Exploiting Friends and Neighbors:
An Instrumental Variable Approach to Estimating Coattail Effects

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I. Introduction

One feature of many countries' political systems is that different political offices are elected concurrently. Political scientists long have believed that such systems may give rise to spillovers – termed coattail effects – where voting decisions made in one race to causally affect voting decisions on another. These beliefs have lead to over fifty years of work by political scientists estimating the relationship between the performance of the candidate for the most prominent offices on the ballot and the performance of other candidates of the same party in less prominent races. Many papers demonstrate substantively large positive associations in the United States and elsewhere between the vote shares of a party's top-ballot candidates, like presidential and gubernatorial candidates, and the vote shares and winning percentages of the party's down-ballot candidates, like congressional and state legislative candidates.

Often academics and journalists alike causally interpret these associations; the night of the 2008 presidential election Roll Call newspaper ran stories with the headlines "Obama Coattails Prevail in N.C. and Va. Races" and "Obama's Coattails a Bit Short in Plains States". These interpretations are despite long-standing warnings about the potential confounds of a causal interpretation of these associations. Miller (1955) notes that coattail effects are a by-product of the personal appeal of top ticket individual candidates, and therefore estimates of coattail effects should be unaffected by voting behavior that is independent of identity of the top ticket candidate. Unfortunately, doing so in practice is difficult because a number of common factors, such as an individual's ideology or the general state of the economy jointly affect both top- and down-ballot candidate preferences. Therefore, it is unclear whether the robust positive conditional

association between top and down-ballot candidate performance represent a causal relationship or the effects of omitted variables that jointly determine top and down-ballot candidate performance

I use an instrumental variables approach to overcome this identification problem in this paper. My approach is based on the "friends-and-neighbors voting" patterns first identified by V.O. Key (1949). The term "friends-and-neighbors voting" refers to the increased support that candidates receive from geographically proximate voters. While Key first recognized this pattern in Southern Democratic primaries, subsequent work demonstrates that this relationship also holds in statewide general elections (Rice and Macht, 1987). I use the increased relative support for top-ballot candidates in their home counties as source of variation in the personal appeal top-ballot candidates that is assumed to be conditionally independent of support for down-ballot candidates, except through the channel of top-ballot voting. I then test how the increased support for top-ballot candidates due to friends-and-neighbors voting affects support for down-ballot candidates.

I analyze the effect of gubernatorial coattails on the vote shares of down-ballot candidates using a unique set of county-level state-wide executive office election outcomes from 1990 – 2008. I first examine properties of the associations between a county's deviation off its normal Democratic vote share in gubernatorial and down-ballot races. Consistent with past work, I find robust positive association between the gubernatorial and down-ballot performance. These associations are significantly higher in the South than in other parts of the country and in lieutenant governors elections than for other down-ballot offices. I observe no difference in these associations in states that

use the straight party ballot or in state that elect their governors in presidential rather than midterm election years.

I next investigate the extent to which gubernatorial candidates receive additional support in their home counties. I estimate that gubernatorial candidates' vote shares increase on average by 3.3 percentage points in their home county. I also find that this relationship varies with the population of the candidates' home county; candidates from less populated counties receive a greater percentage point increase than candidates from larger counties. Finally, I find that incumbents receive a smaller vote share increase in their home counties than non-incumbents.

Finally, I investigate the extent to which governors' home county advantage spills-over onto down-ballot races. My results suggest there are significant gubernatorial coattail effects for down-ballot candidates in the governor's home county. A one percentage point increase in a governor's vote share increases the performance of down-ballot candidates by 0.16 percentage points in my preferred specification. This IV point estimate is roughly 2/3 as large as the corresponding OLS estimate from my preferred specification. I also provide some suggestive evidence about the mechanisms causing the relationship.

The paper proceeds as follows. Section II discusses the relevant literature. Section III describes the data. Section IV presents the empirical specifications. Sections V and VI discuss the cross-sectional and instrumental variable results respectively. Section VI concludes.

II. Relevant Literature

Coattail effects are defined as a process from which the personal appeal of the top ballot candidate (generally a presidential candidate) affects the performance of candidates of the same party down-ballot (generally a congressional candidate). There are a number of theoretical reasons to support the existence of either positive or negative coattail effects. Positive coattail effects may result from attractive top-ballot candidates mobilizing core party supporters to the polls, who in-turn support the party's down-ballot candidates. Cognitive dissonance may also make supporters of a top ballot candidate more likely to vote for down ballot candidate from the same party (Mondak and McCurley 1994). Finally, ballot structures like the straight party ballot (Burden and Kimball 2002) or party column ballots (Roberts 2009) may make it easier to cast votes for candidates of the same party. In contrast, negative coattail effects may result from complementarities from having office-holders from differing parties. For example, Alesina and Rosenthal (1996) develop a model where moderate voters split their presidential and legislative votes, because having divided government moderates policy (see also Fiorina (1996)).

Since the 1940's, political scientists have engaged in trying to empirically estimate the sign and magnitude of coattail effects. Bean (1948) and Moos (1952) claim that the stylized fact that the party of the winning president also tends to do better than average in congressional elections indicates positive coattail effects. However, Warren Miller (1955) critiques this early coattail effects literature, noting that not all straight ticket party voting results from positive coattails. For example, poor economic performance may cause a vote against the incumbent President's party in both the

presidential and congressional races. Miller argues that only factors dependant on the personal identity of the top-ballot candidate should affect estimates of coattail effects.

Scholars have assessed the associations between top- and down- ballot candidates vote share or seat shares in many contexts.[2] Most find large statistically significant positive conditional associations between the performances of the top- and down-ballot candidates. Despite Miller's (1955) critique, many of these subsequent papers refer to conditional associations between top-ballot and down-ballot performance as coattail effects without attempting to isolate the causal effect of the top-ballot candidate.

