# Challenger Quality and the Incumbency Advantage

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**Abstract**

Most estimates of the incumbency advantage and the electoral benefits of previous officeholding experience do not account for strategic entry by high-quality challengers. We address this issue by using term limits as an instrument for challenger quality. Studying U.S. state legislatures, we find strong evidence of strategic behavior by experienced challengers (consistent with previous studies). However, we also find that such behavior does not appear to significantly bias the estimated effect of challenger experience or the estimated incumbency advantage. More tentatively, using our estimates, we find that 30-40% of the incumbency advantage in state legislative races is the result of "scaring off" experienced challengers. Overall, our findings suggest that previous estimates in the literature are not significantly biased due to strategic challenger entry.

**Keywords**: elections, incumbency advantage, challenger quality, term limits

The incumbency advantage is an important phenomenon in U.S. politics, but even after years of study it is not clear what it represents. Theoretically, scholars have pointed to three main factors: (i) incumbents might be of higher "quality" than the average candidate, (ii) holding office might provide resources to incumbents, which they can use to win votes, and (iii) challengers who run against incumbents might be of lower "quality" than the average politician. Decomposing the incumbency is important for normative reasons as well as positive reasons. If the incumbency advantage is mainly caused by factor (iii) – for example, because high-quality candidates tend to wait for open seats – then it may indicate a sub-optimal degree of competition in the electoral system and possibly a need for reform. On the other hand, if the incumbency advantage is mainly due to factor (i) – for example, because on-the-job learning occurs in politics as in other jobs – then it might reflect a desirable outcome of a well-functioning electoral system.

Many scholars have attempted to estimate the magnitude of the different components of the incumbency advantage.[1] One reason it is difficult to estimate the size of component (iii) is that it is difficult to estimate the effect of facing a quality challenger in the race, which is one of the key parameters needed for its estimation.[2] If high-quality challengers tend to wait until incumbents retire or get into trouble to run for a seat – e.g. because they are especially strategic in their behavior – then the observed sample will be skewed toward races where high-quality challengers face weak incumbents. Similarly, if the challengers who decide to

[1] A number of papers – e.g. Erikson (1971), Cover (1977), Nelson (1978), Payne (1980), Alford and Brady (1989), Gelman and King (1990) – focus on estimating the aggregate incumbency advantage. While they recognize that the incumbency advantage may be due to a variety of factors, they focus on the aggregate estimate and do not attempt to decompose it. Other papers, including Johannes and McAdams (1981), Levitt and Wolfram (1997), Cox and Katz (1996), Ansolabehere, Snyder and Stewart (2000), and Hirano and Snyder (2009), attempt to decompose the incumbency advantage in various ways. For example, Cox and Katz (1996) attempt to disaggregate the incumbency advantage into "direct," "scare-off," and "quality" effects. In addition, a number of papers in the literature on campaign finance also provide a decomposition of the incumbency advantage by isolating the effect of campaign spending on election outcomes independent of both incumbency and challenger quality. These papers include Jacobson (1980), Abramowitz (1988), Green and Krasno (1988), and Gerber (1998). However, none of these papers deal explicitly with the problem of strategic challenger entry in the estimation.

[2] The other component is the effect incumbency has on the probability of facing a high quality opponent. Several theoretical papers formalize the scare-off effect. See, for example, Banks and Kiewiet (1989), Epstein and Zemsky (1995), Gordon, Huber and Landa (2007), and Ashworth and Bueno de Mesquita (2008).

run against stronger incumbents are mainly low-quality – because they are less strategic, i.e., less sensitive to their chances of success – then again the sample we observe will be skewed toward races where incumbents face low-quality challengers. In both cases, the behavior will lead to biased estimates both of the effect of challenger quality on electoral success and the incumbency advantage.[3]

This strategic thinking on the part of the potential challengers seems particularly plausible in light of the fact that one of the best measures of candidate quality is previous officeholder experience. Intuitively, many of the strongest candidates are elected officials who hold offices similar to those they are seeking and with similar constituencies – e.g., state legislators running for the U.S. House, state representatives running for the state senate, or state attorneys general running for governor. Given that current officeholders face a high opportunity cost of running for higher office, since they typically must give up their current office in order to do so, they are probably likely to wait for their odds of success to be high (e.g., for the incumbent to retire or get in trouble, or for their party to be strongly favored). Not surprisingly, then, previous empirical work has found strong evidence of strategic challenger behavior.[4]

