# Testing Models of Unequal Representation: Democratic Populists and Republican Oligarchs?

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ABSTRACT

Recent studies indicate that the wealthy receive more representation from their members of Congress, though this relationship may be more pronounced in Republican compared to Democratic districts. However, drawbacks in existing survey data hamper efforts to delineate the relationship between income and representation with precision, especially at the highest income levels. In this paper we use new data to explore the relationship between wealth, the party identity of elected officials, and representation in greater depth. We develop several alternative models of the relationship between income and representation, and compare them with models employed in previous empirical research. We test each of these models, using two different data sets containing large numbers of wealthy individuals and very granular measures of income. Our results suggest that individuals with Democratic congressional representatives experience a fundamentally different type of representation than do individuals with Republican representatives. Individuals with Democratic representatives encounter a mode of representation best described as "populist," in which the relationship between income and representation is flat (if not negative). However, individuals with Republican representatives experience an "oligarchic" mode of representation, in which wealthy individuals receive much more representation than those lower on the economic ladder.

The steady advance of economic inequality in the United States over the past
four decades has aroused considerable concern about the state of American
democracy. A growing body of research (Bartels, 2008; Ellis, 2013; Gilens,
2005; Hacker and Pierson, 2011; Jacobs and Page, 2005; Winters and Page,
2009) examining the relationship between income and representation suggests
that "the wealthiest Americans exert more political influence than their less
fortunate fellow citizens do" (Page *et al.*, 2013). While this research is gener-
ally convincing, much remains to be learned about the relationship between
economic inequality and political representation. A serious problem is that
limitations of survey design and sampling generally constrain researchers'
ability to observe how income relates to representation, especially where it
matters most — at the top of the income distribution. Survey samples typically
contain small numbers of wealthy respondents and, furthermore, top-code
income at relatively modest levels. These limitations have often forced scholars
to examine inequality in representation using relatively coarse income cate-
gories (Bartels, 2008; Ellis, 2013; Flavin, 2012; Hayes, 2013). This, in turn,
may adversely affect our understanding of how economic inequality affects
representation, by obscuring differences in representation within each of these
categories and, especially, within the top category. To use just one — albeit
very important — example, we know very little about whether the top 5% of
income earners receive more representation than those in the top 20%.

Relatedly, while scholars have been attuned to the likelihood that the
representational returns to income may differ depending on whether the
incumbent is a Democrat or a Republican (Bartels, 2008; Brunner *et al.*, 2013;
Ellis, 2013; Hayes, 2013), small survey samples and top-coding of income
measures limit opportunities to investigate these patterns in extensive detail.
Most significantly, they preclude assessment of whether partisan differences
further intensify — or, alternatively, diminish — at the highest income levels.

In this paper we advance understanding of the relationship between income
and representation, both by improving conceptualization of this relationship
and by using richer and more comprehensive data to examine it. We describe
several alternative archetypes of the relationship between wealth and repre-
sentation. We focus on three rival alternatives: an Egalitarian model, which
posits an essentially flat relationship between income and representation; an
Oligarchic model, which suggests extremely strong, and nonlinear, positive
returns to income; and a Populist model, which proposes that representational
returns to income are negative and steeply biased toward less wealthy indi-
viduals. We contrast these archetypes with two models (linear inequality and
tercile inequality) employed in previous empirical work. We also make the

case for further investigating the details of the relationship between income, the partisan identity of the incumbent, and representation, especially at the highest income levels.

Then, using two different sources of data with large numbers of wealthy individuals and fine-grained measures of high incomes, we assess these alternative models through a study of representation in the United States House of Representatives. We structure our analysis to avoid imposing a particular functional form on the relationship between income and representation, providing each of the alternatives with a fair test. Following Bartels (2008), we also present separate analyses for individuals with Democratic representatives and those with Republican representatives, respectively, to assess whether the relationship between income and representation is qualitatively different (as opposed to simply different in degree) in these alternative partisan circumstances.

The results from this descriptive analysis provide an unusually detailed mapping of the relationship between income and representation in contemporary American politics. When all individuals are considered together, the relationship between income and representation is either flat or somewhat negative (depending on the data used) and, by consequence, most consistent with the Egalitarian or even Populist model. However, this aggregate finding is misleading, because it obscures large differences in the way individuals of different incomes are represented depending on the partisan identity of their incumbent. Among individuals with Democratic representatives, the relationship between income and representation is either flat or negative (depending on the data used), suggesting an Egalitarian — if not Populist — model. In contrast, among individuals with Republican representatives, the relationship between income and representation is positive regardless of the data used, suggesting a model of representation that is most similar to linear inequality (if not Oligarchy).