Three previous papers attempt to isolate the affect of the personal identity of the president on congressional performance. Kramer (1971) models the joint determination of presidential and congressional votes by assuming that they both share common unobservable other than a top-ballot shock caused by the identity of the presidential candidate. The common unobservable assumption allows him to identify the coattail effect of the top-ballot specific shock on aggregate congressional vote shares. Ferejohn and Calvert (1984) weaken Kramer's assumption of a common unobservable shock to a common variance shock, which allows them to estimate a range of coattail effects depending on the assumed correlation of the unobservable presidential and congressional shocks. Finally, in the study closest to this one, Calvert and Ferejohn (1983) use an instrumental variable approach to assess how an individual's presidential voting choice affects their congressional vote choice. Their exclusion restriction is that reported likes

[2] Campbell (1986b) examines the relationship between aggregate presidential vote shares and Congressional seat shares. Similarly, Campbell (1986a) and Chubb (1988) estimate the relationship between aggregate top-ballot vote shares and state legislative seats shares. Campbell and Summers (1990), Flemming (1995), and Hogan (2004) correlate down-ballot candidate vote shares with top-ballot performance in the district. Jacobsen (1972), Mondak (1990), and Mondak and McCurley (1994) examine individual-level the associations between presidential and congressional vote choice.

and dislikes of presidential candidates only affects congressional vote choice through presidential vote choice.[3]

My paper has a number of advantages over previous attempts to estimate coattail effects. Kramer (1971) and Ferejohn and Calvert's (1983) assumptions about the unobservables are untestable and without much theoretical basis. Moreover, Ferejohn and Calvert demonstrate the sensitivity of the estimated coattail effect to the assumption about the correlation between these shocks. My approach does not rely on such assumptions. Moreover, a much stronger case can be made that my instrument satisfies the exclusion restriction that it affects down-ballot performance only through its affect on top-ballot performance. Rahn, Krosnick, and Breuning (1994) argue that reported likes and dislikes are, in part, rationalizations for vote choice. As a result, reported likes and dislikes are likely to be affected by omitted variable bias caused by imperfect measurement of variables like party identification.

This paper also contributes more generally to the study voting behavior in statewide executive office elections other than governor. Voting behavior in such elections provides an interesting laboratory to test different schools of political decision-making, because voters make a series of simultaneous vote choices with varying levels of information about the candidates. The Michigan school of political behavior suggests that voter behavior in such elections would largely be based on ones permanent partisan attachments, with little knowledge of the individual attributes of the candidates (Campbell, Converse, Miller, and Stokes 1960). This is contrast to theories posited by scholars like V.O. Key (1966), who argues that in cases where there is sufficient

[3] Tufte (1978) does a similar reduced form analysis of the relationship between presidential likes/dislikes and congressional voting.

differentiation between the candidates, voters' will vote according to their interests.[4] Put another way voters may weight candidate attributes like misbehavior (Welsh and Hibbing 1997) or ineffectiveness (Miquel and Snyder 2006), rather than simply viewing politics through a general partisan lens, when making vote choices.

Thus far, the lack of high quality data has prevented the study of voting patterns in non-gubernatorial statewide elections. The most comprehensive study to date is Ansolabehere and Snyder (2002). They find that the incumbency advantage grew over-time in federal, gubernatorial, and non-gubernatorial statewide elections. They also find less variation in parties vote shares in sub-gubernatorial elections than in gubernatorial elections, and that the variation in parties' performance in all statewide elections grew over the later half of the 20th century. Schaffner and Streb (2002) show that voters' rely on partisan cues in sub-gubernatorial elections to form opinions. Finally, Gerber, Kessler, and Meredith (2011) demonstrate that campaigns matter in down-ballot races by finding a large persuasion affect of direct mail in an attorney general race.

III. Data

Two unique data sources are collected for this paper. The first are county-level returns for statewide executive office elections that are held concurrently with gubernatorial elections. There are 42 states that elect at least one other partisan statewide executive office in conjunction with the governor race.[5] I exclude Louisiana and New York from the analysis due to their electoral systems. I also exclude Delaware,

[4] This is an extrapolation of Key's argument because his discussion is primarily about individuals ability to switch parties in presidential elections across years.

[5] The only elected partisan executive office in this time period in Alaska, Hawaii, Maine, New Jersey, New Hampshire, and Tennessee is governor. In Oregon and Pennsylvania, other statewide executive offices are elected non-concurrently from governor.

Mississippi, Nevada, and Rhode Island because I have yet to obtain a complete set of electoral data. In sum, this results in data from 185 gubernatorial elections in 36 states (five in every state except for Vermont, which has ten), all of which were contested by both Democratic and Republican candidates, for a total of 370 candidates.

I also collect data on the birth places and hometowns of gubernatorial candidates. The primary data sources for these data are various editions of Who's Who in American Politics. Each edition of Who's Who in American Politics has a small biographical record for thousands of individuals active in politics. Figure 1 provides a sample record. I extract from these records both the candidates' place of birth and hometown. In many cases the biography indicates that gubernatorial candidates held a state executive office prior to running for governor. In these cases I code the candidate's hometown based on the place of residence prior to entering state-executive politics.

A number of additional sources are used to obtain birthplace and hometown information in cases where an individuals' birthplace or hometown cannot be assessed from Who's Who in American Politics. These include Wikipedia, archived candidate websites, newspaper articles, politicalgraveyard.com, and various other sources.

I am able to match birth places for 338 (91.3%) and hometowns for 357 (96.5%) of the gubernatorial candidates. I am unable to match either birth place or hometown for 10 (2.6%) of the sample. Of the candidates for whom I am able to match birth place, 209 (61.8%) were born in the state that they run for governor. Perhaps not surprisingly, it was easier to find the birth places of candidates if they were born in the state in which they were running for governor.

I match the retrieved birth places and hometowns of candidates to counties.[6] I construct a variable $Home_{s,j,t}$ which is equal to 1 if the Democratic candidate in state *s* at time *t* was either born or resides in county *j*, -1 if the Republican candidate in state *s* at time *t* was either born or resides in county *j*, and 0 otherwise. In a few cases both the Democratic and Republican candidates have ties to county *j*; I excluded these observations from the analysis.