If high-quality challengers, such as current officeholders, exhibit strategic entry behavior, then conventional OLS estimates of the incumbency advantage may be biased since challenger quality may be endogenous to the vote. To account for this possibility, we adopt an alternative approach. We use term limits as an instrument for challenger quality. Politicians who are term-limited cannot exercise one of their most popular options – running again for the office they currently hold – and must either run for a different office or temporarily retire

[3]Another potential problem arises if low-quality incumbents tend to retire, since we would not observe what would have happened to them had they run. Instead, the observed sample will be skewed toward high-quality incumbents, who do well in their re-election attempts in large part because they are high-quality, not because they are incumbents. Ansolabehere and Snyder (2004) investigate the issue of strategic retirement by incumbents, and conclude that strategic retirement does not significantly bias the estimated incumbency advantage – thus, we do not incorporate this in our analysis.

[4]Relevant papers include Jacobson and Kernell (1983), Bianco (1984), Bond, Covington and Fleisher (1985), Krasno and Green (1988), Jacobson (1989), Stone, Maisel and Maestas (2004), Kiewiet and Zeng (1993), Carson, Engstrom and Roberts (2007), and Carson and Roberts (2013).

from politics. As a result, many term-limited candidates run for another office when they would not otherwise. This yields an exogenous source of variation in the presence of quality challengers, and therefore a plausible instrument.[5]

More specifically, we study state senate elections, and measure challenger quality in terms of previous experience as a state representative. We then use the number of term-limited state representatives who reside in a given state senate district as an instrument for the presence of a high-quality challenger.[6] We find that the instrumental variables (IV) estimates are similar to the OLS estimates. Most importantly, using IV does not substantially reduce the estimated incumbency advantage. It also does not substantially reduce the estimated effect of challenger quality. In fact, the IV estimates of the incumbency advantage and the effect of challenger quality are both slightly larger than the corresponding OLS estimates.

We also show that the instrumental variables are quite strong in the first-stage. Thus, although we find evidence of strategic behavior by experienced challengers (consistent with previous studies), this behavior does not seem to bias the second stage estimates. Why not? Evidently, the strategic choices by experienced challengers are not driven by unmeasured variation in incumbent quality. That is, high quality incumbents and low quality incumbents are, to a first approximation, equally able to scare off experienced challengers. Strategic choices are important, but they appear to depend mainly on variables that are measured fairly accurately, such as district safety, partisan tides, and incumbency status *per se*. In addition, decisions about whether to run for re-election and when to run for another office are probably driven by a variety of idiosyncratic factors – outside employment opportunities, family issues, health, age, the drudgery of campaigning, and, perhaps most importantly, satisfaction or lack of satisfaction with political life and overall political ambition.

[5]The argument is similar to that in Ansolabehere and Snyder (2004), which uses term limits to construct instrumental variables for incumbents, but not for challengers.

[6]Intuitively, the greater the number of term-limited Democratic (Republican) representatives residing within the boundaries of a senate district, the greater the probability of the Republican (Democratic) senate incumbent being challenged by a quality challenger in the form of a term-limited representative.

Overall, then, our findings indicate that – at least for the case of state legislatures – strategic challenger entry is less of a problem in estimating the incumbency advantage than has been previously thought. In addition, using our estimates, we find that as much as 40% of the incumbency advantage in state legislative races is the result of "scaring off" experienced challengers.

# Methods and Data

Let us consider the model typically used to estimate the incumbency advantage, which decomposes the two-party vote share into incumbency effects, challenger quality effects, the normal party vote, and national swings:

$$V_{it} = \beta_1 I_{it} + \beta_2 Q_{it} + \beta_3 N_{it} + \theta_t + \epsilon_{it} \tag{1}$$

where:

- $V_{it}$ is the two-party vote-share received by the Democratic candidate in constituency $i$ at time $t$.
- $I_{it}$ equals 1 if a Democratic incumbent runs for reelection in constituency $i$ at time $t$, - 1 if a Republican incumbent is seeking reelection, and 0 if no incumbent runs.
- $Q_{it}$ equals 1 if there is a Republican, high-quality candidate in the race (excluding the incumbent), -1 if there is a Democratic, high-quality candidate in the race (excluding the incumbent), 0 if either the challenger to the incumbent is not high-quality, or both or none of the candidates in the open race are high-quality.
- $N_{it}$ is the normal vote, capturing the underlying division of partisan loyalties in constituency $i$ at time $t$.
- $\theta_t$ are time fixed effects, which capture the partisan tides at each time $t$.
- $\epsilon_{it}$ are the usual residuals.