## Economic inequality and political representation

While scholars have long debated whether wealthy citizens receive more representation than their less fortunate peers (Ferguson, 1995; Schattschneider, 1960; Truman, 1951), the dramatic increase in economic inequality over the past four decades has renewed fascination with this subject (Piketty and Saez, 2003). Several high-profile studies (Bartels, 2008; Flavin, 2012; Gilens, 2005; Gilens and Page, 2014; Jacobs and Page, 2005) have provided evidence that wealthy Americans enjoy more political influence than poorer citizens. Some scholars have even asserted that the United States is now dominated by an economic "oligarchy" of super-wealthy Americans enjoying decisive political power in certain areas of policy (Hacker and Pierson, 2011; Winters, 2011; Winters and Page, 2009).

This research has advanced our understanding of the relationship between income and inequality in contemporary American politics. Yet much remains to be learned. Existing research has relied on surveys whose characteristics have circumscribed opportunities to investigate the relationship between income and representation in extensive detail. Most surveys contain few if any truly wealthy respondents, obstructing efforts to observe the preferences of very affluent individuals (Page *et al.*, 2013). In any case, most surveys top-code income at a relatively modest level, obscuring potential differences between the merely well-to-do and the truly rich (Page, 2009).

Scholars have done their best under these constraints. One approach has been to model representation as a linear function of the limited number of available income categories (e.g., Ellis, 2012, 2013). Other researchers divide their samples into an even smaller number of discrete income-based categories of relatively equal size, model representation as a function of the ideologies of each of these groups (along with controls), and assess whether the coefficients associated with the higher-income groups are larger than those of the lower-income groups (Bartels, 2008; Flavin, 2012; Gilens, 2005; Hayes, 2013).

These are all reasonable approaches given the characteristics of the data at hand. But they inevitably produce relatively simplistic models of the relationship between income and representation. (Canonical studies of this topic, including Bartels (2008) and Gilens (2005), explicitly recognize this fact and present findings as diagnostic rather than conclusive). Linear approaches, while convenient, potentially obscure more complex relationships between these variables. This could be problematic if there are significant nonlinearities in this relationship at any point along the income distribution. The gravest risk, of course, is that the linear model may actually understate the amount of representation received by the very wealthy.

Scholars who parse the income distribution into several discrete categories and include separate terms for each of the groups are better positioned to observe nonlinear relationships. However, small sample sizes and top-coding of income measures ensures that only a small number of categories can be used (Erikson and Bhatti, 2011; Page, 2009; Page *et al.*, 2013; Soroka and Wlezien, 2008). Indeed, the most common approach is to divide the income distribution into "low," "middle," and "high" income categories of approximately equal size (Bartels, 2008; Erikson and Bhatti, 2011; Hayes, 2013; Page, 2009; Page *et al.*, 2013; Soroka and Wlezien, 2008). Unfortunately, with such coarse divisions it is impossible to determine if there are differences in representation within each of the categories (Page *et al.*, 2013). As with the linear approach, the chief danger of this method is that even more dramatic biases in representation toward the very wealthy may go undetected (Brunner *et al.*, 2013). For example, in Bartel's (2008) influential book on this subject, the "high" income group starts with re-

spondents with a family income of just $40,000 (or about $75,000 in 2016 dollars). This categorization scheme — though necessary given data constraints — precludes assessment of the representation received by the truly wealthy.

Finally, while existing scholarship has been attuned to the likelihood that the relationship between income and representation varies by the party identity of the incumbent (Bartels, 2008; Ellis, 2012, 2013), we believe that further investigation is warranted. As a first observation, research on this question has yielded diverse results. Bartel's (2008) research indicates that while both Republicans and Democrats generally provide more representation to wealthy constituents, this effect is much more pronounced among Republican representatives. But Hayes (2013) reaches a different conclusion, finding no difference between Democratic and Republican elected officials in terms of bias toward the wealthy. Meanwhile, Ellis (2013) finds that Republicans provide more representation to the wealthy, but that Democrats exhibit relatively little class favoritism (and may allocate more representation to poorer constituents under certain conditions); and Brunner *et al.* (2013) suggest that Republicans deliver more representation to the wealthy while Democrats favor the less affluent.

Equally important, the limits of existing survey data have circumscribed consideration of the potential nuances of how the partisan identity of the incumbent conditions the relationship between income and representation. Indeed, it is possible that the divergence in results among existing studies — though likely due in part to the use of different data sources — may also stem to some degree from inadequate samples and measures. Moreover, even if we accept the general premise that Republicans are more responsive to the affluent than are Democratic representatives, it is yet unclear whether the magnitude of this bias remains consistent across the income distribution. Might comparative Republican solicitousness to the affluent become even more extreme at the highest income levels? Alternatively, might Republicans' relatively greater bias toward the views of the wealthy tail off at some point? Unfortunately, data limitations have precluded investigation of these questions.

