class-based coups are only possible if \( C \leq C^{re}(CA) \) and \( C \leq C^{pe}(CA) \). Let us denote \( C^*(CA) = \max\{0, \min\{C^{pe}(CA), C^{re}(CA)\}\} \), such that there is a class-based coup whenever \( C \leq C^*(CA) \). Finally, define \( C^* = \max\{C^*(EA), C^*(CA)\} \), such that for all \( C \leq C^* \) there will be a coup, either based on class or on ethnicity.

**Proposition 1.** There are no \( \lambda \in (0.5, 1) \), \( \beta \in (0, 0.5) \), \( \theta \in (1 - \lambda, 1) \) and \( \delta \in (1 - \beta, 1) \) such that \( C^*(EA) > 0 \) and \( C^*(CA) > 0 \).

Proposition 1 simply says that there are no cases where both class-based and ethnic-based coups happen with positive probabilities. See Appendix B for the proof. Intuitively, the elites of the poor ethnic group are members of each potential coalition. Yet, to join a class-based coup they must prefer a lower tax rate than the tax rate under a democracy, but to support an ethnic-based coup they must prefer a tax rate above it.

**Lemma 1.** For all \( \lambda \in (0.5, 1) \), \( \beta \in (0, 0.5) \), \( \theta \in (1 - \lambda, 1) \) and \( \delta \in (1 - \beta, 1) \) such that

\[ \frac{\delta}{1 - \beta} = \frac{\theta}{1 - \lambda} \]  

(3.18)

\( C^* = 0 \).
See Appendix B for the proof. Lemma 1 says that coups are impossible when the ratio of the income of the rich ethnic group to that of the poor ethnic group (left hand-side of equation 3.18) is equal to the ratio of the income of the elites to that of the masses (right hand-side of equation 3.18). In other words, when class and ethnic inequality are at equivalent levels there are no coups, no matter what is the absolute level of inter-class and inter-ethnic inequality. This is interesting because it means that when both inter-class and inter-ethnic inequality are very high, coups are very unlikely. Intuitively, when inter-class and inter-ethnic inequality are very high the elites and the masses of the poor ethnic group are unwilling to stage an ethnic-based coup because, inter-class inequality being high, the difference between their preferred tax rates is too large. Similarly, the elites of both ethnic groups are also unwilling to join because, ethnic inequality being high, they have very different preferences over tax policies.

Our next result suggests that whenever the upper class of the poor ethnic group agrees to stage an ethnic-based coup, the masses of that ethnic group will also agree. Similarly, when the elites of the poor ethnic group want to wage a class-based coup, the upper class of the rich ethnic group will also want to do so.

Lemma 2. Whenever \( y^{pe} < y^{rm} \), \( C^{pe}(EA) \leq C^{pm}(EA) \). Similarly, whenever \( y^{pe} > y^{rm} \), \( C^{pe}(CA) \leq C^{re}(CA) \).

The first part of Lemma 2 can be shown using the fact that if \( y^{pe} < y^{rm} \)
and $y_{pe} > y_{im}$, the distance between the preferred tax rate of the masses of the poor ethnic group and the tax rate under democracy is larger than the distance between the preferred tax rate of the elites of the poor ethnic group and the tax rate under democracy. Thus, there is a larger set of values of $C$ such that the masses of the poor ethnic group are willing to stage ethnic-based coups. The second part can be showed in a similar way. Lemma 1 is useful, because it implies that to predict when there will be either an ethnic or a class-based coup, we only need to focus on the choice of the upper class of the poor ethnic group.

Now, let us denote $\epsilon_{ea} = \max\{0, \frac{\beta}{\lambda} - \frac{\theta}{\lambda}\}$, $\epsilon_{ca} = \max\{0, \frac{\theta}{\lambda} - \frac{\delta}{\lambda}\}$ and $\epsilon = \max\{\epsilon_{ea}, \epsilon_{ca}\}$. So, $\epsilon_{ea}$ gives the level of inter-ethnic inequality relative to inter-class inequality, $\epsilon_{ca}$ the level of inter-class inequality relative to inter-ethnic inequality and $\epsilon$ the difference between both types of inequality. Of course, we can never have $\epsilon_{ea} > 0$ and $\epsilon_{ca} > 0$. Then, we have our main result.

**Proposition 2.** For all $\lambda \in (.5, 1)$, $\beta \in (0, .5)$, $\theta \in (1 - \lambda, 1) and \delta \in (1 - \beta, 1)$, $C^*$ is weakly increasing in $\epsilon$.

See Appendix B for the proof. Proposition 2 says that when one type of inequality increases \textit{relative} to the other, the likelihood of a coup increases. In other words, the chances that a democracy collapses are highest when either inter-class inequality is high and inter-ethnic inequality is low, or when inter-ethnic inequality is high and inter-class inequality is low. In the former case, a democracy is likely to experience a class-based coup, and in the latter an ethnic-based coup. When both class and ethnic inequality increase by an equivalent amount, the likelihood of a coup is unchanged.
3.3.3 Extensions

Poor Ethnic Group Majoritarian

In the previous section, the rich ethnic group was assumed to form the majority of the population. Here, I examine whether the results change when the poor ethnic groups is instead assumed to be majoritarian.\footnote{Some examples of countries where the majoritarian ethnic group is poor include South Africa, Nigeria and Burundi.} It turns out that if we assume that the elites of the poor ethnic group and the masses of the rich ethnic group cannot form a coalition\footnote{It seems quite reasonable that two groups that do not share either ethnicity nor class will never form a coalition.}, none of the key results changes.

Now, the median voter is a member of the masses of the poor ethnic group.\footnote{The results are also unchanged if instead a member of the elites of the poor ethnic group is the median voter.} The conditions leading to class-based coups are similar to those found above. When inter-class inequality is high while inter-ethnic inequality is low, the elites of both ethnic groups have similar preferences and can form a coalition to overthrow the regime. Ethnic-based coups are again more likely under high levels of inter-ethnic inequality but low levels of inter-class inequality. However, now, the rich ethnic group, which does not control the government, is the one that poses a threat.

Coups by Single Groups

Another possibility is that single groups could stage coups without having to form a coalition with other groups, albeit at a higher cost $K > C$. It can be shown that when this possibility is allowed, groups will only wage coups on their own when both class and ethnic inequality are very high. Intuitively,
if, for example, inter-class inequality is low, then each member of the ethnic group that does not hold power will want to join and pay $C$ instead of staging a coup on their own and pay $K$. However, when intra-ethnic inequality is sufficiently high, the difference between the preferred tax rate of each social class of that ethnic group becomes more important than the difference between the costs of waging coups alone and with a coalition. Thus, while Proposition 2 does not change when groups can stage coups on their own, Lemma 1 does, since coups are now possible even if both inter-class and inter-ethnic inequality are at equivalent levels, as long as they are very high. The probability of a coup increases with inequality, even when class and ethnic inequality are at equivalent levels.

