

The Polarizing Effect of the Stimulus: Partisanship and Voter Responsiveness to the American Recovery and Reinvestment Act¹

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We examine the effect of a sudden influx of government spending, the 2009 American Recovery and Reinvestment Act (ARRA), on support for the President's party. Using a difference-in-differences design, we find that stimulus spending had a modest positive effect on Democratic vote share, but only in counties that were already Democratic-leaning. In Republican counties, by contrast, government spending had a small, but significant negative effect on Democratic vote share. That is to say, ARRA polarized already partisan places. These results have important implications for the study of voter responsiveness to government spending and the measurement of the political effects of policy visibility.

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Introduction

Upon signing the 2009 American Recovery and Reinvestment Act into law, President Obama said, “We expect you, the American people, to hold us accountable for the results” of the new legislation.ⁱ In political science, however, there is substantial debate about the extent to which voters reward or punish their elected officials, and in particular presidents, for their spending choices.

Most notably, the voter responsiveness literature has not yet fully considered the effects of polarization. Polling data suggest that the response to the ARRA in general appears to have been filtered through partisanship. Pew Research Center polling data from 2010 and 2012 reveal that almost 80 percent of Republicans disapproved of stimulus spending, compared with roughly one fifth of Democrats (Pew Research Center 2012). While it is unsurprising that attitudes towards the program writ large are a reflection of the partisan divide concerning President Obama, it may be that voters respond to *actual stimulus spending* in a similarly partisan way. Such a result would be consistent with research on the rising salience of partisanship in America’s polarized politics (e.g. Fiorina et al. 2004, McCarty et al. 2006, Abramowitz 2010). Among elected officials, in the media, and among the mass public, partisanship has become increasingly predictive of political behavior.

To explore the effects of polarization on electoral rewards for federal spending, we take advantage of a sudden influx of government spending courtesy of the 2009 American Recovery and Reinvestment Act (ARRA). In addition to its highly politicized nature, the ARRA represents an excellent case to explore this issue for several reasons. First, the particularly massive and widespread nature of the stimulus offers an unusual opportunity to explore political

responsiveness to federal government spending in a wide variety of geographic locales, including heavily Democratic and Republican places. Moreover, the federal government's attempts to credit-claim for specific stimulus programs via road signs, speeches, and other publicity render it a particularly good test of political responsiveness: if any federal government spending program were likely to generate a constituent response, it would be something as highly visible as the ARRA. Finally, there have been, to our knowledge, no political science studies that examine the democratic implications of the ARRA. That is, while much scholarship—particularly in economics—has been devoted to the effectiveness and economic effects of the program (CEA 2011; Feyrer and Sacerdote 2011; CBO 2012), there has been no research on the political effects of the initiative. We simply do not have any rigorous empirical evidence on whether the American people did indeed hold the Obama administration or Congress accountable for the successes or failures of this signature piece of legislation.

This paper proceeds as follows. First, we examine the existing research about voter responsiveness to spending, and show that this literature does not create a consistent picture of how we should expect voters to react to public spending. Then, using data on the allocation of the ARRA, we estimate the effects of spending on support for the President's party at the county level. We find that ARRA investments have a positive effect on Democratic vote share only in those counties that are already Democratic-leaning; in strongly Republican counties, the effect of increased spending is negative. In total, then, the stimulus had a polarizing effect on the electorate, driving liberal counties to the left and conservative counties to the right.

This finding suggests that highly politicized spending can actually be counter-productive for an incumbent Democrat. Rather than being “unresponsive” (Kriner and Reeves 2012),

conservative counties punished Democrats for the spending they received from the stimulus. This finding may help explain why so much of the literature on voter responsiveness to spending has found null effects. If partisans have opposite responses to highly politicized spending, the spending might appear to have had no electoral effect in the aggregate. Our results suggest the need to reconsider what we mean by voter responsiveness, particularly in conditions of high polarization.

(How) Do Voters Reward Politicians for Local Spending?

Historically, the literature on voter responsiveness to spending has produced inconclusive results. Recent scholarship suggests that part of the problem may be a failure to adequately consider the effect of partisanship on the visibility of public spending initiatives.

David Mayhew's seminal research (1974) defines "particularized benefits" as those that are given to a small enough group of recipients that "a single congressman" can be recognized as the source of the "apparently ad hoc" benefit. As Mayhew notes, the classes in which these particularized benefits can be grouped are "vaguely defined." What one person might deem wasteful might appear to another as public-interested. Indeed, there is an old joke in Washington that defines pork as "money spent in any district but my own." Pork is very much in the eye of the beholder.

Though the motivation to oppose spending *on others* is perhaps relatively obvious, the intuition that spending can be perceived differently by different people may also apply *among beneficiaries*. Certainly, scholars have struggled to find a consistent pattern of electoral response to local spending. There is, instead, a "pattern of non-findings" (Lazarus and Reilly 2010). Many studies of Congressional appropriations have produced "scant evidence" that spending

allocations result in electoral gains (Kriner and Reeves 2012). The problem may be a failure to take account of partisanship. Kriner and Reeves (2012) are unusual for the strength of their results; they show convincingly that the President's party benefits from federal grant spending, and that Democratic voters are more responsive than Republicans to this spending. And Lazarus and Reilly (2010) suggest that Democrats are more likely to reward direct spending than Republicans. In this paper, we push this research farther by considering more fully how partisanship might affect voter responsiveness; we test whether a single spending measure, in different partisan environments, has opposite effects on voting patterns.

