A Dynamic Cost of Voting Index: How Do State Election Administration Rules Impact Voter Turnout and the Integrity of Elections?*

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Abstract

Several recent studies examine the ease of voting across states using a "cost of voting index" (COVI) based on state election administration laws in a given election year (e.g., Pomante II et al., 2023). However, the original COVI is based on different sets of state laws across elections and normalized to have a mean of zero in each election. Consequently, the original COVI does not afford straightforward and meaningful comparisons of changes in the cost of voting over time. We gently revise the original COVI to generate a time-consistent "dynamic cost of voting index" (DCOVI) that is better suited to comparing within state changes in the cost of voting over time. We demonstrate that DCOVI is more strongly associated with state-level voter turnout than COVI, as well as a significant determinant of self-reported individual-level turnout and several measures of perceived frequency of illegal voting (albeit not perceived errors in vote counting). In general, higher costs of voting within a state are associated with lower voter turnout and improved public perceptions of the integrity of elections, although all of these effects are modest.

Keywords: Elections, Election Law, Election Reform, Election Administration, Voter Turnout, Cost of Voting, Integrity of Elections, Vote Fraud.

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1 Introduction

State election institutions have increasingly been the focus of public concern regarding the quality of democracy in America. Policies that facilitate the ease of voting, such as automatic registration and universal mail-in ballots, have become more widespread in the states, but these and similar reforms also raise concerns about the security of the voting process. On the other hand, several states have adopted new policies aimed at shoring up election integrity, such as voter identification and purging deadwood from voter registration rolls; however, opponents of these reforms argue that such laws impede voter access and exacerbate the minority racial gap in voter turnout. In this study we analyze the effects of changes in state election procedures on turnout, the minority voting gap, and public perceptions of election integrity using a time-consistent version of the "cost of voting index" (COVI) first introduced by Li et al. (2018) and subsequently updated and extended by Schraufnagel et al. (2020, 2022), Pomante II et al. (2023), and Pomante II (2025).

The last thirty years have witnessed major federal legislation aimed at lowering the costs of voting. The Motor Voter Act in 1993 and the Help America Vote Act in 2002 spurred several changes in state election administration that facilitate voter access, while the extension of Section 5 of the Voting Rights Act in 2006 (which maintained federal oversight of election administration in several covered states and local jurisdictions) served to stymie certain election security efforts that might raise the cost of voting. However, the United State Supreme Court also issued two landmark decisions on state election administration that facilitate state-level reforms aimed at election security, even if these raise the cost of voting for some persons: in *Crawford v. Marion County* (2006), the Court upheld the ability of states to implement voter identification laws; and in *Shelby v. Holder* (2013), the Court struck down the current process for identifying states and localities subject to federal pre-clearance of election reforms under Section 5 of the Voting Rights Act.

In response to these federal innovations, state election administration has evolved over the last several decades, leading to a wide variety of potentially important state electoral institutions. This variation in voting rules both across states and overtime provides a laboratory for identifying the causal effects of state election administration procedures on voter participation and confidence. However, while there is a long-standing scholarly literature on the effects of state election laws on voter turnout (e.g., Wolfinger and Rosenstone, 1980; Leighley and Nagler, 2014; Burden et al., 2014; and Endersby and Jokinsky, 2024), and to a lesser extent election integrity (e.g., Atkeson and Saunders, 2007; Carter et al., 2024; and Coll, 2024b), few such studies exploit the within state changes in electoral laws using difference-in-difference estimation that is now a standard tool of evaluation studies.[1] In addition, while there is a wide variety of potentially important state

[1]For example, Highton (2017) reviews several studies of the effects of voter ID on turnout, noting that few studies control for state fixed effects; this is problematic to the extent that states that implement voter ID may have lower

electoral institutions, many studies examine only the most focal reforms, such as early voting or automatic registration, with less attention to a variety of other state election administration procedures.[2] We address these two concerns by estimating the effects on turnout and election integrity of within-state changes in a modified version of COVI that facilitates comparisons of state election laws over time.