3.4 Data

3.4.1 Dependent Variable

Coups against democracies: My main dependent variable is a dummy variable that takes the value one if a coup was attempted during a given year, and zero otherwise.\textsuperscript{21} Successful, failed and plotted coup attempts are included.\textsuperscript{22} In order to determine whether a country is a democracy, I use the Polity IV data set. All countries that have polity scores above one are defined as democratic.\textsuperscript{23}

\textsuperscript{21}I did not use the number of coups in a given year, because there are very few cases where multiple coups have been attempted within a year in a democracy. Moreover, whether there are multiple coups may depend on the success of the first attempted coup, which could be influenced by inequality. Thus, using the number of coups might bias the results.

\textsuperscript{22}I have also included cases where, using the definition of democracy described below, a country has experienced a democratic breakdown but not a coup. These are typically cases where a slow erosion of democracy, instead than a surgical strike-like coup, brought the regime down. There are four such cases: Comoros (1993; 1997), Lesotho (1998), and Zimbabwe (1987).

\textsuperscript{23}I employ the Polity IV data set rather than that of Przeworski et al. (2000) because in the latter the standards that a country needs to satisfy in order to be defined as democratic are
I use coup attempts rather than whether a democratic breakdown occurred, because it greatly increases the variation in my dependent variable. Given the relatively low number of observations (about 200), and short period covered (1980-2005), using only actual democratic reversals would have left me with only 12 cases. Considering the relatively large number of controls that must be included, such a low number of cases would make inferences problematic.

Most importantly, there is nothing in my argument that implies that coups that are unsuccessful are driven by different factors than those that succeed. My argument is about whether coups against democracies will be attempted. Moreover, excluding unsuccessful coups may even bias the analysis if some of the independent variables used to explain whether coups are attempted also affect their likelihood of success. For example, imagine that one argues that low levels of income per capita increase the likelihood of coups against democracy, but that one only looks at successful coups. Then, if coups are more likely to succeed in poor countries where the state coercive apparatus is weak, one may find evidence for his/her hypothesis even though in reality poverty does not breed instability. Similar examples could be constructed with class and ethnic inequality.

Democratic Breakdowns: Despite the potential problems of limiting the analysis to actual democratic reversals, I do test the robustness of my results with only these cases. Democratic breakdowns are defined as instances where a country

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24 The total sample contains 15 breakdowns, but data on inequality and on the control variables are missing for two and one of them, respectively.

25 However, here the bias would depend on which social class and ethnic group control the executive.
having a polity score above one at the end of the previous year, finishes the current year with a polity score lower than one.

### 3.4.2 Independent Variables

*Ethnic Inequality: One of the most important contributions of this project is the introduction of an original data set on inequality between ethnic groups. My data set covers 26 of the 31 sub-Saharan African countries that experienced at least one year of democracy between 1980 and 2005.\(^{26}\) To construct these data, I used the survey data from the Demographic and Health Surveys (DHS).\(^ {27}\) The surveys mainly ask questions about health issues, but also cover socioeconomic issues. Unfortunately, there are no questions on income. However, there are questions about education attainment. I use the information on the years of education to obtain measures of inequality between and within ethnic groups.\(^ {28}\)

Information on the ethnicity of the respondents is available for most African countries. Surveys have been conducted since the 1980s. For each year between 1980 and 2005, I used data from the survey which is closest in time. The data set contains a total of 240 observations, which accounts for more than 75 percent of the total number (313) of democratic country-years in sub-Saharan Africa between 1980 and 2005.\(^ {29}\)

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\(^{26}\)Multiple imputation would not have been an appropriate way to solve the missing values problem because it would require data at the ethnic group level, which are not available.

\(^{27}\)The surveys are available online at [http://www.measuredhs.com](http://www.measuredhs.com).

\(^{28}\)In Africa education is the main source of social mobility, and its access is often at the center of ethnic tensions (Bates 1999; Emizet 1999). Thus, education is a very good proxy for wealth in Africa. The same seems to be true in other regions. For example, Sriskandarajah (2003, 2005) argues that limited access to education — perceived as favoring specific ethnic groups — is one of the main driving forces behind the ethnic-motivated coups in Fiji and the ethnic war in Sri Lanka.

\(^{29}\)A total of 73 observations on four democracies are excluded because DHS data are unavailable in these countries: Botswana (26); Djibouti (6); Gambia (15); and Mauritius (26). A further 22 observations on four countries are also not included in the main regressions because
I constructed the data set in two steps. First, for each country-year, I used the method described by Pyatt (1976) to calculate Gini coefficients capturing inequality between each politically relevant ethnic group and the ethnic group that is controlling the executive. Gini coefficients are constructed such that they capture inequality between two typical members of the ethnic groups, regardless of the size of their groups. So, these Gini coefficients reflect the difference in the average level of education between the two groups. The relevant ethnic groups are identified with the Ethnic Power Relations (EPR) data set of Cederman, Wimmer and Min (2010), which gives the politically relevant ethnic groups for each country under each regime since 1946.

An ethnic group that is identified as politically relevant by Cederman, Wimmer and Min (2010) is included in my data set if it satisfies any of the two following conditions. First, all politically relevant ethnic groups that represent at least five percent of the population of their country are included. Second, in some rare cases ethnic groups that represent less than five percent of the population have nevertheless played a pivotal role in the history of their country. For example, in Liberia, Americano-Liberians represent only two percent of

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30Pyatt (1976) proposes a method to decompose the Gini coefficient in three components: within-group inequality, between-group inequality and the overlap. The overlap captures by how much the distributions of the different groups overlap. I do not use this third component in this study.

31The correlation between these data and the simple ratio of the two means is .98.

32In order to match the ethnic groups identifies by Cederman, Wimmer and Min (2010) with those reported in the DHS surveys, I used the encyclopedia **Peoples of Africa** on ethnic groups in Africa (Olson 1996).
the population but have held office on multiple occasions. Therefore, all ethnic groups that have controlled the executive at any point since the independence of their country are included in the data set, regardless of their size.