IV. Empirical Specification

Let $Gov_{s,j,t}$ be the percentage of ballots cast for the Democratic gubernatorial candidate in county j of state s in the election at time t and let $Down_{s,j,t}$ be the percentage of ballots cast for the Democratic candidates in down-ballot races in county j of state s in the election at time t. I would like to estimate

$$Down_{s,j,t} = g(Gov_{s,j,t}, X_{s,j,t}, Z_{s,j,t}) \qquad (1),$$

where $X_{s,j,t}$ and $Z_{s,j,t}$ are vectors of observable and unobservable determinants of the Democratic vote shares respectively. Estimating equation (1) is difficult for a number of reasons. Both the elements of $X_{s,j,t}$ and the function relationship of $g()$ are largely unknown to the researcher. Moreover, it is likely that at least some elements of $Z_{s,j,t}$ also affect $Gov_{s,j,t}$. This creates concern that any estimated relationship between $Gov_{s,j,t}$ and $Down_{s,j,t}$ suffers from severe omitted variable bias.

I exploit a number of features of my data to overcome these identification problems. Building-off Levitt and Wolfram (1997) and Ansolabehere and Snyder (2002), I use a series of fixed-effects to estimate a county normal vote (see Converse 1966 for a

[6] I find that 77.6 percent of Democratic candidates reside in a county in Metropolitan Statistical Areas compare to 69.6 percent of Republican candidates.

discussion of the concept of the normal vote). Ideally, I would be able to estimate a county-time specific fixed effect. Unfortunately, these are unidentified. Instead, I assume that $Down_{s,j,t}$ is a linearly separable function of $\lambda_{s,t}$, an election specific fixed effect, $\lambda_{s,j}$, a county specific fixed effect that in some specifications is allowed to vary linearly across time, $Gov_{s,j,t}$, and an election specific shock $\varepsilon_{s,j,t}$ (see equation (2)).[7]

$$Down_{s,j,t} = \lambda_{s,t} + \lambda_{s,j}(1 + \delta_{s,j}t) + \beta\, Gov_{s,j,t} + \varepsilon_{s,j,t} \qquad (2),$$

In this specification β is determined by the relationship between within county deviations in the normal governor vote and within county deviations in the normal down-ballot vote. Because there are some time specific $Z_{s,j,t}$ that jointly affect $Down_{s,j,t}$ and $Gov_{s,j,t}$, it is expected that $Gov_{s,j,t}$ and $\varepsilon_{s,j,t}$ will be positively related. As a result, it is expected that OLS estimates of β will overestimate the true effect of gubernatorial vote shares on down-ballot vote shares.[8]

I use an instrumental variable regression to isolate the causal relationship between $Gov_{s,j,t}$ and $Down_{s,j,t}$. Similarly to equation (2), I model the percentage of votes for the Democratic gubernatorial candidate as:

$$Gov_{s,j,t} = \gamma_{s,t} + \gamma_{s,j}(1 + \theta_{s,j}t) + f(Home_{s,j,t}, Pop_{s,j}, Inc_{s,t}) + \varepsilon_{s,j,t} \qquad (3),$$

where $\gamma_{s,t}$ is a election specific state fixed effect, $\gamma_{s,j}(1 + \theta_{s,t})$ is a time trended county specific fixed-effect, $f(Home_{s,j,t}, Pop_{s,j}, Inc_{s,t})$ is a function of $Home_{s,j,t}$ (described in previous section), $Pop_{s,j}$, a measure of the population of county j in state s[9], and $Inc_{s,t}$,

[7] Ansolabehere and Snyder (2002) find nearly identical effects of incumbency when they use a linear combination of state and time fixed effects as when they use joint state-time fixed effects.
[8] For example, within-state variation in economic performance may cause all candidates from the incumbent president's political party to perform better relative to their historical performance in counties with better economic performance.
[9] In this version of the paper $Pop_{s,j}$ is defined as the average gubernatorial turnout in the sample. It will be changed in later versions to be something less endogenous.

which is equal to 1 (-1) if the Democratic (Republican) gubernatorial candidate in state *s* at time *t* is an incumbent and 0 otherwise. I define an indicator variable $I_q(Pop_{s,j})$ that is equal to 1 if $Pop_{s,j}$ is in the qth quintile of $Pop_{s,j}$ in the sample (e.g. $I_2(Pop_{s,j})$ equals 1 if $Pop_{s,j}$ is between the 20^{th} and 40^{th} percentile of the distribution of $Pop_{s,j}$ of the hometown counties in the sample). For my baseline specifications I model $f(Home_{s,j,t}, Pop_{s,j}, Inc_{s,t})$ as $Home_{s,j,t}$ interacted with each population quintile indicators as indicated in equation (4).

$$f(Home_{s,j,t}, Pop_{s,j}, Inc_{s,t}) = \sum_{k=1}^{5} \beta_k I_k(Pop_{s,j}) Home_{s,j,t} + Home_{s,j,t} Inc_{s,t} \qquad (4)$$

The exclusion restriction for (3) to be a valid instrument for $Gov_{s,j,t}$ in equation (2) is that $f(Home_{s,j,t}, Pop_{s,j}, Inc_{s,t})$ only effects the performance of the down-ballot candidates through its effects on gubernatorial candidate performance.