In pioneering work, Li et al. (2018) develop a fairly comprehensive state-level "cost of voting index" (COVI); this index has since been updated to cover all Presidential elections from 1996-2024, but with a growing list of institutions included in more recent elections (see Schraufnagel et al., 2020, 2022; Pomante II et al., 2023; and Pomante II, 2025). The most recent version of the COVI for 2024 describes 45 different state election administration laws, so provides a much more comprehensive and rich description of state election administration than is typically employed in the evaluation literature.[3] However, the COVI is not comparable across time, because the number of laws incorporated in the index has changed dramatically over time and because the index is normalized to have a mean of zero in each year. Consequently, while COVI is informative about the relative cost of voting in the states for any given year and for those institutions included in that particular year, it is not a measure of absolute changes in the cost of voting in states over time. As such, COVI is not suited to making causal inferences about the effects of changes to overall state election administration regimes on voter turnout, disparities in turnout, or election integrity.[4]

Nevertheless, several recent studies do find that COVI is associated with voter turnout and voter perceptions about the integrity of elections in cross-sectional analyses of a single election year (e.g., Pomante II et al., 2023; Coll, 2024a; Ritter et al., 2024; and Atkeson et al., 2025).[5] However, the presence of unobserved state-specific effects confounds the interpretation of such estimates. Other recent studies examine the effects of changes in COVI on turnout over time, albeit without including controls for state-specific fixed effects or addressing the concern that COVI is constructed as a relative measure that is not comparable across elections (e.g., Juelich and Coll, 2020; Coll and Juelich, 2022; and Pomante II et al., 2023).

In this study, we build on the pioneering work that developed the original COVI and its updates

turnout prior to adopting voter ID. Recent examples of studies that estimate within state effects of state voter ID on turnout and election integrity include Cantoni and Pons (2021) and Milyo (2025).

[2]For example, Endersby and Jokinsky (2024) do not include voter identification laws in their analysis of the effects of state election administration on voter turnout.

[3]The National Council on State Legislatures (NCSL) is a widely utilized source of information on state election administration procedures (e.g., Cantoni and Pons, 2021; and Milyo, 2025).

[4]Using the ranking of states by COVI in each year does not ameliorate the time inconsistency problem, since a state may move up or down in the ranking due to changes in laws occurring in other states. Moreover, using rankings discards information that is contained in the continuous COVI scores.

[5]Pabayo et al. (2021) find an association between COVI and access to health insurance in a single cross-sectional analysis.

and extensions to produce a time-consistent version of the state-level cost of voting index. We first demonstrate that this dynamic index, or DCOVI, provides an improved understanding of the changes in state election administration over time, then employ DCOVI in several analyses of the effects of state election administration laws on voter turnout, disparities in turnout, and public perceptions of the integrity of elections. Using this time-consistent index of the cost of voting in the states, we find evidence of a modest trade-off: an increase in DCOVI leads to a small reduction in overall voter turnout, but it also improves public perceptions regarding the integrity of elections.

2 From COVI to DCOVI

We rely on the data set describing the cost of voting in American states assembled by Pomante II et al. (2023) and updated in Pomante II (2025); these authors have collected information on state election administration laws for every state and for every Presidential election year since 1996. The number of state election administration laws considered in this data range from just 12 in 1996 to 45 in 2024; these laws are in turn grouped into broad issue areas, such as "registration deadlines" or "polling hours." The number of grouped issue areas ranges from 6 in 1996 to 10 in 2024. Consequently, the number of state laws presumed to increase the cost of voting is generally increasing in each iteration of the COVI for successive election years.

The original cost of voting index (COVI) is created by performing a Principal Component Analysis (PCA) separately for each election year (and including all state voting laws recorded for that year).[6] This process produces a score for each state in each election year (i.e., the COVI), that represents each state's cost of voting relative to other states in the same year based on those state institutions included in each year. As noted above, this state cost of voting index has been employed in several recent studies. For example, Pomante II et al. (2023) us the COVI to determine a ranking of the states in every election year and examine how this ranking relates to various outcome variables such as turnout and minority representation (see especially Pomante II et al., 2023).

One limitation of any such "index" approach is that it imposes equal importance on the presence of each law considered within an issue area.[7] However, for ease of comparison to the original COVI, we do not alter the characterization of state laws that are presumed to influence turnout in

[6]This multivariate statistical method extracts the information from the issue areas into fewer variables called principal components. The first principal component is the linear combination of the original variables that maximally explains the variances of all the variables. The second component explains the second most amount of variation after removing the first component, and so forth. To construct the index, a weighted average of the first three components is computed, where the weights are the amount of variation explained by every principal component.

