Unequal Incomes, Ideology and Gridlock: How Rising Inequality Increases Political Polarization*

John Voorheis[†], Boris Shor[‡], and Nolan McCarty[§]

June 11, 2018

Abstract

Income inequality and political polarization have both increased dramatically in the United States over the last several decades. A small but growing literature has suggested that these two phenomena may be related and mutually reinforcing: income inequality leads to political polarization, and the gridlock induced by polarization reduces the ability of politicians to alleviate rising inequality. Scholars, however, have not credibly identified the causal relationships. Employing a simulated instrumental variables identification strategy with newly available data on polarization in state legislatures and state-level income inequality allows us to obtain the first credible causal estimates of the effect of inequality on political polarization within states. We find that rising income inequality has a large, positive and statistically significant effect on political polarization, and also moves state legislatures to the right overall. This suggests that the effect of income inequality impacts polarization by replacing moderate Democratic legislators with Republicans. We find further that the effect of income inequality systematically varies with the presence of binding pre-*Citizens United* limits on campaign expenditures, suggesting that institutional changes in campaign finance may be an important mechanism for this effect.

*This research was supported in part by a grant from the Washington Center for Equitable Growth. We thank Project Votesmart for access to NPAT survey data. The roll call data collection has been supported financially by the Laura and John Arnold Foundation, the Russell Sage Foundation, the Princeton University Woodrow Wilson School, the Robert Wood Johnson Scholars in Health Policy program, and NSF Grants SES-1059716 and SES-1060092. Special thanks are due to Michelle Anderson and Peter Koppstein for the data collection efforts. We also thank the following for exemplary research assistance: Steve Rogers, Michael Barber, and Chad Levinson. Party data for Nebraska is included thanks to Seth Masket, who generously provided the informal partisan affiliations for Unicameral legislators. We thank the Sunlight Foundation and the OpenStates project for providing public access to its roll call data for 2011-2014. We also thank seminar participants at Princeton, UC-Davis, and Stanford GSB.

[†]US Census Bureau; john.l.voorheis@census.gov

[‡]Department of Political Science, University of Houston; bshor@uh.edu

[§]Woodrow Wilson School, Princeton University; nmccarty@princeton.edu

1 Introduction

Political polarization is one of the most widely discussed transformations of the American political economy. The ideological distance between the two major political parties has risen substantially since the 1970s. This rise has coincided with a dramatic rise in income inequality over the same period. Because in the American system polarization tends towards gridlock and a decrease in legislative capacity, the rise in political polarization has been blamed for a decline in the ability of governments to respond to the observed increase in inequality. Thus polarization may contribute to the propagation of inequality over time, even as polarization may itself be partly caused by increases in inequality.

Previous analyses of the potential relationship between income inequality and political polarization have credibly identified causal effects in neither direction, despite the fact that there is a wealth of theory suggesting that there should be a causal relationship. Use of newly available data on state-level income inequality (Voorheis, 2016), state legislative political polarization (Shor and McCarty, 2011), and an under-utilized identification strategy (a variation of Boustan et al. 2013) allows us to identify the causal effect of state income inequality on state legislative political polarization.

We find that income inequality has a statistically significant, positive, and quantitatively large causal effect on political polarization. We also find evidence that within-state inequality has a roughly symmetric and statistically significant effect on the mean position of the Democratic and Republican parties. We extend the analysis to consider how income inequality affects the partisan balance of the legislature. We find that income inequality shifts the mean ideology within state legislatures to the right, and increases the share of seats held by Republicans. This is in turn consistent with the effect of income inequality on polarization working primarily through a composition effect, where moderate Democrats are replaced by Republicans, leaving behind a more liberal Democratic party.

We explore whether institutional changes in campaign finance might serve as a mechanism by which rising inequality increases polarization and moves legislatures to the right. We specifically focus on the *Citizens United v FEC* Supreme Court decision, which struck down federal and state-level restrictions on independent expenditures. By allowing the effect of income inequality on polarization to systematically vary depending on whether pre-*Citizens United* expenditure restrictions were in place, we can infer whether campaign finance is a causal channel from inequality to polarization. We find, consistent with this hypothesis, that in state-years with no expenditure restrictions there is a strong association between inequality and polarization and ideology, whereas in state-years with restrictions in place, there is no statistically significant relationship.

Section 2 briefly surveys the relevant literature on inequality and polarization. Section 3 describes our data and identification strategy for estimating causal effects of state-level income inequality on legislative polarization. We present and discuss our empirical results as well as a series of robustness checks, in Section 4. In section 5, we consider whether pre-*Citizens United* expenditure limits may have had a dampening effect on the link between inequality and polarization. We conclude with directions for future research and some potential policy implications.

2 Previous Literature

Scholars generally agree that the U.S. Congress has polarized significantly over the past several decades. Based on the most frequently used measures of congressional polarization, those derived from the DW-NOMINATE measures of congressional ideology (Poole and Rosenthal 1997), the recent rise in congressional polarization began in the mid-to-late 1970s.

The causes of rising polarization, however, remain far from certain. The literature has been far more successful in ruling out potential causes than for offering a well-supported causal story. Consider, for example, widely-held beliefs about how certain electoral institutions might produce legislative polarization. Many journalists and practitioners have argued that features such as gerrymandering, partisan primaries, and under-regulated campaign finance are important contributors to polarization. But little systematic evidence has been produced to support such claims. An important role for gerrymandering is undermined both by its inability to explain polarization in the US Senate and by more extensive quantitative analyses.[1] Arguments about the role of partisan primaries in the nomination of extreme candidates has also not fared well empirically. First, the timing is wrong. Primaries have tended to become more open to participation by independents as polarization has increased. Hirano et al. (2010) have studied the history of Senate primaries and find that the introduction of a primary had no effect on polarization in the Senate. They also refute a common corollary argument that primaries have become polarizing because turnout has fallen – it turns out primary turnout has always been low. Second, arguments about partisan or "closed" primaries have been rejected by statistical analyses. Using a panel of state legislative elections, McGhee et al. (2014) found no evidence that switching away from closed primaries reduced the level of polarization.

In contrast, there is growing evidence that at least some features of our campaign finance system may be connected to increasing polarization. Barber (2016) provides evidence that polarization has grown significantly less in states which limit individual campaign contributions bur more in states that limit contributions from corporations and labor unions. Similarly, La Raja and Schaffner (2015) find more polarization in states that limit the role of political parties in funding candidates as candidates in those states will be more reliant on ideological individuals and interest groups. Public financing of elections is more controversial, with Hall (2014) and Masket and Miller (2015) showing conflicting evidence on whether this policy reform ameliorates or exacerbates state level polarization.

Given the weak effects of electoral law on polarization, some scholars have sought to explore links between large scale economic and social change on polarization. A prominent set of hypotheses for rising polarization focuses on the coincident rise of income and wealth

[1]While Theriault (2008) reports small effects of redistricting on polarization, several studies find none. See Mann (2006); McCarty, Poole and Rosenthal (2006, 2009); and Masket, Winburn and Wright (2012).

inequality since the 1970s.[2] Not only have polarization and inequality risen in tandem over the past forty years, but their respective measures declined together during the first part of the 20th Century before leveling off after World War II. McCarty, Poole and Rosenthal (2006) were the first to observe a strong correlation between the time series for income inequality and political polarization over the long run.

While it may well be the case that inequality causes polarization, we must be concerned about reverse causality where polarized legislatures either produce policies that promote inequality or gridlock in ways that facilitate further growth of inequality. So any attempt to isolate the effects of inequality on polarization will have to account for such a policy/gridlock channel. The second issue with assessments based solely on national time series evidence are concerns about omitted variables. The 20th Century witnessed any number of large-scale social, political, and economic changes, including the rise and fall of large scale immigration; Great Depressions and Recessions; wars (popular and unpopular); civil rights movements for African-Americans, women, and other groups. Importantly, many of these trends covary with polarization and inequality or represent events at or near the inflection points in the two series. Thus, parsing out the specific contribution of inequality is difficult.[3]

Despite the challenges to identification faced by empirical analyses of the relationship between inequality and polarization, the observed correlation between inequality and polarization has been recognized as a "stylized fact" about the contemporary American political economy. A small but growing number of theoretical models seek to explain such a relationship. Recent examples include Ma (2014), Feddersen and Gul (2014), and Vlaicu (2016). One implication of the model by Feddersen and Gul (2014) is that income inequality simultaneously moves the median ideology of a legislature to the right while increasing political polarization. The primary mechanism for this link is the impact of inequality on campaign donor behavior.

[2] See Piketty and Saez 2003 and Piketty 2014.

[3] Of course, researchers who model the effect of inequality on polarization using only cross-sectional data (e.g. Garand 2010, Gelman, Kenworthy and Su 2010) have a similarly difficult task in attempting to identify causal effects.

Political polarization has been linked to a number of negative policy consequences. Polarization increases gridlock and reduces the ability of legislatures to enact policies (Binder, 2015) and to update statutory frameworks (Mettler 2016). This is especially salient for the political system in the United States, which requires legislation to pass through multiple veto points before it can be enacted as policy, a status-quo bias with potentially negative consequences in the faces of changing circumstances. Many states, too, require super-majorities for the passage of certain important bills (such as annual state budgets or tax increases). Polarization may thus serve as a mechanism for "political reinforcement" (Barth, Finseraas and Moene 2014). Increases in political polarization may then, in turn, reduce the capacity of legislators to (a) enact policies which might constrain further increases in inequality (e.g. increases in the minimum wage, strengthening union bargaining power), (b) engage in redistribution to directly reduce inequality in disposable incomes or (c) modernize and reform welfare state institutions (Hacker 2005). The positive feedback effect of income inequality on political polarization may thus lead to further increases in income inequality. The possibility of such a feedback loop—from inequality to polarization to further inequality—provides strong motivation for a careful study of these relationships, but also suggests very real empirical challenges for identifying causal effects at any given link in this chain.