V. Cross-Sectional Results

I begin by looking at how OLS estimates of β from equation (2) vary with respect to state characteristics and down-ballot offices. The first state characteristic I investigate is geography. I test whether there is a differential conditional association between Democratic governor performance and Democratic down-ballot performance in the South. Because this the period when two-party competition is first fully realized in the South, voters may be less aligned with a given parties at the state-level and hence be more likely to be affected by the top-ballot vote. I also look at whether the availability of the straight party ballot increases the conditional association between governor and down-ballot vote share. Finally, I test whether there is a differential conditional

association between governor and down-ballot performance in states that elect the governor concurrent with the midterm versus presidential elections.[10]

Table 1 reports the contextual correlates of the conditional association between Democratic governor and down-ballot performance. Column (1) indicates that $\hat{\beta}$ = 0.348 (σ = 0.020) when I estimate equation (2) without county specific time trends. This estimate implies that in elections where the Democratic governor's vote share is 10 percentage points above its estimated normal vote, the Democratic down ballot vote share is 3.48 percentage points above its estimated normal vote. Column (2) reports coefficients from an augmented equation (2) that also includes the interaction of Democratic governor vote share with an indicator for being a southern state, an indicator for having a straight party ballot option, and indicators for election concurrency. Column (2) shows that the conditional association between governor and down-ballot vote shares is substantially larger in the South; a 10 percentage point increase in Democratic governor vote share associates with an additional 1.86 percentage point increase in the South relative to the rest of the county. No significant difference is found between states with and without the straight party ballot or in states that elect governors in presidential and midterm elections.

Columns (3) and (4) indicate that including county specific time trends substantially attenuates the conditional association between Democratic gubernatorial and down ballot vote shares. The estimate of $\hat{\beta}$ = 0.188 (σ = 0.020) is roughly half of the magnitude of the estimate when county time trends are excluded. The substantial attenuation of this association when county time trends are included suggests that many

[10] Kentucky and Virginia elect their governors in off-year elections, and therefore get dummied out of this analysis.

of the previous correlations reported to be coattail effects suffered from severe omitted variable bias due to measurement error resulting from estimating the normal vote. Although the differential conditional association between the South and rest of the county is still significant at standard levels, the point estimate is also attenuated by roughly 50 percent when county time trends are included. This suggests that measurement error in the normal vote is particularly problematic when party preferences are shifting, as they were in the South over this time period. Again, no differential conditional association is found between states with and without straight party voting or between states electing governors in presidential and midterm elections.

One potential explanation for the difference between Southern and non-Southern states is that the types of down-ballot offices are different. To address this possibility, I replicate the analysis in columns (1) – (4) restricting the down-ballot vote share to only include the secretary of state and attorney general races. The results reported in columns (5) – (8) suggest that some of the difference between the Southern and non-Southern states is due to the types of down-ballot offices in the South. The point estimates of the differential between the South and non-South from the restricted race sample are roughly half as large as the point estimates obtained from the full sample of races and no longer statistically significant at standard levels when county specific time trends are included.

To gain further insight on how the conditional associations between governor and down-ballot offices vary by office, I estimate equation (2) (without county specific time trends) for separately for each office. The different estimates of β are reported in column (1) of Table 2. Table 2 indicates that the Democratic governors' vote share conditionally associate more with the Democratic lieutenant governors' vote share than with the

Democratic vote share for any other office. Column (2) suggests that this association is not driven by the types of states that elect a lieutenant governor; the conditional association between the Democratic governor's vote share and the Democratic attorney general and secretary of state's vote share is not larger in states that elect a lieutenant governor. Table 2 also indicates that the Democratic governor's vote share is related somewhat more strongly with Democratic auditors than with other offices.

One potential explanation for the stronger relationship between the vote shares governor and lieutenant governor from the same party is that the lieutenant governor immediately follows the governor on the ballot. It may be that gubernatorial coattails are the greatest immediately after casting a ballot for the governor. I investigate this hypothesis by looking at whether the conditional associations are greater for other offices when the immediately follow the governor on the ballot. I find some weak evidence in support of the hypothesis In 20 of the 30 states that elect a secretary of state in my dataset, the secretary of state is listed immediately after the governor. I find that conditional association between the vote shares of the Democratic governor and secretary of state is 0.080 ($\sigma = 0.040$) greater in states where the secretary of state is listed immediately after the governor on the ballot. Similar patterns are not observed in the 8 states that list the attorney general immediately after the governor; the conditional association between the Democratic governor and attorney general's vote shares is 0.024 ($\sigma = 0.060$) less in states that list the attorney general immediately following the governor.

VI. IV Results

I next turn to the instrumental variable analysis outlines in section IV. I start my analysis by looking at the first-stage relationship between the home counties of governor's and their vote share. The top panel of Figure 2 plots the distribution of partial residuals of gubernatorial candidates vote shares in their home counties.[11] This figure confirms the expected pattern that gubernatorial candidates receive more votes than expected in their home counties. Moreover, the top panel of Figure 2 suggests that this relationship is dependent on population; gubernatorial candidates get a larger percentage point increase in their vote shares in their home county if it is less populated. The bottom panel of Figure 2 plots analogous partial residuals from a regression with Democratic down-ballot performance as the dependent variable. Consistent with their being gubernatorial coattails, the bottom panel of Figure 2 suggests that down-ballot candidates from the governors' party do better than expected in their parties' gubernatorial candidate's home county. Figure 3 further demonstrates this by showing that Lowess smoothed lines of the average partial residuals in the gubernatorial and down-ballot races move in tandem with respect to population.

Regression results presented in Table 3 confirms the increased vote share for gubernatorial candidates in their home counties. Column (1) presents estimates of equation (3) excluding the county fixed effects. Using this specification I find that on average gubernatorial candidates' vote share is 3.3 percentage points (σ = 0.3 percentage points) greater in their home counties. The specification used in column (2) allows this effect to vary by the quintile of the population in the home county. Home county candidates increase their vote share by 6.4 percentage points (σ = 1.3 percentage points)

[11] I estimate equation (3) with $f(Home_{s,j,t}, Pop_{s,j}) = Home_{s,j,t}$ and set the partial residuals equal to $\hat{\varepsilon} + \hat{\beta} Home_{s,j,t}$ when $Home_{s,j,t}$ equals 1 and $-\hat{\varepsilon} + \hat{\beta} Home_{s,j,t}$ when $Home_{s,j,t}$ equals -1.

in counties in the first quintile of population (e.g. those counties where the average number of votes is below 7700). The effect size decreases to 5.1 percentage points (σ = 1.0 percentage points) in the second quintile (e.g. average number of votes is between 7700 and 26300), 3.6 percentage points (σ = 0.7 percentage points) in the third quintile (e.g. average number of votes is between 26300 and 72700), 1.4 percentage points (σ = 0.8 percentage points) in the fourth quintile (e.g. average number of votes is between 72700 and 180500), and 1.8 percentage points (σ = 0.8 percentage points) in the fifth quintile (e.g. average number of votes above 180500). Column (2) also shows the incumbents benefit on average 1.7 percentage points less in their home counties than non-incumbents.