## Models of income and representation

The foregoing suggests that there is still much to learn about the precise form of the relationship between the income of constituents, the party identities of elected officials, and representation. To begin our investigation, we consider several alternative models that might represent distinct archetypes. Figure 1 provides a graphical representation of each of these models. The $x$-axis in these plots is meant to represent an individual's position in the income distribution in the United States. Individuals with low values are relatively poor and those
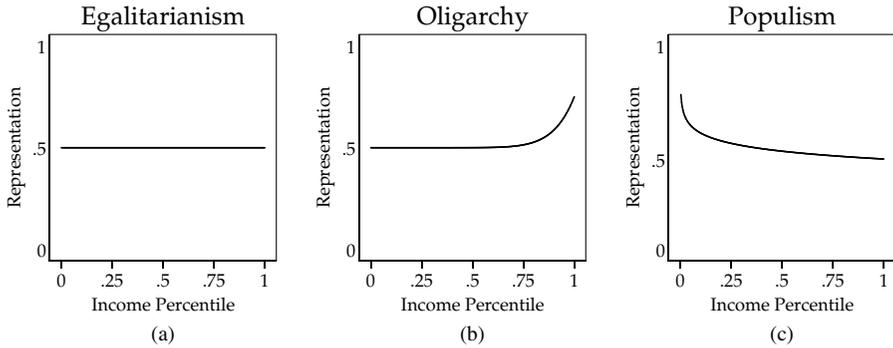
Figure 1: The distribution of American adults across values of household income.

with the highest values represent the richest constituents in America. The $y$-axis in this graphic represents the degree of similarity between the constituent's political ideology and that of his elected representative. Lower values represent less similarity (or less representation) and higher values reflect greater agreement.

Figure 1(a) illustrates what we might expect in a system where the amount of representation an individual receives is unrelated to her income. The flat line in this graphic indicates that constituents' ideologies are equally close to their incumbent's ideology regardless of their income. Arguably, this Egalitarian model represents the normative ideal in a representative democracy.

Figure 1(b) and (c) shows contrasting models of how income might condition representation. Figure 1(b) shows what the relationship would look like in an Oligarchic system. In this plot, individuals experience only modest concordance with their representatives except when they are among the most wealthy. Figure 1(c) illustrates the opposite case, what we describe as a Populist system. In this case, the poorest citizens experience high levels of similarity with their elected officials while the richest individuals experience much less representation.

We contrast these alternatives with statistical tests that have been adopted in previous research. Specifically, Figure 2 shows what our standard statistical tests would reveal if the Oligarchic model in Figure 1 was true. Figure 2(a) presents a linear test of inequality. Note that because in an oligarchy the degree of concordance between constituents and representatives is flat and only begins to increase at high levels of income, a linear estimation of the relationship provides a misleading characterization of unequal representation. Notably, the linear inequality model uncovers a more gradual and less extreme form of inequality in representation than does the Oligarchy model.

Figure 2(b) presents the tercile approach to testing inequality, in which the representational returns to income are allowed to increase in a nonlinear
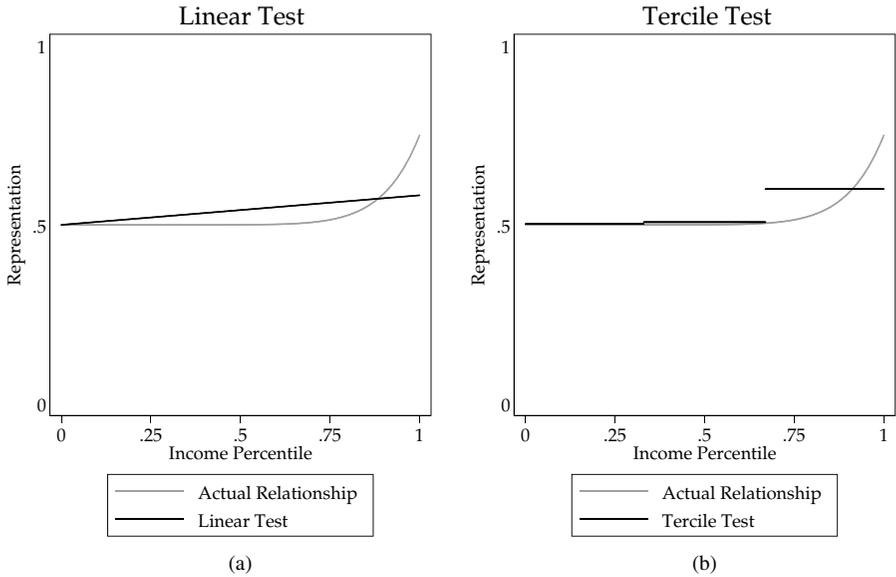
Figure 2: How statistical tests of inequality might obscure the true relationship.

fashion across the three income groups. This approach is a closer test in a broad sense to the Oligarchy model. After all, unlike with the linear test, the tercile test would at least reveal that those in the bottom two-thirds of the income distribution receive much less representation. However, the functional form in this test is still very coarse, failing to capture the extreme bias toward the wealthy evident in the Oligarchy model. Indeed, note that lumping all individuals in the top-third of income into a single bin means losing a great deal of insight into how much more representation the 95th percentile of income earners receive relative to those in the 75th percentile.