Note that $Q_{it}$ is constructed so that we expect $\beta_2 < 0$. For example, the presence of a high-quality Republican challenger in the race (i.e., $Q_{it}$=1) should decrease the vote-share received by the Democratic candidate (i.e., $\beta_2 \times 1$ should result in a decrease of $V_{it}$, therefore we expect $\beta_2$ to be negative). Similarly, the presence of a high-quality Democratic challenger

in the race (i.e., $Q_{it}$=-1) should increase the vote-share received by the Democratic candidate (i.e., $\beta_2 \times$ (-1) should result in a positive change of $V_{it}$; therefore we expect $\beta_2$ to be negative).

Notice that this model does not account for the strategic entry of quality challengers. The presence of a high-quality challenger in the race is, however, likely to be correlated with both the presence of an incumbent seeking reelection as well as with the incumbent's a priori expected performance in the polls. In other words, prospective high-quality challengers might choose only to run when either there is no incumbent or the incumbent defending his or her seat is perceived as electorally weak and expected to loose in the upcoming election. This would create a situation in which the presence of a high-quality challenger ($Q_{it}$) would be correlated with the incumbent's electoral weakness (call it $W_{it}$), which in turn is a determinant of our dependent variable ($V_{it}$). Failing to control for $W_{it}$ would bias our estimates of the effect of facing a high-quality challenger ($\hat{\beta}_2$).[7] Intuitively, if we only observe high-quality challengers when incumbents are weak and we do not control for such weakness, then we will be assuming that the positive results achieved by the challenger are all due to his being a quality candidate and not to the incumbent's lack of strength. On the other hand, if the only high-quality candidates that decide to face the incumbent are those of lesser quality and with less to lose, then we would be underestimating the effect that a more representative high-quality challenger would have on the electoral outcome. In short, this model, which for practical matters we will call the OLS model, produces biased estimates of the effect of quality challengers and, as a result, it also produces biased estimates of the incumbency advantage because it fails to adequately control for the presence of high-quality challengers in the race.

To be able to estimate the effect of quality challengers without this type of omitted variable bias, we use an instrumental variable analysis by taking advantage of the exogenous

[7]The stylized vote share model that would capture this would be as follows: $V_{it} = \beta_1^{'} I_{it} + \beta_2^{'} Q_{it} + \beta_3^{'} N_{it} + \beta_4^{'} W_{it} + \theta_t^{'} + \epsilon_{it}^{'}$. When estimating equation (1) then, $\epsilon_{it} = \beta_4^{'} W_{it} + \epsilon_{it}^{'}$, where $W_{it}$ is correlated with $Q_{it}$. Omitting $W_{it}$ from the model, makes the estimate of the effect of high-quality challengers ($\beta_2$) suffer from omitted variable bias.

increase of high-quality challengers produced by term limits in state legislatures.[8] More specifically, we use the number of term-limited state representatives to instrument for the presence of quality challengers in the state upper house elections. The idea is the following. Usually the costs of running for higher office are rather large since state lower house members are usually required to give up their current office in order to do so. When they become term-limited, however, the option of staying put is no longer available and, thus, the costs of running for the state's upper house decrease substantially. In these circumstances, we expect a higher number of high-quality candidates to decide to challenge the incumbent than they would have otherwise. The number of term-limited representatives residing within a senate district can thus help predict the presence of a high-quality challenger for that senate district.

Statistically, we follow a two-stage least squares framework, and estimate the following system:

$$\begin{aligned} V_{it} &= \beta_1 I_{it} + \beta_2 Q_{it} + \beta_3 N_{it} + \theta_t + \epsilon_{it} && \text{(Second Stage)} \\ Q_{it} &= \alpha_1 T^D_{it} + \alpha_2 T^R_{it} \ (+\alpha_3 T2^D_{it} + \alpha_4 T2^R_{it}) \ + \alpha_5 I_{it} + \alpha_6 N_{it} + \gamma_t + \mu_{it} && \text{(First Stage)} \end{aligned} \quad (2)$$

where the new variables are:

- $T^D_{it}$ and $T^R_{it}$ are the number of term-limited Democratic and Republican representatives residing in senate district $i$ at time $t$. Since we study general elections, we instrument for challenger quality from the opposite party when there is an incumbent present. In other words, we ignore the number of term-limited Democrats when instrumenting for challengers of a Democratic incumbent. Similarly, we ignore the number of term-limited Republicans when we instrument for challengers of a Republican incumbent. Mathematically, this means that we set $T^D_{it} = 0$ when $I_{it} = 1$ and, likewise, set $T^R_{it} = 0$ when $I_{it} = -1$.
- Because state lower house terms do not always coincide with state upper house terms, we also need to consider the state representatives that are term-limited two years prior to the election of their corresponding upper house seat. To capture these representatives we created two additional instruments: $T2^D_{it}$ and $T2^R_{it}$. For simplicity sake, we perform the analysis with and without these extra set of instruments. We call the one without: IV (i), and the one with: IV (ii).