The states provide an ideal observational setting for studying polarization due to the vast increase in statistical power inherent in studying the fifty states as opposed to a single Congress. Until recently, scholars have been unable to measure whether or not similar trends in polarization are present there, given a lack of roll call data and a method to measure ideology on a common scale. Shor and McCarty (2011), however, have recently developed measures of state legislator ideology which can be used to measure party positions and polarization over time for the fifty states.

3 Data and Identification Strategy

3.1 Inequality Data

Until very recently, reliable data on income inequality in the United States has been available only at the national level. It is difficult to measure income inequality at sub-national geographies due to censoring of individual incomes in the publicly available micro-data. Such individual-level income micro-data are available from two sources in the United States: tax returns and responses to Census Bureau surveys (chiefly the Current Population Survey or CPS). These data are either censored geographically for privacy purposes (as is the case with the public-use IRS files) or too sparsely distributed to produce credible estimates (as is the case for the CPS for geographies smaller than metropolitan areas). Additionally, the censoring of top incomes by the Census Bureau complicates estimation of inequality even for geographies that have adequate coverage (e.g. states and metropolitan statistical areas.)

Aside from these data quality issues, the different data sources are not equally suited to the calculation of different inequality measures. The IRS data are extremely rich but cover only the population of tax return filers, not the full population of income earners. Filing rates increase with income, so this means that the IRS data are ill-suited to make statements about the entire income distribution.[4] The IRS micro-data also describe a relatively limited definition of income—taxable income accruing to "tax units." Census Bureau micro-data, on the other hand, are nationally representative samples of the entire US population, not just tax filers. Census Bureau data are therefore better able to recover estimates of income inequality in the population of all income earners. Additionally, the Census Bureau micro-data contain rich detail about household structure and non-taxable income sources. It is then possible to use a definition of income (i.e. pre-tax, post-transfer, size-adjusted household income) that more closely aligns with potential consumption than does the income definition in the IRS

[4]For this reason the literature that utilizes IRS tax return data (e.g. Piketty and Saez 2003) focuses almost exclusively on top income shares as a measure of income inequality as opposed to indices such as the Gini, Theil and Atkinson which are sensitive to the entire distribution.

tax-return data.

A substantial literature has sought to leverage the conceptual advantages of using Census Bureau income data while addressing its chief drawback—censoring (by the Census Bureau) and under-reporting (by individual respondents) of top incomes. Voorheis (2016) is the first study to provide state-level data on income inequality using Census Bureau micro-data that addresses both censoring and potential under-reporting. This correction is performed by modeling the right tail of the income distribution as following a Generalized Beta II (GB2) distribution. Censored (top coded) incomes and incomes above the 97.5th percentile are replaced by draws from the fitted GB2 distribution in a multiple imputation process. Jenkins et al. (2011) show that this method can closely match inequality trends estimated using uncensored, confidential CPS data, and Voorheis (2016) shows that this method can match the levels and trends in state-level top income shares estimated using public-use IRS data. The Voorheis data set includes a number of measures of income inequality, although here we use only the Gini coefficient. These data are available from 1977 through 2016.

3.2 Polarization and Ideology Data

Empirical spatial models of roll-call votes have become commonplace in political science. These models assume that legislators have symmetric and single-peaked preferences along a latent dimension that is often interpreted as ideological. Under the assumption that legislators vote for their most preferred outcomes, statistical procedures can recover their most-preferred outcome or their *ideal point*. Intuitively, legislators who typically vote together will have ideal points that are close together, and legislators who rarely vote together will have ideal points that are far apart. However, ideal point measures of ideology are only comparable for legislators who vote on a common set of roll calls. This implies that ideology measures can be estimated only for a single legislative body.[5] Hence, it has been difficult to develop ideology measures for state legislators that are comparable across states, since

[5]Making comparisons over time is facilitated by the overlapping memberships of succeeding legislatures.

legislative agendas differ radically and there may be no common roll calls.

Shor and McCarty (2011) provide a solution to this problem, however, by using the Project Vote Smart National Political Awareness Test (NPAT), an annual survey of federal and state legislative candidates that has been fielded since the mid-1990s as a way to bridge across legislatures.[6] Using these data, it is possible to put all state legislators on a common scale, and hence to estimate ideology scores for state legislators which are comparable both over time and across states. The data contains estimates of individual legislator ideal points for the vast majority of legislators who held office from 1993-2016. These data are cross-sectional, providing a single average measure capturing the ideology of each legislator which is constant over the course of her legislative career. Consequently, changes in chamber-level ideology are generated only from legislator turnover, and not from changes in individual legislator ideology over time.[7] These data are aggregated to the state-chamber level to produce estimates of the mean ideal point of each party and the overall mean ideology for the chamber. We measure polarization as the difference between the mean ideal points of the Democratic and Republican parties within a legislative chamber.[8]

All states except Nebraska have bicameral legislatures, so we must aggregate scores from two chambers to obtain a state-level measure. We use a measure that averages the polarization measures from the two chambers in each state. Similarly, we use the average, across the two chambers, of the two Democratic and Republican party means to capture asymmetric polarization effects. Using other bicameral measures, such as those based on pooling legislators across chambers, does not meaningfully change our results.

To complement the two main state-level data sets, we obtain state-level demographic and

[6]The NPAT has subsequently been renamed the "Political Courage Test," although the survey methodology and questions remain the same. This survey has been used by other scholars to characterize candidate ideology. See, for example, Ansolabehere, Snyder and Stewart (2001*b*,*a*). More information about the survey is available at: `http://votesmart.org/about/political-courage-test`.

[7]The assumption that within-legislator movement is small is empirically well documented. See, for example, Poole (2007).

[8]We use means instead of the more commonly used medians as the former are more likely to capture changes at the extremes of the party distributions. Our models return qualitatively similar results with medians, however.

aggregate economic data from the CPS and Bureau of Economic Analysis (BEA) National Income and Product Accounts (NIPA) tables. These measures include population density, state real personal income, racial composition (the proportions of black and Hispanic residents), education (proportion of the population with a college degree), poverty rates, median income, median age, the proportion of the population under 25 and over 55, and union membership rates. In all, our data covers state-level inequality, state-level polarization, and state demographics for the period of 1993 to 2016.[9]

3.3 Identification Strategy and Empirical Model

Our basic model is

$$Polar_{i,t} = \alpha + \beta INEQ_{i,t} + \gamma X_{i,t} + \epsilon_{i,t} \tag{1}$$

where $X_{i,t}$ is a vector of time-varying state-specific covariates. Let the error term be described by

$$\epsilon_{i,t} = \alpha_i + e_{i,t} \tag{2}$$

where α_i is a state-specific component, and $e_{i,t}$ is the remaining state-year error. Then we control for any unobserved but non-time-varying heterogeneity by transforming equation 1 into a first-difference model:

$$\Delta Polar_{i,t} = \beta_{OLS} \Delta INEQ_{i,t} + \gamma \Delta X_{i,t} + \Delta e_{i,t} \tag{3}$$

If there are time-period-specific shocks that affect all states, so that the error term is described instead by:

$$\epsilon_{i,t} = \alpha_i + \alpha_t + e_{i,t} \tag{4}$$

[9]The number of observations (889) is less than 1150 (50 states for 23 years) because of missing observations for ideology and polarization for some states in some years. Missing values occur when a state does not make roll call vote data available for a particular year. We treat these instances as missing-at-random.

then we might control for unobserved state- and time-specific heterogeneity by estimating a model with state and year fixed effects:

$$Polar_{i,t} = \alpha_i + \alpha_t + \beta_{OLS} INEQ_{i,t} + \gamma X_{i,t} + e_{i,t} \tag{5}$$

Note, however, that estimating either equation 3 or equation 5 via OLS will not generally recover the true effect of income inequality on polarization, since there is likely time-varying endogeneity between income inequality and political polarization.

There are three sources of endogeneity bias that may occur. First, there could be non-random locational sorting of households into more-polarized or less-polarized states based on income. If this locational sorting does vary systematically with income, polarization may mechanically affect state-level income distributions. The direction of this effect is uncertain, however. Whether this process increases or decreases measured inequality over time depends on the relative sizes of the flows at the bottom and top of the income distribution. Second, the causal effect could work in the other direction. More-polarized legislatures, compared to less-polarized legislatures, may enact (or fail to enact) policies that affect the income distribution (either increasing or decreasing inequality). However, such policy effects may be less important in practice at the state level, since almost all tax-and-transfer redistribution occurs at the federal level. Finally, there may be measurement error bias if income inequality is mismeasured. If any of these effects are present, then the apparent effect of income inequality on polarization revealed by estimating either equation 3 or equation 5 via OLS will be biased. The direction of the bias is uncertain, however. Policy effects will inflate the estimates, measurement error will bias estimates towards zero, and the net direction of any locational sorting bias is uncertain.

We propose an instrumental variables estimation strategy that is robust to all three sources of bias outlined above. We adapt an instrument proposed by Boustan et al. (2013) and use the GB2 multiple imputation approach from Voorheis (2016) to address censoring and under-reporting in the micro-data. The instrument is constructed by "freezing" the baseline income distribution in each state at some initial year, and then simulating the income distributions for each subsequent year based on nationwide trends in income growth at each decile. This instrument is one example of so-called "Bartik-style" instruments.[10] The identifying variation in this type of instrument comes from the cross-sectional variation in the initial level of income inequality across states. The identifying assumption of this simulated instrumental variables strategy thus amounts to an assertion that the initial level of income inequality is unrelated to subsequent changes in the outcome variable (in our case, political polarization or other measures of ideology).

