Unbundling Democracy

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Abstract:

Much of the recent political economy and political science literature views democracy in one-dimensional terms, primarily in terms of political rights. This feature is particularly pronounced in the empirical literature, especially in the recent strand that seeks to identify the determinants of democracy. We expand on this view of democracy by incorporating the role of civil liberties, noting that these are conceptually at the core of modern democracy. We offer a conceptual framework that identifies five sources of potential differences in the evolution of political rights and civil liberties. We investigate the empirical evidence on this differential evolution using cross-national panel data based on the Freedom House measures of political rights and civil liberties. We show that civil liberties are more persistent than political rights in affecting subsequent outcomes and that this result is robust to the addition of covariates, estimation techniques, and variations in our sample. Moreover, we also show that while prior levels of civil liberties impact substantially and positively current levels of political rights, the reverse is not the case. We then consider how the unbundling of democracy relates to two important recent findings: Acemoglu et al's (2008) conclusion that long-run income changes do not affect democracy in terms of political rights holds as well for civil liberties; Tsui's (2011) conclusion that changes in oil discoveries affect democracy in terms of political rights negatively is consistent with our finding that total oil reserves affect democracy negatively, not only in terms of political rights but also in terms of civil liberties.

I. INTRODUCTION

Economists (and some political scientists) often view democracy in one-dimensional terms: the existence of political rights. Sometimes the latter are even more narrowly defined as, the occurrence of free and fair elections. Political scientists tend to recognize the limitations of this view. For instance, views of democracy tied solely to the holding of free elections are referred to as minimalist and they are contrasted to an alternative insisting on "...a more ample degree of protection of political and civil liberties," Plattner (2002, pp.56-57). Indeed, Coppedge et al (2011) survey the immense literature on the topic and argue that it can be classified into six key models of democracy: electoral, liberal, majoritarian, participatory, deliberative and egalitarian models. Economists, however, tend to be less concerned with these distinctions and generally follow Schumpeter's view. The latter is approvingly described in Acemoglou and Robinson's (2006) third chapter (titled 'What do we know about democracy') as "... the institutional arrangement for arriving at political decisions in which individuals acquire the power to decide by means of a competitive struggle for the people's vote."

Notwithstanding these differences in general, once we turn to the empirical literature, both economists and political scientists tend to proceed in a similar manner by focusing on political rights. This is especially so in the recent strand of empirical literature that seeks to explain the determinants of democracy. Here the dependent variable is always democracy defined in terms of political rights. Acemoglou, Johnson, Robinson and Yared (2008) [henceforth AJRY] provide a prominent example in economics and Przeworski, Alvarez, Cheibub and Limongi (2000, Ch.2) do the same in political science. Both of these contributions seek to assess the role of per capita income, if any, in explaining democracy defined in terms of political rights. More specialized

contributions seek to establish the role of specific sources of income, for example oil, in explaining democracy, again defined in terms of political rights, Tsui (2011).

The empirical analysis in this paper focuses on examining a well-known additional dimension of democracy, namely civil liberties. An obvious but nonetheless important question in this setting is to what extent the results obtained with respect to political rights hold for this separate dimension and to what extent do they differ? This question will be the focus of our empirical analysis.

In framing this question, it is useful to provide a point of departure embedded in the literature on democracy that allows rich variations across time and space to manifest themselves. Tilly (2007) provides this point of departure for our work in his recent book. He puts forth the following view of democracy: "...a regime is democratic to the degree that political relations between the state and its citizens feature broad, equal, protected and mutually binding consultations" (p.13). Tilly argues that these four features generate four partly independent dimensions of variations across regimes. Furthermore, he states that, "roughly speaking, political rights correspond to broad, equal, mutually binding consultations, whereas civil liberties refer especially to protection" (p.45). This statement is made in a context where he is using the Freedom House measures of political rights and civil liberties to discuss post-socialist democratization. Tilly's work highlights conceptually the potential for differences in the evolution of the core dimensions of democracy.

Empirical measures of political rights and civil liberties have been available in similar forms for over 40 years thanks to Freedom House (for details, see Piano and Puddington 2006). Furthermore, the Freedom House measure of political rights is used in almost all studies of democracy as a primary measure of political rights or as a robustness check on any other measure used as the principal measure. The civil liberties measure, however, is much more rarely used as an

outcome variable in such studies of democracy. We take advantage of the comparability in the construction and design of these two measures in the empirical analysis.

We provide a conceptual framework underlying the potential for divergence of political rights and civil liberties and identify five different sources of potential differences in the evolution of these two dimensions of democracy. This framework is laid out in Section 2. In Section 3, we discuss in detail the data sources used throughout the paper. One of the potential sources of differences in the evolution of these variables is differences in their persistence in affecting subsequent outcomes. Section 4 provides a set of baseline results on these differences in persistence. Other sources of differences in the evolution of these two dimensions of democracy are differences in the appropriability of the rents generated by the exercise of political rights and the enjoyment of civil liberties. Section 5 examines these potential differences in the course of economic development by looking at the relationship between income and democracy. Since the appropriability of rents generated by natural resources can be very different than those generated by other sources of economic growth, Section 6 examines the operation of these potential differences when oil is the main driver of income growth by looking at the relationship between oil and democracy. A brief conclusion highlights implications of these results.

Perhaps the most notable result from the analysis of our panel of countries is that changes in civil liberties often presage changes in political rights, but not the other way around. We also find substantial evidence that civil liberties respond similarly to political rights with respect to per capita income changes and natural resource booms: namely no effect for per capita income changes once fixed effects are introduced and a negative effect for changes in total oil reserves. The results from this first systematic attempt to unbundle the concept of democracy in general reveal the need for a thorough re-examination of several strands of recent empirical literature on the topic. A few

examples would be: acceleration or deceleration of democratization processes, transitions from socialism to market economies, and regime stability.

II. CONCEPTUAL FRAMEWORK: SOURCES OF POTENTIAL DIVERGENCE IN THE EVOLUTION OF POLITICAL RIGHTS AND CIVIL LIBERTIES

Political rights are widely accepted as an essential dimension of democracy in recent political economy and political science literature. Their definition commonly revolves around the provision of free and fair elections. Most directly, they involve providing an electoral process with these characteristics at the executive, legislative and local level. One step removed is the provision of an environment free from intimidation and coercion for open and broad participation by citizens as voters, candidates and members of political parties. Finally, these rights also include the provision of mechanisms that link the policies undertaken to their control by elected leaders in transparent ways that lead to accountability. Freedom House's political rights index is the empirical measure most directly linked to these features.[1]

While civil liberties are in principle widely recognized as an essential element of democracy in terms of protection of individual rights, they tend to be neglected in practice, as indicated in the introduction. Hence, it is useful to discuss these in more detail. Osiatyński (2009, p.2) makes a distinction between individual rights, which he characterizes as emerging in the 18th century, and human rights, which he views as a 20th century concept. Individual rights have been recognized as essential characteristics of democracy over the last two hundred years, embedded as they are in many countries' constitutions. These individual rights are often referred to as first generation

[1] Alternative measures are also used empirically. The most prominent among them is the Polity IV index that captures balance of power aspects of democracy by measuring constraints on politicians and politically connected elites. We focus on the FH measure because it stresses positive aspects of political rights and it is done in similar style and intent as our measure of civil liberties.

human rights. They usually include freedom of speech, freedom of assembly and a category that is much more difficult to describe. It is sometimes referred to as due process protection, equal treatment under the law or protection from arbitrary treatment by the state.