In the analyses that follow, we take a fully flexible approach to plotting the relationship between income and representation. Specifically, we take advantage of two large-N data sources which allow us to estimate a unique value of representation at each of a large number of income categories — including within the top 10% of incomes. This approach has the benefit of allowing for discovery of nonlinearities (so avoiding the problem shown in the Figure 2(a)) while also observing dynamics at very high income levels (thereby avoiding the problem shown in Figure 2(b)).

In addition, we test for not only patterns of income and representation across all citizens, but also whether and how these relationships depend on the party of the representative holding office. The conventional wisdom is that

the relationship between income and representation is generally stronger in Republican districts, though (as noted earlier) empirical results reach quite different conclusions about the precise nature of this pattern.

We strongly suspect that representation plays out quite differently in Democratic and Republican districts, respectively (Clinton, 2006). Indeed, building on the work of Bartels (2008), Ellis (2013), Hayes (2013), and Brunner *et al.* (2013), we suggest that the relationship between income and representation may be completely different in Democratic versus Republican districts, with the relationship more closely approximating an Egalitarian (if not Populist) model in Democratic districts and more closely resembling the Oligarchic model in Republican districts.

In our view, these fundamental differences likely derive from the very different coalition partners embraced by the two parties (Bawn *et al.*, 2012; Grossmann and Hopkins, 2015). The Democratic Party coalition draws disproportionately from the working and lower classes, as well as from demographic groups (African Americans, Hispanics, women) that are more likely to have lower incomes; while the Republican Party enjoys stronger support from more-advantaged upper-income groups (Bartels, 2006; Brewer and Stonecash, 2001, 2007; Stonecash, 2006; Stonecash *et al.*, 2000). In fact, partisan polarization on the basis of class has been increasing significantly over the past three decades (Knuckey, 2013; Nadeau *et al.*, 2004; Stonecash and Mariani, 2000). Thus, the contrasting coalition partners of the Democratic and Republican parties incline their respective members toward very different modes of representation.

In Democratic districts, these patterns suggest that, on average, the ideologies of lower-income constituents will be at least as, if not more, related to those of incumbents as are those of higher-income constituents. In Republican districts, however, there should be greater ideological agreement between higher-income constituents and incumbents than between lower-income constituents and incumbents. These considerations provide a strong justification for estimating the effects of income on representation separately for individuals living in Democratic districts and those residing in districts with Republican representatives, respectively, so that divergent patterns can be modeled properly.

We note here that our analysis is purely focused on descriptive, rather than causal, inference. That is, we seek to examine how the amount of representation one receives is related to his or her income, but we do not seek to explain why such patterns might exist. To be sure, questions about what causes potential inequalities in representation are of clear importance, but so too is developing a full accounting of the phenomena of unequal representation itself. By applying unique large-N data to this issue, we can provide a uniquely detailed accounting of how representation tracks with income in the United States, and a better understanding of the precise nature of this relationship will almost surely help to foster more complete theory-building and empirical

work into questions of *why* these inequalities persist.

With that in mind, we begin in the following section by examining the relationship between income and representation in the House of Representatives using data from the voter file firm Catalist. This data is especially useful for allowing us to examine the functional form of this relationship because of the exceptionally large number of individual observations it includes (our analysis with this data includes more than 1.5 million individuals). We then take advantage of the large-N survey data from the Cooperative Congressional Election Study to further examine the relationship between income and representation in Democratic and Republican districts.

## Test 1: Catalist data

The analysis that follows relies in part on data from Catalist, a private political data vendor that sells detailed voter information to the Democratic Party, Democratic candidates, and progressive interest groups. The full Catalist database is comprised of detailed records of more than 265 million American adults. The Catalist database begins with voter registration data from all states and counties, which is cleaned and standardized. Then, Catalist appends hundreds of variables to each record. Using registration addresses, Catalist appends Census data describing the characteristics of the neighborhood in which each individual resides. Catalist also contracts with other data vendors to incorporate data on the consumer habits of each household. Finally, Catalist generates an array of imputed variables from the other variables it has gathered, validating its imputation models against survey data that has been merged into its database and matched with relevant records.[1]

While Catalist was originally designed for electioneering purposes, Catalist data are also available to academic researchers via subscription (academic users do not have access to identifying information such as individuals' names or addresses). Catalist provides subscribers with a 1% sample data set comprised of individual-level records; after accounting for missing data, the sample we analyze in this paper is comprised of 1,546,026 American adults.