We construct our instrument as follows. We select the 1990 income distribution as the baseline for each state.[11] We estimate average incomes for each decile in this initial year, using the previously mentioned GB2 imputation method. We estimate the growth rates of the average incomes of each decile of the *nationwide* income distribution for each year from 1990 through the end of our estimating sample (2016), again using the GB2 imputation method to calculate average decile incomes for each year.

We then simulate state-level income distributions for each year between 1993 and 2016 as follows. We assign each state decile in the initial year to the matching nationwide decile. We then simulate state-level income distributions for each year by assuming each state decile grows at the matching nationwide decile's growth rate for that year. Finally, we construct our instrument for income inequality by calculating the Gini coefficient using the simulated decile incomes in each year.

Using the simulated Gini instrument, we can then estimate the effect of income inequality on polarization by two-stage least squares. In our preferred specification, we estimate a model

[10]Baum-Snow and Ferreira (2015) summarizes the theory and practice of using Bartik-style instruments in a variety of settings.

[11]We have also experimented with other years in the range 1988-1992. We settle on 1990 as the baseline year since it produces the strongest instrument (i.e. the instrument with the largest first-stage F-test statistic). Table A4 illustrates that using different starting years in the calculation of the simulated instrument does not meaningfully change the point estimates of the main result.

in first-differences with state-specific trends.[12]

$$\text{First Stage: } \Delta Ineq_{i,t} = \alpha_i \times t + \theta \Delta Pred\_Ineq_{i,t} + \Gamma \Delta X_{i,t} + \nu_{i,t} \tag{6}$$

$$\text{Second Stage: } \Delta Polar_{i,t} = \alpha_i \times t + \beta_{2SLS} \widehat{\Delta Ineq}_{i,t} + \gamma \Delta X_{i,t} + e_{i,t} \tag{7}$$

We also estimate models with state and year fixed effects as a robustness check:

$$\text{First Stage: } Ineq_{i,t} = \delta_i + \delta_t + \theta Pred\_Ineq_{i,t} + \Gamma X_{i,t} + \nu_{i,t} \tag{8}$$

$$\text{Second Stage: } Polar_{i,t} = \alpha_i + \alpha_t + \beta_{2SLS} \widehat{Ineq}_{i,t} + \gamma X_{i,t} + \epsilon_{i,t} \tag{9}$$

We can interpret β_{2SLS} as the causal effect of income inequality on polarization. X_{it} is a vector of time-varying covariates, including state real personal income, the proportion of the state's population that is black or Hispanic, log median income, the proportion of the population with a college degree, population density, the unemployment rate, median age, the proportion of the population over 55 years of age, the proportion of the population under 25 years of age, and the unionization rate. We additionally include the proportion of total state legislators (upper and lower chambers) representing majority-minority districts.[13] This is an important potential confounder, since these districts are both more common in states with high levels of inequality, and are more likely to elect Democrats to the left of the party median.

Our identification strategy requires that our instrument affects inequality (i.e. instrument relevance) and affects polarization only through its effect on actual income inequality (i.e. the exclusion restriction). Instrument relevance can be directly tested by performing inference on the first stage regression. Figure A1 shows a scatter plot of the calculated Gini coefficient

[12] The state-specific trends capture the well-known fact that both polarization and inequality are trending upward. We do not, however, want to impose a uniform trend. In this regard our design is very conservative in that it exploits neither cross-state variation in the levels or trends in polarization and inequality.

[13] We define a district as majority-minority if the proportion of total population who are black or Hispanic is greater than 50%.

for the actual data against the simulated Gini instrument, and Table A3 shows the first stage estimation results. The first-stage F-test statistic is well above the rule-of-thumb cutoff of ten, and the first-stage coefficient on the instrument is statistically significant and positive, as expected. Note that the first-stage F-test statistic is slightly below the usual cutoff in the fixed effects specification without state-specific trends.[14]

Our instrument is, by design, uncorrelated with any within-state variation over time in political polarization or legislative ideology except through its effect on within-state variation in income inequality. As noted above, the identifying assumption of our empirical strategy amounts to an assumption that initial state income inequality is unrelated to future changes in political polarization. This assumption is directly testable. Figure A3 shows scatterplots comparing initial income inequality to subsequent year-to-year changes in the four main outcome variables (polarization, average chamber ideology, average Democratic ideology and average Republican ideology). In all cases, the slope of the line of best fit is close to zero (formally, the slope is not statistically significantly different from zero at conventional levels). Thus we argue that the identifying assumption of our simulated instrumental variables identification strategy is satisfied, and hence β_{2SLS} can thus be interpreted as the causal effect of income inequality on political polarization (or other measures of ideology).

4 Empirical Results

4.1 Aggregate State Polarization

We first consider the effect of inequality on state-level polarization, measured by the distance between the mean ideal points of the Democratic and Republican parties. We then disaggregate this effect by examining the influence of inequality on each of the two separate party means. Income inequality may also affect the overall average ideology of the legislature in addition to the distance between parties. We thus consider how inequality might

[14] Since the model is exactly identified, this should not cause too much concern (Angrist and Pishke 2009).

affect the overall mean ideal points of legislative chambers within each state, as well as the partisan balance of legislative chambers, as measured by the proportion of seats held by Republicans in each chamber. As noted earlier, we aggregate across upper and lower state legislative chambers to arrive at single numbers for political polarization and ideology within each state. Table 1 demonstrates the aggregation process using data from California in 2000 as an example.

Table 1: Aggregating Polarization Across Chambers (California, 2000)

	Lower Chamber	Upper Chamber	State Average
Rep Mean	1.25	1.27	1.26
Dem Mean	-1.39	-1.36	-1.37
Polarization	2.64	2.63	2.63

Table 2 presents our first main result, showing the effect of income inequality on state polarization using a variety of first difference specifications. The top panel shows the results from our IV model, while the bottom panel shows the results from a naive OLS specification. There are five columns in this table of results (similarly with subsequent tables). The first column reports a model with no other covariates aside from the state-level Gini coefficient. The second column reports results from a model that controls for election-year effects, since we expect large changes in polarization in years immediately after regular legislative elections. The third column adds time-varying sociodemographic and economic controls. The fourth and fifth columns include time-varying controls and state-specific linear trends, without election-year controls in the fourth column, and with election-year controls in the fifth column. Each model reports standard errors clustered at the state level to account for arbitrary serial correlation in polarization within states.

The IV point estimates for each specification are larger in absolute value than the OLS estimates, and more precisely estimated. Our preferred first-differences specification includes state-specific linear trends, as in column 4. Using this specification, the effect of inequality on polarization is positive and statistically significant at conventional levels. To contextualize the effect size reported in column 4 (1.086), a one-standard-deviation (0.032) greater change

Table 2: Effect of Income Inequality on State Legislative Polarization

	(1)	(2)	(3)	(4)	(5)
IV Results: Gini	1.123***	0.582***	0.596***	1.086***	0.526**
	(0.254)	(0.209)	(0.215)	(0.268)	(0.216)
OLS Results: Gini	0.113	0.064	0.065	0.138	0.069
	(0.090)	(0.083)	(0.073)	(0.086)	(0.074)
Observations	942	942	942	942	942
Election-year Dummies?	No	No	Yes	No	Yes
Other Controls?	No	Yes	Yes	Yes	Yes
Linear Trend?	No	No	No	Yes	Yes
First Stage F	110.24	100.43	79.48	86.73	75.13

in state income inequality would correspond to a change in polarization that is larger by 0.035. The average *annual* change in state polarization is 0.021 while the average cumulative change in polarization across states over 1993-2016 is about 0.41.

4.2 Party Means

Our main result suggests that income inequality increases the distance between the median ideology of the two main political parties within state legislatures. This effect could occur in a number of different ways. Income inequality might move both parties symmetrically away from the political center. Alternately, the effect may be asymmetric, where one party becomes more extreme at a faster rate than the other. To differentiate between these possibilities, we estimate models using the mean ideology of each state party as the dependent variable. By convention, positive values on the ideology scale reflect right-of-center positions and negative values reflect positions that are left of center. A positive coefficient estimate, therefore, implies that inequality moves the party median to the right and a negative estimated effect implies that inequality moves the party median to the left. If income inequality moves both parties symmetrically away from the center, we would expect a positive estimated effect on Republican party mean ideology and a negative estimated effect on the Democratic party mean of roughly the same absolute magnitude. On the other hand, if there is an asymmetric effect, then the estimated effect of inequality on ideology for one party will be substantially larger in absolute value.

Table 3 reports the key parameter estimates for the effect of income inequality on Democratic Party mean ideology from first difference models (the specifications in each column mirror those in Table 2). Essentially identical patterns of relative effect sizes and statistical significance emerge as in the aggregate polarization case. The OLS estimates of the key parameters appear to be small and insignificant, while the estimated effects in the IV model are statistically different from zero at the 5% significance level and substantively meaningful. As expected, the sign of the coefficient is negative which implies that income inequality moves the Democratic party mean to the left. The point estimates suggest that a one-standard-deviation (3.2 Gini points) increase in inequality moves the Democratic party mean to the left by 0.017, using the IV estimate in column 4. The average *cumulative* change in Democratic party means over 1993-2016 is -0.2.