Table 3 also confirms that down-ballot candidates increase their vote share in their party's gubernatorial candidate's home county. Column (3) indicates that the average increase in down ballot candidate's vote share is 0.4 percentage points (σ = 0.2 percentage points) larger in the governor's home county. Column (4) shows that this relationship also is inversely related to county population. The largest increase is a 2.1 percentage point (σ = 0.6 percentage points) increase in the first quintile, in contrast to a -0.9 percentage point (σ = 0.6 percentage points) decrease in the fifth quintile.

The results presented in columns (1) – (4) of Table 3 largely hold when we add county specific trends into the regression specifications. Column (5) again shows a 3.3 percentage point average home county increase in gubernatorial vote shares, albeit with twice the estimated standard error (σ = 0.6 percentage points). Column (6) also indicates little change across the different population subgroups. Column (7) again shows a 0.4 percentage point average gubernatorial home county down-ballot vote share increase,

although column (8) indicates there is some compression across the population subgroups.

Table 4 displays the estimates of the coattail effects. Columns (1) and (2) respectively present the OLS results without and with county time trends. Including the time trends reduces the estimate of β from 0.344 ($\sigma = 0.010$) to 0.239 ($\sigma = 0.010$). Columns (3) and (4) present instrumental variable results when only the home county indicator is used as the instrument for Democratic Governor vote share. Similar coattail estimates are found with county time trends ($\beta = 0.133$, $\sigma = 0.068$) and without county time trends ($\beta = 0.127$, $\sigma = 0.093$), although the standard error increases in the latter so that it is no longer statistically significant at conventional levels. Slightly larger and more precisely estimated coattail effects are presented in columns (5) and (6) when the full set of instruments is utilized. Column (6) displays my preferred estimate of the coattail effect ($\beta = 0.161$, $\sigma = 0.073$), which is estimated using the full set of instruments and county specific time trends. This point estimate suggests that for every 10 percentage point increase in governor vote share, down-ballot vote share increases by 1.61 percentage points. This estimate is roughly 2/3 as large as the corresponding OLS estimate.

There are two likely mechanisms that could cause an increase in gubernatorial candidate's performance in their home counties. Having home county candidates may increase turnout among the types of people who support the home county governor. This may lead to coattail effects because these mobilized voters are likely to also be predisposed to support other candidates from the home county governor's party (e.g. a turnout effect). Alternatively, voters who would otherwise cast a vote for the other party

in the gubernatorial election may switch to voting for the home county candidate. This may also lead to coattail effects if switching the gubernatorial vote causes them to also switch their down-ballot (e.g. persuasion effect).[12] To help distinguish between these mechanisms, I look at the effect of having a home county gubernatorial candidate on turnout.

Figure 4 does not show a strong pattern in the partial residuals on turnout in gubernatorial candidates' home counties. Regression results in Table 4 also confirm the relative small effects of home county on turnout. The regression reported in Table 4 are variants on equation (3) with ln(Turnout) as the dependent variable. Column (3) indicates that the average turnout increase in the home counties of gubernatorial candidates is about 0.7 percentage points (σ = 0.6 percentage points). Column (4) indicates that these turnout increases are concentrated in the two smallest quintiles of population. However, even in these two quintiles the point estimate on the increase in turnout is less than 1/3 of the increase in vote share. Overall, the results in Table 4 suggest that most of the increased performance by governors in their home counties result from persuasion.

VII. Conclusion

I estimate the effect of gubernatorial coattails on down-ballot statewide executive office races in this paper. I first estimate the conditional associations between governor and down-ballot candidate performance. I find that these correlations are largest in the South and in lieutenant governor elections. I find no difference in states with and without

[12] A third potential, but less likely, mechanism is that having a gubernatorial candidate from your home county induces voters who generally dislike the party of the home county candidate to abstain.

the straight party ballot or in states that elect governor in presidential and midterm elections.

I then show cross-sectional methods often used to estimate coattail effects are likely to severely overestimate effect. My preferred instrumental variable point estimate suggest that a one percentage point increase in gubernatorial vote share increase down-ballot performance by 0.16 percentage points. The point estimate is less than half of what is estimated using a standard OLS approach. The attenuation of this coefficient results both from corrections designed to better estimate the normal vote (e.g. county specific trends) and from applying the instrumental variable.

While my results suggest that turnout is not the primary mechanism causing the increase in the governor's performance in their home counties, the point estimates and standard errors are such that I cannot rule out that the entire coattail effect can be explained by turnout. Moreover, my preferred point estimate on the coattail effect is relatively small; even if I assume a lower bound of no turnout effects, it implies that in less than 1 out of every 5 times does switching the governor vote affect down-ballot performance. Moreover, the associations suggest the effect may differ by office, with voters particularly linking their governor and lieutenant governor votes. Overall, I believe these results hint at a model of voter behavior more in-line with that of Key than the Michigan school, where voters are differentiating their votes across offices rather than essentially casting one vote for a slate of candidates.

Finally, my results have implications for theories of ticket splitting. In models like Alesina and Rosenthal (1996), increased support for a party's top-ballot candidate should decrease support for that party's down candidates. For example, voters would

want an attorney general of an opposite party from the governor, so that the attorney general has more incentive to monitor the behavior of the governor. While my results do not preclude the existence of such balancing voters, their influence is swamped by positive coattail effects. I believe this result is consistent with Burden and Kimbell's (2002) assessment that balancing is unlikely to be the primary force explaining split ticket voting.