For this paper, we are primarily interested in two variables available from Catalist — an estimate of each individual's income, and an estimate of each individual's political ideology. The income measure is estimated based on a

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[1] A reasonable question is how well Catalist matches individuals with their voting records, commercial information, and federal data. One reason for confidence in Catalist's matching ability is its impressive performance in the 2011 MITRE name-matching challenge, an independent name-matching competition gauging the performance of commercial name-matching services (Catalist finished second among 40 participants in the 2011 challenge). Additionally, Ansolabehere and Hersh (2012) have independently validated Catalist's matching procedures and concluded that they are highly successful. These independent validations provide us with considerable confidence in the accuracy of Catalist's matches.
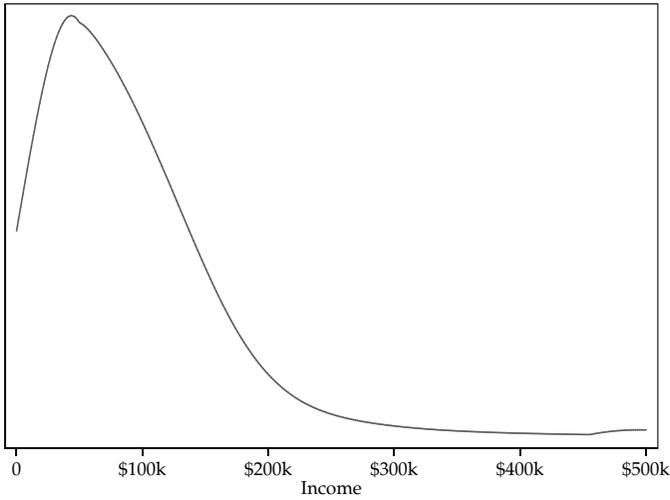
Figure 3: The distribution of American adults across values of household income.

**Note:** Figure shows a Kernel plot representing the distribution of the American adult population across values of household income based on estimates from the Catalist database.

series of regressions using a combination of numerous consumer variables from InfoUSA and data from the Census. Using a model based on these factors, individuals are placed into one of 495 categories, with the lowest category indicating an income of $5,000 and the highest indicating an income of $500,000 or more. Figure 3 shows a kernel plot of the distribution of American adults across levels of household income. Note that most Americans have a household income near the low-end of the distribution. In fact, over half of all adults in our sample were assigned an estimate of household income at $73,000 or below. Fewer than 10% of adults in our sample were recorded as having a household income above $170,000, and the top 5% had an estimated household income of $212,000 or higher. This distribution corresponds fairly closely to the actual distribution of incomes in the United States. For our analyses, we translate the raw income predictions from Catalist into the income percentile that each individual falls in to nationally.

Catalist also includes an estimate of each individual's ideology. While the details of the model used to estimate this variable are proprietary, we know that the model is built as a series of linear regressions using variables from the database to predict the values of a liberal/conservative ideology index, with the index based on a wide range of questions selected from national polls and merged into the database. Catalist's individual ideology scores have a value between 0 and 100, with 0 being the most conservative and 100 being the most

liberal. Catalist has performed a validation of its ideology model and found that it predicts actual issue positions taken by individuals with a reliability of 0.67.

In the Appendix, we include two of our own validation exercises for this measure of ideology. First, we were able to match 792 state legislators into the Catalist database and extract Catalist's ideology predictions for those individuals. We then compared the Catalist prediction to a roll call vote based measure of ideology for those legislators generated by Shor and McCarty (2011). The Catalist measure of ideology was correlated at 0.81 with the roll call vote based measure. Second, we created mean ideology scores for congressional districts using the Catalist ideology scores and compared those point estimates to a survey-based district ideology measure (Tausanovitch and Warshaw, 2013). Those measures were correlated at 0.82, providing further confirmation of the accuracy of the Catalist ideology estimates (see Appendix for more details on these validation tests).

We use the Catalist measure of ideology to construct our measure of representation. Specifically, for this analysis, our measure of representation is the regression coefficient for individual ideology when regressed on the House member's NOMINATE score, or what Achen (1978) calls "responsiveness." In effect, this measure assesses the association between representatives' ideologies and constituents' ideologies. Higher (positive) coefficients indicate that House members' roll call votes are more strongly associated with the ideologies of their constituents, and smaller coefficients suggest weaker associations. This measure of representation is basic, but useful for our purposes. After all, a primary fact that we might wish to establish about unequal representation is the extent to which constituent opinions are associated with representatives' behavior across different levels of income. After we determine these patterns with the regression coefficients from the Catalist data, we employ more direct measures of representation using data on salient roll call votes from the CCES.

We also note that we calculate the relationship between citizens' ideologies and the ideologies of their representatives separately by income group. Again, our primary aim here is to understand whether the amount of representation one receives is conditional on how much that person earns, what the functional form of that relationship is, and the extent to which that form is conditional on the party of the representative. An alternative approach would be to conduct the analysis at the level of the congressional district and investigate how much representation different income groups receive while controlling for ideologies of all the other income groups. Such an approach would have the advantage of potentially revealing which income groups are most consequential in driving legislator behavior, but it also introduces a host of complicated modeling issues that threaten the validity of such findings.

First, once aggregated to the district level, the ideologies of different income groups are very highly correlated. In the Catalist data, the median ideology

of individuals in the 1st to 30th percentiles of income is correlated at 0.93 with those in the 31st to 60th percentiles of income, 0.85 for those in the 61st to 90th percentiles of income, and 0.77 with those in the 91st percentile of income and above. This high degree of multicollinearity may produce imprecise estimates of the quantities of interest in a pooled regression model.