The top equation is simply equation (1) above. The bottom equation is the first stage, in which we predict challenger quality using the number of term-limited representatives by

[8] We follow Ansolabehere and Snyder (2004) in using term limits as an instrumental variable.

party, as well as an indicator for incumbency, a measure of the normal vote, and time fixed effects.

The key identifying assumption is that $T_{it}^D$ and $T_{it}^R$ (and $T2_{it}^D$ and $T2_{it}^R$, for that matter) are uncorrelated with $W_{it}$ – i.e., the number of term-limited representatives eligible to run in a given senate district in a given year is not correlated with the unmeasured weakness of the incumbent state senator in that district that year. This seems plausible. For example, term limits were imposed well before any of the races in our sample. Furthermore, we will show that the districts in which term-limited and non-term-limited representatives run do not differ substantially in terms of partisanship or two-party competitiveness.

Our analysis, then, focuses on the general elections for the upper houses from 2002 to 2010 in eleven states that had legislative term limit laws in place during this period.[9] We begin in 2002 to avoid crossing major redistricting episodes and we focus on senate races because state legislators' moves from the lower to the upper houses are a lot more common than moves from the upper to the lower houses.

In regards to the construction of our variables, we follow previous work and define challenger quality in terms of prior officeholder experience. More specifically, since we focus on state senate elections, we identify as high-quality challengers those who currently are or have been state representatives at some point during the last ten years.[10]

[9]Fifteen states have imposed limits on state legislators at some point during our sample period. However, we can only include eleven of them in our analysis. We exclude Louisiana because its "top two" electoral system allows for two members of the same party to run against each other, Nevada and Oregon because they have too few cases, Nebraska because it has a unicameral (and non-partisan) legislature, and Oklahoma because legislators become term-limited based on the total number of years they have served regardless of the chamber. As a result, our study focuses on Arkansas, Arizona, California, Colorado, Florida, Maine, Michigan, Missouri, Montana, Ohio, and South Dakota. See Table A.1 in the Appendix for a summary of the characteristics of the term limits legislation in these fifteen states.

[10]Jacobson (1989, 2009), Squire (1992), Cox and Katz (2002), Carson, Engstrom and Roberts (2007), and many others find that candidates who previously held elective office have significantly larger vote shares and significantly higher probabilities of winning than other candidates. While scholars acknowledge that previous elective office experience is only one component of quality, it is an important component – at least from an electoral point of view. Bond, Covington and Fleisher (1985), Krasno and Green (1988), and Canon (1990) have constructed more comprehensive measures of quality. Carson and Roberts (2011) conclude that, "Despite numerous attempts to develop more detailed codings of challenger quality... the simple dichotomy has typically proven just as reliable a predictor of a competitive House election... we believe that trying to come up with yet another alternative measure of candidate quality represents an area where further research is clearly unwarranted." (p. 151)

To measure the normal vote we use two standard approaches from the existing literature: (i) district fixed effects (Levitt and Wolfram 1997), and (ii) lagged vote share together with lagged party control (Gelman and King 1990).[11] Although the choice of specification does not affect our conclusions, the estimated coefficient on the *Incumbency Status* dummy is consistently larger in the specification that uses lagged vote; this may be due to selection bias from dropping cases that were uncontested in the previous election (that is, where there is no observation for lagged vote).

In order to construct our instruments, we identify the number of term-limited state representatives eligible to run for each senate district. Matching representatives to senate districts is challenging, because in most states there is no simple correspondence between state house and state senate district boundaries; nor are state house districts nested inside state senate districts. Since a candidate is required to be a resident of a senate district in order to run for the senate seat, we compiled representative addresses from candidate filing information available from Secretary of State offices.[12] In cases where both residential addresses and mailing addresses were available, we used the residential address to maximize accuracy. The addresses were geocoded and matched with senate district shape files in GIS to identify the senate district for which a term-limited representative was eligible to run for based on residency.