We also differ from much of the existing literature in the precision with which our spending measure can be connected to one particular political party—a point that we contend is critical in affecting voter responsiveness to government spending. The research examining “pork” spending has traditionally used widely varying definitions of the term, with a great deal of theorizing about what, exactly, should constitute pork (e.g. Maass 1951; Ferejohn 1974; Arnold 1980; Lee 2003). Some scholars narrow their focus to spending they deem to be relatively manipulable by ambitious politicians (e.g. Levitt and Snyder 1995, Berry et al. 2010, Crespin and Finocchiaro 2012, Kriner and Reeves 2012), such as federal grants or line-item appropriations. Others specifically exclude discretionary project grants from their definition of pork, focusing instead on entitlements and “contingent liabilities,” such as loan guarantees (Bickers and Stein 2000). While some research encompasses broad categories of spending—Kriner and Reeves (2012), for example, use a measure of “federal grant spending” which amounts to 11-14.4% of total federal spending—others hone in on more specific programs (Ferejohn 1974, Hansen 1991). Our chosen policy—the American Recovery and Reinvestment

Act—is a heterogeneous policy that falls between the broad federal spending and specific budget items that comprise prior research. What distinguishes it from the loci of previous studies is its strong partisan valence: as we noted in our introduction, Democrats and Republicans have sharply polarized views of the spending initiative, in large part because of the measure’s inextricable link with a polarizing president (e.g. Tesler 2012). Media coverage of the stimulus—which was intense during the project’s promulgation (Project for Excellent in Journalism 2009)—frequently referred to the measure as “Obama’s Stimulus” (e.g. Freeman 2014),ⁱⁱ with the policy—along with health care reform—comprising two of Obama’s most salient policy proposals (Tesler 2012). We argue below that the stimulus’ polarizing nature should, in expectation, affect voter responsiveness in ways previously unspecified in the pork literature.

Polarization and Voter Response to Spending

The American political sphere has seen a marked increase in partisan and ideological polarization in recent years among elected officials (McCarty et al. 2006), the mass public (Abramowitz 2010), and the media (Prior 2007, Jamieson and Cappella 2008). Based on this substantial literature, one might reasonably expect polarization to influence or even alter the electoral response to government spending.

The influence of polarization might be felt through any of a number of mechanisms. First, a multitude of studies suggest that individuals are hesitant to believe information that is not in keeping with their partisan and ideological priors (Lord et al. 1979, Bullock 2007, Lebo and Cassino 2007, Nyhan and Reifler 2010, Slothuus and de Vreese 2010). Partisans might, therefore, discount the positive influence of policy decisions made by officials of the other party. Second, partisans tend to seek out media that reinforces their existing beliefs (Stroud 2007), an

increasingly easy task as media itself have become more partisan (Mutz in Iyengar and Hahn 2007). Those in Democratic circles, therefore, might be more likely to encounter information that promotes the benefits of spending policies promulgated by Democrats, while Republicans might be more apt to hear about these policies' shortcomings. Finally, polarization may lead elected officials themselves to change their credit-claiming behavior. For instance, an official in a highly partisan district may be more likely to promote the effect of policies associated with his own party, either for his own electoral advantage or as part of a strategy of partisan teamwork (Lee 2009).

We suspect, therefore, that, especially when a spending measure is highly politicized and associated with the governing party, co-partisans of the government are more likely to view the spending positively and reward the government for it. On the electoral region level, this dynamic would imply:

Hypothesis 1: *Spending will increase support for the governing party only in areas where most voters are ideologically aligned with the governing party.*

As we have already noted, prior scholarship reveals that Democrats and ideological liberals are, in general, more likely to reward direct spending, whether that spending is implemented by Democrats or Republicans (Kriner and Reeves 2012, Lazarus and Reilly 2010). Because the federal spending we will examine, the American Recovery and Reinvestment Act of 2009, was implemented by a Democratic administration, a correlation between spending and Democratic support could be a consequence of the fact that Democrats are more likely to see and respond to federal spending, no matter who is president.

However, if partisanship is as powerful of a variable as the polarization literature suggests, we might expect stimulus spending to have the opposite effect in Republican parts of the country. That is to say, in conditions of high polarization, a spending measure that is strongly associated with the incumbent party might reduce that party's vote share among strong partisans from the other party.

Again, there are several mechanisms by which this might take place. Most simply, if local spending simply improved local economic conditions and increased local constituents' resources, those already interested in politics might be slightly more inclined to participate (e.g. Brady, Verba, and Schlozman 1995). In already highly partisan districts, an increase in political participation would yield an increase in partisanship. In addition, if local spending is of a kind that the out-party opposed on ideological grounds, each dollar of additional spending might drive not merely apathy, but anger, from supporters of the out-party. We should thus anticipate Republicans' increasing ideological opposition to "big government" (Skocpol and Williamson 2012) to yield a negative response to stimulus spending—particularly in light of the ARRA's emphasis on more traditionally Democratic policies like education, social services, and infrastructure (Conlan and Posner 2011). Finally, a conservative electorate, confronted with additional government spending, might be expected to become even more conservative; indeed, Sellers (1997) finds that, fiscal liberals perform better electorally in districts receiving substantial pork, while fiscal conservatives receive electoral advantages in low-pork districts. And, political parties increasingly engaged in partisan teamwork (and thus, partisan conflict) might be inclined to encourage this type of voter response to government spending (Lee 2009). Thus three different mechanisms could imply that in conditions of high polarization:

Hypothesis 2: *Spending that is strongly associated with the governing party will decrease support for that party in areas where most voters are opposed to the governing party.*

We should note here that, in some circumstances, Hypothesis 2 could be confused with an incumbency effect, simply because incumbents are likely to be co-partisans. For instance, if voters reward their incumbent, regardless of party, for local spending, Republican districts would tend to increase their votes for the incumbent Republican, and Democratic districts would tend to increase their votes for the incumbent Democrat, following an influx of local investment. However, because we will look both at House and Presidential races, we can distinguish our hypothesis from an incumbency effect. If high levels of stimulus spending resulted in benefits for all incumbents, Republican counties receiving high levels of spending should show higher levels of support for the incumbent President Obama, and higher levels of support for their own (likely Republican) representative. If, by contrast, Republican counties respond to high levels of stimulus spending with lower support for the governing party, we should see in conservative districts a reduction in support for Democrats at both the House and Presidential level.

If Hypothesis 2 is confirmed by the data, our results go beyond the finding of Kriner and Reeves (2012) that conservative counties “offer decidedly more tepid support for federal spending than liberal and moderate counties.” Instead, spending can have a polarizing effect on the electorate, with additional funds increasing Democratic support in blue counties, and increasing Republican support in red counties.