Table 4 reports results from first-difference models using the mean ideology of state-level Republican parties as a dependent variable. The IV point estimates of the effect sizes are larger in magnitude than the OLS effect sizes for all specifications and sample. In the preferred specification (column 4) the Republican and Democratic effects are of roughly the same magnitude. As above, a one-standard-deviation increase in income inequality moves the Republican party mean to the right by 0.018 annually. The average *cumulative* change in Republican party means over 1993-2016 is 0.21.

Table 3: Effect of Income Inequality on Democratic Party Ideology

	(1)	(2)	(3)	(4)	(5)
IV Results: Gini	-0.517^{***}	-0.281^{***}	-0.333^{**}	-0.530^{***}	-0.289^{**}
	(0.131)	(0.098)	(0.136)	(0.162)	(0.134)
OLS Results: Gini	-0.038	-0.017	-0.027	-0.057	-0.027
	(0.037)	(0.037)	(0.042)	(0.044)	(0.044)
Observations	942	942	942	942	942
Election-year Dummies?	No	No	Yes	No	Yes
Other Controls?	No	Yes	Yes	Yes	Yes
Linear Trend?	No	No	No	Yes	Yes
First Stage F	110.24	100.43	79.48	86.73	75.13

Table 4: Effect of Income Inequality on Republican Party Ideology

	(1)	(2)	(3)	(4)	(5)
IV Results: Gini	0.606^{***}	0.301^{*}	0.263^{*}	0.556^{***}	0.238^{*}
	(0.198)	(0.176)	(0.136)	(0.170)	(0.143)
OLS Results: Gini	0.075	0.048	0.038	0.081	0.042
	(0.074)	(0.068)	(0.053)	(0.063)	(0.054)
Observations	942	942	942	942	942
Election-year Dummies?	No	No	Yes	No	Yes
Other Controls?	No	Yes	Yes	Yes	Yes
Linear Trend?	No	No	No	Yes	Yes
First Stage F	110.24	100.43	79.48	86.73	75.13

4.3 Chamber Means and Partisanship

Income inequality appears to affect the mean ideology of parties, and the ideological distance between them. But inequality might also affect the average ideology around which this polarization is occurring. Hence we next assess the extent to which income inequality affects the mean ideology of the entire legislature. To this end we estimate models using the previous specifications, using the state mean ideology as a dependent variable. State mean ideology is calculated as the average across chambers of the mean ideology score within each chamber, for each state in each year. Table 5 reports estimates for these models. The effects are statistically significant for all alternate specifications. The point estimates of the effect of income inequality on state median ideology are much larger in size than the effect of inequality on polarization (shown in Table 2), and are much more stable across specifications than previous results. The evidence that rising income inequality moves chamber means to the right is strong.

Table 5: Effect of Income Inequality on Average Chamber Ideology

		(1)	(2)	(3)	(4)	(5)
IV Results:	Gini	1.206***	1.123***	1.269***	1.267***	1.223***
		(0.276)	(0.264)	(0.313)	(0.328)	(0.319)
OLS Results:	Gini	0.042	0.029	0.017	0.048	0.030
		(0.048)	(0.047)	(0.050)	(0.052)	(0.051)
Observations		942	942	942	942	942
Election-year Dummies?		No	No	Yes	No	Yes
Other Controls?		No	Yes	Yes	Yes	Yes
Linear Trend?		No	No	No	Yes	Yes
First Stage F		110.24	100.43	79.48	86.73	75.13

That income inequality causes the median ideology of state legislative chambers to move to the right may result from three mechanisms. This effect might be the consequence of inequality causing (a) both parties to move to the right, (b) the Republicans to move to the right more than the Democrats move to the left or (c) changes in the partisan balance of the legislature where more Republicans are elected, replacing Democrats. Possibility (a) is ruled out by the previous results where we find that inequality moves Democrats to the *left*. Similarly, possibility (b) is undermined by the rough symmetry of the partisan effects. So we explore the possibility that income inequality changes the partisan balance of legislatures by increasing the proportion of seats held by Republicans. We estimate similar models as in the previous analysis, this time using the proportion of seats in state legislatures held by Republicans as the outcome variable. Table 6 summarizes the results of this analysis. Here the results are broadly in line with the results from Table 5—income inequality increases the *share* of seats held by Republicans, often substantially. The estimate of the effect in the model that includes state-specific trends as well as election-year dummies and all covariates is 0.811. This estimate implies that a one-standard-deviation increase in income inequality increases the Republican seat share in a state legislature by 2.6 percentage points.

4.4 Party Quantiles and Extremism

One result which has remained constant through a variety of specifications and estimating samples is the seeming symmetry between the effect of income inequality on the ideologies of the two parties. Income inequality appears to move Democrats to the left and Republicans to the right. There is also evidence that inequality moves the overall ideology of the legislature to the right. To further investigate these two results, we consider the effect of income inequality on quantiles of the ideology distribution within each party. Because the ideal point scores are ordered by conservatism, the "moderate" wing of the Democratic party is captured by the right tail of the ideology distribution (e.g. the 90th quantile), while the moderate wing of the Republican party is captured by the left tail (e.g the 10th quantile), and the opposite is true for the "extreme" wings of each party.

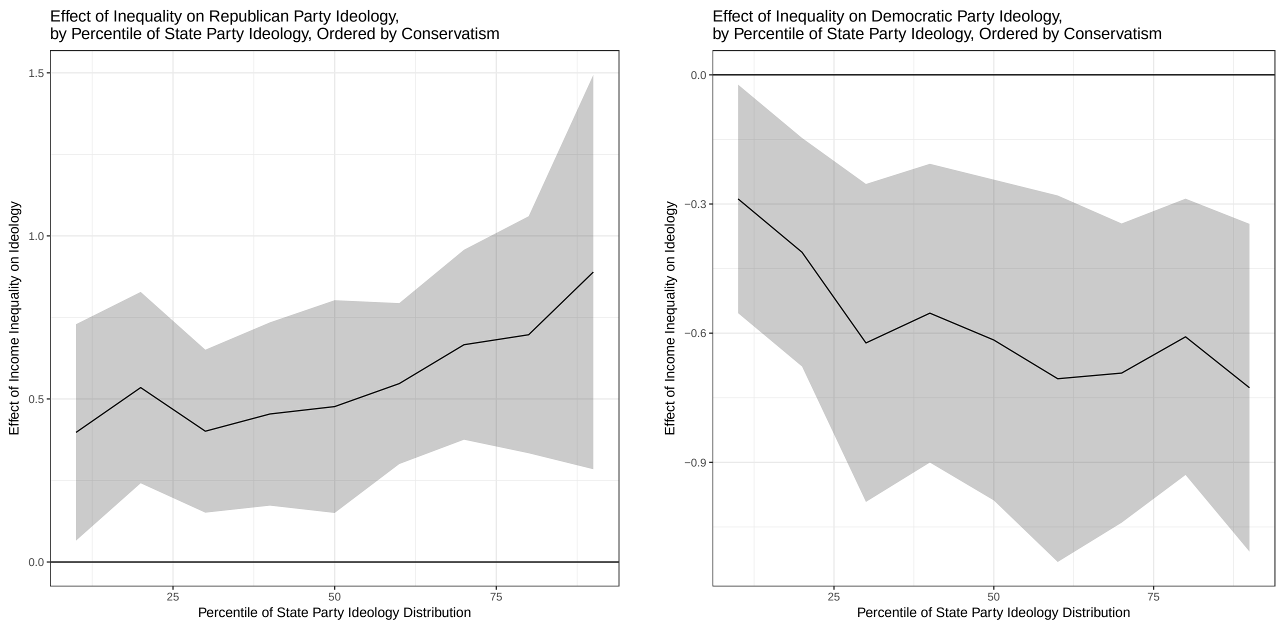
Table 6: Effect of Income Inequality on Republican Seat Share

		(1)	(2)	(3)	(4)	(5)
IV Results:	Gini	0.806***	0.774***	0.843***	0.824***	0.811***
		(0.161)	(0.153)	(0.185)	(0.192)	(0.189)
OLS Results:	Gini	0.054*	0.048	0.031	0.046	0.036
		(0.032)	(0.032)	(0.034)	(0.035)	(0.034)
Observations		942	942	942	942	942
Election-year Dummies?		No	No	Yes	No	Yes
Other Controls?		No	Yes	Yes	Yes	Yes
Linear Trend?		No	No	No	Yes	Yes
First Stage F		110.24	100.43	79.48	86.73	75.13

Figure 1 summarizes the effect of inequality from models estimated using different quantiles of the party ideology distribution as dependent variables, using our preferred specification. Two striking features are immediately apparent: first, the effect of income inequality on ideology increases with conservatism. This is to say, the effect of inequality is largest for the most conservative (i.e. extreme) wing of Republican parties, and for the most conservative (i.e. moderate) wing of the Democratic parties. In other words, rising income inequality appears to move the extreme wing of the Republican party further to the right, while moving the moderate wing of the Democratic party further to the left.

Since the ideal point ideology scores are fixed over time for any individual legislator, the only way that aggregate measures of state polarization can change over time is through the replacement of legislators (either in a normal election, or via retirement, death or party defection). This fact can be used to rationalize the results on the effect of income inequality on the various aggregate state measures of ideology and political polarization. Rising income inequality moves Republican parties to the right on average (especially for extreme Repub-

Figure 1: Effect of Income Inequality on Party Quantiles (Ordered by Conservatism)



licans), and Democratic parties to the left on average (especially for moderate Democrats), but in a way that increases both the overall conservatism and the share of seats held by Republicans. If these outcomes can only change due to legislator replacement, these results are all strongly suggestive of an effect of income inequality that works through the replacement of moderate Democrats with more extreme Republicans, leaving behind a more liberal moderate wing of the Democratic party (because the most moderate Democrats were defeated), and a more extreme Republican party (because the newly elected Republican legislators are more conservative.)