[7]For example, a state with a so-called "non-photo" ID requirement receives a score of 1 in the voter ID issue area, while a state with a photo ID requirement receives a 2. This *a priori* ordering and weighting of voter ID laws is contrary to the findings in Cantoni and Pons (2021), who find negligible impacts of voter ID laws on turnout. However, in this paper, we take as given the particular counting approach of the original COVI.

the original COVI. Instead, we focus here on another potential drawback, that of time consistency. Because the COVI is built separately every election year, it doesn't capture possible time trends in the cost of voting happening across all states in this time frame. Moreover, since the PCA index is a relative measure, the COVI of a particular state could increase not because it has become more costly to vote in that state, but just because, on average, in other states it has become easier.

Because we are interested in exploring how changes in the cost of voting across states over time have affected turnout and perceptions of election integrity, we develop a time-consistent version of the original COVI. To do so, instead of performing a separate PCA for every election year, we perform a single PCA using all state-year observations. This approach allows us to capture the evolution of election administration laws relevant for the cost of voting and yields a less volatile measure of the cost of voting for most states (since the new index values for a given state is less influenced by changes in laws of other states).

Table 1 reports all of the state laws considered for every issue across the years in our sample; for ease of comparison, we employ the same naming convention for state laws as Pomante II et al. (2023). Our dynamic cost of voting index, or DCOVI, adheres closely to the spirit of the original COVI, but does have a drawback in that we have to include the same number of issues across all years for the PCA to work. For this reason, we do not include some issue areas that Pomante II et al. (2023) only record for recent years. These include: Early Voting Days, introduced in 2012, and dedicated issues on Registration Drive Restrictions, Automatic Registration, and Absentee Voting, which were introduced by the authors in 2012, 2020, and 2024, respectively (see Table 1).[8] Moreover, because the number of laws considered within an issue group also varies over time for the original COVI, instead of using the sum of laws in each issue group, we take their average, normalizing Issues 2 (Registration Restrictions) and Issues 4 (Voting Inconveniences) into continuous variables ranging from 0 to 1, to facilitate comparisons across years.[9]

While our approach in generating DCOVI does not include all information available in later years, it does stay as true as possible to the COVI while permitting us to construct a time-consistent index that permits more meaningful comparisons over time. This feature is important, since the overall cost of voting in the U.S. has been steadily decreasing for the last two decades, as shown in Figure 1. In contrast, the original COVI has a mean of zero in each year, by construction, which

[8] We nonetheless still include both Registration Drive Restrictions ("novoterregdriveallowed") and Automatic Registration ("NoAutomaticReg") but, to facilitate time consistency, they are included in the Registration Restrictions issue area. For the same reason, we also include three types of absentee voting ("Absentee-ExcuseReq," "NoAbsenteeInPerson," "NoPermanentAbsentee") as part of the Voting Inconveniences issue area.

[9] An alternative approach would be to build the six issues by including only the considerations present in every year (the variables in bold in Table 1). We find this approach less optimal, as it would drastically reduce the number of laws considered in more recent years (e.g., 12 instead of 30 for 2024) and would not include important innovations such as online registration.

obscures this trend and may give a mistaken impression regarding trends in the cost of voting.

Figure 2 further demonstrates the potential for intertemporal comparisons using COVI to be misleading; in this figure we compare DCOVI (Panel A) and COVI (Panel B) over time for a subsample of states highlighted in Pomante II et al. (2023). These authors compare states that (using the original COVI) were ranked first and last in 1996 (North Dakota and Tennessee), first and last in 2020 (Oregon and New Hampshire), and the state which experienced the largest relative reduction in voting costs over this time frame (Maryland). The first thing to notice by looking at the two panels of Figure 2 is that DCOVI is much less volatile than the original COVI, which better reflects the number of actual changes in election administration in these states over time.

In particular, the plots for COVI in Panel B of Figure 2 suggest that New Hampshire was continually increasing the cost of voting and became the state with the highest cost of voting only recently. But DCOVI tells a different story: the cost of voting in New Hampshire has remained fairly constant. Indeed, Pomante II et al. (2023) note that New Hampshire "has largely failed to act on any significant legislation that would have reduced the state's cost of voting" and that it "has failed to adopt new technologies that allow for early voting, online voter registration, or AVR."