Data and Methodology

To evaluate these two hypotheses, we need a policy initiative that spurred large investments across the country and was firmly associated with the majority party. Fortunately,

the American Recovery and Reinvestment Act of 2008 (ARRA) provides a perfect lens through which to investigate our predictions. In this section, we present our data and the model we used to assess its implications.

The American Recovery and Reinvestment Act

The American Recovery and Reinvestment Act of 2009 (ARRA) was a major economic stimulus package passed in the first weeks of the Obama Administration. The stimulus, as it was commonly known, was an immense investment, estimated to cost \$787 billion at the time of its consideration.ⁱⁱⁱ The ARRA included a wide range of expenditures, including additional funding for states and localities' health, education, and transportation projects; extensions of unemployment insurance and welfare programs; direct federal infrastructure investments; and tax expenditures for individuals and businesses.

The precise economic impact of the ARRA is the subject of debate, but several major studies suggest the effects have been substantial. The Congressional Budget Office (2012) estimated that ARRA spending raised GDP between .2 and 1.5%, and created over 2 million jobs (see also CEA 2011). Feyrer and Sacerdote (2011) find similar results, suggesting that the cost of each additional job created was between \$170,000 and \$400,000. Not all aspects of the ARRA produced similar job-creation results, however; support for low-income individuals, in the form of unemployment insurance extensions and nutritional assistance programs, has a particularly high rate of return (CBO 2012, Feyrer and Sacerdote 2011).

The data on ARRA spending is readily available at a very high level of detail. Geo-coded information for all stimulus contracts, grants and loans (in other words, stimulus spending excluding tax benefits and entitlements) was made available at the federal website

www.recovery.gov. In addition, ProPublica, an independent and nonprofit investigative journalism organization, combined the recovery.gov data with thousands of other ARRA spending reports to produce an independent analysis of the stimulus plan's local investments. Our results were originally produced using our own analysis of the recovery.gov data, and were confirmed when tested using the ProPublica data. Because the ProPublica data is more complete than that available through recovery.gov, we present results based on the ProPublica data set.^{iv}

Our dataset does not include every dollar spent through the stimulus; we use data gathered from 2009 to 2012, for over 290,000 stimulus-funded projects in total, for which just over \$500 billion was spent. This stimulus spending reached all but three counties in the United States. Distributed by over 200 different federal agencies and offices, the projects include over 200,000 grants, 100,000 loans and 59,000 contracts. Note that projects do not include entitlements spending or tax credits, which respond strongly to annual changes in economic and demographic conditions in the counties and therefore would create a substantial endogeneity problem. Spending data is available at the county level in the ProPublica dataset, allowing for a direct comparison with county-level election returns.^v

Voting Data

There are several potential dependent variables that might, theoretically, be affected by stimulus spending. Perhaps most importantly, there are two different kinds of elections to consider: congressional and presidential. We evaluate both and anticipate effects consistent with our hypotheses in both models. We will be attentive, however, to potential differences; in particular, previous empirical research suggests that we might see a larger effect if we look at support for the President, rather than local representatives (Kriner and Reeves 2012, p. 348).

While prior scholarship has sought to connect the electoral success of a member of Congress to his or her capacity to direct spending to the district, these efforts have largely proved unsuccessful (Anagnoson 1980, 1982, Chernick 1979, Stein and Bickers 1994; though see Bickers and Stein 2000, Lazarus and Reilly 2010).

All voting data are obtained from David Leip's Atlas of US Presidential Elections (2013). Our main dependent variable is the change in Democratic vote share of all votes cast in a county.^{vi} Note that we use 2012 data, because, in 2010, a significant portion of the stimulus funding was appropriated, but not yet spent, locally. That is to say, the totals allocated to each locality might not be good indicators of the stimulus's real impact.

Model

We examine whether variation in stimulus spending in a county correlates with change in voter support for the President's party between the 2008 and the 2012 general elections. We use a difference-in-differences model, with change in county-level Democratic vote share as the dependent variable (for more on the setup of a difference-in-differences model see for example Angrist and Pischke (2015)).^{vii} This approach controls for time-invariant county differences in partisanship as well as the nation-wide average change in the Democratic vote share from 2008 to 2012, removing a significant amount of noise from the model.

Determinants of Stimulus Spending

The difference-in-differences design that our analysis will be built on controls for variables that have a constant effect on total Democratic vote share over time. We can compare relatively Republican and relatively Democratic counties without including county-level controls for partisanship because we are analyzing changes in vote shares, as opposed to absolute levels.

The model thus soaks up variation in the Democratic vote share that is due to relatively permanent differences, such as urban/rural divisions. Since demographic characteristics such as racial composition and relative per capita income generally change slowly, much of the impact of these variables is also controlled for. Indeed, according to American Community Survey 1-year estimates, between 2008 and 2012, median household income decreased, on average, by a mere 1.3 percent, representing a .05 standard deviation change based on the 2008 income distribution. In 85 percent of counties, the absolute change in median household income was less than 10 percent. Similarly, the county percent white declined by an average 2.4 percentage points, a .14 standard deviation decrease. 85 percent of counties experienced an absolute change of less than 4 percentage points.^{viii}

This model, however, does not address the impact of any background variables on *changes* in Democratic vote share over time. For example, the proportion Black in a county may affect both that county's Democratic vote share in 2008 *and* the change in the Democratic vote share from 2008 to 2012. A difference-in-differences model accounts for the former effect, but not the latter. The Appendix includes the results of analysis on the determinants of ARRA spending by county characteristics, which can inform an assessment of how serious the issue of potential omitted variables is. Some variables that predict smaller losses in the Democratic vote share from 2008 to 2012, in particular population percent Black, are negatively related to ARRA spending, and would therefore, if anything, bias our estimates downward.^{ix} Others, like the county unemployment rate, are related to ARRA spending in a direction that creates the potential for omitted variable bias; we include a list of potential confounders as controls in our final difference-in-differences model in order to account for the confounding potential of these

variables. The results presented in the Appendix also show that the predictors of 2009 federal spending are demonstrably different from predictors of ARRA spending; this further supports our argument that the ARRA represents a distinct infusion of federal spending in these counties, as distinct from a simple augmentation of regular spending patterns.