The concept of human rights, however, is somewhat broader and Osiatyński (2009, Ch.1) describes its evolution from the incorporation of an alternative tradition of collective rights or group rights in the 19th century through ideas of minority rights and finally leading to notions of social and economic security in the post-WWII period. This broader view of human rights is reflected in the UN Universal Declaration of Human Rights. One interpretation of this broader view of human rights is that it incorporates notions of human dignity and includes rights which are not necessarily individual in nature. As might be expected, this interpretation is not universally accepted, because it can be interpreted as implying that the state guarantees the entitlement of every individual to some minimum standard of living. Such a guarantee has not been met by any state (if the standard is defined liberally).

A narrower interpretation of additional human rights, however, has been adopted in the economics literature and referred to as "second generation human rights" by Kaufmann (2004) and others. These additional human rights—which are also of post-WWII vintage--include secure ownership rights and individual mobility (in the pursuit of economic betterment) with respect to location, education and employment. They have been viewed over the last several decades as part of the array of civil liberties to be provided and protected by a democratic government; for example, Freedom House includes them as part of its civil liberties index (see Piano and Puddington 2006). We include these narrower second generation human rights in our concept of civil liberties

as an essential characteristic of democracy and we use the Freedom House measure of civil liberties in our empirical work.[2]

With these clarifications as a preamble, we can now proceed to show conceptually that these two essential dimensions of democracy need not move together in many circumstances for a variety of reasons usually related to their different economic aspects. For instance, the typical economic costs and benefits of political rights identified in the literature are those directly or indirectly related to notions of self-interest by participants in the electoral process. This is the case when considering citizens as voters, e.g., Feddersen (2004), where the issue is why they bother to vote in the absence of a clearly defined self-interested motivation to do so. It is also the case when considering politicians or candidates representing other citizens, e.g., Keane and Merlo (2010), where the issue is how the pursuit of self-interested policies determines their behavior.

Interestingly, some benefits and costs of political rights arise primarily as a result of collective good provision, but these are usually ignored. For instance, the start-up costs of setting up a system of free and fair elections in countries where none existed before are the result of providing a collective good. Furthermore, the economic benefits of this collective good often go unnoticed because they are in the nature of an "opportunity benefit." Namely, the political rights associated with free and fair elections in a democracy provide a non-violent mechanism for the transmission of inter-temporal power.[3] Important economic benefits of a non-violent transmission of power would be the saving of life and property from destruction as well as the investments that would have been foregone due to the added uncertainty brought on by violence. These benefits

[2] Just as in the case of political rights, there are alternative measures of some of these civil liberties, for example the Economic Freedom Index developed by Gwartney and Lawson (2008) on behalf of the Fraser Institute. We focus on the Freedom House measure for comparability with the political rights measure and because of its more extensive coverage of civil liberties.

[3] Given the recent emphasis on the role of violence in history by economists, e.g., Findlay and O'Rourke (2007) and North, Wallis and Weingast (2009), it is interesting that the economics literature has not addressed this issue explicitly.

could be quite sizable, but their size depends on the counterfactual one employs to evaluate them, which may be the reason they have been ignored.

Economic benefits associated with civil liberties are easier to identify, even though they are also the outcome of collective good provision. For instance, some are generated by the provision of public goods such as law and order, which is necessary to provide first generation human rights such as freedom of the press and freedom of assembly. Of course, the provision of law and order is not limited to democracies and its existence has supported a high level of transactions in traditional markets since the beginning of recorded history. Others are generated by the provision of public goods such as the rule of law, which is more closely related to the civil liberties associated exclusively with democracy and it is viewed as necessary for the provision of second generation human rights. The latter are indispensable for the existence of "socially contrived" modern markets operating at a high level of transactions (BenYishay and Betancourt 2010). These socially contrived markets--for example, financial and capital markets—are essential for modern economic growth and development.

Civil liberties associated with second generation human rights have very direct economic benefits: first, secure property rights increase output by lowering uncertainty and transaction costs; second, mobility rights with respect to location, employment and education increase output by improving the allocation of human capital resources. By their very nature, many of these benefits to society are realized only through widespread access. That is, these benefits come into existence when each individual in the society is able to appropriate the rents civil liberties allow to come into being. Thus, these benefits are difficult to appropriate by others, whether they be dictators or democratic politicians.

On the other hand, the economic benefits of political rights tend to be more easily appropriable by democratic politicians and a few of their core supporters. These rents are

generated as private goods arising from the heavy reliance on self-interest for securing them in a representative modern democracy. This difference in appropriability by individuals of the rents generated by political rights and civil liberties (particularly second generation human rights) provides our first important source of potential divergence in the evolution of these dimensions of democracy.

By contrast, the civil liberties associated with first generation human rights have mainly indirect economic benefits to society. Moreover, by their nature these benefits generate rents that are more easily appropriated by democratic politicians in pursuit of self-interest. Freedoms of speech and assembly are almost indispensable in facilitating the generation and distribution of knowledge that underlies modern economic growth (Aghion and Howitt 1998). Without freedom of the press or assembly, this process would take place at a much slower pace. At the same time, however, appropriation of the benefits to society of the rents generated by these rights is more feasible than in the case of secure property rights or mobility rights. The rationale is the visibility of the gains from the main innovations that emerge in societies due to freedom of speech and assembly. These gains are quite large and often concentrated in time, space and the individuals to whom they accrue. Thus, they become a visible target for democratic politicians or other powerful individuals primarily motivated by self-interest.

Difference in the appropriability by individuals of rents generated by the indirect economic benefits associated with first generation human rights can provide a source of divergence in the evolution of different types of civil liberties. Nonetheless, the appropriability by individuals of the rents generated by the economic benefits associated with political rights of power holders is likely to be higher than for the ones generated by civil liberties associated with first generation human rights. These former rents are generated directly and often as private goods. Hence, this second

difference in appropriability provides another important source of potential divergence in the evolution of political rights and civil liberties.

Some of the costs required for maintaining a democratic system are shared by political rights and civil liberties but others are separate. For instance, an independent judiciary for the adjudication of disputes and ensuring that elected officials are responsible for the policies they adopt is required by both dimensions. Similarly, law enforcement and the administrative costs of providing law and order are required for both holding elections that are free from coercion and intimidation and for more day-to-day economic and social transactions. These examples suggest, however, that the brunt of the work of the judiciary and law enforcement in providing law and order or the rule of law is generated by the provision of civil liberties, not political rights.