To determine which ethnic group is controlling the executive, I use the status variable also available in the data set of Cederman, Wimmer and Min (2010). There are seven possible status ranked from the highest to the lowest: monopoly, dominant, senior partner, junior partner, regional autonomy, powerless and discriminated. The dominating ethnic group is defined as the one with the highest status. For example, in Ghana between 2000 and 2005 the ethnic group that dominated the executive is the Akan, which had the status of senior partner. For each democratic country-year, my data set thus reports inequality between the dominating ethnic group and each politically relevant dominated group. This produces vectors with N-1 Gini coefficients for each country-year, where N is the total number of ethnic groups.

Second, I identify, in each country-year, the politically relevant ethnic group between which inequality is the greatest with respect to the ethnic group that is in power. In other words, I select the largest of the N-1 Gini coefficients. For example, in Benin between 1996 and 2005 there were four politically relevant ethnic groups included in the data set: the Fon, the Yoruba, the Adja and the Bariba/Betamaride. The Bariba/Betamaride are identified as the group dominating the executive during that period. The Gini coefficients between the Bariba/Betamaride, on the one hand, and the Fon, Yoruba and Adja, on the other hand, are respectively 0.199, 0.196 and 0.169. The dominated group is

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33 In some rare instances, multiple groups occupy the same highest status. For example, in Niger in 1995 both the Djerma-Songhai and the Hausa are senior partners. In such cases, both groups are used to calculate the Gini coefficients.

34 Notice that this ethnic group can be either poorer or richer than the one that controls the executive.
thus identified as being the Fon and the inter-ethnic Gini coefficient in Benin between 1996 and 2005 is 0.199.

Although this is the first study that tests the effect of ethnic inequality on democratic consolidation using cross-national data, it is not the first to have employed the data from the DHS to measure ethnic inequality. Ostby (2008) has used the DHS data to examine the effect of ethnic inequality on civil conflicts. My data set on ethnic inequality differs in two important ways from that compiled by Ostby (2008). First, she includes all ethnic groups regardless of whether they are politically relevant or not. This is problematic because not all ethnic groups are relevant politically (see Cederman, Wimmer and Min 2010). Ethnicity is, to some extent, malleable, such that objective ethnic categories do not always correspond to what is found on the ground (see Posner 2005). Moreover, different ethnic groups often join each other. This is the case notably in Uganda, where some of the relevant groups are formed around regions: the Far North-West Nile groups (Kakwa-Nubian, Madi, Lugbara and Alur), the Northerners (Langi, Acholi and Teso), and the South-Westerners (Ankole, Banyoro, Toro and Banyarwanda).

Second, Ostby (2008) uses the level of inequality between the two largest ethnic groups. This is problematic notably because the ethnic group that holds power is not necessarily among the two largest. For example, in Ivory Coast between 2000 and 2005 the regime was dominated by the Kru, which is the smallest of the three main ethnic groups. Thus, in that specific case, the data set of Ostby (2008) does not capture inequality between those that control policies and those that do not, but only among the latter. Since my predictions are driven by the difference in the preferences between the ethnic group that determines redistributive policies and the one that does not, it would not have been...
appropriate to use these data to test them.

Moreover, the two largest groups may not be those between which inequality is largest. Yet, we only need one dissatisfied group to destabilize a regime, and that group may not be among the two that account for the largest shares of the population. For example, most of the political instability in Niger has been caused by conflicts between the government and the Tuareg, even though they are the smallest of the four politically relevant ethnic groups of Niger, accounting for only eight percent of the population. Further, in many countries multiple groups are of similar size. For example, in Uganda the Baganda, the Basoga, the Far North-West Nile groups, the Northerners, and the South-Westerners represent respectively 16, 8, 7.9, 18 and 20 percent of the total population. Only picking the two largest would arbitrarily exclude potentially important groups.

Using the two largest groups often leads to misleading results. For example, in the data set of Ostby (2008), South Africa is among the most ethnically equal African countries. This is because the two biggest ethnic groups in South Africa are not the Blacks and the Whites but the Zulu and the Xhosa, two Black tribes. My definition, for its part, captures inequality between Blacks and Whites. Kenya is another good example. Most of the instability created by the December 2007 presidential election has led to confrontations between the Kikuyu, the group in power, and the Luo, the third largest ethnic group. Again, by definition, the ethnic inequality measure of Ostby (2008) cannot capture inequality between these two groups.

There are four countries for which, although DHS surveys have been conducted, information about the ethnicity of the respondents is missing. In three of these cases, I gathered alternative information that could help to (imperfectly) predict the ethnic identity of the respondents. First, the main ethnic
division in Madagascar is between the Highlanders and the Cotiers (those living on the coast). To create the ethnic inequality data for Madagascar I have divided provinces between those that belongs to the highlands and the coast. I then use information on the province in which the respondent is living to infer its ethnicity. Second, in Burundi most of the Tutsi live in urban areas and most Hutu in rural areas. Therefore, I used information about whether the respondent is living in a rural or a urban area to infer its ethnic identity. It should be noted that this is an highly imperfect proxy, since we should still expect many Hutu and Tutsi to live in urban and rural areas respectively. Third, Sudan is one of the only sub-Saharan African countries where religious cleavages are salient (Emizet 1999). So, in Sudan inter-ethnic inequality captures inequality between Muslims and non-Muslims. These additional observations are not included in the main analysis and are only used as robustness checks.

Class Inequality: In addition to calculating inequality between each ethnic group, I calculated inequality within each of them, for all politically relevant groups that represent at least 5 percent of the total population or that have held power at least once in the history of their country. The variable Class Inequality is a Gini coefficient, calculated using the method of Pyatt (1976), that gives the overall level of inequality within ethnic groups in the country. Ethnic group are weighted by their size. Class Inequality thus captures the level of inequality that is driven strictly by within ethnic group inequality. There is no overlap between the measures of class and ethnic inequality.

35Notice that all politically relevant ethnic groups that satisfy those two conditions, not only the two ethnic groups used to calculate Ethnic Inequality, are included in the calculation. This is because there is no reason why inequality within other ethnic groups could not affect democratic consolidation.
3.4.3 Control Variables

GDP per capita: Modernization theorists have argued that countries become more likely to install and sustain democracy as they develop (e.g., Lipset 1960). Many recent empirical studies have found that while income per capita has little effect on democratization, it indeed does promote the consolidation of already existing countries (Przeworski and Limongi 1997; Przeworski et al. 2000). It has also been shown that poor nations are more likely to experience coups (Londregan and Poole 1990; Stone 2004). Wealth may also be related to inequality, for instance, through the Kuznets curve. I use GDP per capita, derived from purchasing power parity (PPP) calculations, taken from the World Bank.