4.5 Mechanisms: ***Citizens United*** and Campaign Finance

One potential mechanism through which rising income inequality might affect the distribution of legislator ideology is through campaign finance, as in Feddersen and Gul (2014). We can explore this potential mechanism by exploiting variation in state-level restrictions on independent campaign expenditures (IE) which were overturned by the *Citizens United* (CU) ruling in 2010. These pre-CU restrictions may have effectively cut off the effect of inequality on polarization and ideology by reducing the ability of top income earners to transfer resources to their preferred candidates. We test for the presence of this mechanism by allowing the effect of income inequality to vary systematically with the presence of a pre-CU expenditure restriction. For more details on the pre-CU expenditure restrictions, see Spencer and Wood (2014) and Klumpp, Mialon and Williams (2016).

Let $LIM_{i,t} = 1$ if a pre-CU expenditure limit was in place in state i in year t and zero otherwise. Table A5 lists the state-years for which this condition is true. To allow the effect of income inequality to vary systemically with the presence of these expenditure restrictions, we then estimate a series of two stage least squares models which modify the preferred specifications above to allow for the effect of income inequality to vary depending on whether a pre-Citizen's United campaign finance restriction was in place:

$$\begin{aligned}
\text{First Stage 1: } & \Delta Ineq_{i,t} = \alpha_i \times t + \theta_1 \Delta Pred_Ineq_{i,t} + \theta_2 \Delta Pred_Ineq_{i,t} \times LIM_{i,t} + \\
& \theta_3 LIM_{i,t} + \Gamma \Delta X_{i,t} + \nu_{i,t} \\
\text{First Stage 2: } & \Delta Ineq_{i,t} \times LIM_{i,t} = \alpha_i \times t + \theta_1 \Delta Pred_Ineq_{i,t} + \theta_2 \Delta Pred_Ineq_{i,t} \times LIM_{i,t} + \\
& \theta_3 LIM_{i,t} + \Gamma \Delta X_{i,t} + \nu_{i,t}
\end{aligned}$$

$$\Delta Polar_{it} = \alpha_i t + \beta_1 \Delta \widehat{Ineq}_{it} + \beta_2 \Delta Ineq\widehat{_{i,t} \times L}IM_{i,t} + \beta_3 LIM_{it} + \gamma \Delta X_{it} + e_{it}$$

Where we instrument separately for $Gini$ and $Gini \times LIM$. The effect of inequality on polarization (or another measure of ideology) when expenditure restrictions are binding is $\beta_1 + \beta_2$, and when restrictions are not binding is β_1. If $\beta_1 > 0$ and $\beta_1 + \beta_2 = 0$ this suggests that expenditure restrictions fully interrupt the campaign finance mechanism through which inequality affects polarization, while as long as $|\beta_1 + \beta_2| < |\beta_1|$, there is evidence that expenditure limitations are at least partially interrupting the campaign finance mechanism.

Tables 7-10 summarize the estimation results of several models which allow for this heterogeneity of the effect of income inequality based on whether a pre-*Citizens United* expenditure restriction was in effect. Each table refers to the results of models using, respectively, political polarization, Republican party mean ideology, Democratic party mean ideology and chamber mean ideology as outcome variables. Each table is ordered in the same manner as previous tables (e.g. Table 2), with the first column referring to a model with no covariates, the second with election-year dummies but no controls, the third with election-year dummies and controls, the fourth with controls and state trends, and the fifth with election dummies, controls, and state trends.

Table 7: Effect of Income Inequality on Polarization, by IE Effect

	(1)	(2)	(3)	(4)	(5)
IV Results: Gini	1.621***	0.996***	1.052***	1.631***	0.935***
	(0.411)	(0.321)	(0.295)	(0.423)	(0.287)
IE × Gini	−1.173**	−1.017**	−1.021**	−1.093**	−0.905**
	(0.520)	(0.441)	(0.433)	(0.527)	(0.440)
OLS Results: Gini	0.111	0.093	0.083	0.129	0.085
	(0.116)	(0.106)	(0.089)	(0.105)	(0.091)
IE × Gini	−0.005	−0.097	−0.056	0.002	−0.060
	(0.199)	(0.186)	(0.183)	(0.197)	(0.187)
Observations	942	942	942	942	942
Election-year Dummies?	No	No	Yes	No	Yes
Other Controls?	No	Yes	Yes	Yes	Yes
Linear Trend?	No	No	No	Yes	Yes
$Gini + IE \times Gini$	0.45	-0.02	0.03	0.54	0.03
P($Gini + IE \times Gini$)=0	0.08	0.47	0.46	0	0.46
First Stage F	57.96	52.84	42.46	45.23	38.67

Table 7, which reports the effect of inequality on polarization by varying by LIM_{it}, strongly supports a campaign finance mechanism. In all specifications, the effect of income inequality on polarization is positive and statistically significant when there are no pre-*Citizens United* limitations on campaign expenditures (i.e. $\beta_1 > 0$), but in most specifications, the effect of income inequality on polarization is not statistically different from zero when these limitations are in effect.

Table 8: Effect of Income Inequality on Republican Party Ideology, by IE Effect

	(1)	(2)	(3)	(4)	(5)
IV Results: Gini	0.998***	0.640**	0.621***	0.944***	0.571***
	(0.336)	(0.287)	(0.197)	(0.282)	(0.200)
IE × Gini	−0.856**	−0.766**	−0.754**	−0.779**	−0.683**
	(0.384)	(0.347)	(0.295)	(0.347)	(0.299)
OLS Results: Gini	0.102	0.092	0.068	0.097	0.072
	(0.103)	(0.097)	(0.075)	(0.086)	(0.077)
IE × Gini	−0.087	−0.138	−0.088	−0.052	−0.088
	(0.130)	(0.124)	(0.113)	(0.122)	(0.115)
Observations	942	942	942	942	942
Election-year Dummies?	No	No	Yes	No	Yes
Other Controls?	No	Yes	Yes	Yes	Yes
Linear Trend?	No	No	No	Yes	Yes
$Gini + IE \times Gini$	0.14	-0.13	-0.13	0.16	-0.11
P($Gini + IE \times Gini$)=0	0.23	0.26	0.27	0	0.31
First Stage F	57.96	52.84	42.46	45.23	38.67

The evidence for the campaign finance mechanism on the Republican party position is also very clear. Across all specifications in Table 8, there is little or no effect of inquality on polarization in states with an independent expenditure limitation. The effects of expenditure limitations are weaker for the Democrats, however. In Table 9, all of the interactions between inequality and expenditure limitaitons are positive, indicating a dampening of polarization in limitation states. But none of the coefficients reaches conventional levels of statistical significance. One way to interpret the weaker findings for Democrats is that expenditure limitations may bind both on left-wing and moderate Democratic donors.

Table 9: Effect of Income Inequality on Democratic Party Ideology, by IE Effect

	(1)	(2)	(3)	(4)	(5)
IV Results: Gini	−0.624***	−0.356**	−0.431**	−0.687***	−0.363**
	(0.190)	(0.149)	(0.180)	(0.221)	(0.171)
IE × Gini	0.318	0.251	0.267	0.314	0.221
	(0.285)	(0.259)	(0.264)	(0.296)	(0.271)
OLS Results: Gini	−0.009	−0.001	−0.015	−0.033	−0.014
	(0.034)	(0.034)	(0.045)	(0.047)	(0.046)
IE × Gini	−0.081	−0.042	−0.032	−0.054	−0.028
	(0.107)	(0.104)	(0.106)	(0.114)	(0.112)
Observations	942	942	942	942	942
Election-year Dummies?	No	No	Yes	No	Yes
Other Controls?	No	Yes	Yes	Yes	Yes
Linear Trend?	No	No	No	Yes	Yes
$Gini + IE \times Gini$	-0.31	-0.11	-0.16	-0.37	-0.14
P($Gini + IE \times Gini$)=0	0.06	0.27	0.2	0	0.25
First Stage F	57.96	52.84	42.46	45.23	38.67

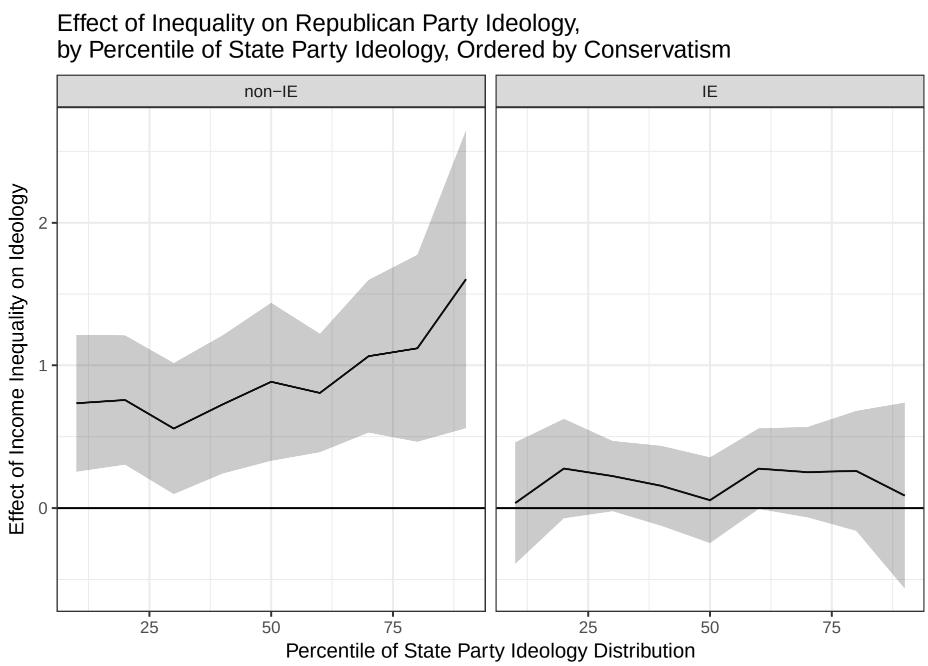
However, the statistical evidence for the campaign finance mechanism as described above is strongest when looking at the overall chamber average ideology as an outcome variable, as in Table 10. Here there is consistent and statistically significant evidence that income inequality moves legislatures to the right absent expenditure restrictions, with no statistical effect when these restrictions are in place.