In a representative democracy, the exercise of political rights is concentrated in time and space for citizens and in a limited number of individuals for politicians. In contrast, the exercise of civil liberties in a democracy is much more broadly distributed over time, space and individuals that benefit from them. As a result, the costs of administering the public goods necessary to support civil liberties are likely to be much higher than for political rights. Differences on the cost side thus provide a third source of potential divergence in the evolution of political rights and civil liberties.

More generally, the exercise of political rights, for example by voters, often acts as a constraint on the ability of politicians and small groups to appropriate the benefits from economic and non-economic activities generated by others. On the other hand, the prevalence and enjoyment of civil liberties by citizens usually enhance the ability of all individuals, by themselves or through organizations, to generate economic and non-economic benefits indirectly, through first generation human rights, and directly, through second generation human rights, in the presence of the state's monopoly power over violence. This suggests a differential role of political rights as constraints and civil liberties as enhancers of economic and non-economic activities. Because the constraints

only bind intermittently, political rights are likely to be less persistent than civil liberties, whose role as enhancers is more continuous. This suggests a fourth source of potential difference in the evolution of political rights and civil liberties, namely the extent of their persistence.

Finally, there may be interactions in the production of the different dimensions of democracy. For example, civil liberties such as freedoms of association and speech are naturally crucial for the emergence of competitive political parties that take part in free and fair elections. Second generation human rights may also be important for the production of political rights if equitable access to education shapes the emergence of representative political leaders. Thus, we may observe that rather than moving entirely independently, the two dimensions of democracy may well move in sequence, as independent variations in one dimension lead to subsequent changes in the other. Nonetheless, this difference in timing appears to have been glossed over in most of the existing economic literature.

All five sources of potential differences in the evolution of political rights and civil liberties suggest a wide array of possibilities for them to relate to each other in direct, inverse or independent fashion. How they in fact do relate is an overwhelmingly empirical matter. We examine the determinants of their evolution empirically in the rest of the paper.

III. DATA SOURCES

As our primary measures of the dimensions of democracy, we use the civil liberties (CL) and political rights (PR) data from Freedom House, which are available at annual intervals between 1973 and 2009[4]. We focus our investigation on effects at 5-year intervals. Both the CL and PR variables are measured on a 1-7 scale, with lower scores representing better conditions. To make

[4] Available online at http://www.freedomhouse.org

our results more easily interpretable, we convert these measures onto a [0,1] scale, with higher scores representing better conditions.

The Freedom House PR variable reflects three primary factors: (a) The fairness and freedom of the electoral process, (b) the ability of diverse individuals and groups to fully participate in the political process, including to gain power, and (c) the efficiency of the government in operating with accountability and with limited corruption and undue influence from the military, criminals, or other groups. Freedom House's CL measure, meanwhile, reflects four core dimensions: (a) Freedom of expression and belief, (b) rights to freely organize and associate with other individuals and groups, (c) law and order, supported by an independent judiciary and reflecting equal legal treatment of diverse populations, and (d) personal autonomy over property ownership as well as a variety of other rights, including the choice of residence, employment, marriage partners, and higher education institution. BenYishay and Betancourt (2010) discuss these sub-factors underlying the PR and CL variables in further detail and assess the relative influence of the sub-factors on long-run economic growth.

We begin with the sample of 150 countries for which PR data are available for the countries used in the AJRY sample. We impute the 1970 CL and PR value using the earliest observation in 1973. AJRY also further supplement this data with data from Bollen (1990, 2001) for political rights in 1950, 1955, 1960, and 1965, obtaining 945 observations for these countries. Because comparable data are not available for CL for these early years, we restrict our sample to the years 1975-2000, thus using 718 observations.[5]

AJRY rely on estimates of real GDP per capita in constant 1996 purchasing power parity-adjusted (PPP) dollars derived from the Penn World Tables [PWT] (version 6.1). Newer data from the PWT (version 6.3, benchmarked to 2005 PPP dollars) now include observations on 172

[5] When we replicate AJRY's estimation using this subsample, we find qualitatively similar results for the effects of GDP per capita on political rights. These results are reported in column 2 of Appendix Table A1.

country-years in the AJRY sample of countries over our reference time period, providing us with 890 observations. These country-years observations are spread over 40 countries, and are quite different from those that AJRY use in their estimation: The levels of political and civil freedoms in these countries are much lower than those in the AJRY sample, and while their mean levels of income are comparable to those in the AJRY sample, their changes in income over this time period are significantly lower. When we replicate AJRY's estimation adding these new observations from the PWT (version 6.3), we also find qualitatively similar results for the effects of GDP per capita on political rights (see column 3 of Appendix Table A1).

One of the instruments used in AJYR was the savings rate. We also make use of the updated PWT data on government and private consumption to calculate the national savings rate, data which are available for 849 observations in our sample. AJYR relied on these data to obtain 2SLS estimates. We replicate their 2SLS estimation for PR with both their original sample of countries and our extended sample. Again the results are qualitatively similar, which can be seen in columns 4-6 of Appendix Table A1. We report summary statistics for the main variables used in the next two sections in part A of Table 1.

For the analysis of the relationship between oil and democracy we constructed a separate sample of country observations for which reliable oil reserve data are available. The data on oil reserves come from Dr. Colin Campbell at the Association for the Study of Peak Oil (ASPO), a non-profit organization gathering industrial data to study the dates and impact of the peak and decline of world oil. These data are a particularly useful source because they include oil discoveries and thus permit credible computation of real changes in oil reserves. The total oil reserves in this dataset are measured as the cumulative quantity of oil discoveries minus the cumulative quantity of oil production as of year *t*. Thus, changes in reserves in a given period reflect the net change in

discoveries and production over that period. Cotet and Tsui (2010) describe these advantages of the ASPO data on reserves over other data sources in more detail.

Since many countries in this sample don't produce oil, we impute zero oil reserves for the non-oil producing countries in our sample. For five former Soviet countries, we also impute missing pre-1991 observations by fitting their post-1991 data on that of several comparator countries (Canada, Great Britain and Romania) and predicting the pre-1991 reserves based on these comparator observations (we verify in a robustness check that these observations do not drive our results). Our dataset thus contains 952 observations between 1970-2000 for which there is both CL and oil reserve data; when we limit the sample to those observations with lagged CL and oil reserves and demographic data from the UN Population Division, we obtain 847 country-year observations. We present summary statistics for these observations in part B of Table 1. We also present correlations in Table 2.

IV. BASELINE RESULTS

Our conceptual framework highlights a variety of factors that may cause PR and CL to move jointly, inversely, sequentially, or independently of one another. We now turn to assessing the empirical evidence on these dynamics. We begin by simply examining the reduced form relationship of PR and CL to lagged values of both variables without the inclusion of additional control variables. We do so by estimating via OLS a basic specification that includes a lag for each PR and CL, as well as country and year fixed effects. We use this specification with each democracy variable as an outcome variable:

$$Democ_{it} = \alpha_1 PR_{it-1} + \beta_1 CL_{it-1} + \gamma_i + \delta_t + \epsilon_{1it} \qquad (1)$$

where γ_i is a country-specific fixed effect and δ_t is a year-specific fixed effect.