VIII. References

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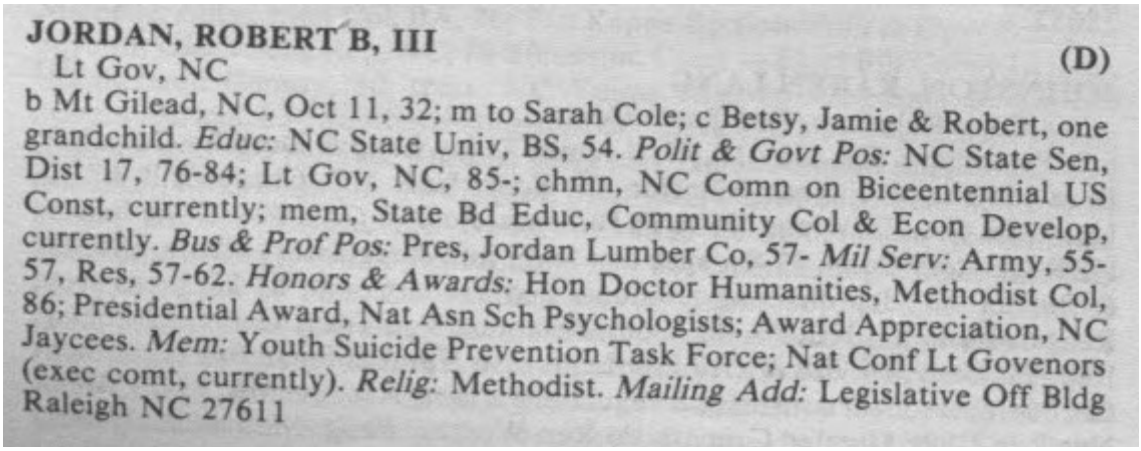
Who's Who in American Politics, various editions.

Tables and Figures

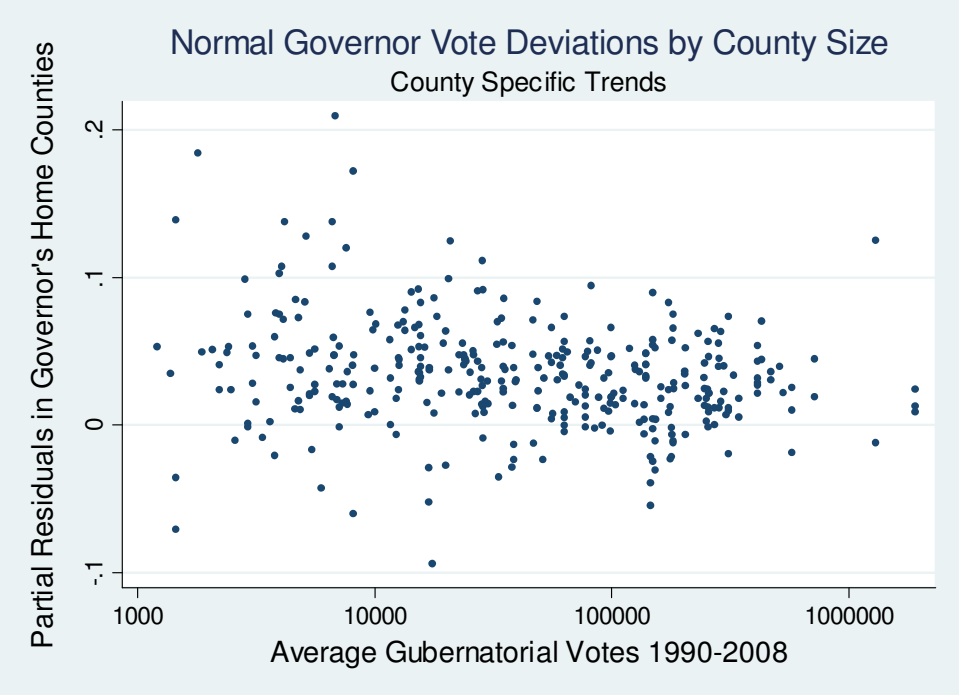
Figure 1: Sample Record from Who's Who in American Politics



JORDAN, ROBERT B, III (D)
Lt Gov, NC

b Mt Gilead, NC, Oct 11, 32; m to Sarah Cole; c Betsy, Jamie & Robert, one grandchild. *Educ:* NC State Univ, BS, 54. *Polit & Govt Pos:* NC State Sen, Dist 17, 76-84; Lt Gov, NC, 85-; chmn, NC Comn on Biceentennial US Const, currently; mem, State Bd Educ, Community Col & Econ Develop, currently. *Bus & Prof Pos:* Pres, Jordan Lumber Co, 57- *Mil Serv:* Army, 55-57, Res, 57-62. *Honors & Awards:* Hon Doctor Humanities, Methodist Col, 86; Presidential Award, Nat Asn Sch Psychologists; Award Appreciation, NC Jaycees. *Mem:* Youth Suicide Prevention Task Force; Nat Conf Lt Govenors (exec comt, currently). *Relig:* Methodist. *Mailing Add:* Legislative Off Bldg Raleigh NC 27611

Figure 2: Partial Residuals on Vote Share in Home County of Gubernatorial Candidates by County Size