Second, when aggregating these estimates to the district level, it is crucial to consider whether other potentially moderating factors need to be modeled as well. For example, the proportion of each congressional district that is comprised of individuals who occupy the top 10% of the national income distribution ranges from 0.002 to 0.487. Normatively (and empirically), we should expect quite varying degrees of responsiveness to the very wealthy depending on how much of a district's population they comprise. Likewise, shifting the level of analysis in this way also raises questions about whether it makes more sense to consider one's income relative to the national population or relative to other individuals in that person's own congressional district.

To be sure, considering whether the rich or poor are more influential when their opinions diverge is an important undertaking. However, in this analysis we focus on first establishing a more precise understanding of the amount of representation received at very fine grained (and very extreme) levels of income. Nevertheless, in the Appendix we produce an analysis of the Catalist data at the congressional district level. This analysis is largely consistent with the patterns we find in the sections that follow.

Finally, it is important to note that the use of NOMINATE scores as our dependent variable may possibly bias our results in favor of finding unequal representation. NOMINATE scores are based on all roll-call votes taken by House members — including both high-salience and low-salience votes. All things being equal, representatives may be less constrained from providing unequal representation on low-visibility votes, because it is less likely that lower-income constituents will possess the information to punish them for their votes in such cases. Given the large number of low-salience votes, NOMINATE-based measures may advantage high-income constituents. These considerations should be kept in mind in interpreting the results discussed in the following section.

### Results

Figure 4 presents two plots. Figure 4(a) plots the regression coefficients between individual ideology scores and representative NOMINATE scores across percentiles of income for the 112th Congress. Specifically, we rounded income percentiles to the nearest even percentile and then estimated a separate regression model for each of those even percentiles. Because Figure 4(a) incorporates all individuals in the database, it provides a global assessment of
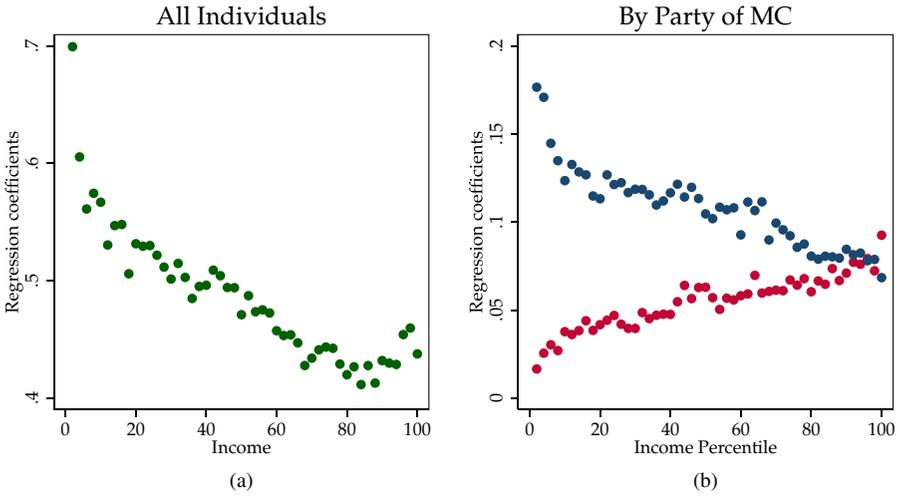
Figure 4: Analysis of legislator responsiveness to constituent ideology by income percentile, 112th congress.

**Note:** Plots show the regression coefficients for DW-nominate scores of U.S. House members on individuals' ideologies across 26 income categories.

the relationship between individual ideology and representative NOMINATE scores at each income level. This plot provides a clear indication of the utility of adopting a flexible approach to analyzing the relationship between income and representation. Far from showing that higher-income Americans receive more representation than less-fortunate citizens, the trend produced by the series of regression coefficients is, for the most part, decreasing, suggesting that those with lower incomes actually receive more representation. Only at the top 15% of incomes does the line turn positive, but people in the top 15% of incomes still appear to receive much less representation than those at lower incomes.

However, as we have suggested, aggregating this relationship for all individuals may mask important cross-party differences. Figure 4(b), which shows the coefficients separately for individuals represented by Democratic House members and those represented by Republicans, respectively, indicates that the initial plot obscures profound partisan differences.

In districts represented by Democratic members of Congress, the trend created by the series of regression coefficients suggests a negative relationship between income and representation. Indeed, the Democratic pattern is most similar to the Populist archetype discussed in the previous section. In contrast, the slope of the trend created by the series of regression coefficients is positive (though generally linear) in districts represented by Republican members of

Congress, indicating that wealthier constituents receive more representation from Republican representatives than do less-affluent constituents. This pattern is arguably most consistent with the linear inequality model.