Ethnic Fractionization: Some scholars have suggested that divided societies are less likely to successfully maintain democratic institutions (e.g., Dahl 2000). For example, an incumbent may be less willing to leave office if his/her opponent belongs to another ethnic group. Also, the effect of ethnic inequality may depend on how ethnically diverse a society is. An indicator of ethnic fractionization, taken from the extended data set of Przeworski et al. (2000), is thus added to the analysis. These indicate the probability that two individuals selected randomly are from different ethnic groups.

Oil: The likelihood of a coup may depend on the spoils associated with holding office. If gaining access to political power provides important economic gains, then groups that do not control the executive may be more willing to take the risk of staging a coup. One important source of rent is oil revenues, which are usually controlled by the state. I thus add a dummy variable for major oil ex-
porters, taken from the extended data set of Przeworski et al. (2000).36

*Muslim:* Religion is often argued to influence the attitude of people toward democracy. For example, Islam is thought to be particularly harmful to democracy (Huntington 1991; Midlarsky 1998). Religion may also influence the tolerance of the population toward inequality (Milanovic, Gradstein and Ying 2001). A variable, taken from the extended data set of Przeworski et al. (2000), measuring the percentages of the population that is Muslim is included.

*Growth:* Many scholars argue that economic performances influence the stability of political regimes (e.g., Gasiorowski 1995). Regimes may lose legitimacy if they perform poorly economically. Growth may also influence inequality, because economic crisis or booms tend to affect diverse segments of the population differently. Growth is measured by the growth rate in GDP per capita taken from the World Bank.

*Former British Colony:* Former British colonies are often said to have inherited institutions particularly conducive to democracy (e.g., La Porta et al. 1998). I thus include a dummy variable taking the value one is the country has ever been a British colony and zero otherwise. Again, these are taken from the extended data set of Przeworski et al. (2000).

# Past Breakdowns: Londregan and Poole (1990) find strong evidence for a coup trap in which countries that have experienced coups in the past are more likely

\[\text{It takes the value one if the average ratio of fuel exports to total exports in 1984-86 is greater than 50 percent, and zero otherwise.}\]
to experience coups in the future. I used the Polity IV data set to calculate the number of transitions away from democracy that a country experienced since its independence.

*Time since Last Breakdown:* If coups breed further coups, we should expect coups to be more likely to occur relatively soon after other coups. To capture this idea, I used the Polity IV data set to construct a variable giving the number of years since the previous democratic breakdown.

*Poor form majority:* The effect of ethnic inequality may also depend on the relative size of each ethnic group. I add a dummy variable taking the value one if the poor ethnic group is larger than the rich ethnic group.

*Majority in Power:* I also include a dummy variable taking the value one if the ethnic group that holds power is larger than the one that does not. Combining this variable with *Poor form majority* also tells us whether the poor ethnic group holds power.

### 3.5 Descriptive Statistics

Before undertaking the statistical analysis, I take a preliminary look at the data. According to my argument, inter-class inequality should be particularly harmful to democratic consolidation when inter-ethnic inequality is low. Similarly, inter-ethnic inequality should be most destabilizing when inter-class inequality is low. When both types of inequality are high, the preferred policies of each of the four possible groups differ greatly, such that class- or ethnic-based
coalitions are difficult to form.

In order to see if the data lends some support for this idea, I first divide the sample between low and high inter-ethnic inequality observations. Observations with ethnic inequality levels under the median are classified as having low ethnic inequality, and those with ethnic inequality levels above the median as having high ethnic inequality. Then, for each group, I further classify the observations as having either low or high inter-class inequality, again using the median within each group. This creates four groups with about the same number of observations: observations with low inter-ethnic and inter-class inequality; observations with low ethnic but high inter-class inequality; observations with high inter-ethnic but low inter-class inequality; and observations with high inter-ethnic and inter-class inequality. Table 3.2 reports the probability of a coup or a democratic reversal within each of these groups. The hypothesis would be supported if the probabilities given in the off-diagonals are largest.

**Table 3.2: Probability of Coups and Democratic Breakdowns at Different Class and Ethnic Inequality Combinations**

<table>
<thead>
<tr>
<th>Coups Against Democracies</th>
<th>Democratic Breakdowns</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Class Inequality</strong></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>0.052</td>
</tr>
<tr>
<td>High</td>
<td>0.217</td>
</tr>
<tr>
<td><strong>Ethnic Inequality</strong></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>0.157</td>
</tr>
<tr>
<td>High</td>
<td>0.133</td>
</tr>
</tbody>
</table>

As shown in the left portion of Table 3.2, democracies with either low ethnic but high class inequality, or with high ethnic but low class inequality are
the most likely to experience coups. Among democracies with low inequality between ethnic groups, those that have a high level of class inequality are more than four times as likely to experience a coup than those having a low level of inter-class inequality. Yet, among democracies with high inter-ethnic inequality, those that have high inter-class inequality levels are actually less likely to experience coups than those at low level of inter-class inequality, although only slightly (13.3 vs. 15.7 percent, respectively).

Similarly, among democratic countries with low levels of inter-class inequality, those with a high level of inter-ethnic inequality are more than three times as likely to experience a coup than those where inter-ethnic inequality is low. Among democracies with high within-group inequality, however, having a low level of inter-ethnic inequality actually increases the likelihood of a coup from 13.3 to 21.7 percent. The right portion of Table 3.2 shows that the same relationships exist when one looks at democratic breakdowns rather than at coups against democracies. Again, each type of inequality is most destabilizing when the other type is low.

Table 3.2 also supports the idea, discussed in section 3.3.3, according to which single groups (e.g., the masses of the poor ethnic group) can stage coups on their own, but at a higher cost. Indeed, coups against democracies and democratic breakdowns are more likely when both inter-ethnic and inter-class inequality are high than when they are both low (13.3 vs. 5.2 percent; and 6.7 vs. 1.7 percent, respectively). Inequality is thus generally harmful to democratic consolidation, but the effect of each type of inequality, and especially its magnitude, crucially depends on the level of the other type of inequality.

Notice that the results reported in Table 3.2 are not consistent with the relationship hypothesized by Esteban and Ray (2008b). According to these authors,
democracies with low between but high within ethnic groups inequality should be the most unstable, which is indeed generally the case. However, for their relationship to hold we would also need democracies with high between and low within ethnic inequality to be the most stable. In reality, such a combination is the most prone to democratic breakdowns and the second most prone to coups against democracies.

### 3.6 Empirical Results

This section tests my hypothesis using multivariate regressions. To do so, I run probit models with all observations where the regime was democratic at the end of the previous year. The estimates in the first three columns give the effect of each independent variable on the probability of a coup against a democracy within a given year. The last column instead estimates their effect on the likelihood of a democratic breakdown. Positive coefficients indicate that the corresponding independent variable increases the likelihood of a coup/democratic breakdown.