# Results

Table 1 presents the estimated incumbency and quality challenger effects using each method. The first three columns use the district fixed effects model (Model 1), and the last three

[11] Lagged party control is defined as 1 if the Democratic party won the last election, and - 1 if it was the Republican party that won.

[12] California and South Dakota do not have residency requirements, but given the strong norms against "carpet-bagging" throughout the U.S. it is rare for candidates to run outside the area where they live. In any case, this simply means there is measurement error in our instrumental variables. Montana has a unique residency requirement, according to which a candidate for a state legislative office must be "a resident of the county if it contains one or more districts or of the district if it contains all or parts of more than one county." We incorporate this feature in defining our instruments.

columns use the Gelman and King (1990) model with lagged vote and lagged party control (Model 2). Remember that for each one of these models, we estimated the OLS model as well as two different IV analysis: one with only $T_{it}^D$ and $T_{it}^R$ as instruments (IV i), the other with $T_{it}^D$ and $T_{it}^R$ as well as $T2_{it}^D$ and $T2_{it}^R$ (IV ii).

Table 1: **Estimates of Incumbency and Quality Challenger Effects**

| | Dependent Variable = *Vote Share* | | | | | |
|---|---|---|---|---|---|---|
| | District Fixed Effects Model 1 | | | Gelman and King (1990) Model 2 | | |
| | OLS | IV i | IV ii | OLS | IV i | IV ii |
| Incumbency Status | **0.052** | **0.058** | **0.052** | **0.073** | **0.084** | **0.087** |
| | (0.004) | (0.010) | (0.009) | (0.006) | (0.010) | (0.009) |
| Quality Challenger | **-0.035** | **-0.045** | **-0.036** | **-0.049** | **-0.069** | **-0.075** |
| | (0.005) | (0.016) | (0.014) | (0.005) | (0.015) | (0.013) |
| Lagged Vote Share | | | | **0.729** | **0.692** | **0.681** |
| | | | | (0.035) | (0.044) | (0.042) |
| Lagged Party Control | | | | **-0.029** | **-0.034** | **-0.036** |
| | | | | (0.006) | (0.007) | (0.007) |
| District Fixed Effects | Yes | Yes | Yes | No | No | No |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 929 | 929 | 929 | 504 | 504 | 504 |
| Hausman Test | | 0.464 | 0.004 | | 2.028 | 4.999 |
| | | [0.998] | [1.000] | | [0.958] | [0.660] |

Standard errors are in parentheses. P-values are in square brackets. Coefficients statistically significant at the 95 percent level of confidence are shown in bold.

The OLS models follow equation (1). The IV models follow the equations described in (2). IV i include only $T_{it}^D$ and $T_{it}^R$ as instruments. IV ii also include $T_{it}^D$ and $T_{it}^R$.

The first thing to notice is that the estimated effect of quality challengers increases but by a small amount once we get rid of the omitted variable bias by way of using instrumental variable analyses. In Model 1, it goes from 3.5 percentage points of the vote share in the OLS model to 4.5 or 3.6 percentage points depending on the IV model used. In Model 2, it goes from 4.9 percentage points to 6.9 or 7.5 percentage points. Perhaps more importantly, improving upon the high-quality challenger control does not seem to affect the estimated in-

cumbency advantage. To determine how much strategic challenger entry affects incumbency advantage estimates, we can compare the ordinary least squares (OLS) and instrumental variables (IV) estimates. The OLS regressions produce estimates of the incumbency advantage ranging from 5.2 percentage points in Model 1 to 7.3 percentage points in Model 2. Using term limits to instrument for challenger quality results in slightly different estimates, as shown in the IV rows of Table 1. The IV (i) estimate of the incumbency advantage is 5.8 percentage points in Model 1 and 8.4 percentage points in Model 2. In both model specifications, the IV (i) estimates of incumbency advantage are a bit higher than the conventional OLS estimates. However, Hausman tests indicate that the difference between the OLS and IV (i) estimates is not statistically significant – for neither model can we reject the null hypothesis that the OLS and IV (i) coefficient estimates are equal. This includes the coefficients of both quality challenger effects and incumbency advantage. We arrive at very similar results and conclusions comparing the OLS estimates to those of the IV (ii) models.[13]

These findings imply that strategic entry by experienced politicians does neither affect the estimates of the effect of quality challengers nor the estimates of incumbency advantage. If experienced politicians were systematically challenging only "weak" incumbents, then introducing an exogenous assignment of high-quality challengers through using IV would result in a different estimate of incumbency advantage. However, since our IV estimates are not significantly different from the OLS estimates, we can conclude that strategic entry by high-quality challengers was not noticeably affecting the OLS estimates of incumbency advantage in the first place. This conclusion holds true if our instruments are indeed strong and excludable. We turn to examine this next.