Table 10: Effect of Income Inequality on Average Chamber Ideology, by IE Effect

	(1)	(2)	(3)	(4)	(5)
IV Results: Gini	1.817***	1.700***	1.991***	2.079***	1.917***
	(0.515)	(0.482)	(0.593)	(0.647)	(0.603)
IE × Gini	−1.513**	−1.483***	−1.646**	−1.631**	−1.568**
	(0.588)	(0.573)	(0.648)	(0.681)	(0.654)
OLS Results: Gini	0.058	0.054	0.059	0.077	0.066
	(0.066)	(0.066)	(0.072)	(0.076)	(0.076)
IE × Gini	−0.071	−0.094	−0.127	−0.119	−0.134
	(0.139)	(0.140)	(0.144)	(0.149)	(0.150)
Observations	942	942	942	942	942
Election-year Dummies?	No	No	Yes	No	Yes
Other Controls?	No	Yes	Yes	Yes	Yes
Linear Trend?	No	No	No	Yes	Yes
$Gini + IE \times Gini$	0.3	0.22	0.35	0.45	0.35
P($Gini + IE \times Gini$)=0	0.1	0.18	0.09	0	0.09
First Stage F	57.96	52.84	42.46	45.23	38.67

As the results in Figure 1 suggested, there appears to be heterogeneity across the party ideology distributions in the effect of inequality (with large effects for extreme Republicans and moderate Democrats). We extend this to allow for systematic variation based on whether pre-CU expenditure limitations were in place. These results are summarized in Figure 2 for Republican parties and Figure 3 for Democratic parties. We find striking evidence for the campaign finance mechanism: income inequality moves the extreme wing of the Republican party to the right, and the moderate wing of the Democratic party to the left only when there are no restrictions on expenditures.

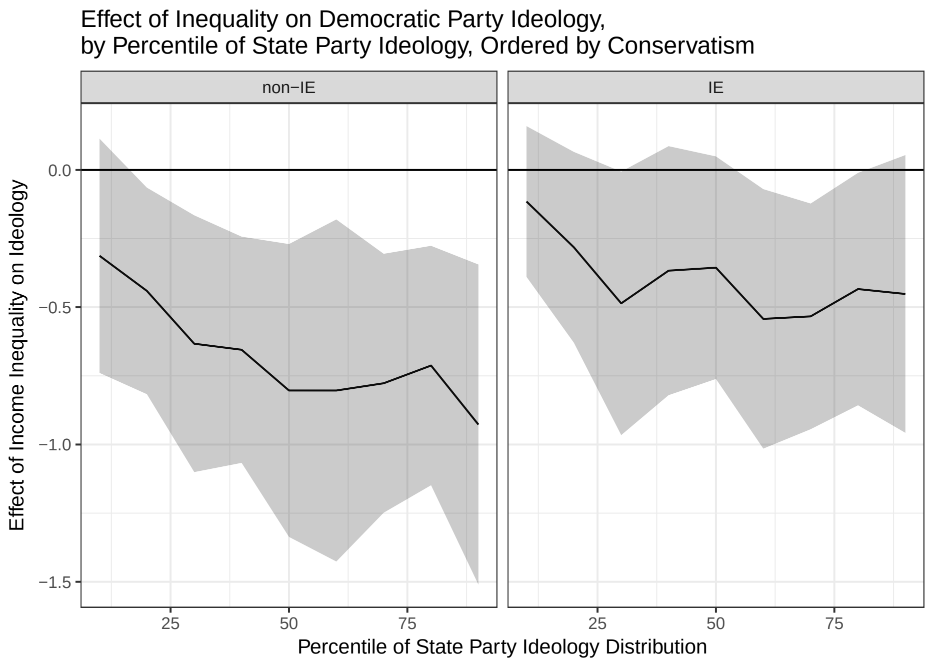
Figure 2: Effect of Income Inequality on Republican Party Quantiles (Ordered by Conservatism), by CU Effect



5 Conclusion

We have examined the relationship between income inequality and political polarization in a number of different contexts. By moving to the state level, and by adopting an instrumental

Figure 3: Effect of Income Inequality on Democratic Party Quantiles (Ordered by Conservatism), by IE Effect



variables empirical strategy that discards variation due to non-random sorting across state lines and corrects for measurement error, we are able to recover estimates of the effect of inequality on polarization that are causal. Our results from models examining the effect of income inequality on aggregate polarization within state legislatures align with previous studies of an equivalent national-level relationship (McCarty, Poole and Rosenthal, 2006). Using an instrumental variables identification strategy, we find that within-state income inequality has a significant, positive and quantitatively large effect on within-state legislative political polarization. These results are robust to a number of different specifications.

In addition to examining how income inequality affects the distance between party ideologies, we also consider how income inequality affects the mean ideological positions of individual parties and the legislature as a whole. We find the effects on the two parties to be approximately symmetrical. However, we find that income inequality moves the mean of the entire legislature to the right, and increases the proportion of seats held by Republicans.

These results are consistent with income inequality affecting polarization by "flipping" moderate districts from Democratic to Republican control, leaving behind an increasingly liberal Democratic party.

We posit that campaign finance may serve as the causal mechanism linking rising income inequality to rising polarization and rightward movement in the ideology of state legislatures. Our results, when allowing for systematically varying effects based on whether pre-*Citizens United* independent expenditure restrictions were in place suggest that the presence of these independent expenditure restrictions either partially or fully interrupts the inequality-polarization relationship, whereas in state-years with no restrictions, the effect of inequality on polarization and the average conservatism of legislatures is large and statistically significant.

Our findings are consistent with a political reinforcement mechanism for the propagation of inequality—increases in income inequality move the entire legislature to the right, while at the same time increasing political polarization. This diminishes both the appetite and ability of state legislatures to engage in redistribution, which in turn further increases income inequality. All is not lost, however—our systematically varying effects results provide strong evidence that restricting campaign spending, where constitutionally permissible, can disrupt this "inequality spiral."

References

Angrist, Joshua and Jorn-Steffen Pishke. 2009. *Mostly Harmless Econometrics*.

Ansolabehere, Stephen, James Snyder and Charles Stewart. 2001*a*. "Candidate Positioning in U.S. House Elections." *American Journal of Political Science* 45(1):136–159.

Ansolabehere, Stephen, James Snyder and Charles Stewart. 2001*b*. "The Effects of Party and Preferences on Congressional Roll-Call Voting." *Legislative Studies Quarterly* 26(4):533–572.

Barber, Michael J. 2016. "Ideological Donors, Contribution Limits, and the Polarization of American Legislatures." *The Journal of Politics* 78(1):296–310.
URL: *http://dx.doi.org/10.1086/683453*

Barth, Erling, Henning Finseraas and Karl O. Moene. 2014. "Political Reinforcement: How Rising Inequality Curbs Manifested Welfare Generosity." *American Journal of Political Science* pp. n/a–n/a.

Baum-Snow, Nathaniel and Fernando Ferreira. 2015. Causal Inference in Urban Economics. In *Handbook of Regional and Urban Economics, vol. 5A*, ed. Gilles Duranton, Vernon Henderson and William Strange. Elseview North-Holland.

Binder, Sarah. 2015. "The Dysfunctional Congress." *Annual Review of Political Science* 18:85–101.

Boustan, Leah, Fernando Ferreira, Hernan Winkler and EM Zolt. 2013. "The Effect of Rising Income Inequality on Taxation and Public Expenditures: Evidence from US Municipalities and School Districts, 19702000." *Review of Economics and ...* 95(October):1291–1302.

Feddersen, Timothy and Faruk Gul. 2014. "Polarization and Income Inequality: A Dynamic Model of Unequal Democracy." *Working Paper* .

Garand, James C. 2010. "Income Inequality, Party Polarization, and Roll-Call Voting in the U.S. Senate." *The Journal of Politics* 72(04):1109–1128.

Gelman, Andrew, Lane Kenworthy and Yu-Sung Su. 2010. "Income Inequality and Partisan Voting in the United States." *Social Science Quarterly* 91(5):1203–1219.

Hacker, Jacob S. 2005. "Policy drift: The hidden politics of US welfare state retrenchment." *Beyond continuity: Institutional change in advanced political economies* pp. 40–82.

Hall, Andrew B. 2014. "How The Public Funding Of Elections Increases Candidate Polarization.".

Hirano, Shigeo, James M. Snyder Jr., Stephen Ansolabehere and John Mark Hanson. 2010. "Primary Elections and Partisan Polarization in U.S. Congressional Elections." *Quarterly Journal of Political Science* 5(2):169–191.

Jenkins, Stephen, Richard Burkhauser, Shuaizhang Feng and Jeff Larrimore. 2011. "Measuring inequality using censored data: a multiple-imputation approach to estimation and inference." *Journal of the Royal Statistical Society: Series A (Statistics in Society)* 174(1):63–81.