To test my hypothesis, I include the interaction between Ethnic Inequality and Class Inequality, along with the two variables on their own. The hypothesis is supported if the coefficients on both Ethnic Inequality and Class Inequality are positive, whereas that on Ethnic Inequality * Class Inequality is negative. To see this, notice that if the coefficients on Ethnic Inequality and Class Inequality are positive, then each type of inequality increases instability, when the other type is low. If the coefficient on Ethnic Inequality * Class Inequality is negative then the effect of each type of inequality weakens, and may even reverse, as the other type of inequality becomes more important. Results are reported in Table 3.3.
In addition to the control variables discussed above, decade dummy variables have been included.

Table 3.3: Probit Analysis of the Effect of Class and Ethnic Inequality on Coups Against Democracies and Democratic Breakdowns

<table>
<thead>
<tr>
<th></th>
<th>Coups Against Democracies</th>
<th>Democratic Breakdowns</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Class Inequality</td>
<td>5.538</td>
<td>6.447</td>
</tr>
<tr>
<td></td>
<td>(1.959)**</td>
<td>(2.223)**</td>
</tr>
<tr>
<td></td>
<td>(5.311)**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(9.809)**</td>
<td>(9.489)**</td>
</tr>
<tr>
<td>logged GDP pc</td>
<td>.495</td>
<td>.786</td>
</tr>
<tr>
<td></td>
<td>(.429)</td>
<td>(.583)</td>
</tr>
<tr>
<td>Ethnic frac.</td>
<td>.006</td>
<td>.0003</td>
</tr>
<tr>
<td></td>
<td>(.009)</td>
<td>(.011)</td>
</tr>
<tr>
<td>Oil</td>
<td>-.088</td>
<td>.036</td>
</tr>
<tr>
<td></td>
<td>(.082)</td>
<td>(.788)</td>
</tr>
<tr>
<td>Muslim</td>
<td>-.012 (.007)*</td>
<td>-.014</td>
</tr>
<tr>
<td></td>
<td>(.011)</td>
<td>(.011)</td>
</tr>
<tr>
<td>Growth</td>
<td>-.081 (.031)**</td>
<td>-.078</td>
</tr>
<tr>
<td></td>
<td>(.033)**</td>
<td></td>
</tr>
<tr>
<td>British Colony</td>
<td>.051 (.414)</td>
<td>.065 (.431)</td>
</tr>
<tr>
<td></td>
<td>(.414)</td>
<td>(.431)</td>
</tr>
<tr>
<td># Past Breakdowns</td>
<td>-.54 (.364)</td>
<td>-.483</td>
</tr>
<tr>
<td></td>
<td>(.343)</td>
<td>(.291)</td>
</tr>
<tr>
<td>Time since Last Breakdown</td>
<td>-.031 (.018)*</td>
<td>-.003 (.021)</td>
</tr>
<tr>
<td></td>
<td>(.021)</td>
<td></td>
</tr>
<tr>
<td>Poor form the majority</td>
<td>.305 (.342)</td>
<td>.426 (.41)</td>
</tr>
<tr>
<td></td>
<td>(.41)</td>
<td>(.301)</td>
</tr>
<tr>
<td>Majority in power</td>
<td>.367 (.4)</td>
<td>.641 (.498)</td>
</tr>
<tr>
<td></td>
<td>(.498)</td>
<td>(.349)</td>
</tr>
<tr>
<td>80s</td>
<td>-.136 (.566)</td>
<td>-.137 (.721)</td>
</tr>
<tr>
<td></td>
<td>(.721)</td>
<td>(.451)</td>
</tr>
<tr>
<td>90s</td>
<td>.597 (.3)**</td>
<td>.671 (.322)**</td>
</tr>
<tr>
<td></td>
<td>(.322)**</td>
<td></td>
</tr>
<tr>
<td>Log-Lik.</td>
<td>-66.28</td>
<td>-59.82</td>
</tr>
<tr>
<td>N</td>
<td>197</td>
<td>156</td>
</tr>
</tbody>
</table>

Note: Column 2 excludes observations on South Africa and Namibia; column 3 includes observations on inter-regional (Madagascar), urban/rural (Burundi) or inter-religion (Sudan) inequality. Standard errors in parentheses. ***p < .01, **p < .05 and *p < .1.

Column 1 of Table 3.3 reports the effect of ethnic and class inequality on the likelihood of a coup against a democracy. All coefficients are of the expected...
signs and statistically significant at the one or five percent level. Both within- and between-group inequality increase the probability of a coup when the other type of inequality is very low. The marginal effect of class inequality on coups at different levels of ethnic inequality, calculated from column 1 of Table 3.3, is illustrated in Figure 3.1. As I found in Chapter 1, class inequality destabilizes democracy at low levels of ethnic inequality. However, when inter-ethnic inequality reaches a Gini coefficient of about 0.14, the effect of intra-ethnic inequality is no longer statistically significant. When inter-ethnic inequality attains a Gini coefficient of about 0.23, intra-ethnic inequality now decreases the likelihood of coups, although the relationship is not statistically significant.\(^{37}\)

Figure 3.2 gives the effect of inter-class inequality on the predicted probability of a coup against a democracy at low (10th percentile) and high (90th percentile) levels of inter-ethnic inequality, calculated from column 1 of Table 3.3. As expected when inter-ethnic inequality is low, intra-ethnic inequality has a very strong positive effect on the probability of coups. In low inter-ethnic inequality democracies, the predicted probability of a coup when the level of inter-class inequality is at its mean (0.261) is 8.45 percent per year. If inter-class inequality were to increase by one standard deviation (0.177), the probability of a coup would become 34.66 percent per year, more than four times as high.\(^{38}\)

When inter-ethnic inequality is high, however, inter-class inequality has basically no effect on instability. Now, increasing class inequality from its mean by one standard deviation actually decreases the likelihood of a coup from 47.03 to 46.24 percent. Again, these findings support the possibility, discussed in sec-

\(^{37}\)The proportion of countries with inter-ethnic Gini coefficients above 0.14 and 0.23 are about 40 and 10 percent respectively. So, the effect of intra-ethnic inequality is statistically significant at the five percent level in 60 percent of the cases.

\(^{38}\)At that level of ethnic inequality, the effect of class inequality is statistically significant at the one percent level.
Figure 3.1: Marginal Effect of Class Inequality on Coups at Different Ethnic Inequality Values

![Graph showing the marginal effect of class inequality on coups at different ethnic inequality values.](image)

...tion 3.3.3, that single ethnic groups can stage coups, although at a higher cost. Indeed, as illustrated in Figure 3.2, democracies where intra-ethnic and inter-ethnic inequality are high are much more likely to experience coups than those where they are both low.