[13]We performed the same analysis using as a dependent variable an indicator of whether the winner was the Democratic candidate. We arrive at the same substantive conclusions. The IV estimates were very similar to the OLS estimates and the Hausman test indicated that the differences were not significant.

## Strength and Exogeneity of the Instruments

Table 2 shows the results of the first-stage estimates for our IV analyses, which use the number of term-limited state representatives in a district to predict challenger quality in state senate elections.[14]

Table 2: **First-Stage Estimates**

| | Dependent Variable = *Quality Challenger* | | | |
|---|---|---|---|---|
| | District Fixed Effects Model 1 | | Gelman and King Model 2 | |
| | IV i | IV ii | IV i | IV ii |
| No. Term-Limited Democrats | **-0.191** | **-0.189** | **-0.261** | **-0.254** |
| | (0.040) | (0.040) | (0.053) | (0.052) |
| No. Term-Limited Republicans | **0.142** | **0.136** | **0.275** | **0.271** |
| | (0.035) | (0.035) | (0.044) | (0.043) |
| No. Term-Limited Democrats (2 yrs. prior) | | **-0.088** | | **-0.236** |
| | | (0.044) | | (0.054) |
| No. Term-Limited Republicans (2 yrs. prior) | | **0.134** | | **0.203** |
| | | (0.046) | | (0.046) |
| Incumbency Status | **0.561** | **0.537** | **0.436** | **0.373** |
| | (0.025) | (0.026) | (0.038) | (0.039) |
| Lagged Vote Share | | | **-1.392** | **-1.167** |
| | | | (0.239) | (0.237) |
| Lagged Party Control | | | -0.234 | **-0.201** |
| | | | (0.042) | (0.041) |
| District Fixed Effects | Yes | Yes | No | No |
| Year Fixed Effects | Yes | Yes | Yes | Yes |
| First-Stage F-Test | 18.6 | 12.4 | 31.1 | 25.3 |

Standard errors are in parentheses. P-values are in square brackets. Coefficients statistically significant at the 95 percent level of confidence are shown in bold. The F-Tests are performed on the null hypothesis that the coefficients on all instruments equal 0. The p-values of the F-Tests are all very close to zero.

[14]Even simple summary statistics indicate a high degree of strategic behavior by experienced challengers. Consider all state senate races with an incumbent running. In districts with no term-limited state representatives (i.e., cases where the instrument is 0) a high-quality challenger was present in 7% of the races. In districts with with at least one term-limited state representative (i.e., cases where the instrument is positive), a high-quality challenger was present in 47% of the races. Of these high-quality challengers, 41% were term-limited.

Recall that the dependent variable $Q_{it}$ is defined to capture the experience of the challenger, signed so that it is positive when there is a Republican high-quality candidate challenging the Democratic incumbent, negative when there is a Democratic high-quality candidate challenging the Republican incumbent, or capturing the difference between the qualities of the candidates when the seat is open (Republican - Democratic). As a result, we should expect a negative sign on the coefficient for the number of term-limited Democrats because a greater number of term-limited Democratic representatives should result in a greater probability of a high-quality Democratic challenger (which is equivalent to a negative number of the dependent variable). Likewise, we should expect a positive sign on the coefficient for the number of term-limited Republicans because a greater number of term-limited Republican representatives should result in a greater probability of a high-quality Republican challenger. As before, Model 1 measures the normal vote using district fixed effects, while Model 2 measures the normal vote using the district's lagged vote share with an indicator of the lagged party control.

The first-stage regressions confirm the strength of our instruments; term limits have a substantive impact on the probability of having a quality candidate in the race. The coefficients on the number of term-limited Democratic representatives and the number of term-limited Republican representatives (at the time of the election or two years prior) range in magnitude from 8.8 percentage points to 27.5, depending on the model, and are all statistically significant. F-tests are performed for the joint hypothesis that all of the coefficients on our instruments equal 0. Since the $p$-values of the F-test is close to 0, we reject the null hypothesis that the coefficients are equal to 0. The F-statistics, which provide a measure of information contained in the instruments, are much larger than the standard benchmark of 10, indicating that our instruments are strong.[15]

[15]If we construct our instruments differently, capturing the number of term-limited representatives in one variable, with different signs depending on their party affiliation, then we reduce the number of instruments by half and we get much higher F-tests. In this case, the F-tests would range from 27.7 to 62.2.