Results of this estimation are presented in Columns (1) and (2) of Table 3. They indicate that both variables display limited persistence–each lagged dependent variable has a positive coefficient, though one that is much smaller than unity. This persistence is more pronounced for CL than for PR (with a coefficient on the dependent variable lag of 0.33 vs. 0.12). Interestingly, in the PR regression, the coefficient on lagged CL is also highly significant and three times as large as that of lagged PR. In the CL regression, however, the coefficient on lagged PR is small and insignificant.

Taken together, the results suggest that improvements in PR have more limited scope than do those in CL, which are both more persistent and affect subsequent PR as well as CL. One interpretation of these results would suggest that civil liberties are crucial for the emergence of political rights. For example, the broadening of freedoms of association and speech may lead competitive political parties to emerge, a process that can reasonably take place over a 5-year period. Since these results are novel as well as important, we will consider the extent of their robustness to a well known econometric problem in panel data settings: namely "dynamic panel bias".

Using lagged dependent variables as regressors introduces "dynamic panel bias" because those lags will themselves be correlated with previous observations' error terms (i.e., CL_{it-1} will be correlated with ϵ_{1it} for $s < t$). While this bias disappears as the number of periods increases (as $T \rightarrow \infty$), our sample includes only 5 periods. To address this issue, we first implement the instrumental variables (IV) approach proposed by Anderson-Hsiao (1982). The latter requires specification of the model in first differences and the use of two-period lags of PR and CL as instruments for the respective first differences. Our specification is thus:

$$\Delta Democ_{it,t-1} = \alpha_1 \Delta PR_{it-1,t-2} + \beta_1 \Delta CL_{it-1,t-2} + \Delta\delta_{t,t-1} + \Delta\epsilon_{1it,t-1} \qquad (2)$$

Implementation of the Anderson-Hsiao approach yields results that are qualitatively similar to those obtained in our levels fixed effects specifications, which can be seen in columns 3 and 4 of Table 3. Lagged differences in PR are more persistent than was the case for levels (coefficient of 0.29), but the effect of lagged CL differences on PR differences remains significant and large (coefficient of 0.36). CL differences themselves are even more persistent, with an own coefficient of 0.48, and remain unaffected by lagged differences in PR.

Arellano and Bond (1991) difference GMM estimator improves on the efficiency provided by the Anderson-Hsiao IV estimator by using available lags greater than two periods as instruments in the difference equations.[6] The results are shown in Columns (5) and (6) of Table 3. While the coefficients are quite similar in magnitudes to those in the IV estimation, they are more precisely estimated. Furthermore, the main findings of interest remain: the notable cross-effect of CL on subsequent PR; the absence of a robust cross-effect in the opposite direction (namely, PR on subsequent CL); and differential levels of persistence in each equation.

Presence of first order serial correlation in the error terms of the levels equations would lead to invalid instruments in the GMM estimator (and the IV). For this correlation makes the two period lagged levels invalid instruments for the one period lagged differences. The p-values for the Arellano Bond autocorrelation test are also shown in columns (5) and (6), the null hypothesis of serial correlation is rejected at the 1% level for both equations and at the 5% level for the PR equation but not for the CL equation, which has a p-value on the z-score of 0.02. We therefore restrict our instrument set to only lags of PR and CL of three or more periods and we find no evidence of third order serial correlation in the errors. The results, displayed in columns (7) and (8), highlight even more intensely the disproportionate role of lagged CL. This variable impacts

[6] One could also estimate a system GMM in which both the difference and levels equations are estimated, and in which the lagged differences are instruments in the levels equations (following Arellano and Bover 1995). However, in our type of setting, these instruments are unlikely to be valid, as the time-differenced instruments are likely to be correlated with the fixed effect in the level equation.

both current PR and CL; while lagged PR, on the other hand, no longer affects current PR. Finally, the validity of the instruments in the GMM setting can be explicitly checked using overidentification tests based on Hansen's (1982) J test statistic. We display the p-values for these test statistics as well in columns (7)-(8). The null hypothesis that the instruments are valid can not be rejected at values well beyond the 10% level for either equation.

Our results highlight the effect of CL on subsequent levels of both PR and CL. While the magnitudes of these effects are not so large as to suggest a feedback loop of increasing improvements in civil liberties, these results indicate that civil liberties are particularly influential in affecting the dynamic path of democracy. Countries may experience improvements in civil liberties that are followed by subsequent improvements in both a broader set of political rights and further improvements in civil liberties. These findings suggest that if one must emphasize one or the other as a precondition for further progress, the emphasis should be on civil liberties.

V. DEMOCRACY AND INCOME

We next ask whether this broader conceptualization of democracy's dimensions alters some of the recent findings in the literature on the determinants of democracy. We first turn to the strand of literature assessing the effects of aggregate income shocks on democracy, focusing on AJRY's finding that GDP per capita gains do not lead to subsequent improvements in political rights. We note that a number of other papers have examined the impacts of specific macroeconomic shocks, often those associated with temperature, rainfall, and terms of trade fluctuations (see, for example Burke and Leigh 2010 and Bruckner and Ciccone 2011). We focus on AJRY's specification as an illustrative case, recognizing that other income shocks may yield different results (in fact, we assess one of these cases in the next section).

Using civil liberties as a dependent variable extends the results in AJYR to this neglected but important dimension of democracy. Table 4 presents the main results of adding GDP per capita as an independent variable to the lagged values of the PR and CL measures in each equation. Just as before, we include year fixed effects in all of the regressions, and cluster standard errors by country.

For comparability with AJRY's results, we begin with pooled OLS regressions for PR and CL, i.e., dropping the country fixed effects (Column 1 is akin to the results AJRY display in their Table 2, Column 1). The results are displayed in Columns 1 and 2. We find that CL significantly increases subsequent PR as well as the other way around. In both regressions, we find that lagged GDP per capita is associated with higher levels of PR and CL (with comparable magnitudes), at least at the 5% level of significance.

Controlling for the endogeneity of GDP per capita eliminates its statistical association with both PR and CL. Columns 3 and 4 show the two stage least squares (2SLS) results using the double lag of the national savings rate as an instrument for lagged GDP per capita. Lagged GDP per capita is no longer statistically significant even at the 10% level in either regression. Furthermore, it has no effect on the roles of lagged CL and PR in determining current PR and CL. On the other hand, adding fixed effects (columns 5-8) has a dramatic impact on the role of lagged political rights. They no longer affect civil liberties and even their own persistence disappears using a 5% level of significance or using a 10% level after the endogeneity correction (column 7). Fixed effects also eliminate any effects of lagged GDP/POP on either dimension of democracy using a 5% level of significance. Moreover, the endogeneity correction eliminates the positive effect of GDP/POP on CL even at the 10% level of significance (column 8).