These findings help us to make sense of the puzzle raised by my results in Chapter 1 that, although inter-class inequality destabilizes democracies, some democracies with low levels of inter-class inequality, such as Uganda and Niger, have fallen. It is interesting that most of these cases are from sub-Saharan Africa, one of the regions where inter-ethnic inequality is the highest and eth-
Figure 3.2: Effect of Class Inequality on the Predicted Probability of a Coup at Different Ethnic Inequality Levels

nicity the most politically salient. In fact, most of these exceptions have inter-ethnic inequality around the 90th percentile even within Africa, suggesting that the relationship between inter-class inequality and coups is very similar to that of countries with high levels of inter-ethnic inequality, shown in Figure 3.2. For example, when democracy collapsed in Uganda in 1985, its inter-ethnic Gini coefficient was 0.258, which corresponds to the 96th percentile. In turn, its intra-ethnic Gini coefficient was only 0.12, placing it at the 26th percentile. We see that in such countries, the likelihood of a coup against a democracy is very high, even if inter-class inequality is low. Interestingly, the relationship be-
tween inter-class inequality and instability among low inter-ethnic inequality countries is almost identical to that reported in Chapter 1 (Figure 1.2).

Figure 3.3: Marginal Effect of Ethnic Inequality on Coups at Different Class Inequality Values

Next, Figure 3.3 gives the effect of inter-ethnic inequality on coups against democracies at different levels of intra-ethnic inequality, calculated from the results reported in column 1 of Table 3.3. As expected, at low levels of within-group inequality, between-group inequality destabilizes democracies.\(^{39}\) Figure 3.4 shows the effect of inter-ethnic inequality on the predicted probability of a

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\(^{39}\)The effect of inter-ethnic inequality is statistically significant at the five percent level for about 62 percent of the observations.
coup when inter-class inequality is low (10th percentile). Among these countries, when inter-ethnic inequality is set at its mean (0.127) the likelihood of a coup is 13.41 percent. If inter-ethnic inequality were to rise by one standard deviation (0.078), the probability of a coup would increase to 35.47 percent, nearly three times as large.  

Figure 3.4: Effect of Ethnic Inequality on the Predicted Probability of a Coup at Different Class Inequality Levels

As shown in Figure 3.3, when inter-class inequality attains a Gini coefficient of about 0.25, the effect of inter-ethnic inequality on coups is no longer

\[40\] At that level of intra-ethnic inequality, the effect of inter-ethnic inequality is statistically significant at the five percent level.
statistically significant. At very high levels of inter-class inequality, it even becomes negative. Figure 3.4 gives the effect of inter-ethnic inequality on the predicted probability of a coup at high intra-ethnic inequality levels (90th percentile). When inter-ethnic inequality rises from its mean to one standard deviation above its mean, the likelihood of a coup reduces from 66.73 to 51.74 percent. Inter-ethnic inequality can thus have a substantively important stabilizing effect on democracy when intra-ethnic inequality is sufficiently high, even though the probability of a coup remains remarkably high.

Model 1 of Table 3.3 includes every sub-Saharan African country for which data are available. Yet, we may think that it would be preferable to only include countries that are highly similar to one another. For example, in Chapter 2 of this dissertation, I argue that inequality affects democratization differently at different levels of economic development. Although my argument is mainly about transitions to democracy, it is also possible that the effect of inequality on transitions away from democracy depends on the level of development. Column 1 of Table 3.3 does control for GDP per capita, but here the argument is about the interaction between development and inequality, which cannot be accounted for simply by controlling for development. In column 2 of Table 3.3, I thus exclude the only two countries — South Africa and Namibia — that could be considered as having attained at least a middle level of economic development. Model 2 only includes very poor countries, in which the effect of inequality should be the same. The results strengthen statistically and remain qualitatively unchanged.

41See Reenock, Bernhard and Sobek (2007).
42Botswana and Mauritius could also be considered as intermediate or even high-income countries, but data on these two countries are not available. Other countries that have never been democratic during the period covered, such as Gabon, have also attained fairly high GDP per capita levels.
As discussed above, in a few cases, the DHS does not include information about the identity of the respondents. In some of these instances, I was able to use other information reported in the DHS data sets to construct alternative measures of inter-ethnic inequality. In Madagascar I used information on regions; in Sudan on religion; and in Burundi about whether the respondent lives in a rural or urban area. In model 3 of Table 3.3, I redo model 1 with these three additional countries. Again, my hypothesis is supported, even though the relationship is somewhat weaker. This may not be surprising because these new observations create measurement error in the independent variables, which biases the coefficients downward.

Up to now, our analysis has focused on coups against democracies. Yet, it would be interesting to also understand how inter-ethnic and intra-ethnic inequality affect actual democratic breakdowns. Column 4 of Table 3.3 reports the effect of inter-class and inter-ethnic inequality on democratic reversals. Given the extremely low number of cases (12), no control variables are included. The results are qualitatively unchanged, although, unsurprisingly, somewhat weaker. Both types of inequality increase the probability of a democratic reversal when the other type of inequality is low. Yet, as either type of inequality rises, the effect of the other type of inequality on democratic breakdowns weakens and may even reverse. For example, when inter-ethnic inequality is low, intra-ethnic inequality has a strong, and statistically significant at the five percent level, positive effect on democratic reversals, but as ethnic inequality increases, the effect of class inequality reduces since the coefficient on the interaction term is negative.

Most of the control variables included in the regressions are found to have very little effect on coups against democracies. Given the low number of ob-
servations and high number of control variables, this finding is not surprising. Some control variables have even the opposite effect than expected, although the relationship is usually not statistically significant. For example, income per capita does not seem to affect the likelihood of coups against democracies. In the context of sub-Saharan Africa, however, this finding may not be surprising, given that almost all countries, apart from some cases such as South Africa and Namibia, have very low level of GDP per capita. We may have too little variation in the variable to capture any meaningful relationship.

Similarly, although Londregan and Poole (1990) found very strong evidence that an history of coups is likely to lead to further coups, the number of past democratic reversals has a weak — and not statistically significant — negative effect on coups against democracies. Again, this finding may not be surprising when we consider that very few sub-Saharan African countries had ever established democratic regimes before the 1990s. One of the only examples of countries where democracy was adopted and then collapsed before that period is Ghana, which turned out to be one of the most stable democracies since its most recent transition to democracy. In fact, these findings are consistent with those I found in Chapter 1, according to which an history of political instability affects the likelihood of transition to but not away from democracy. One variable that affects coups in the expected direction is growth rates. Estimation consistently suggests that economic crises lead to coups against democracies.