Difference-in-Differences Set Up

We now proceed to the set-up of the difference-in-differences model, predicting change in Democratic vote share as a function of ARRA spending on the county level.^x As mentioned above, because a difference-in-differences model uses change in vote share as the dependent variable, fixed attributes of counties are accounted for and county fixed effects are unnecessary.^{xi} Our variable of interest is the interaction between stimulus spending and county partisanship. The basic model can be summarized as follows:

$$\Delta \text{Demvote}_{2012-2008i} = \alpha + \text{ARRA}_i + \text{Demvote}_{2008i} + \text{ARRA} * \text{Demvote}_{2008i} + \varepsilon$$

where α is the intercept, indicating the average county-level change in Democratic vote share from 2008 to 2012, Demvote_{2008i} is the Democratic vote share of county i in 2008, $\Delta \text{Demvote}_{2012-2008i}$ is the change in Democratic vote share of county i between 2008 and 2012, ARRA_i is logged stimulus spending per capita in county i (excluding tax credits and entitlements), and ε is the error term. We run this model using two different sets of voting data: House election results and Presidential election results by county. The model thus allows us to compare whether trends in support for the President's party varied according to levels of ARRA spending, and to see

whether the relationship between stimulus spending and election results varies depending on county partisanship.

For both our House and presidential election models, we use a measure of *presidential* vote share in the interaction term that estimates whether the relationship between election results and ARRA spending varies according the partisan and ideological leaning of a particular locale. This use of Democratic presidential vote share as a proxy for local partisan and ideological inclinations is a frequently employed methodology in the study of legislative and urban politics (Canes-Wrone et al. 2002; Choi et al. 2002; Craw 2010; Hajnal and Trounstein 2010; Minkoff 2012; Einstein and Kogan 2015). Indeed, recent research on local ideology reveals that it is highly correlated with presidential vote share (Tausanovitch and Warshaw 2013). Moreover, prominent research findings on the relationship between local ideology and urban revenue and expenditure allocation (Tausanovitch and Warshaw 2014) are virtually identical when Democratic presidential vote share is substituted for local ideology scores (Einstein and Kogan 2015).

We add to the basic model some background variables that may impact changes in Democratic vote share and/or correlate with ARRA spending on a county level, as discussed above. We include controls for population in thousands, percent black, percent Latino, unemployment rates in 2008, poverty rate in 2008,^{xiii} and other federal spending (per capita, logged) in 2009.^{xiii} Thus, our final models are as follows:

$$\begin{aligned} \textbf{Presidential Elections: } \Delta \text{PresidentialDemvote}_{2012-2008i} = & \alpha + \text{ARRA}_i + \text{PresidentialDemvote}_{2008i} \\ & + \text{ARRA} * \text{PresidentialDemvote}_{2008i} + \text{TotalFederalExpenditures}_{2009i} + \text{Unemployment}_{2008i} + \\ & \text{PercentLatino}_{2008i} + \text{PercentBlack}_{2008i} + \text{Population}_i + \varepsilon \end{aligned}$$

$$\begin{aligned} \textbf{House Elections: } \Delta \text{HouseDemVote}_{2012i} = & \alpha + \text{ARRA}_i + \text{PresidentialDemvote}_{2008i} + \\ & \text{ARRA} * \text{PresidentialDemvote}_{2008i} + \text{TotalFederalExpenditures}_{2009i} + \text{Unemployment}_{2008i} + \\ & \text{PercentLatino}_{2008i} + \text{PercentBlack}_{2008i} + \text{PovertyRate}_{2008i} + \text{Population}_{2008i} + \varepsilon \end{aligned}$$

Having controlled for time-invariant characteristics of the counties, as well as for several possible confounders, we believe that any remaining variation in changes to the Democratic vote share between 2008 and 2012 that systematically co-varies with ARRA spending can reasonably be explained by voter reactions to this spending.

Results

Table 1 presents the results of our models, looking at the relationship between total per capita stimulus spending received and change in Democratic vote share from the 2008 to the 2012 House and presidential elections. Columns 1 and 2 feature a simple model specification, without the interaction term, for the 2012 House and presidential elections. Columns 3 and 4 present the same model, plus an interaction of stimulus spending and partisanship.

[Table 1 about here]

The point estimates for the underlying time trend are negative: on average, the Democrats lost votes from 2008 to 2012. The positive coefficients on the county percent black and Latino suggest that support for Barack Obama decreased less over this time period in more heavily black and Hispanic communities. A county's population, on the other hand, does not have a substantively significant impact on changes in Democratic vote share. The results for the two economic variables are contradictory: while counties with higher unemployment rates in 2008 saw smaller decreases in support for Obama, higher poverty counties saw greater decreases. The control variables show more mixed patterns for House elections, with counties with higher percentages of Blacks reducing support for the Democrats more than other counties, while their counterparts with higher percentages of Hispanics reduced their support less than other counties. More populous counties reduced their support less than other counties; higher poverty counties, conversely, saw greater reductions in support for Democratic House candidates. We find no effect of overall federal per capita spending on changes in Democratic vote shares.

When we model a direct effect of stimulus spending on the Democratic vote share, we get null results in both presidential and House elections. This occurs despite the sizeable expenditures made through the stimulus package: the median county in our dataset received \$857 in per capita spending through stimulus projects, with counties at the 10th percentile of spending receiving \$453 per capita, and counties at the 90th percentile receiving \$2230 per capita.^{xiv} (The move from the 10th to the 90th percentile represents an additional \$1777 of per capita spending, and below we analyze the hypothetical impact of this amount of additional spending on change in Democratic vote share.)

But the null average result hides partisan variation in how stimulus spending was received. Turning to Columns 3 and 4, we find results consistent with our hypotheses: the overall impact of ARRA spending on change in Presidential and House Democratic vote share is negative in heavily Republican counties and positive in strongly Democratic counties.