As mentioned before, our analysis is only valid if our instruments, in addition to being strong, are also exogenous. In other words, the number of term-limited representatives in a district should not be correlated with the electoral vulnerability of the incumbent of the senate seat in that district. We see no reason why this would be the case. Also, for example, the correlation between the number of term-limited Democrats and the seniority of the Republican incumbent is -0.05, and the correlation between the number of term-limited Republicans and the seniority of the Democratic incumbent is 0.02. Since seniority is related to vulnerability (more vulnerable incumbents are less likely to survive), the low correlations between our instruments and incumbent seniority suggest that our instruments are also not correlated with incumbent vulnerability.

## External Validity

Finally, we think that our findings are informative beyond the senate races that we look at. Table 3 presents some summary statistics that help us make that case. The first two rows show that, in states with term limits, term-limited representative run in similar races as non-term limited representatives. The partisanship, electoral safety, and incumbent seniority (in years) of these races are similar. Obviously, the representatives are different in terms of seniority, since one group was already term-limited while the other had not been yet.

The third row shows the same statistics for the senate races challenged by state representatives in states without term limits. As one can see by comparing the first two rows with the third, states with term limits are only slightly different from the rest. To begin with, as one would expect given the usage of term limits, the average incumbent has been in office for a shorter period of time. However, the average experience of the term-limited challengers in our sample is similar to that of the state representatives that run for higher office in the states without term limits. Also, in states without term limits state representatives tend to run in districts that are "safer" for one party.

Table 3: **Races Challenged by Term-Limited Representatives vs. Races Challenged by Non-Term-limited Representatives**

| | District Partisanship [a] | District Marginality [b] | Challenger Seniority [c] | Incumbent Seniority [d] |
|---|---|---|---|---|
| *States with term limits* | | | | |
| - Term-limited challengers | 0.490 | 0.110 | 7.92 | 7.92 |
| - Non-term-limited challengers | 0.480 | 0.136 | 4.93 | 8.62 |
| *States without term limits* | | | | |
| - (Non-term-limited) challengers | 0.482 | 0.168 | 7.41 | 12.82 |

[a] Democratic share of two-party voter registration (2008 data only).
[b] Absolute distance of two-party voter registration from 50-50 (2008 data only).
[c] Measured as previous years served.
[d] From cases where the challenger faced an incumbent.

In addition, we also examined whether the states with term-limits are unusual in other ways. One key dimension is legislative professionalism, since it is likely that the incumbency advantage, the effect of challenger quality, and the degree to which potential candidates are strategic is higher in professional legislatures. Using the well-known Squire index (from 2005, midway through in our sample), we find that the states with term limits in our sample are slightly more professional than other states – the average Squire index in states with term limits is 0.22 and the average in other states is 0.17 – although the difference is not statistically significant even at the 0.10 level.[16]

## Implications: The Scare-off Effect

As described in the introduction, one of the main causes of the incumbency advantage is the so-called "scare-off" effect. Incumbents make an effort to deter serious opposition and ambitious career politicians, aware of the advantage incumbents have, make strategic decisions about when to enter a race. As a result, incumbents end up facing weak challengers and, thus, they win their re-election bids with large margins. As Jacobson (2009) explains: "The electoral value of incumbency lies not only in what it provides to the incumbent but

[16] See Squire (2012) for details about the Squire index. The range of the index used is [0.03, 0.63].

also in how it affects the thinking of potential opponents and their potential supporters. Many incumbents win easily by wide margins because they face inexperienced, sometimes reluctant, challengers who lack the financial and organizational backing to mount a serious campaign for congress." (p. 45)

Now that we have an unbiased estimate of the effect of challenger quality, we can now use it to estimate how much of the incumbency advantage is due to incumbents scaring off high-quality challengers. To do so, we follow Cox and Katz (1996) and define the scare-off effect as:[17]

$$S = \beta_2 \cdot [\Pr(Q_{it} = 1|I_{it} = 0) - \Pr(Q_{it} = 1|I_{it} = 1)] \tag{3}$$

where $\beta_2$ represents the effect that facing a high quality challenger would have in the vote share of a candidate and the difference in probabilities represents the effect that the presence of the incumbent has on the probability of having a high quality challenger in the race. For our calculations, then, we can use the coefficient on *Quality Challenger* from the second-stage regressions (which is an unbiased estimate of $\beta_2$) and the coefficient on *Incumbency Status* from our first-stage regressions (which is as good an estimate as we can get of the difference in probabilities).