43This may be surprising giving that Stone (2004) found that income per capita reduces the likelihood of coups in Africa. The main difference between his analysis and mine is that my sample only includes democracies. Moreover, inequality data are missing for some rich and stable democracies (e.g., Mauritius and Botswana). I ran model 1 of Table 3.3 again without the variables on inequality and with all countries (including autocracies and countries for which data on inequality are unavailable). The sample increases from about 200 to 1000 observations. Now, development decreases the likelihood of a coup and the effect is significant at the one percent level.
3.7 Conclusion

While most authors agree that inequality harms the consolidation of democratic regimes, little work has been done about how different types of inequality affect democracy. In particular, few studies have looked at the effect of inequality between different groups — for example, defined along ethnic or religious lines — or within these groups. Yet, it seems plausible, for example, that inequality may be especially harmful when it reinforces other cleavages, and that the effect of between-group inequality depends on the level of within-group inequality, and vice versa. In this paper, I have unpacked the relationship between inequality and democracy, and have argued that democracies with either low between-group and high within-group inequality, or with high between-group and low within-group inequality are most likely to collapse. I conduct the first cross-national test of the effect of inequality between and within ethnic groups on democratic consolidation. Using an original data set on intra- and inter-ethnic inequality in 26 African democracies between 1980 and 2005, I find strong evidence supporting my hypothesis. These findings suggest that democracy is most unstable when inequality is such that the population is divided into two clear groups with homogenous preferences.

However, these results only provide limited evidence in favor of the theory on reinforcing and cross-cutting cleavages. In fact, there is nothing in my argument or empirical findings that suggest that groups that are defined around ethnicity are more likely to lead to violence than those that are based on class. If the theory on reinforcing and cross-cutting cleavages were completely right then we would expect countries with low intra- but high inter-ethnic inequality to be much more unstable than those with high intra- but low inter-ethnic
inequality, because ethnic and class cleavages would be reinforcing each other. Yet, this is not the case. This means that the existence of clear groups — based on any cleavage — in which members share similar preferences is what threatens democracy, not reinforcing cleavages themselves.

This paper has important implications for policies aimed at promoting democracy and reducing civil conflicts. Among other things, it suggests that ethnic divisions are not as dangerous as most of the previous literature has argued. When animosity between social classes is high, ethnicity can actually prevent instability by precluding each social class from mobilizing. So, whether the adoption of policies promoting national as opposed to ethnic identity is desirable is, in the end, contingent on the conditions under which a country finds itself. Likewise, political institutions, such as federalism, that may enable minorities to organize could ultimately lead to instability if these groups are not already politically mobilized and if their members live under similar economic conditions. However, if society is already ridden by conflicts based on other cleavages, the adoption of such institutions may, to paraphrase Ross (1920, p.165), actually sew society together.
Bibliography


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Appendix A

Appendix to Chapters 1 and 2: Multiple Imputation

The multiple imputation is done with *Amelia II*, which accounts for the time-series cross-sectional structure of the data. Ten datasets are imputed for all countries on which at least one capital share observation is available. Resource distribution is highly persistent within countries over time. Therefore, for each country, the available observations are used to impute the unavailable ones. The full dataset includes 4029 observations, 590 (15 percent) of which are imputed. It covers 116 countries between 1960 and 2000.¹

The imputation model includes two polynomials of time, which are interacted with the cross-sectional unit. This enables the patterns over time to differ across countries. This is important because we have no reason to believe that inequality evolves in the same way over time in all countries. As recommended by Honaker and King (2007), I include lags and leads for my central variable, capital shares. Given the high proportion of missing values (15 percent), I set the empirical prior at five percent of the total number of observations, which is

¹In Chapter 2, which only covers autocracies, the data set contains 2224 observations on autocracies, 473 (21.3 percent) of which are imputed.
relatively high.\textsuperscript{2} The online documentation on \textit{Amelia II} recommends that the empirical prior should be increased in datasets with high degree of missingness and many parameters. It notes that “A prior of up to five percent is moderate in most applications” (p.13). The capital share variable is also bounded between zero and one.

Many other sets of imputed datasets have been imputed using alternative setups, without significantly affecting the results. In particular, to verify that my results are not driven by the choice of the empirical prior, I redo the imputation with an empirical prior of 0.5 percent (not reported). The results are unchanged. There is no inverted U-shaped or decreasing relationship between inequality and democratization. Moreover, capital share has a substantial and significant (at the one percent level) positive effect on the likelihood of democratic breakdown.\textsuperscript{3}

As advised by King et al. (2001), all control variables used in Chapters 1 and 2 are included in the imputation. The model also uses three other measures of inequality. First, Jayadev (2007) proposes an alternative definition of capital share which is calculated as a proportion of the total GDP.\textsuperscript{4} Those of Ortega and Rodriguez (2006) are proportional to the value added in production. Second, I include the proportion of farming land that is used by family farms, which is reported by Vanhanen (1997).\textsuperscript{5} Family farms are defined as the "farms that provide employment for not more than four people, including family members,

\textsuperscript{2}The documentation on \textit{Amelia II} suggests starting at 0.5 or one percent.
\textsuperscript{3}More detail on the imputation model is available from the author upon request.
\textsuperscript{4}One problem with the database of Jayadev (2007) is that the earnings of the self-employed are not considered labor revenues and are thus classified as belonging to the upper class. This is especially problematic in the case of small entrepreneurs and subsistence farmers that should be included in the lower class. The problem is less severe with the database of Ortega and Rodriguez (2006), because the self-employed usually represent only a small portion of the industrial sector (Baudey 2003).
\textsuperscript{5}Boix (2003) also uses this dataset to measure inequality.
[...] that are cultivated by the holder family itself and [...] that are owned by the cultivator family and held in ownerlike possession” (Vanhanen 1997, p.48). A larger proportion of family farms indicates less land inequality.

Third, I use the Gini coefficients from the Estimation of the Household Inequality and Inequity (EHII), which is estimated by the University of Texas Inequality Project (UTIP). The UTIP uses the UNIDO dataset to compute the Theil’s T, a measure of the spread in wage pay. It regresses the Deininger and Squire (1996) Gini coefficients on the Theil’s T and corrects for the bias in the data source (e.g., pre-tax versus post-tax income). It then uses the predicted values as estimated Gini coefficients. The dataset covers more than 2800 country-years and 156 countries from 1963 to 1999. Because the UTIP corrects for the bias in the data source, cross-country comparisons are meaningful. Its major drawback is that, since it only looks at wage dispersion and not inequality between the lower and upper classes, it measures inequality within the labor class. As discussed above, the recent theoretical literature has emphasized inequality across social classes, and therefore the EHII database may not capture the relevant type of inequality. Despite these drawbacks, these data provide information that is useful for the imputation.