This impact is substantively significant. Looking at presidential vote share, counties need to be at least 65% Democratic for a two standard deviation increase in ARRA spending to have a statistically significant positive impact on change in Democratic vote share. Just over 5% of the counties analyzed were this Democratic in 2008, representing just over 60 million people, or about 20% of the population.

Spending can also hurt the Democrats depending upon the amount of ARRA dollars spent and the partisan leanings of the county. A two standard deviation increase in ARRA spending actually starts reducing Democratic vote share in counties that are at least 80% Republican (representing 5% of counties but less than 1% of the population). The estimated interaction effect is visualized in Figure 1, which shows the estimated impact of a move from the 10th to the 90th percentile of per capita spending (an additional \$1777 per capita) on change in the Democratic share of the vote in Presidential elections.

[Figure 1 here]

For those counties in which we do observe a significant change in presidential vote share, the effect of an additional \$1777 per capita is, on average, about 0.58 percentage points. This is comparable to the finding of DellaVigna and Kaplan (2007) that the availability of Fox News added between .4 to .7 percentage points to the Republican vote in presidential elections between

1996 and 2000. It is also roughly equivalent to the impact of a 0.2% growth in election year incomes on incumbency vote share in presidential elections (Bartels 2008, pp. 103).

For the House Democratic vote share, it appears as though the effect is somewhat more limited to politically extreme counties, in part because of the relatively wider confidence bands around our House coefficient estimates.^{xv} A two standard deviation increase in ARRA spending only yields a positive and statistically significant effect on House Democratic vote share when the county is more than 83% Democratic (less than 1% of counties representing about 2% of the population). Similarly, a significant and negative effect only emerges when the county is more than 78% Republican. These results are displayed in [Figure 2].

[Figure 2 here]

The more precise results for our presidential model are in keeping with the recent literature suggesting that the president, rather than Congress, receives credit for local spending (Kriner and Reeves 2012). It is easier for presidents to claim credit for legislation, and this may have been especially true in this instance, given how closely tied the stimulus was to the Obama administration. Moreover, the rise of the Tea Party rendered credit claiming for the stimulus challenging for many members of the House, creating heterogeneity in the extent to which House members attempted to use the infusion of stimulus funds for political gain (Grimmer et al. 2014). Finally, there are sources of measurement error in the House data that make the results noisier; counties fit only imperfectly into House districts, the 2010 redistricting changed the local political calculus in some races, and we are unable to control for incumbency in 2010 and 2012 as a consequence of concerns about post-treatment bias.^{xvi} Overall, however, the consonance of our results for the House and the Presidency serves to strengthen the case for our hypotheses.

Limitations and Implications for Future Research

Our results suggest that ARRA spending in Democratic districts is correlated with a significant increase in support for the President in 2012. But in conservative districts, the effect of the ARRA was actually negative for Democrats' electoral chances. These findings have certain noteworthy limitations, but also important implications for the study of voter responsiveness.

One should be careful in generalizing from the data presented here, because the ARRA (1) represents a large spending initiative and (2) was strongly identified with a *Democratic* president. Other legislation that is smaller in fiscal scope or less clearly identified with a single party would likely see a less powerful impact of local partisanship. Moreover, as other researchers have shown, Democrats and liberals may be generally more inclined to positively respond to federal spending initiatives, and so it is unclear whether similar effects would be found if a large spending measure were passed under a Republican administration. While these features potentially limit the generalizability of our findings, there are some advantages to using a best-case testing scenario; in particular, the stimulus provides an excellent opportunity to observe whether an effect that is likely to be muddled in other instances actually occurs in any context.

We believe that our results have crucial implications for the study of voter responsiveness. Our results suggest that the non-findings in previous research on spending effects may be a consequence of opposing influences on different segments of the population. Future research should thus be attentive to disaggregating the impact of spending by partisanship, ideology, and other potentially salient demographic characteristics.

Additional studies could explore the mechanisms undergirding our results. For example, did the ARRA increase voter turnout among highly liberal or conservative individuals in particular counties? Did politicians campaign differently in places that received a great deal of ARRA funding? Or was local media coverage of the parties the mechanism by which ARRA spending affected voter behavior? Our data cannot distinguish between these alternative explanations. In particular, we encourage future scholarship exploring whether the effects of stimulus spending were particularly acute in districts where the government made an extra effort to link spending with the ARRA, whether via road signs or other public outreach.

Conclusion

In 2009, Republicans strongly resisted the use of the ARRA highway signs. “These signs are simply for political self-interest, and it’s high time we stop using stimulus dollars to fund them,” announced Senator Judd Gregg, Republican from New Hampshire. Politicians clearly believed that local stimulus spending would have an electoral impact. Our preliminary results suggest that they did, indeed, have reason to worry – but perhaps not in the way they expected. At least in the most conservative counties, Republican opposition to Obama was strengthened by greater stimulus spending. While presidents are already quite effective at targeting benefits to particular core constituencies (Kriner and Reeves 2015), our research results are a point in favor of a similarly strategic approach to presidential credit claiming.

The net effect of the stimulus was not in an overall gain for Democrats or Republicans, but rather an increase in polarization in states that have highly Democratic and highly Republican counties. The possibility that government programs might further fragment an already divided country is surely disconcerting to scholars, policymakers, and theorists seeking

democratic responsiveness. Most disturbingly, it suggests that there are few avenues, even for the most universalistic president, to potentially ameliorate polarization (or attract supporters from the other political party) via government spending.

Appendix

Our difference-in-differences model controls for the effect of static county-specific factors but does not resolve the possibility that dynamic variables might be correlated with both the level of ARRA spending and the change in Democratic vote share. To identify these potential confounders, we predict both ARRA spending and other federal spending by county^{xvii} in 2009 with key county-level demographic variables: unemployment rate in 2008, percent Black, percent Latino, population, and Democratic vote share in 2008 presidential and house elections. We also examine the relationship between ARRA spending and federal spending more generally.^{xviii} The results are presented in Table A1.