In sum, our results for political rights in Table 4 (columns 5 and 7) are comparable to AJRY's results in Table 5 (columns 3 and 5, respectively) and lead to the same conclusion with respect to

per capita income: it has no effect on democracy. Furthermore, our results for civil liberties (columns 6 and 8) corroborate this same result for this second dimension of democracy. On the other hand, with respect to lagged political rights, our results are dramatically different from the comparable results in AJRY: lagged political rights have no effect on either political rights or civil liberties. Moreover, lagged civil liberties exhibit strong persistence effects on both dimensions of democracy.

A number of robustness tests are reported in Table 5 to explore the sensitivity of these results to outliers, balanced panel issues, system estimation and dynamic panel bias. First, we estimate these relationships with a systems method, namely 3SLS. The results in Columns 1 and 2 correspond to the no fixed effects 2SLS results in Columns 3 and 4 of Table 4 and those in Columns 3 and 4 of Table 5 correspond to the fixed effects 2SLS results in columns 7 and 8 of Table 4. Concentrating on the latter comparison, the results are the same for GDP per capita and for civil liberties. They are also the same for political rights at the 1 % level of significance. At the 5% level, however, the own persistence of political rights cannot be rejected, although its magnitude remains substantially smaller than the effect of lagged civil liberties on current political rights.

Second, we also re-estimate Columns 5 and 6 of Table 4 (fixed effects OLS) with two different balanced panels (reported in Columns 5-8 of Table 5): one for the 1970-2000 period (Columns 5 and 6) and another for the 1980-2000 period (Columns 7 and 8). At the 1% level of significance, the substantive results are exactly the same as in Table 4. Furthermore, at any level of significance the substantive results are exactly the same for the second, most restrictive balanced panel (columns 7 and 8). For the first balanced panel (columns 5 and 6), however, lagged political rights exhibit persistence at the 5% level in explaining current political rights although the effect is substantially smaller than that of lagged civil liberties and GDP/POP has a positive effect on civil liberties at the 10% level of significance.

Third, we also drop outlier observations using the DFBeta test recommended in Kennedy (2008, Ch.20) and re-estimate Columns 5 and 6 of Table 4 (fixed effects OLS). The results, reported in Columns 9 and 10 of Table 5, are essentially the same. In addition, because the full distribution of national savings rates includes some very extreme values (a minimum of -243%, for example), we trim the sample based on the 5th and 95th percentiles of the national savings rates data and repeat the 2SLS estimation in columns 7 and 8 of Table 4 (fixed effects OLS). We find that the results are largely unchanged in this trimmed sample (Columns 11 and 12 of Table 5).

Finally, to ensure that dynamic panel bias does not drive our results, we re-estimate the OLS fixed effects specification (columns 5 and 6 of Table 4) using Arellano-Bond GMM, with 3-period lags of the levels as instruments for the first differences in the democracy variables. The results, displayed in Columns 13 and 14, are the same with respect to the democracy variables as we found in Table 3, Columns 7 and 8. Interestingly, while at the 1% level the results on GDP per capita are the same as before, at the 10 % level we find the surprising result that GDP per capita may negatively influence both political rights and civil liberties. The result for political rights is comparable in magnitude to what AJRY find using the same Arellano-Bond estimator (although in a slightly larger sample) i.e., see their Table 2 column 4. These negative effects led AJRY to conclude (p.823) that, "these IV results, therefore, show no evidence of a positive causal effect of income on democracy."

In conclusion, one of the main empirical findings in the recent economics literature is the rejection of the modernization hypothesis[7] when democracy is measured in terms of political rights, AJRY (2008, 2009). Our findings in this section confirm this result and extend it to the measurement of democracy in terms of civil liberties. Perhaps more importantly, our results show that lagged civil liberties play a positive, robust and substantial role in explaining both dimensions

[7] This hypothesis, suggesting a positive relation between democracy and income levels, was set out originally in the political science literature by Lipset (1959) and supported more recently by others, e.g., Huntington (1991).

of democracy while political rights play no role in explaining civil liberties and perhaps a positive but small and not very robust role in explaining political rights.

Other sources of economic shocks, however, may have different effects on these democratic dimensions, depending on their nature and patterns of spatial and intertemporal variability as suggested in our conceptual framework. We explore this possibility in the next section, where we consider the potential role of oil wealth shocks in driving changes in PR and CL.

VI. DEMOCRACY AND OIL

While the modernization hypothesis proposed a positive channel whereby progress in education and urbanization generates broad based income gains that help sustain competitive democratic processes, utilization of natural resources is generally seen as a hindrance rather than an aid to the emergence and consolidation of democracy. Natural resources that can generate large, concentrated rents can also become fertile ground for oligopolistic behavior, corruption, and conflict.

In a cross-country setting, the "natural resource curse" studied by Sachs and Warner (1999, 2001,) suggests that resource booms often slow economic development. Mehlum, Moene and Torvik (2006) find that the extent of this curse varies inversely with the initial institutional quality of the country. Tsui (2011) finds that changes in democracy (as measured by the Polity IV index) are negatively associated with oil discoveries, arguing that the incentives for dictators to monopolize the state are heightened when the state can control larger oil wealth. More generally, natural resource curse hypotheses rest on the idea that some natural resources that involve large fixed costs for extraction or utilization—like oil—can be effectively controlled and allocated by the state. Because the rents from this control can be highly concentrated, they can lead political leaders to limit government competition in order to protect these rents.

Authoritarian regimes experiencing positive income shocks associated with oil discoveries, for example, may face popular pressure to extend political and civil rights. Because extending political rights would be more likely to induce entry and competition for government—including competition over oil rents—these regimes may be more willing to relinquish control over civil rights than political ones. Thus, some regimes may improve civil liberties even as they curtail political ones.

Here we seek to ascertain the degree, if any, to which rents from natural resource wealth related to oil production lead to differential effects on PR and CL. Oil rents can be defined as *(price – cost) * production*. Either the quantity of oil production or the value of this production (or both) is likely to vary endogenously with changes in a given country's institutional setting. Use of data on the quantity of oil reserves as a proxy for oil rents in a panel of countries, mitigates this endogeneity, as changes in these reserves are primarily related to changes in discoveries and can thus be viewed as exogenous. We use oil reserves lagged three five-year periods (i.e., 15 years) because the lag between discovery and first production is often two to ten years long (Laherrere 2003). In addition, these longer lags are useful because we incorporate lagged values of the democracy dependent variables in our analyses. Finally, in our panel setting, we can control for period-specific effects through year fixed effects that are likely to account for changes in global oil prices that affect contemporaneous oil rents.

Tsui (2011) argues that total oil wealth rather than per capita wealth is the primary concern for political leaders aiming to monopolize control over the state, but we note that this need not be the case if the costs of limiting political entry are endogenously related to the size of the population. If an authoritarian regime must maintain military rule to limit political competition and maintain its monopoly over oil rents, the costs of maintaining and deploying the military are surely larger when

it must control a population of 50 million people than one of 5 million. It is therefore possible that PR and CL would respond to per capita rather than aggregate oil reserve measures.