Klumpp, Tilman, Hugo Mialon and Michael Williams. 2016. "The Business of American Democracy: Citizens United, Independent Spending, and Elections." *Journal of Law and Economics* 59.

La Raja, Raymond J. and Brian F. Schaffner. 2015. *Campaign Finance and Political Polarization: When Purists Prevail*. University of Michigan Press.

Ma, Yanlei. 2014. "Income Inequality , Political Polarization and Fiscal Policy Gridlock." *Working Paper* pp. 1–51.

Mann, Thomas E. 2006. Polarizing the House of Representatives: How Much Does Gerrymandering Matter? In *Red And Blue Nation?: Characteristics And Causes of America's Polarized Politics*, ed. Peitro Nivola and David Brady. Washington D.C.: Brookings Press.

Masket, Seth E., Jonathan Winburn and Gerald C. Wright. 2012. "The Gerrymanderers Are Coming! Legislative Redistricting Wont Affect Competition or Polarization Much, No Matter Who Does It." *PS: Political Science* January:39–43.

Masket, Seth E and Michael G Miller. 2015. "Does public election funding create more extreme legislators? Evidence from Arizona and Maine." *State Politics & Policy Quarterly* 15(1):24–40.

McCarty, Nolan, Keith T. Poole and Howard Rosenthal. 2006. *Polarized America: The Dance of Ideology and Unequal Riches*. Cambridge: MIT Press.

McCarty, Nolan, Keith T. Poole and Howard Rosenthal. 2009. "Does Gerrymandering Cause Polarization?" *American Journal of Political Science* 53(3):666–680.

McGhee, Eric, Seth E. Masket, Boris Shor, Steven Rogers and Nolan M. McCarty. 2014. "A Primary Cause of Partisanship? Nomination Systems and Legislator Ideology." *American Journal of Political Science* .

Mettler, Suzanne. 2016. "The Policyscape and the Challenges of Contemporary Politics to Policy Maintenance." *Perspectives on Politics* 14(02):369–390.

Piketty, Thomas. 2014. *Capital in the Twenty-First Century*.

Piketty, Thomas and Emmanuel Saez. 2003. "Income Inequality in the United States, 19131998." *The Quarterly Journal of Economics* 118(1):1–41.

Poole, Keith and Howard Rosenthal. 1997. *Congress: A Political-Economic History of Roll Call Voting*. New York: Oxford University Press.

Poole, Keith T. 2007. "Changing Minds? Not in Congress!" *Public Choice* 131(3-4):435–451.

Shor, Boris and Nolan McCarty. 2011. "The Ideological Mapping of American Legislatures." *American Political Science Review* 105(03):530–551.

Spencer, Douglas M. and Abby Wood. 2014. "Citizens United, States Divided: An Empirical Analysis of Independent Political Spending." *Indiana Law Journal* 89.

Theriault, Sean M. 2008. *Party Polarization in Congress.* New York: Cambridge University Press.

Vlaicu, Razvan. 2016. "Inequality, Participation, and Polarization.".

Voorheis, John. 2016. "State and Metropolitan Area Income Inequality in the United States: Trends and Determinants, 1968–2012." *Working Paper* .
URL: *https://sites.google.com/site/johnlvoorheis/research/State_ineq_wrapper.pdf*

A Additional Tables and Figures

Table A1: Summary Statistics, Dependent Variables

Statistic	Mean	St. Dev.	Min	Max
Polarization	1.451	0.484	0.222	3.299
Mean Ideology	0.002	0.372	−0.994	0.945
Dem. Mean	−0.742	0.386	−1.661	0.115
Rep. Mean	0.708	0.335	−0.374	1.820

Table A2: Summary Statistics, Independent Variables

Statistic	Mean	St. Dev.	Min	Max
Gini	0.475	0.041	0.361	0.634
Median Income	54,563.030	8,346.758	36,574	78,632
Pop. Dens.	190.112	253.333	1.057	1,199.802
Union Membership	0.066	0.032	0.012	0.148
Union Coverage	0.008	0.003	0.001	0.030
Latino	0.094	0.098	0.004	0.466
Black	0.102	0.097	0.000	0.412
Native American	0.014	0.026	0.000	0.176
Asian	0.038	0.078	0.001	0.705
Other Race	0.013	0.024	0.000	0.219
Married	0.426	0.024	0.354	0.486
Divorced	0.142	0.017	0.080	0.196
Native Born	0.910	0.065	0.710	0.994
Noncitizen	0.047	0.035	0.001	0.192
Over 55	0.230	0.035	0.084	0.336
Under 25	0.362	0.029	0.290	0.493
College Degree	0.186	0.041	0.084	0.314
In Poverty	0.124	0.034	0.045	0.255
Attending School/College	0.035	0.010	0.011	0.074
Median Age	35.818	2.566	26	43
Population	6,068,207.000	6,684,287.000	488,167	38,332,521
Unemployment Rate	5.501	1.930	2.300	13.800