Another example of the potentially misleading impression left by examining changes in COVI over time is illustrated by Maryland. Using the original COVI (Panel B) we observe two equally large drops in the cost of voting in Maryland, one between 1996 and 2000, and the other between 2008 and 2012. In contrast, DCOVI shows a small decrease between 2008 and 2012, and a much larger decrease between 2016 and 2020. These changes are also noted by Pomante II et al. (2023): "the greatest impact came when the (Maryland) adopted early voting between 2008 and 2012... Moreover, by 2020 the state had done away with its 29-day voting registration deadline, adopting EDR, with an option to register to vote at polling locations." Here as well, DCOVI provides a more straightforward and accurate reflection of within state changes in election administration than might be inferred from the original COVI.

As a final example, Pomante II (2025) compares changes in COVI in states controlled by Republicans versus Democrats; this comparison gives the impression that "Red" states are increasing the cost of voting over time. However, in Figure 3, we plot DCOVI scores over time for state that have been consistently "Red" or "Blue" in recent Presidential elections. Using a time-consistent index makes clear that the cost of voting is generally declining across all states in recent years, albeit more so in reliably "Blue" states.

However, the value-added of DCOVI extends beyond just appearances and impressions. In

order to identify the effects of the costs of voting on outcomes of interest, such as voter turnout, disparities in turnout, or the integrity of elections, it is necessary to examine within state changes over time after controlling for other relevant confounders (i.e., regression analyses that include state fixed effects). This is our primary motivation for adapting COVI to create a time-consistent dynamic cost of voting index (i.e., DCOVI).

3 DCOVI and Voter Turnout

In this section, we use DCOVI to examine whether state election administration laws have important consequences for voter turnout and disparities in turnout. Conventional wisdom, at least among more progressive advocates for election reforms, is that increases in the cost of voting will have very large impacts on turnout and will thereby exacerbate voting disparities. However, to the extent state election laws that raise costs of voting also generate counter mobilization or even improve public perceptions of election integrity, voter turnout may respond positively. In addition, the rational choice theory of voting implies that changes in the net cost of voting will only affect the turnout decisions of individuals who are close to the margin of voting or not, which may not be a large number relative to the size of the electorate. Moreover, while changes in the cost of voting may impact individuals disproportionally across groups, the degree to which these same individuals are close to the margin of voting or not may also be distributed differently across groups. It is therefore not self-evident that changes in the state laws that raise (or lower) the cost of voting will be manifest in significantly lower (higher) turnout, or greater (lesser) racial disparities in turnout. Consequently, it is very much an empirical question whether observed changes in the cost of voting over time have any significant impact on either turnout or disparities in turnout across groups.

A First Look at DCOVI and Trends in Voter Turnout and Disparities in Turnout

As noted above, DCOVI has been decreasing over time, but especially in more recent years and in "Blue" states (see Figure 3). In Figure 4 we plot voter turnout in Presidential elections relative to voting-eligible population (McDonald, 2024a,b). Consistent with the general decrease in DCOVI, turnout has increased over the last twenty years. However, despite the much more pronounced decrease for DCOVI for Blue states, the upward trend in turnout moves in lockstep for reliably Red vs. Blue states. In addition, the biggest increases in voter turnout occur prior to the 2008 election, while the decline in DCOVI occurs mostly after 2008.

A similar inconsistency is observed for movements in the minority racial gap in voting. In Figure 5, we plot changes in the minority voting gap, defined as the difference in self-reported turnout from the Current Population Survey for Black and Hispanic respondents versus Non-Hispanic White respondents. Despite the general decline in DCOVI (especially after 2008), the minority voting gap

has grown wider in recent elections. In addition, prior to 2012, the minority voting gap improved more outside of Blue states, even though there was very little movement in DCOVI during that period. And the more recent decrease in Black and Hispanic voter turnout (relative to Non-Hispanic White) is very similar in all states, despite the much larger decrease in DCOVI in Blue states over this same period. If anything, the intertemporal movements in the minority turnout gap in Blue versus Red states appear to be more correlated with each other than changes in DCOVI in these states.