Mention should also be made of another strand of literature that suggests oil reserves per capita as an independent variable: Namely, the strand focusing on the role of distributional factors in democratization processes. It suggests a positive impact on the stability of regimes for this variable on the basis of the following intuition: "...a given amount of revenue is less useful to regimes if it needs to be distributed among more people" (Morrison, 2009, p.117). The formal logic stems from extending the redistribution model of democratization in Acemoglou and Robinson (2006) to incorporate non-tax revenues through a variety of additional assumptions, Morrison (2007). In all the cases considered, non-tax revenues such as oil rents can act as a substitute for tax revenues, providing incentives and the wherewithal to relieve pressure from the class struggle over the tax rate. In our broader context this same mechanism allows regimes to devote resources to expanding political rights, civil liberties or both, depending on the predominance of other considerations in the objective function of power holders.

Finally, some writers have begun to investigate the effect of oil wealth on demographic outcomes such as population growth through its effects on fertility and migration, e.g., Cotet and Tsui (2010). The main finding in this literature is a positive association between oil wealth and population growth. Since the latter affects the age structure of the population, we consider two alternative specifications that control for the possible effects of changes in the age structure on political rights and civil liberties. One alternative is median age and the other is the share of the population in different age groups.

In sum, we use total oil reserves and oil reserves per capita as alternative primary independent variables in this section to see if the issue of which one is the relevant variable in the context of oil producing countries can be resolved empirically. In these specifications, we limit our

sample to oil producing countries (defined as those countries in which reserves are ever greater than 0). Our results are in Table 6. Columns 1-6 present the results of three different specifications using total oil reserves; columns 7-12 present the results of these same specifications using oil reserves per capita. The first specification is a baseline one, adding either total oil reserves (columns 1 and 2) or oil reserves per capita (columns 7 and 8) to the specification in Section IV; the second specification adds the age structure directly to each baseline and the third one adds instead a summary measure in the form of median age.

Notwithstanding the previous discussion, it must be emphasized that the most important result emerging from this table is a confirmation of our main result in the two previous sections. Namely, the most important and robust substantive result when oil wealth is a source of income, as in the case of these oil producing countries, continues to be the persistence effect of civil liberties on both dimensions of democracy captured by lagged civil liberties. This is the case for each specification in the table at the 1% level of significance and for the ones explaining the current levels of civil liberties at the .01% level. Lagged political rights, on the other hand, play no role in explaining either dimension of democracy in any specification (All its t-ratios are less than unity).

A second result that emerges from Table 6 is some evidence of a negative effect on both dimensions of democracy for total oil reserves. In columns 1, 2, 5, and 6, this effect is statistically significant at the 5% level. Notably, there is also some evidence of a positive effect for oil reserves per capita for civil liberties. In columns 8, 10 and 12 this effect is positive and statistically significant at the 10% level. Interestingly, the R^2 in the six comparable regressions in Table 6 is exactly the same regardless of which of these two variables is used as a primary independent variable. A non-nested J-test between the specifications in columns 5-6 and 11- 12 favors total oil reserves at the 5% level for both political rights and civil liberties and is inconclusive for civil

liberties at the 10% level. Thus, the evidence of an effect on democracy from a statistical point of view is somewhat stronger for total oil reserves.

Columns 3-4 and 9-10 add controls for the population age structure in each country in period t-1. In these columns, we include the shares of the population falling into the 0 - 15, 15 - 30, 30 - 45, and 45- 60 age groups (with the share over 60 years old serving as the excluded reference group). The greater the share of any group below the oldest group the lower the levels of political rights and civil liberties, but all effects are statistically insignificant at the 5% level and all but one even at the 10% level. The more parsimonious specification including only median age of the population in each country in period t-1 (columns 5- 6 and 11- 12) also shows a negative effect, which is not statistically significant at the 5 % level.

To ensure that our primary results are not due to particularly influential outlier countries or regions, we conduct a number of robustness checks in Table 7. First, we drop Venezuela, a country that has experienced swings in both political freedoms and oil wealth in recent years. The results (in Columns 1- 2 and 7-8) are largely unchanged compared to the relevant ones, namely columns 5- 6 and 11-12 of Table 6, respectively. We next conducted a DF Beta test to identify influential observations, finding that these observations are solely in Kuwait, Qatar and UAE. This suggests—perhaps not surprisingly—that our findings may be driven by the political experience and reserve trends in the Middle East. To test whether this is the case, we drop all Middle East and North African countries from our sample (Columns 3- 4 and 9-10). The results on lagged civil liberties and lagged political rights remain the same. On the other hand the weaker results on the other variables lose their statistical significance at both the 5% and 10% level. This is not surprising since in this experiment we lose almost 1/4 of the original observations. We also drop the ex-Soviet countries for which we imputed portions of the oil reserves time series. While our main results on lagged civil liberties and lagged political rights are not affected, there is a

differential effect on oil reserves per capita and total oil reserves. The former (columns 11-12) are hardy affected but the latter (columns 5-6) lose their statistical significance completely. Finally, as can be seen from Table 8, adding oil reserves per capita to specifications 5-6 in Table 6 does not alter the results.

VII. CONCLUSIONS

Summing up, our introduction of civil liberties as an intrinsic dimension democracy changes our perspective on the dynamic effects of democracy dramatically. While lagged political rights exhibit little persistence on current PR and have no effect on current CL, the latter have substantial persistent effects on current CL as well as on PR. Furthermore, these persistent effects of civil liberties are robust to a wide variety of alternative estimation techniques, choices of panel data sets and inclusion of a variety of controls. Interestingly, civil liberties exhibit two additional empirical properties which are the same as those exhibited by political rights as a dimension of democracy. First, the level of per capita income appears to have no effect on civil liberties once we adjust for reverse causation and/or country heterogeneity. Second, the political "natural resource curse" seems to operate as much on civil liberties as it does on political rights.

One important policy implication of our results is that in promoting democracy, emphasizing civil liberties generates dynamic gains through its persistent effects on future civil liberties and through its indirect effects on future political rights. Ironically, current efforts toward democracy promotion seem to focus at times exclusively on the promotion of political rights, often through free and fair elections. Indeed, in light of our results, neglecting civil liberties may be misguided even for those who find political rights of utmost importance!

What do our results imply for the substantial empirical literature on democracy?

Some writers argue that variables such as per capita income—while having no effect on democracy in the long-run—do affect democracy during periods of limited duration or for certain ranges of per capita income, e.g., Przeworski, Alvarez, Cheibub and Limongi (2000). It is unlikely that these ranges or the length of duration would be the same for both dimensions of democracy. Writers focusing on democratization in transition countries have emphasized political rights and the nature of structural reforms, for example this is the case in a thoughtful study by Haggard and Kaufman (2008). Recent events in Romania and Hungary, however, (two of the six countries covered in their analysis of Eastern Europe, Ch.8) suggest that a systematic examination of civil liberties in both countries might affect their evaluation of the interactions between political rights and social welfare in these countries. Finally, the literature on regime stability has concentrated on political rights in their definition of regimes, for example Morrison (2009). It is difficult to believe that the results in this literature would remain the same if their regime definition were to take place in terms of civil liberties or in a combination of both dimensions.