Stimulus spending (non-entitlement only) is positively predicted by Democratic Presidential (and less strongly, House) vote share in 2008 as well as the poverty rate, but negatively predicted by the unemployment rate in 2008 and percents black and Latino in the county. The negative correlation of ARRA spending with the percents black and Latino significantly reduces our concern about race being the hidden variable driving our results. Disproportionately Democratic counties did receive more ARRA spending than Republican counties, and we include a control for Democratic vote share in 2008 in all the difference-in-differences analyses in our paper (as well as controls for the demographic characteristics included in these models).

[Table A1 about here]

The second column in Table A1 predicts other federal spending as a function of the same county-level demographic variables. Federal spending was predicted positively by presidential and House (though not significantly) Democratic vote share in 2008 and the poverty rate, but negatively by the unemployment rate and the percents black and Latino. The raw correlation between ARRA spending (2008-2012) and federal spending in 2009 is 0.32.

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Tables and Figures^{xix}

Table 1. Difference-in-differences model of change in Democratic vote share 2008-2012 as a function of Stimulus expenditure in 2009-2012. Spending is calculated as logged per capita expenditure on the county level; the dependent variable is change in Democratic vote share (coded 0-1) on the county level.

	<i>Dependent variable:</i>			
	Presidential Elections (1)	House Elections (2)	Presidential Elections (3)	House Elections (4)
ARRA spending (per capita, log)	0.0002 (0.001)	-0.006 (0.005)	-0.005*** (0.002)	-0.034*** (0.013)
Presidential Dem. Vote Share 2008	0.0004 (0.004)	0.132*** (0.027)	-0.087*** (0.027)	-0.317* (0.190)
Population (thousands)	0.00000*** (0.00000)	0.00002** (0.00001)	0.00000*** (0.00000)	0.00002* (0.00001)
Percent Black	0.001*** (0.00004)	-0.001*** (0.0003)	0.001*** (0.00004)	-0.001*** (0.0003)
Percent Latino	0.001*** (0.00004)	0.002*** (0.0003)	0.001*** (0.00004)	0.002*** (0.0003)
Unemployment Rate	0.001*** (0.0003)	-0.001 (0.002)	0.001*** (0.0003)	-0.001 (0.002)
Poverty Rate	-0.039*** (0.009)	-0.254*** (0.067)	-0.043*** (0.009)	-0.276*** (0.067)
Federal Spending (per capita, log)	-0.0004 (0.001)	0.001 (0.007)	-0.0005 (0.001)	0.001 (0.007)
ARRA * Pres. Dem. vote share 08			0.012*** (0.004)	0.064** (0.027)
Constant	-0.042*** (0.009)	-0.090 (0.066)	-0.003 (0.015)	0.108 (0.106)
Observations	3,116	3,059	3,116	3,059
Adjusted R ²	0.314	0.041	0.316	0.042
Residual Std. Error	0.025 (df = 3107)	0.178 (df = 3050)	0.025 (df = 3106)	0.178 (df = 3049)
F Statistic	179.125*** (df = 8; 3107)	17.145*** (df = 8; 3050)	160.968*** (df = 9; 3106)	15.895*** (df = 9; 3049)

Note:

*p<0.1; **p<0.05; ***p<0.01

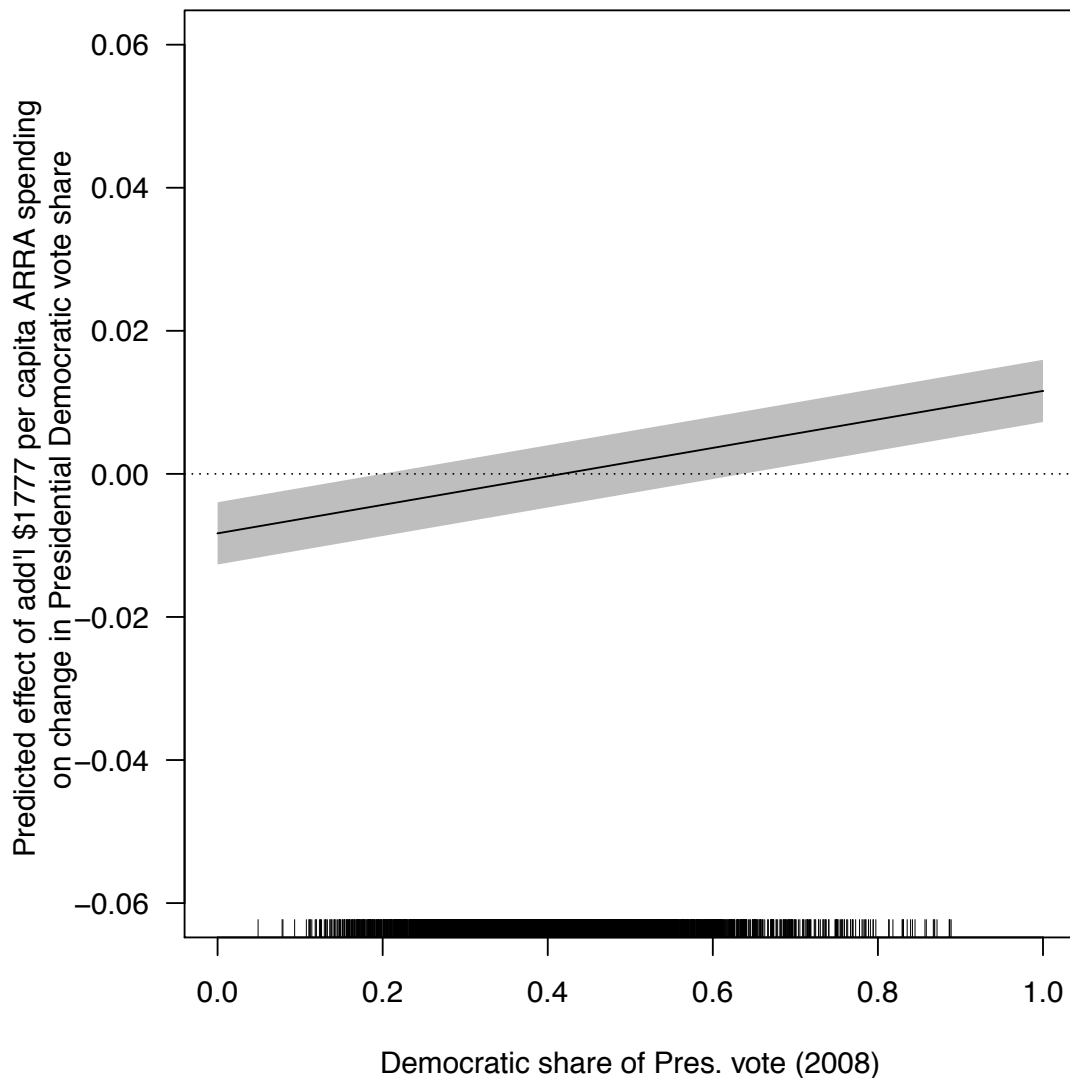


Figure 1. Predicted relationship between Stimulus spending and change in Presidential vote. The solid line shows the predicted relationship between an additional \$1777 per capita Stimulus spending (representing a move from the 10th to the 90th percentile of spending) and change in county-level Democratic Presidential vote (coded 0-1) from 2008 to 2012. The grey shadow represents the 95% confidence interval for the interaction effect; numbers based on Model 3 in Table 1. The rug shows counties by their Democratic share of the Presidential vote in 2008.

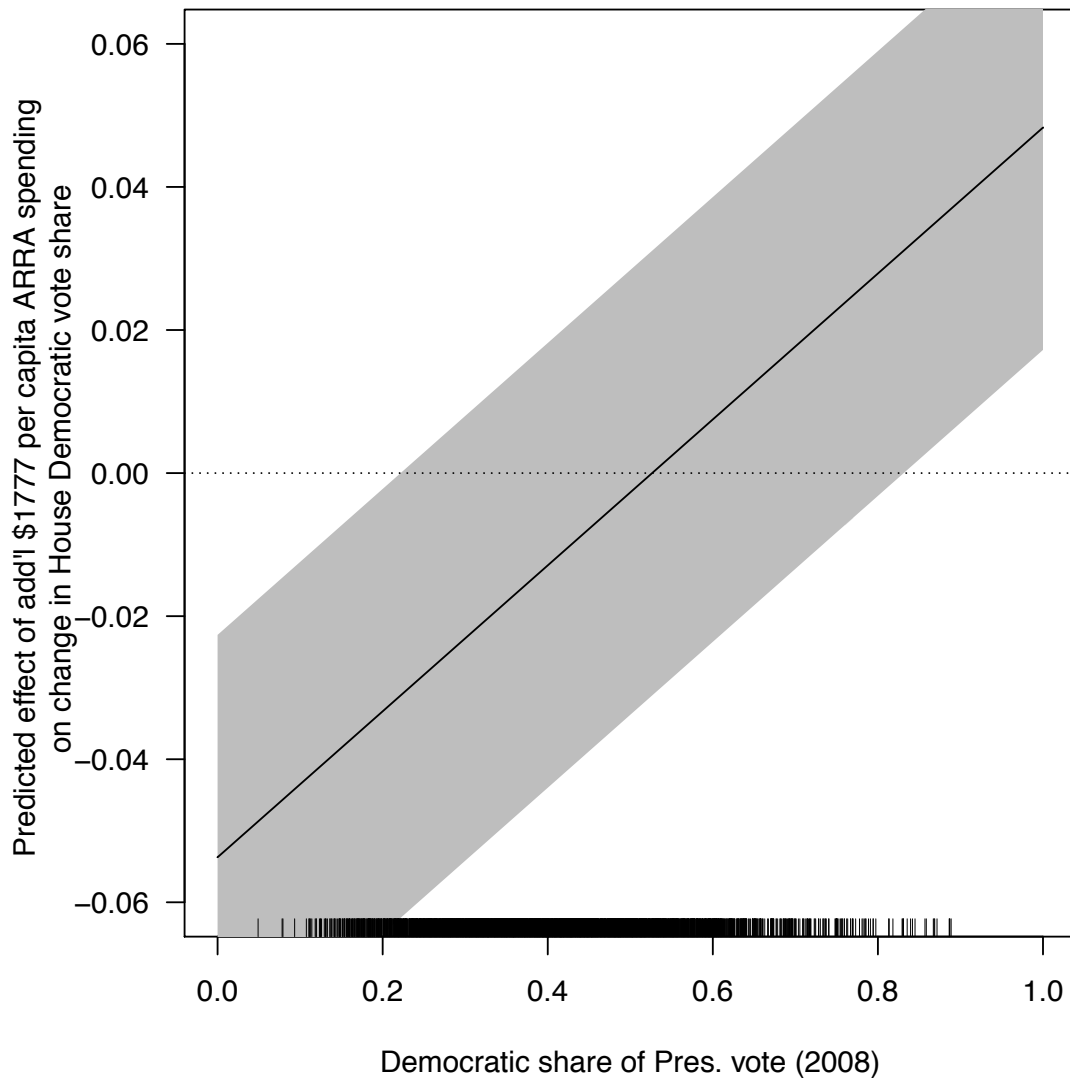


Figure 2. Predicted relationship between Stimulus spending and change in House vote. The solid line shows the predicted relationship between an additional \$1777 per capita Stimulus spending (representing a move from the 10th to the 90th percentile of spending) and change in county-level Democratic House vote (coded 0-1) from 2008 to 2012. The grey shadow represents the 95% confidence interval for the interaction effect; numbers based on Model 4 in Table 1. The rug shows counties by their Democratic share of the Presidential vote in 2008 (the Presidential vote is used as a proxy of county partisanship to calculate the interaction effect).

Table A1. Predictors of Stimulus (ARRA) Spending and Other Federal Spending. ARRA spending occurred in 2009-2012, Federal Spending occurred in 2009. All spending is calculated as logged per capita expenditures.