Together, the results suggest that individuals experience different forms of representation from members of Congress depending on whether their representative is a Democrat or a Republican — but that these differences matter most at lower income levels. When lower-income individuals have a Democratic House representative, they appear to receive much more representation than when they have a Republican representative. This is evident from the large gap between the Democratic and Republican coefficients for incomes in the bottom half of the distribution. But the party of the representative matters hardly at all for wealthier Americans. There is little separation between the coefficients for people represented by Democrats and those represented by Republicans in the top 20% of the income distribution, indicating that the wealthiest Americans receive similar amounts of representation in Congress regardless of whether they are represented by a Democrat or a Republican.

## Test 2: CCES data

The analysis of the Catalist data provides preliminary evidence for our suggestions that (1) there are nonlinearities in the relationship between income and representation and (2) individuals in Democratic and Republican districts receive very different types of representation from their representatives in the House. We continue our analysis with the 2012 Cooperative Congressional Election Study (CCES), which provides opportunities to examine these patterns in more detail.

The 2012 CCES is a national stratified sample survey of 54,535 respondents administered by YouGov. Because the CCES has such a large sample size, it is particularly useful for analyzing relatively rare populations, such as individuals with very high incomes. In previous years, the CCES did not take full advantage of this possibility because its top income category binned together anybody with a family income of $150,000 or more. Beginning in 2012, however, the question was altered to allow for more granularity among this group of high earners. Specifically, the 2012 CCES includes categories for $150,000–199,999 (1,544 respondents), $200,000–249,999 (583), $250,000–349,999 (367), $350,000–499,999 (171), and $500,000 and above (118). We transformed each of the 17 income categories used by the CCES into the appropriate percentile by translating the bottom range of each income bin into the related national income percentile in 2012. For example, those in the $150,000–199,999 bin were coded as being in the 91st percentile of incomes since a family income of $150,000 would have put an individual in the 91st percentile in 2012. Thus, our top five bins are coded as relating to the 91st

percentile, 95th percentile, 97th percentile, 98th percentile, and 99th percentile of all incomes in 2012.

The 2012 iteration of the CCES also includes an unusually robust set of questions that allow us to obtain an especially rich measure of the representation received by different income groups from their House members. The 2012 survey queried respondents' support for/opposition to eight separate, high-profile proposals (the Ryan budget bill, the Simpson–Bowles budget plan, the "Middle Class Tax Cut" Act and the "Tax Hike Prevention" Act, the U.S.–Korea free trade agreement, a proposal to repeal the Affordable Care Act, a bill to approve the Keystone XL pipeline, and a proposal to end the military's "Don't Ask, Don't Tell" (DADT) policy) that were also voted on in the House of Representatives. Because respondents were asked about the same issues on which their members of Congress voted, it is possible to observe agreement/disagreement between respondents and representatives on each of these issues, as well as the overall level of agreement/disagreement across all eight issues, and determine whether and how these quantities are related to income. These measures, which provide a much more direct assessment than the responsiveness measure used above of the extent to which House members actually represent their constituents' preferences, closely resemble the "key vote representation" measures employed by Ellis (2013).[2]

Importantly, and in contrast to the NOMINATE scores used in the previous test, the roll call votes selected for inclusion on the CCES are generally among the most salient issues to come before Congress during the preceding term. As a result, it may be less likely that we would observe income differences on representation among these salient roll call votes, as it may be more difficult to provide unequal representation on issues that attract widespread attention. Thus, in this analysis we might expect income differences to be less pronounced than they are for the Catalist analysis.

### Results

Figure 5 includes three plots of the estimated relationship between income and representation on key House votes in the 2012 CCES. The dependent variable ($y$-axis) for each plot is the proportion of roll calls on which the respondent took the same position as his/her member of Congress. If the respondent did not take a position on a particular issue, then that issue was not included in the calculation. For example, a respondent could receive a 1 for this measure if he took the same position as his incumbent on all 8 votes, or if he took the same position as the incumbent on 7 votes and did not take a position on

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[2]To be sure, these measures are not perfect. The choice situations facing members of Congress and survey respondents, respectively, are distinctive, so the decisions of each group may reflect somewhat different underlying psychological processes (Jessee, 2012; Lewis and Tausanovitch, 2015).
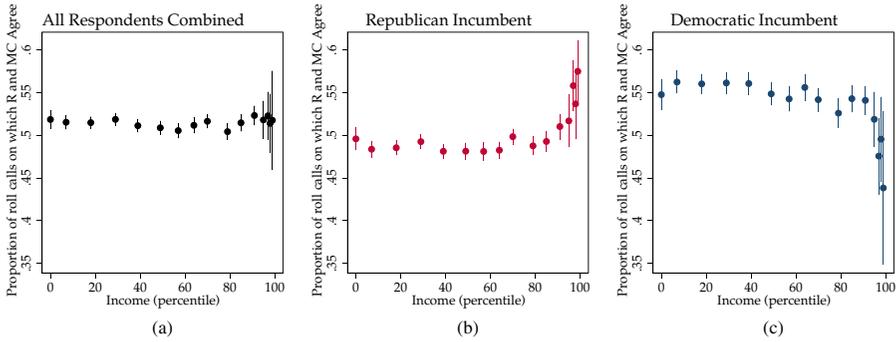
Figure 5: Relationship between income and key vote representation on key house votes, 2012 CCES.