Taken together, the descriptive trends illustrated in these figures underscore the caveat above that changes in the cost of voting across states or groups may have subtle or even counterintuitive impacts on turnout and disparities in turnout. Of course, these simple ocular comparisons do not account for other important determinants of voting behavior that may confound the observed relationship between DCOVI and voter turnout. In the next section, we address the concern regarding potential confounding factors – including unobserved and time-invariant state-specific determinants of voting — using regression analyses.

Estimated Effects of DCOVI on Aggregate Voter Turnout

We first estimate the effects of DCOVI and COVI on state-level voter turnout from official election returns for Presidential elections from 1996-2024. In Table 2, for each dependent variable, we present three nested regression specifications that vary in the set of included covariates. All specification include controls for the log of state population, shares of population by race or age, and the share of population with educational attainment of at least a college degree; the second specification includes state unemployment and median income, while the final specification (our preferred model) also includes controls for the presence of concurrent state-wide elections (governor or U.S. Senate) and an indicator for whether the state was a Presidential battleground in that year.[10] In addition, for every regression model, we include indicators for year and state; and standard errors are corrected for clustering at the state-level (Primo et al., 2007).

Regardless of the specification, once we control for other relevant determinants of voting, DCOVI is significantly and negatively related to state voter turnout. DCOVI has a standard deviation of 0.82, so a one-standard deviation increase in this measure of the cost of voting reduces state turnout by about 0.6%. In contrast, the original COVI exhibits a smaller negative association with state turnout that is at best only marginally significant. COVI has a very similar standard deviation (0.84) as DCOVI, therefore a one-standard deviation increase in the original COVI is estimated to reduce state turnout by just over 0.4%, or about two-thirds the impact implied by employing DCOVI in these regressions. The difference in these estimates in terms of both magnitude and statistical significance is consistent with attenuation bias attributable to over-time comparisons of

[10] We define "battleground" states as those where the margin of victory was less than 5% in the Presidential race.

COVI, which is a decidedly noisy measure of changes in state-level costs of voting.

As noted above, a drawback to any index of state laws is that it imposes equal importance on different types of laws. In order to tease out these potential differential effects of the component issue areas that comprise DCOVI, we disaggregate the index by issue areas, as defined in Table 1 following Pomante II et al. (2023), and examine the effects of these issue areas on state voter turnout. As shown in Table 3, the component issue areas are: Registration Deadlines, Other Registration Restrictions, Pre-Registration Restrictions, Voting Inconvenience, Voter ID Laws, and Polling Hours. We estimate the effects of each of these components using our preferred specification (model 3 in Table 2); in general, state restrictions related to voter registration have larger and statistically significant effects on turnout, post-registration laws (e.g., early voting, mail voting, voter ID, and polling hours) have estimated effects that are much smaller and statistically indistinguishable from zero. This finding is consistent with several studies that find at best modest effects of state reforms designed to increase turnout (e.g., Endersby and Jokinsky, 2024), as well as recent studies that indicate negligible effects of state voter ID laws on voter turnout (e.g., Cantoni and Pons, 2021; and Hoekstra and Koppa, 2021).

Estimated Effects of DCOVI on Individual-Level Voter Turnout

We now turn to analyzing the differential effects of DCOVI on turnout by race; to do so, we utilize individual-level voting from the November supplement of the Current Population Survey (CPS).[11] The CPS includes individual's self-reported vote and registration, as well as reported race/ethnicity. We examine two different dependent variables: turnout among voting age population and turnout among registered voters. Given the findings regarding the differential effects of component issue areas of DCOVI, we expect that any effects of DCOVI on turnout should be mitigated among individuals who are already registered to vote.

We present regression estimates from linear probability models for ease of interpretation of the estimated coefficients (and for interpretation of state fixed effects).[12] The regression specification mimics the preferred model above, except that control variables for age, education, employment, ethnicity, and race are all measured at the individual level. All regressions also include controls for year and state, as well as indicators for concurrent statewide and Presidential battleground elections, and standard errors are adjusted for clustering at the state level.

The result reported in column 1 of Table 4 indicates that a one-standard deviation increase in DCOVI reduces the probability that an individual reports voting by 0.4%. Not only is the

[11] The source for these data is Flood et al. (2025).