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Table 1: Summary Statistics

Panel A: Democracy and Income Sample

	CL	PR	Ln GDP per capita	Savings rate
N	890	890	890	849
Mean	0.51	0.51	8.49	15.28
SD	0.32	0.37	1.15	26.32
Min	0	0	5.03	-243.30
Max	1	1	11.31	85.74

Panel B: Democracy and Oil Sample

	CL	PR	Oil reserves (total)	Oil reserves (per capita)	Median age
N	847	847	847	847	847
Mean	0.50	0.51	82,495	0.18	22.65
SD	0.32	0.37	889,377	1.15	6.85
Min	0	0	0	0	14.4
Max	1	1	13,000,000	19.48	41.3

Table 2: Correlations

	PR	CL	Oil reserves, total	Oil reserves per capita	Ln GDP pc (PWT)	Median age	Savings rate
PR	1						
CL	0.917***	1					
Oil reserves, total	-0.0670	-0.0772*	1				
Oil reserves per capita	-0.108**	-0.0825*	-0.00810	1			
Ln GDP pc (PWT)	0.518***	0.551***	0.0357	0.294***	1		
Median age	0.549***	0.564***	0.129***	0.0324	0.733***	1	
Savings rate	0.179***	0.173***	0.0484	0.269***	0.380***	0.558***	1

* p<0.05, ** p<0.01, *** p<0.001. Correlations are pair-wise and use all available observations in which both variables are non-missing. The results are qualitatively similar when the sample is limited to the observations in which all variables are non-missing.

Table 3: Baseline

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Estimation	Baseline		Anderson-Hsiao IV		GMM		GMM, using 3-period lagged levels as instruments	
Dependent Variable	PR	CL	Δ PR (t - t-1)	Δ CL (t - t-1)	Δ PR (t - t-1)	Δ CL (t - t-1)	Δ PR (t - t-1)	Δ CL (t - t-1)
PR, t-1	0.117+	0.0501						
	(0.068)	(0.046)						
CL, t-1	0.384***	0.330***						
	(0.077)	(0.052)						
Δ PR, t-1 (t-1 - t-2)			0.287*	0.0733	0.263**	0.0811	0.131	0.0931
			(0.118)	(0.081)	(0.094)	(0.062)	(0.207)	(0.176)
Δ CL, t-1 (t-1 - t-2)			0.361**	0.482***	0.408***	0.456***	0.627**	0.511*
			(0.127)	(0.085)	(0.094)	(0.074)	(0.238)	(0.219)
Time FE	Y	Y	Y	Y	Y	Y	Y	Y
Country FE	Y	Y	N	N	N	N	N	N
Observations	890	890	740	740	740	740	740	740
R-squared	0.821	0.841						
p-values for…								
AR(2)					[0.141]	[0.022]		
AR(3)							[0.371]	[0.181]
Hansen J-test							[0.310]	[0.280]

Robust standard error clustered by country in parentheses

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1

Table 4: Democracy and Income

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	No FE				FE			
	OLS		2SLS		OLS		2SLS	
Dependent variable:	PR	CL	PR	CL	PR	CL	PR	CL
PR, t-1	0.468***	0.124**	0.453***	0.122***	0.116+	0.0469	0.100	0.0390
	(0.0572)	(0.0375)	(0.0561)	(0.0363)	(0.0677)	(0.0460)	(0.0712)	(0.0468)
CL, t-1	0.423***	0.674***	0.455***	0.705***	0.383***	0.328***	0.362***	0.311***
	(0.0590)	(0.0438)	(0.0594)	(0.0450)	(0.0766)	(0.0513)	(0.0800)	(0.0528)
Ln GDPpc, t-1	0.0217*	0.0275***	0.0128	0.00973	0.0253	0.0420+	0.187	0.0551
	(0.00846)	(0.00758)	(0.0115)	(0.00937)	(0.0292)	(0.0245)	(0.248)	(0.110)
Time FE	Y	Y	Y	Y	Y	Y	Y	Y
Country FE	N	N	N	N	Y	Y	Y	Y
Observations	890	890	849	849	890	890	849	849
R-squared	0.741	0.767	-	-	0.821	0.842	-	-

Robust standard error clustered by country in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.1

Table 5: Democracy and Income, Robustness Checks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Estimation	3SLS, No FE		3SLS, FE		OLS, Balanced Panel				OLS		2SLS		GMM	
Sample	Full sample				Only countries fully observed 1970-2000		Only countries fully observed 1980-2000		Dropping observations based on DFBeta		Dropping savings rate outliers		Full sample	
Dependent var.	PR	CL	PR	CL	PR	CL	PR	CL	PR	CL	PR	CL	PR	CL
PR, t-1	0.451***	0.117***	0.107*	0.0400	0.169*	0.0686	0.0411	0.0496	0.0954	0.0533	0.124+	0.0514	0.0917	0.0475
	(0.0431)	(0.0350)	(0.0450)	(0.0359)	(0.0728)	(0.0484)	(0.0705)	(0.0559)	(0.0713)	(0.0443)	(0.069)	(0.048)	(0.195)	(0.167)
CL, t-1	0.444***	0.678***	0.376***	0.313***	0.329***	0.312***	0.419***	0.274***	0.445***	0.358***	0.333***	0.311***	0.551*	0.487*
	(0.0521)	(0.0423)	(0.0560)	(0.0446)	(0.0798)	(0.0520)	(0.0885)	(0.0649)	(0.0767)	(0.0511)	(0.078)	(0.055)	(0.233)	(0.216)
Ln GDPpc, t-1	0.0141	0.0128	0.187	0.0550	0.0182	0.0451+	0.0309	0.0443	0.00735	0.0220	0.192	0.0491	-0.13+	-0.151*
	(0.0122)	(0.00998)	(0.139)	(0.108)	(0.0272)	(0.0245)	(0.0347)	(0.0322)	(0.0260)	(0.0202)	(0.258)	(0.114)	(0.070)	(0.059)
Country FE	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	849	849	849	849	744	744	732	732	826	836	819	819	726	726
R-squared					0.826	0.850	0.820	0.843	0.868	0.875				
p-value of…														
Hansen J-test													[0.495]	[0.785]
AR(3)													[0.370]	[0.216]