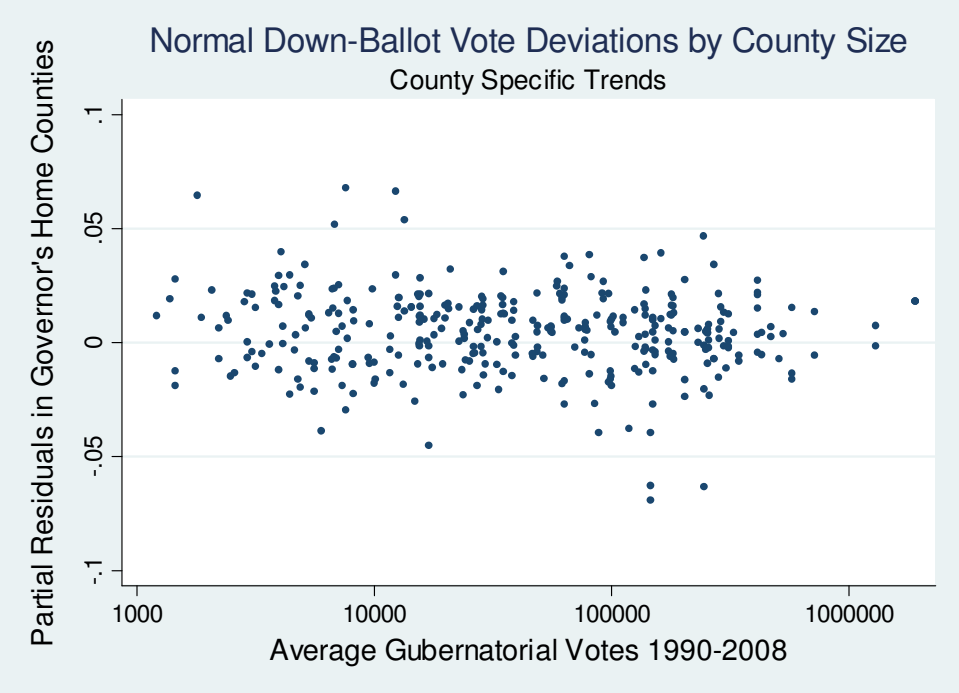


Figure 3: Lowess Smoothed Partial Residuals on Vote Share in Home County of Gubernatorial Candidates by County Size

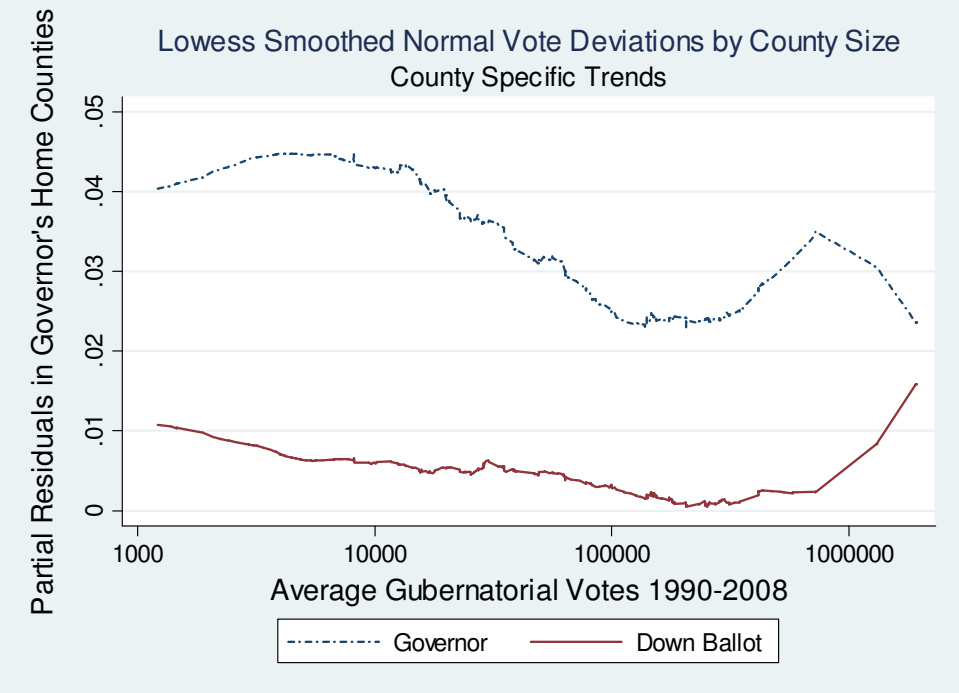


Figure 4: Partial Residuals on ln(Turnout) in Home Counties of Gubernatorial Candidates

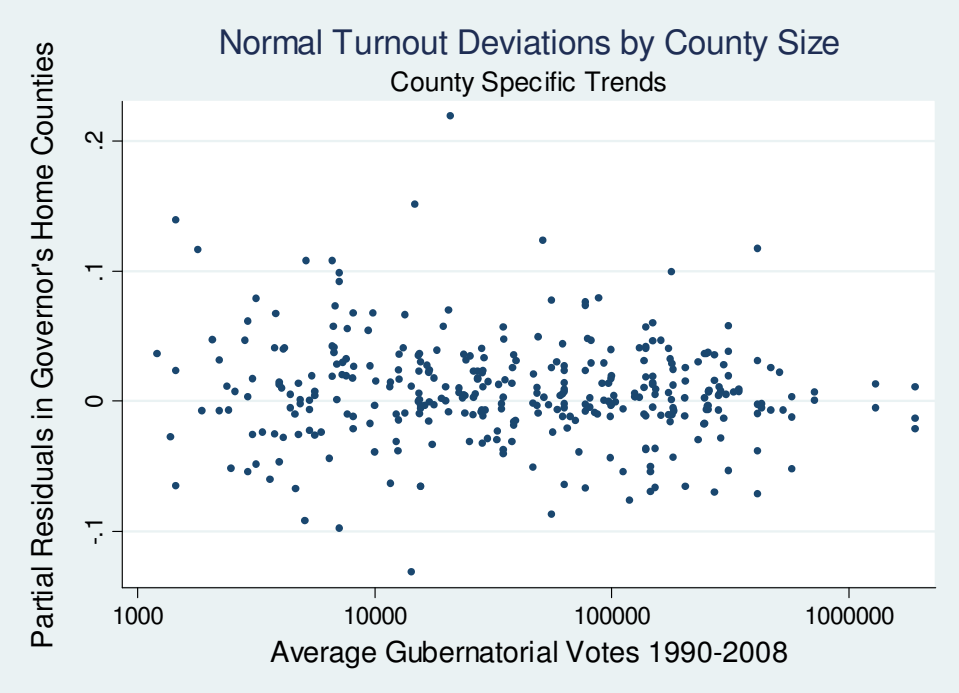


Table 1: Contextual Correlates of Association between Counties' Democratic Governor and Down-Ballot Vote Shares