**Note:** Plot shows the proportion of major bills on which respondents in each income percentile took the same position as their House incumbent. Sampling weights applied in calculating these estimates. Vertical bars represent 95% confidence intervals.

the 8th bill. The average for this variable is 0.51, indicating that an average respondent received representation on about half of the bills on which she took a position. However, there is a great deal of variance in this measure, as the standard deviation is 0.19.

Figure 5(a) combines all respondents, while Figure 5(b,c) presents results separately for respondents with Republican and Democratic representatives, respectively. The pattern when we combine all respondents is one of relative Egalitarianism. The line is essentially flat, indicating that, on average, individuals receive relatively similar levels of representation regardless of their income. As noted, this pattern may reflect the fact that this representation measure (unlike that employed in the Catalist analysis) incorporates only highly salient votes.

Of course, looking at the pattern for all respondents may well obscure potential differences across representatives of different parties. Figure 5(b,c) helps us unpack these differences. First, the pattern for individuals with Republican incumbents reveals a fairly level relationship through the 90th percentile, and then a dramatic increase in the top tenth of the income distribution. What happens in the top 5% of the income distribution is especially noteworthy and indicative of the utility of considering nonlinear effects of income in models of representation. An individual with an income in the 85th percentile receives representation on 49% of the major bills from a Republican incumbent, but that increases to 56% when her income is in the 97th percentile and 58% if she is in the top 1% of income earners. In other words, Republican House members provide about 10% more representation to the 99th percentile as they do to the 85th percentile. Given that we examined

8 major bills, a 10% increase would amount to being represented on almost one additional piece of major legislation. All things considered, the pattern evident in Republican districts is most consistent with an Oligarchic model of representation.

For individuals represented by Democratic incumbents, a contrary pattern occurs. There is a small gradual decline in representation as one moves into higher income groups, though these differences are generally not statistically significant. Representation drops dramatically in the top 10% of the income distribution, with individuals in the 99th percentile receiving representation on about 10% fewer major bills than those at the 91st percentile of income (a difference that is statistically significant). For individuals represented by Democratic incumbents, the relationship between income and representation is nonlinear — but in a Populist mode.

## Conclusion

Existing research has provided considerable insights into the relationship between income and representation. However, due to limitations of the data used in most studies, important questions remain. Can the relationship between income and representation be accurately represented using linear models and/or coarse income categories, or are more complex and nuanced approaches needed? How does the party identity of the incumbent condition the relationship between income and representation, especially at the very highest income levels? Are both Democrats and Republicans more responsive to wealthy constituents (albeit with the caveat that this dynamic is more exaggerated on the Republican side)? Or do individuals in Republican and Democratic districts receive qualitatively different modes of representation?

In this paper, we provide fresh insights on these questions, using two new data sets with large numbers of wealthy people and very fine-grained income categories. Our findings suggest the importance both of flexibly modeling the relationship between income and representation and of placing party differences at the core of the analysis. First, we found important — and extremely illuminating — nonlinearities in the relationship between income and representation. Most dramatically, our analysis of the 2012 CCES showed that Republican representatives (though generally more responsive to higher-income constituents) provided a much higher degree of representation to individuals in the 97th, 98th, and 99th percentiles. Second, our results revealed that individuals residing in Democratic districts received a fundamentally different mode of representation than those living in Republican districts. In Democratic districts, the relationship between income and representation was either negative (in the Catalist data) or generally flat with negative effects in the highest income categories (in the CCES data), suggesting an Egalitarian —

if not Populist — mode of representation. In stark contrast, the relationship between income and representation most closely resembled Linear Inequality — if not Oligarchy — in Republican districts.

To be sure, our findings come with caveats. First, our analysis is only of one Congress (the 112th), so further work is needed to establish the generalizability of our results. Additionally, the findings of our two tests were somewhat different (though ultimately consistent) — a fact that is probably attributable to the different approach to measuring representation in the two different analyses. Second, our analysis is entirely descriptive in nature. Our aim here was not to explain why there is unequal representation for individuals with different financial resources, but rather to document the patterns of unequal representation in a far more comprehensive way than has previously been possible.

In this way, our results point to fruitful directions for future research on the relationship between income and representation in the United States and elsewhere. Indeed, we find that much of the action in the interplay between income and representation happens at the very top of the income distribution. Thus, our study demonstrates the importance of utilizing data sets with large numbers of wealthy people and fine-grained measures of income, in conjunction with flexible modeling approaches that do not make premature assumptions about the functional form of the relationship between income and representation. The question is whether large-N data sets can be effectively used to understand what causes unequal representation. We encourage scholars to think creatively about designs that can be particularly effective with big data — natural experiments and regression discontinuity designs, for example — in the aim of better understanding the relationship between income and inequality, particularly among the wealthiest citizens. After all, such questions are of vital importance in this era of ever-increasing economic inequality.

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