Table 6: Democracy and Oil

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Baseline			Adding demographics			Baseline			Adding demographics		
Dependent variable:	PR	CL	PR	CL	PR	CL	PR	CL	PR	CL	PR	CL
PR, t-1	0.0647	0.0144	0.0528	0.00990	0.0656	0.0171	0.0620	0.00865	0.0513	0.00597	0.0630	0.0117
	(0.103)	(0.057)	(0.107)	(0.056)	(0.104)	(0.058)	(0.103)	(0.056)	(0.107)	(0.055)	(0.104)	(0.057)
CL, t-1	0.398**	0.313***	0.384**	0.289***	0.394**	0.302***	0.400**	0.314***	0.385**	0.292***	0.396**	0.303***
	(0.117)	(0.067)	(0.125)	(0.073)	(0.120)	(0.068)	(0.117)	(0.067)	(0.124)	(0.072)	(0.120)	(0.068)
Total oil reserves, t-3	-4.28e-08*	-2.97e-08*	-1.63e-08	-2.00e-08	-4.40e-08*	-3.33e-08*						
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)						
Oil reserves per capita, t-3							0.00436	0.00680+	0.00241	0.00550+	0.00425	0.00646+
							(0.005)	(0.004)	(0.006)	(0.003)	(0.005)	(0.003)
% of population very young			-1.101	0.0508					-1.050	0.204		
t-1			(1.141)	(1.081)					(1.167)	(1.085)		
% of population young			-1.808	-0.611					-1.817	-0.578		
t-1			(1.427)	(1.237)					(1.403)	(1.211)		
% of population middle aged			-2.529+	-1.137					-2.454+	-0.920		
t-1			(1.323)	(1.199)					(1.407)	(1.214)		
% of population old			-1.477	-1.433					-1.356	-1.115		
t-1			(1.769)	(1.606)					(1.862)	(1.641)		
Median age of population					-0.00418	-0.0119+					-0.00377	-0.0114+
t-1					(0.008)	(0.007)					(0.008)	(0.007)
Country & Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	409	409	409	409	409	409	409	409	409	409	409	409
R-squared	0.834	0.858	0.838	0.862	0.834	0.860	0.834	0.858	0.838	0.862	0.834	0.860

Robust standard errors in parentheses *** p<0.001, ** p<0.01, * p<0.05, + p<0.1

Table 7: Democracy and Oil, Robustness Checks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Dropping Venezuela		Dropping Middle East		Drop ex-Soviet countries		Dropping Venezuela		Dropping Middle East		Drop ex-Soviet countries	
	PR	CL	PR	CL	PR	CL	PR	CL	PR	CL	PR	CL
PR, t-1	0.0663	0.0184	0.0239	-0.0266	0.0670	0.0123	0.0636	0.0130	0.0266	-0.0175	0.0684	0.00769
	(0.105)	(0.058)	(0.115)	(0.060)	(0.107)	(0.059)	(0.105)	(0.057)	(0.115)	(0.062)	(0.107)	(0.059)
CL, t-1	0.385**	0.291***	0.438**	0.347***	0.391**	0.306***	0.388**	0.293***	0.439**	0.336***	0.394**	0.307***
	(0.121)	(0.068)	(0.131)	(0.075)	(0.124)	(0.070)	(0.121)	(0.067)	(0.132)	(0.073)	(0.123)	(0.070)
Total oil reserves, t-3	-4.42e-08*	-3.30e-08*	-3.19e-08	-2.04e-08	-0.0376+	-0.0149						
	(0.000)	(0.000)	(0.000)	(0.000)	(0.021)	(0.018)						
Oil reserves per capita, t-3							0.00432	0.00651+	0.0404	0.252	0.00412	0.00644+
							(0.005)	(0.003)	(0.161)	(0.181)	(0.005)	(0.004)
Median pop age, t-1	-0.00414	-0.0115+	-0.00476	-0.0127	-0.00468	-0.0112	-0.00372	-0.0110	-0.00429	-0.0105	-0.00313	-0.0103
	(0.008)	(0.007)	(0.010)	(0.008)	(0.008)	(0.007)	(0.008)	(0.007)	(0.010)	(0.008)	(0.009)	(0.007)
Country Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	403	403	309	309	387	387	403	403	309	309	387	387
R-squared	0.833	0.863	0.815	0.843	0.831	0.860	0.833	0.864	0.815	0.845	0.829	0.861

Table 8: Resource curse?

	(1)	(2)	(3)	(4)
	PR	CL	PR	CL
PR, t-1	0.0656	0.0171	0.0612	0.0104
	(0.104)	(0.058)	(0.105)	(0.057)
CL, t-1	0.394**	0.302***	0.393**	0.301***
	(0.120)	(0.068)	(0.120)	(0.069)
Median pop age, t-1	-0.00418	-0.0119+	-0.00391	-0.0115+
	(0.008)	(0.007)	(0.008)	(0.007)
Total oil reserves, t-3	-4.40e-08*	-3.33e-08*	-4.38e-08*	-3.29e-08*
	(0.000)	(0.000)	(0.000)	(0.000)
Oil reserves per capita, t-3			0.00424	0.00645+
			(0.005)	(0.003)
Country Fixed Effects	Y	Y	Y	Y
Year Fixed Effects	Y	Y	Y	Y
Observations	409	409	409	409
R-squared	0.834	0.860	0.835	0.861

APPENDIX

Table A1: Replicating AJRY results in CL and PWT 6.3 Sample

	Replicate AJRY Table 2 Col 2 (OLS)			Replicate AJRY Table 5 Col 5 (2SLS)		
	AJRY Subsample	Subsample with CL data post-1970	Subsample with CL post-1970 using PWT 6.3 data	AJRY Subsample	Subsample with CL data post-1970	Subsample with CL post-1970 using PWT 6.3 data
	(1)	(2)	(3)	(4)	(5)	(6)
PR, t-1	0.379***	0.333***	0.342***	0.363***	0.336***	0.309***
	(0.0509)	(0.0644)	(0.0534)	(0.0563)	(0.0653)	(0.0642)
Ln GDPpc, t-1	0.0104	-0.0314	0.0289	-0.0205	-0.0867	0.177
	(0.0345)	(0.0472)	(0.0309)	(0.0814)	(0.101)	(0.259)
Country FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observations	945	718	890	891	691	849
R-squared	0.796	0.804	0.811	-	-	-

Countries in additional PWT 6.3 subsample:

Country	Number of observations added	Min year added	Max year added
Afghanistan	6	1975	2000
Albania	5	1975	1995
United Arab Emirates	5	1980	2000
Bulgaria	5	1975	1995
Bahrain	5	1980	2000
Bahamas	5	1980	2000
Bosnia and Herzegovina	1	2000	2000
Bhutan	6	1975	2000
Cuba	3	1975	1985
Djibouti	4	1985	2000
Eritrea	1	2000	2000
Estonia	1	1995	1995
Georgia	1	2000	2000
Grenada	1	1980	1980
Iraq	6	1975	2000
Cambodia	5	1975	1995
Kiribati	4	1985	2000
Kuwait	6	1975	2000
Lao PDR	6	1975	2000
Lebanon	4	1975	1990

Liberia	6	1975	2000
Libya	6	1975	2000
Maldives	6	1975	2000
Malta	5	1975	1995
Mongolia	6	1975	2000
Oman	6	1975	2000
Poland	2	1975	1980
Qatar	5	1980	2000
Russia	1	1995	1995
Saudi Arabia	6	1975	2000
Sudan	6	1975	2000
Solomon Islands	4	1985	2000
Somalia	6	1975	2000
Suriname	5	1980	2000
Swaziland	6	1975	2000
Tajikistan	1	2000	2000
Turkmenistan	1	2000	2000
Tonga	6	1975	2000
Vietnam	4	1975	1990
Vanuatu	4	1985	2000