Moreover, the multiple imputation model employs diverse variables closely related to inequality. For example, it uses the data on education attainment of Barro and Lee (2000). This database contains the proportion of the population that has no schooling, an elementary school education, a secondary school education and a university education. It also gives the average number of education years. It thus provides a detailed measure of inequality of education attainment. The proportion of the population that has no schooling is interacted with the proportion that has university degrees. A country is likely to
be more unequal if there is, at the same time, a large proportion of the population with no schooling and with university degrees. The proportion of the population with no schooling is also interacted with the average number of education years. Again, a high proportion of people that never went to school coupled with a high average number of education years should indicate more inequality.

In addition, some scholars argue that trade openness affects inequality, although its actual effect is controversial (e.g., Kumar and Mishra 2008; Mahler et al. 1999). The sum of total exports and imports divided by the total GDP is included. These data are taken from the extended dataset of Przeworski et al. (2000). To capture the effect of the Kuznets curve – according to which there is an inverted U-shaped relationship between GDP per capita and inequality – I add GDP per capita squared. Inequality is also closely related to infant mortality (Epstein et al. 2004); therefore, child mortality (World Bank) is included.
Appendix B

Appendix to Chapter 3: Proofs

Proposition 1

Proof. Suppose not. Then, $C^*(EA) > 0$. Therefore, the elites of the poor ethnic group prefer the tax rate under an ethnic-based autocracy ($\tau^{ea}$) to the tax rate under a democracy ($\tau^d$). Since $\tau^{ea} > \tau^d$, this implies that the masses of the rich ethnic group are richer than the elites of the poor ethnic group, i.e. $y^{pe} < y^{rm}$. Further, if $C^*(CA) > 0$, then the elites of the poor ethnic group prefer the tax rate under a class-based autocracy ($\tau^{ca}$) to that under a democracy ($\tau^d$). Given that $\tau^{ca} < \tau^d$, it implies that the masses of the rich ethnic group are poorer than the elites of the poor ethnic group, i.e. $y^{pe} > y^{rm}$, which is a contradiction. □

Lemma 1

Proof. This result can be demonstrated by showing that whenever equation (3.18) holds, the preferred tax rate of the elites of the poor ethnic group is equal to the tax rate under democracy ($\tau^{pe} = \tau^d$), such that they will never agree to wage either kinds of coups. In fact, when equation (3.18) holds, the income of the elites of the poor ethnic group is equal to that of the masses of the rich ethnic group, i.e. $y^{pe} = y^{rm}$. Since coups of either types can only be successful
if the elites of the poor ethnic group agree to join them, coups will never occur when equation (3.18) holds.

Proposition 2

Proof. Proposition 2 can be proven in four steps.

1. Whenever $y^{pe} < y^{rm}$, $\epsilon^{ea} > 0$ and $\epsilon^{ca} = 0$. Similarly, whenever $y^{pe} > y^{rm}$, $\epsilon^{ca} > 0$ and $\epsilon^{ea} = 0$.

2. Whenever $y^{pe} < y^{rm}$, $C^{pe}(EA)$ is weakly increasing in inter-ethnic inequality and weakly decreasing in intra-ethnic inequality. Similarly, whenever $y^{pe} > y^{rm}$, $C^{pe}(CA)$ is weakly decreasing in inter-ethnic inequality and weakly increasing in intra-ethnic inequality. The first part of this result can be demonstrated by showing that when inter-ethnic inequality increases or intra-ethnic inequality decreases, the distance between the preferred tax rate of the elites of the poor ethnic groups and the tax rate under democracy increases. For example, when intra-ethnic inequality decreases, $\tau^{d}$ decreases, $\tau^{pe}$ increases and $\tau^{ea}$ (which is always larger than $\tau^{pe}$) remains constant. The second part of this result can be shown by using a similar logic.

3. For all $\lambda \in (.5, 1)$, $\beta \in (0, .5)$, $\theta \in (1 - \lambda, 1)$ and $\delta \in (1 - \beta, 1)$, $C^{*}(EA)$ is weakly increasing in $\epsilon^{ea}$. Moreover, if $\epsilon^{ca} > 0$ or $\epsilon^{ca} = 0$, $C^{*}(EA) = 0$. The first part of this result says that ethnic-based coups become more likely when inter-ethnic inequality increases or when intra-ethnic inequality decreases. Here, there are two possible cases: $y^{pe} \geq y^{rm}$ and $y^{pe} < y^{rm}$. Let us start with the case where $y^{pe} \geq y^{rm}$. Then, by Lemma 2 we know that $C^{*}(EA) = 0$. There are two possible reasons why $\epsilon^{ea}$ may increase: (1)
inter-ethnic inequality increases; or (2) intra-ethnic inequality decreases. Both of these decrease \( y^{pe} \) and increase \( y^{rm} \), such that for a sufficiently large increase in \( \epsilon^{ea} \), \( y^{pe} < y^{rm} \), and ethnic-based coups may be possible (i.e. \( C^*(EA) \geq 0 \)). Now, I will consider the case where \( y^{pe} < y^{rm} \).

From Lemma 2, we know that we only need to focus on the impact of intra- and inter-ethnic inequality on \( C^{pe}(EA) \). Again, \( \epsilon^{ea} \) increases whenever inter-ethnic inequality increases or intra-ethnic inequality decreases. Then, from step 2, if either inter-ethnic inequality increases or intra-ethnic inequality decreases, \( C^{pe}(EA) \) increases and thus, \( C^*(EA) \) increases. The second part of this result follows directly from step 2 and says that there are never ethnic-based coups when intra-ethnic inequality is larger than inter-ethnic inequality.

4. For all \( \lambda \in (.5, 1) \), \( \beta \in (0, .5) \), \( \theta \in (1 - \lambda, 1) \) and \( \delta \in (1 - \beta, 1) \), \( C^*(CA) \) is weakly increasing in \( \epsilon^{ca} \). Moreover, if \( \epsilon^{ca} > 0 \) or \( \epsilon^{ca} = 0 \), \( C^*(CA) = 0 \). Step 4 says that class-based coups are more likely to happen as the difference between intra- and inter-ethnic inequality increases, and that class-based coups never happen if inter-ethnic inequality outweighs intra-ethnic inequality. Step 4 can be showed in a similar way as we did for step 3 above.

Proposition 2 follows directly from the combination of steps 3 and 4. \( \square \)