Robust standard errors clustered by county in parenthesis.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Races Included in Dependent Variable	All	All	All	All	SS, AG	SS, AG	SS, AG	SS, AG
County Time Trend	No	No	Yes	Yes	No	No	Yes	Yes
% Dem. Governor	0.348	0.421	0.188	0.239	0.300	0.154	0.187	0.082
	(0.020)	(0.052)	(0.020)	(0.066)	(0.022)	(0.081)	(0.025)	(0.083)
% Dem. Governor X South		0.186		0.109		0.088		0.066
		(0.047)		(0.050)		(0.045)		(0.054)
% Dem. Governor X Straight Party Ballot		-0.049		0.039		0.003		0.049
		(0.043)		(0.046)		(0.048)		(0.054)
% Dem. Governor X Federal Election		-0.144		-0.116		0.143		0.089
		(0.056)		(0.068)		(0.085)		(0.085)
% Dem. Governor X Presidential Election		0.051		0.033		-0.075		-0.069
		(0.051)		(0.050)		(0.049)		(0.059)

All regressions also include county and state-year fixed effects. Regressions weighted within, but not between, states.

Table 2: Differential Associations of Down-Ballot Vote Share with Governor Vote Share by Office

Robust standard errors clustered by state in parenthesis.

Office Type	(1) Own Correlation	(2) Benchmark Correlation
Agriculture Commissioner (N = 10)	0.393	0.388
	(0.056)	(0.046)
Attorney General (N = 35)	0.302	
	(0.027)	
Auditor (N = 19)	0.430	0.227
	(0.050)	(0.029)
Comptroller (N = 8)	0.343	0.376
	(0.055)	(0.043)
Insurance Commissioner (N = 6)	0.335	0.448
	(0.077)	(0.061)
Lieutenant Governor (N = 13)	0.541	0.328
	(0.035)	(0.041)
Secretary of State (N = 30)	0.335	
	(0.024)	
State Superintendent (N = 9)	0.321	0.330
	(0.036)	(0.041)
Treasurer (N = 29)	0.332	0.274
	(0.027)	(0.025)

Each cell in column (1) represents an estimate and standard error of β in equation (2) (without county time trends) for the office listed on the left. Each cell in column (2) represents a corresponding estimate and standard error of β for the attorney general and secretary of state in the states with the office listed on the left. Regressions weighted within, but not between, states. N refers to the number of states with that office in the dataset

Table 3: OLS Estimates of Effect of Governor's Home County on Gubernatorial and Down-Ballot Vote Share in County

Robust standard errors clustered by state in parenthesis.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable (vote share)	Governor	Governor	Down-Ballot	Down-Ballot	Governor	Governor	Down-Ballot	Down-Ballot
County Time Trend	No	No	No	No	Yes	Yes	Yes	Yes
Home County	0.033		0.004		0.033		0.004	
	(0.003)		(0.002)		(0.006)		(0.003)	
Home County X 1st Quintile of Population		0.064		0.021		0.069		0.013
		(0.013)		(0.006)		(0.018)		(0.007)
Home County X 2nd Quintile of Population		0.051		0.010		0.052		0.007
		(0.010)		(0.005)		(0.014)		(0.006)
Home County X 3rd Quintile of Population		0.036		0.011		0.029		0.008
		(0.007)		(0.004)		(0.009)		(0.004)
Home County X 4th Quintile of Population		0.014		-0.009		0.012		-0.002
		(0.008)		(0.007)		(0.009)		(0.008)
Home County X 5th Quintile of Population		0.018		-0.002		0.019		0.001
		(0.008)		(0.008)		(0.009)		(0.008)
Home County X Incumbent		-0.017		-0.007		-0.011		-0.005
		(0.007)		(0.005)		(0.008)		(0.005)

All regressions also include county and state-year fixed effects.

Table 4: OLS and IV Estimates of Coattail Effects of Governor Vote Share on Down-Ballot Vote Share

Robust standard errors clustered by county in parenthesis.

	(1)	(2)	(3)	(4)	(5)	(6)
Estimation Type	OLS	OLS	IV	IV	IV	IV
Set of Instruments			Table 3 Column (1)	Table 3 Column (2)	Table 3 Column (5)	Table 3 Column (6)
County Time Trend	No	Yes	No	Yes	No	Yes
% Dem. Gov	0.344	0.239	0.133	0.127	0.243	0.161
	(0.010)	(0.010)	(0.068)	(0.093)	(0.049)	(0.073)
F-Statistic of Excluded Instrument Significance			68.14	31.18	17.08	7.15

All regressions also include county and state-year fixed effects.

Table 5: OLS Estimates of Effect of Governor's Home County on ln(Turnout)
Robust standard errors clustered by county in parenthesis.

	(1)	(2)	(3)	(4)
County Time Trend	No	No	Yes	Yes
Home County	0.005		0.007	
	(0.006)		(0.006)	
Home County X 1st Quintile of Population		-0.001		0.020
		(0.015)		(0.017)
Home County X 2nd Quintile of Population		0.028		0.016
		(0.021)		(0.015)
Home County X 3rd Quintile of Population		0.006		0.002
		(0.017)		(0.009)
Home County X 4th Quintile of Population		0.008		0.005
		(0.014)		(0.013)
Home County X 5th Quintile of Population		-0.011		-0.010
		(0.012)		(0.009)
Home County X Incumbent		-0.005		-0.003
		(0.011)		(0.010)

All regressions also include county and state-year fixed effects.