Figure A1: First Stage: Simulated vs. Actual State Gini

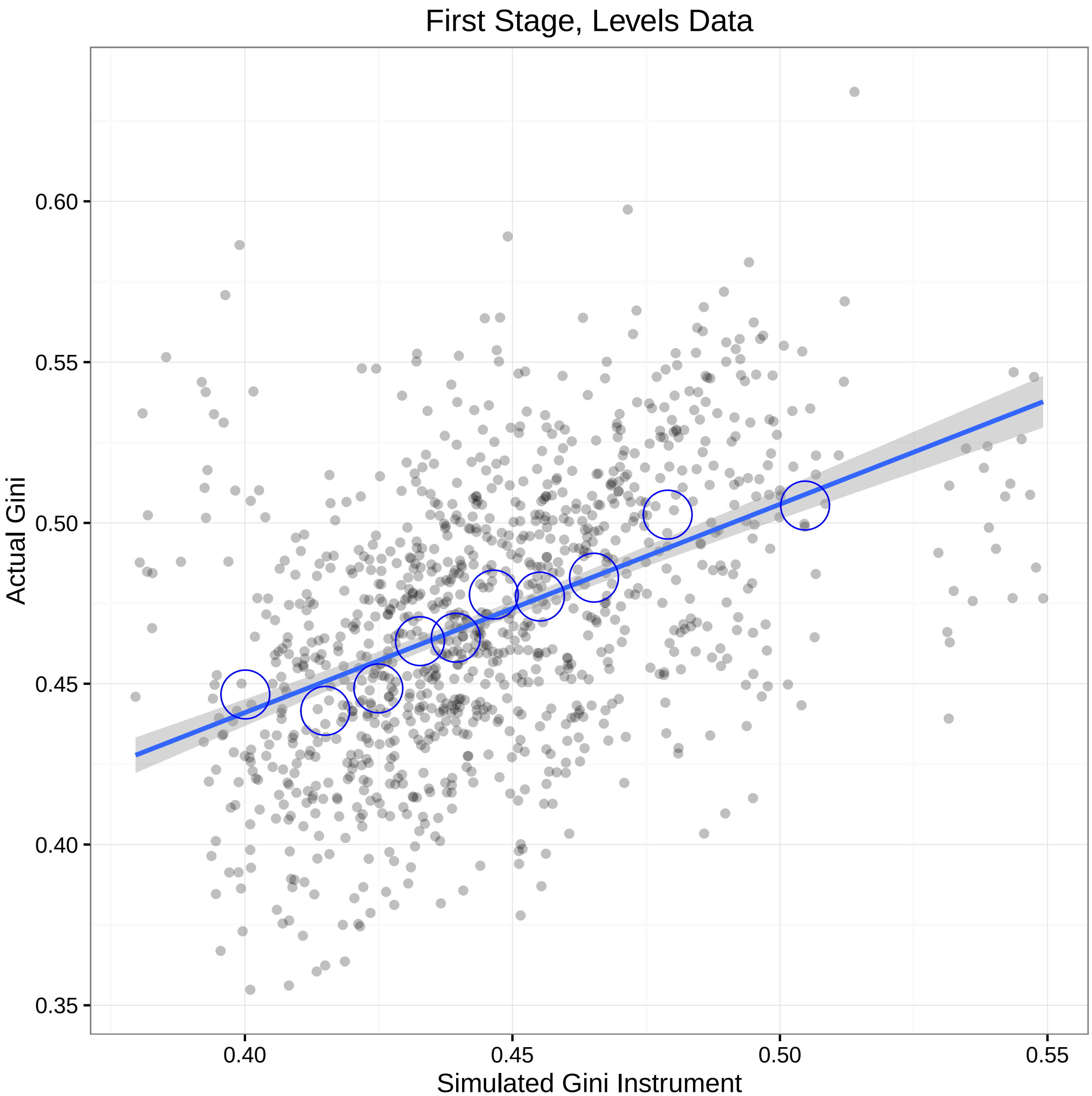


Figure A2: First Stage: Simulated vs. Actual State Gini

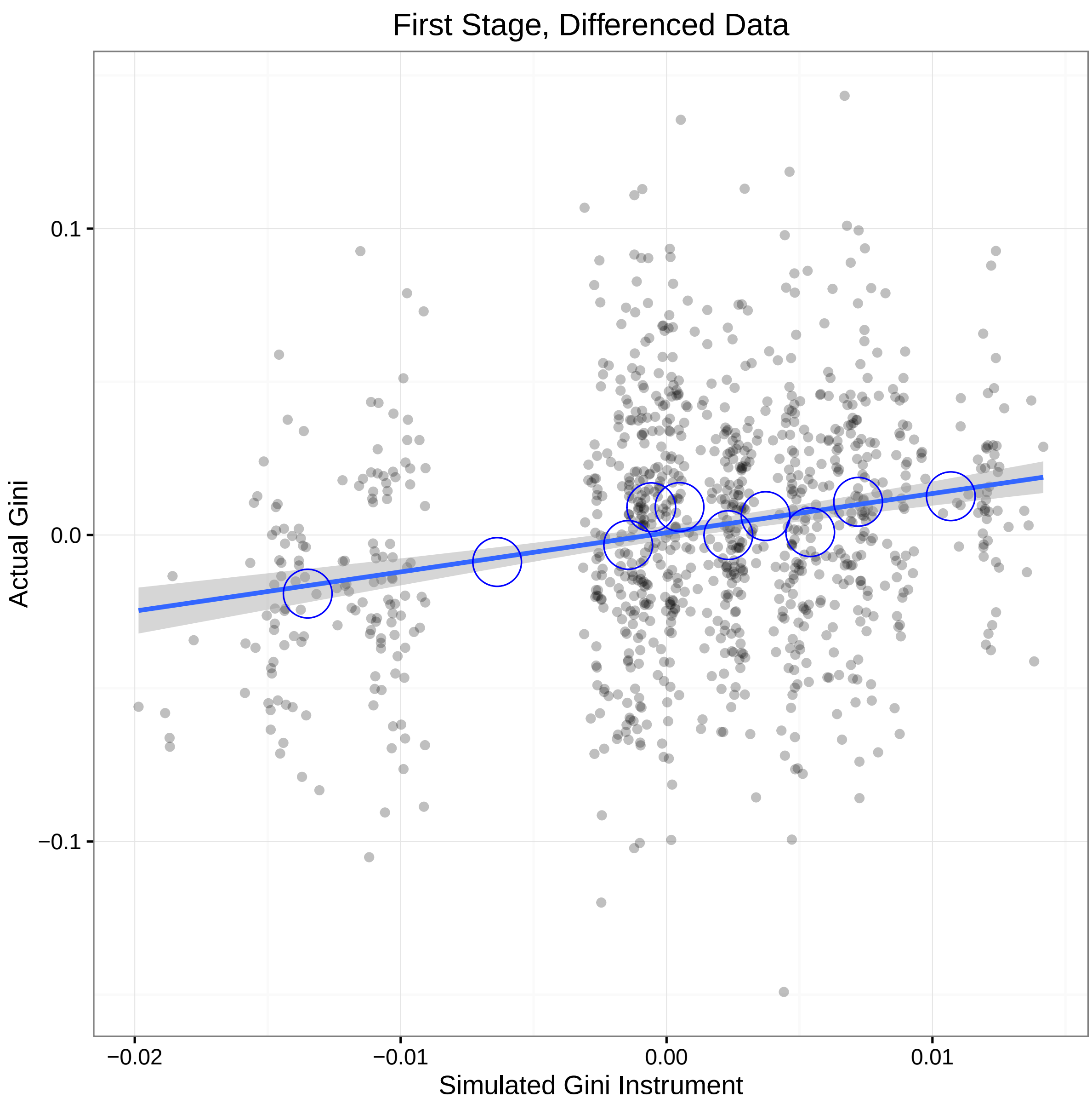


Table A3: First Stage Estimation Results

	Dependent variable:			
	Gini			
	First Diff.		Fixed Effects	
	(1)	(2)	(3)	(4)
log(Med. Inc.)	-0.086^{***}	-0.096^{***}	-0.046^{*}	-0.088^{***}
	(0.033)	(0.035)	(0.024)	(0.027)
Pop. Dens.	0.00002	-0.001	-0.0002	-0.0004
	(0.001)	(0.001)	(0.0001)	(0.0003)
Union Mem.	-0.318	-0.310	-0.095	-0.325
	(0.326)	(0.332)	(0.215)	(0.293)
UR	-0.004^{***}	-0.004^{***}	-0.003^{**}	-0.003^{**}
	(0.001)	(0.001)	(0.001)	(0.001)
Simulated Gini	1.263^{***}	1.256^{***}	2.119^{**}	3.192^{***}
	(0.208)	(0.216)	(1.049)	(0.948)
Control Variables?	Yes	Yes	Yes	Yes
State-specific Linear Trend?	No	Yes	No	Yes
First Stage F	89.12	79.64	6.67	27.37
Observations	822	822	890	890
Note:	*p<0.1; **p<0.05; ***p<0.01			

Table A4: Effect of Inequality on Average State Polarization, Alternate Instruments

	Dependent variable:				
	comp_diffs				
	1988	1989	1990	1991	1992
	(1)	(2)	(3)	(4)	(5)
‘Gini(fit)‘	0.855^{**}	0.846^{**}	0.844^{**}	0.845^{**}	0.868^{**}
	(0.396)	(0.384)	(0.378)	(0.385)	(0.393)
First Stage F	64.92	67.15	72.71	70.2	65.17
Observations	822	822	822	822	822
Note:	*p<0.1; **p<0.05; ***p<0.01				

Figure A3: Testing Identifying Assumptions: Initial Inequality is Unrelated to Subsequent Changes in Ideology/Polarization

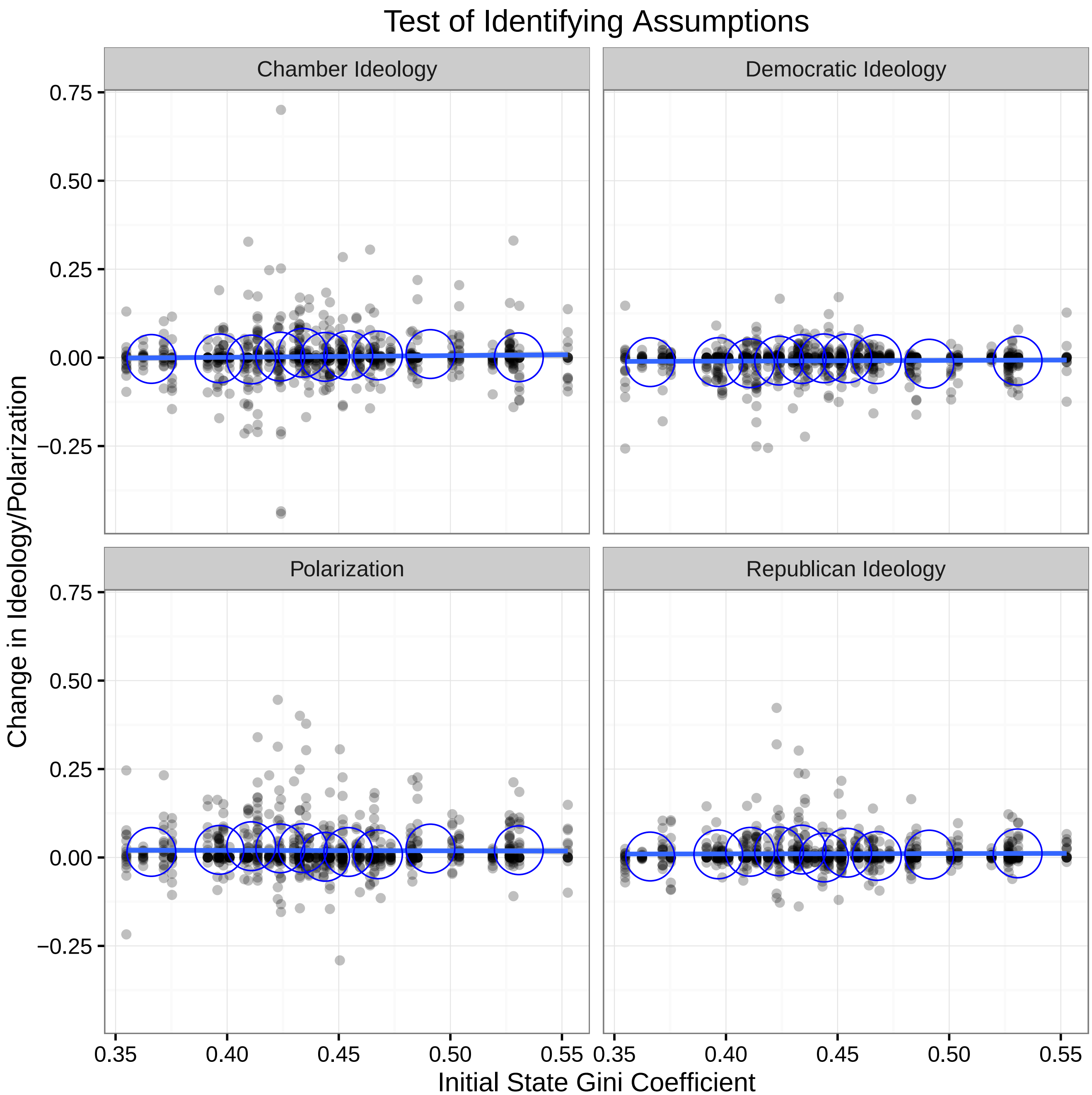


Table A5: Start and End Years of State-level Independent Expenditure Limits

State	IE Enacted	IE Rescinded
Alabama	1975	2010
Alaska	1996	2010
Arizona	1980	2010
Colorado	2003	2010
Connecticut	1987	2010
Iowa	1975	2010
Kentucky	1974	2010
Massachusetts	1975	2010
Michigan	1976	2010
Minnesota	1988	2010
Montana	1947	2012
New Hampshire	1978	2000
New York	1976	2010
North Carolina	1973	2011
Ohio	2005	2010
Oklahoma	2007	2010
Pennsylvania	1979	2010
Rhode Island	1988	2010
South Dakota	2007	2010
Tennessee	1972	2010
Texas	1987	2010
West Virginia	1908	2010
Wisconsin	1973	2010
Wyoming	1977	2010

Source: Spencer and Wood (2014)