Using the estimates from Tables 1 and 2 we can construct Table 4, where we show that, based on our calculations, the scare-off effect ranges from 2 to 3 percentage points of the vote and represents between 30 and 40 percent of the estimated incumbency advantage. This is consistent with Cox and Katz (1996) findings, who estimated that the scare-off effect comprised 29 percent of the incumbency advantage in 1990, the latest year in their sample.[18]

[17] What we call the scare-off effect is what Cox and Katz (1996) refer to as the "total indirect effect".

[18] Cox and Katz (1996) use the Gelman and King model for the estimations, thus, their results are comparable to our Model 2 results.

Table 4: **Estimates of the Scare-off Effect**

| | District Fixed Effects Model | | Gelman and King Model | |
|---|---|---|---|---|
| | IV i | IV ii | IV i | IV ii |
| Incumbency Advantage (from Table 1) | 0.058 | 0.052 | 0.084 | 0.087 |
| Quality Challenger Effect on Vote Share (from Table 1) | -0.045 | -0.036 | -0.069 | -0.075 |
| Incumbency Status Effect on Probability of Quality Challenger (from Table 2) | 0.561 | 0.537 | 0.436 | 0.373 |
| Scare-off Effect | 0.025 | 0.019 | 0.030 | 0.028 |
| Portion of Incumbency Advantage due to Scare-off Effect | 43% | 37% | 36% | 32% |

# Conclusion

In conclusion, our results indicate that state representatives strategically decide when to run for higher office, but that their strategic entry to the race does not bias the the estimated effect that having a quality challenger has on the vote share, nor does it bias the estimated incumbency advantage. This is probably because strategic entry is highly correlated with variables that we can measure relatively accurately and control for (e.g., the district partisanship or "the normal vote", and partisan tides due to midterm slumps, coattails, and other phenomena). In other words, based on our results, the strategic entry by state representatives is not highly correlated with the unmeasured "electoral vulnerability" of particular state senate incumbents. Otherwise, the OLS and IV estimates would be quite different.

What does the estimated coefficient on incumbency status represent? We have isolated incumbency from one component of challenger quality: previous legislative experience. Since previous research on U.S. House elections suggests that the prior officeholder experience – especially state legislative experience – captures one of the most important aspects of challenger quality our findings represent significant progress. Other challenger attributes may

matter however – prior service in offices other than state representative, business experience, and leadership in community groups. Thus, we cannot yet conclude that the coefficient represents only average incumbent quality relative to a "randomly drawn" challenger, plus officeholder benefits.

What about portability to other contexts? As noted above, the states with term limits are similar to the states without term limits in terms of partisanship and legislative professionalism, although on average the senate districts in these states are more competitive than those in other states. It is also possible that strategic calculations are different in states with term limits. For example, some state representatives might prefer to wait until after the next redistricting to challenge a state senator, but cannot do so because they will be term-limited beforehand. On the other hand, compared to states without term limits, it is likely that state representatives in states with term limits are more tempted to wait for open state senate seats, because state senators also face term limits. On balance, it is not clear whether these differences make it more or less difficult to plan in states with term limits, but this would appear to be a fruitful area both for theory and future empirical work.

In any case, our findings can be taken as good news for many previous studies in the literature. Our results suggest that the bias due to strategic challenger entry may be less of a problem in practice than it is in theory, so the estimates in previous studies that "punt" on this issue might not be seriously biased.

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# Appendix

Table A.1: **State Lower House Term Limit Laws**

| State | Number of Years | Impact Period |
|---|---|---|
| Arizona | 8 | 2000–present |
| Arkansas | 6 | 1998-present |
| California | 6 | 1996–present |
| Colorado | 8 | 1998–present |
| Florida | 8 | 2000–present |
| Louisiana | 12 | 2007–present |
| Maine | 8 | 1996–present |
| Michigan | 6 | 1998–present |
| Missouri | 8 | 2002–present |
| Montana | 8[a] | 2000–present |
| Nevada | 12 | 2010–present |
| Ohio | 8 | 2000–present |
| Oklahoma | 12[b] | 2004–present |
| Oregon | 6 | 1998–2002 |
| South Dakota | 8 | 2000–present |

[a] An individual may not serve more than 8 years over a 17 year period.
[b] 12 years total in the legislature (across both lower and upper houses).
Idaho passed a term-limit law in 1994 but repealed the law before it went into effect.