	<i>Dependent variable:</i>	
	Stimulus (ARRA) Spending	Other Federal Spending
	(1)	(2)
Democratic Vote Share (2008 House)	0.166** (0.075)	0.038 (0.047)
Democratic Vote Share (2008 Pres.)	1.084*** (0.130)	0.254*** (0.082)
Population (thousands)	0.00000 (0.00000)	−0.00000 (0.00000)
Unemployment Rate	−0.065*** (0.007)	−0.045*** (0.005)
Percent Black	−0.007*** (0.001)	−0.002** (0.001)
Percent Latino	−0.003*** (0.001)	−0.003*** (0.001)
Poverty Rate	2.727*** (0.261)	2.151*** (0.165)
Constant	6.381*** (0.055)	8.975*** (0.035)
Observations	3,061	3,061
Adjusted R ²	0.075	0.066
Residual Std. Error (df = 3053)	0.719	0.454
F Statistic (df = 7; 3053)	36.684***	32.037***

Note:

*p<0.1; **p<0.05; ***p<0.01

ⁱ Remarks by the President and Vice President at the signing of The American Recovery and Reinvestment Act, Denver Museum of Nature and Science, Denver, Colorado, February 17, 2009. Available at: http://www.whitehouse.gov/the_press_office/Remarks-by-the-President-and-Vice-President-at-Signing-of-the-American-Recovery-an.

ⁱⁱ A LexisNexis Search reveals that the phrase “Obama’s Stimulus” appeared over 1,000 times in newspapers *between January and July 2009 alone*.

ⁱⁱⁱ Though the Congressional Budget Office originally estimated the budget effect of ARRA at \$787 billion, it later revised the estimate to \$831 billion. CBO 2012.

^{iv} The ProPublica dataset is “Recovery Tracker Data” (2013), available at <https://projects.propublica.org/data-store/>. Replication code for the analysis will be made available online on publication.

^v While ProPublica data is aggregated to the county (FIPS code) level, the original spending data available at recovery.org uses zip codes as the main geographic identifier. For analysis of recovery.org, we made use of crosswalk files provided quarterly by the Department of Housing and Urban Development, which allow researchers to rigorously match zip codes with counties.

^{vi} This county-level Democratic vote share proves somewhat problematic for House elections, where many counties are split between two (or more) House districts. We anticipate that this issue will introduce noise into our statistical analyses, but should not bias our results. In particular, neighboring districts are unlikely to have radically different within-party candidates and (most importantly) when they do differ, there is no reason to expect such differences to be related to our treatment, ARRA spending. Note that we are not aggregating ARRA spending to

the congressional-district level; rather, we are using *county-level* congressional vote returns from David Leip's Atlas of U.S. Presidential Elections to estimate the *county-level* effect of stimulus spending on Democratic vote share. These county-level House results are reported in official state-level vote returns using aggregated precinct-level data.

^{vii} This model follows, in format, one of the most prominent difference-in-differences model studies, Card and Krueger's (1994) research on the minimum wage in New Jersey. In this research, Card and Krueger juxtapose New Jersey, which saw an increase in its minimum wage in 1992, with Pennsylvania, which did not. They compare the difference in the change in employment rate in New Jersey and the corresponding change in Pennsylvania. Analogously, we explore the difference in change in the Democratic vote share in counties that received stimulus spending with those that did not. In both models, there are changes in the independent variable; in Card and Krueger's, there's a change in minimum wage in one locale but not others, while in ours, there's a change in stimulus spending in some counties, but not others. More importantly—and the part that makes both of our studies a difference-in-differences design, we explore differences in the changes of our key dependent variables: in Card and Krueger's case, employment, and in ours, county-level Democratic vote share.

^{viii} Because these numbers were calculated using ACS 1-year estimates with large standard errors, many of these figures have overlapping confidence bounds.

^{ix} Between 2008 and 2012, Black citizens reduced their support for Obama at a slower rate than other racial groups, creating the potential for omitted variable bias in the difference-in-differences set-up. Fortunately, since percent Black *negatively* predicts stimulus spending, we

can rule out the possibility that disproportionately Black counties a) received more ARRA spending, b) reduced support for Obama at a slower rate than other groups and therefore, and therefore c) make it appear as though counties that received ARRA spending remained more supportive of Obama than other counties.

^x The effect of ARRA spending here can be interpreted as a per dollar effect. Our results thus should be unaffected by the fact that presidents target spending toward their same-party constituents (Dynes and Huber 2015).

^{xi} In the case of two time points, a difference-in-differences set-up is mathematically equivalent to a fixed-effects model (see Angrist and Pischke 2009, Ch.5).

^{xii} Because the 2008 American Community Survey does not include poverty data for roughly one-third of the counties in our stimulus data set, we linearly interpolated poverty data from the 2000 Decennial Census and the 2010 American Community Survey 5-year estimates to maximize the number of observations with valid data. These linearly interpolated data are highly correlated with their 2008 ACS counterparts for those counties for which data are available, with a correlation coefficient of .9165.

^{xiii} Because unemployment at later dates was itself influenced by the ARRA, we do not include controls for later unemployment rates.

^{xiv} The mean amount of per capita spending was \$1441, with a standard deviation of \$3010. Because the data is skewed, with a few counties receiving very high per capita expenditures, we use logged per capita expenditures in all model specifications.

^{xv} While the interaction term in our presidential model is 1/5 as large as that in our House model, we cannot definitively say which model exhibits a *stronger* effect because of the large confidence intervals surrounding our House coefficient estimates. We can, however, assert that our key interaction term is more *precise* in our Presidency model relative to its House counterpart.

^{xvi} Our main variable of interest (ARRA spending) might affect the probability that a member of the House is an incumbent in 2010 and 2012. Including a control for incumbency in those years, then, might bias our results.

^{xvii} Federal spending data for 2009 taken from the National Atlas of the United States publication “Federal Expenditures by County” (2011.10), <http://nationalatlas.gov/pros.htm>.

^{xviii} We do not include a measure of 2010 turnover or incumbency because, with the treatment of Stimulus funding already underway, including such a measure risks significant endogeneity.

^{xix} Tables created with the Stargazer v.5.1 package in R, by Marek Hlavac, Harvard University.