[12] This is also the disciplinary norm in economic analyses of individual-level voter turnout employing state-fixed effects (e.g., Cantoni and Pons, 2021; Raze, 2022).

effect of DCOVI less than what we observed in our analysis of state-level turnout, but the effect is only marginally significant ($p < .10$) after controlling for individual-level covariates, despite the large number of observations in the CPS. In column 2 of Table 4, we break out the estimated effects of DCOVI by race/ethnicity; we observe a larger and significant effect of DCOVI for Asian and Other individuals; DCOVI also has a marginally significant and negative effect on voting for Hispanic respondents, but no significant effect for Black or White respondents. Finally, as anticipated, DCOVI has negligible and insignificant effects on turnout among *registered* voters of any race/ethnicity (see columns 3 and 4 of Table 4). Taken together, these modest to null effects of the cost of voting on turnout may be at first blush counter-intuitive, but these findings are in keeping with the caveat made above that changes in state election administration have ambiguous effects on both turnout and disparities in turnout. The absence of a negative impact on Black voters from DCOVI is also consistent with the descriptive trends in the minority voting gap presented in Figure 5.[13] One possible reason for the modest net effects of DCOVI on voter turnout is that state election laws that increase the cost of voting may also assuage public concerns regarding the integrity of elections; we test this hypothesis in the next section.

4 DCOVI and Public Perceptions of the Integrity of Elections

While several studies argue that actual fraud in U.S. elections is very rare (e.g., Minnite, 2010; Pomante II et al., 2023), the public nevertheless remains concerned with the integrity of elections. For example, Milyo (2025) reports that opinion polls repeatedly show that voter identification requirements have high public approval and that public confidence in the integrity of elections increases after states adopt strict identification laws. In this section, we test whether changes in DCOVI are similarly associated with individual perceptions of election integrity.

The Survey of the Performance of American Elections (SPAE) includes several questions relevant for gauging respondents' perceptions of election integrity. The SPAE is administered immediately after Election Day to 200 registered voters in each of the 50 states. In 2012, 2016, 2020, and 2024 the SPAE included a comprehensive battery of questions relevant for measuring trust and confidence in the integrity of elections. These questions range from confidence in whether votes were counted correctly, a common proxy for election integrity (see Gronke, 2014), to queries about the frequency of specific types of illegal activities, such as double-voting, non-citizen voting, stolen ballots, and voter impersonation.

We analyze the effects of DCOVI on public perceptions in the accuracy of vote counting in much the same manner as our analysis of individual voter turnout above. Again, for ease of ex-

[13] Also, see Cantoni and Pons (2021), who report non-negative effects of state strict voter ID laws on Black and Hispanic voter turnout.

position, we estimate linear probability models and transform all dependent variables into binary indicators measuring the two highest levels of confidence ("very confident" and "confident") on a four-point response scale. All regressions include controls for respondent age, education, employment, race/ethnicity, party ID, and sex. As above, we also include indicators for the presence of state-wide elections, and battleground state in a Presidential election, as well as year and state indicators (all standard errors are clustered at the state-level). However, because the SPAE includes information on respondents' party ID (as opposed to the CPS), we also include indicators for year interacted with party ID to control for election-specific waves that favor one party or another. Controlling for temporal party effects is important, since it is well-established that many people view the performance of electoral institutions through a partisan lens (e.g. Gronke, 2014; Sances and Stewart III, 2015; Richardson and Milyo, 2016; VanderMolen and Milyo, 2016; Primo and Milyo, 2020; and Ferroni, 2024).

Table 5 reports our initial analysis of the effects of DCOVI on SPAE respondents' confidence in vote counts. The first row of Table 5 presents results for the aggregate effect on confidence that votes are counted correctly, from the respondent's own vote, to votes cast in the respondent's county, state, or nationally. All of the point estimates indicate a positive relationship between DCOVI and confidence in vote counting, but none of these estimates are statistically significant. This remains the case even when we combine each of these outcome variables into an overall index for confidence in vote counting.[14] The remaining rows of Table 5 report the estimated effects of DCOVI interacted with year indicators; interestingly, the pandemic-affected election of 2020 stands out in that DCOVI is strongly associated with higher confidence in vote counting. But this same pattern is not observed for other years.

Thus far, there is no consistent evidence that increases in DCOVI improve confidence in vote counting. However, when the question is framed differently, specifically, asking whether it is "very common" for public officials to alter vote counts, we find a significant and negative impact of DCOVI on the perceived frequency of this illicit activity (see column 6). This relationship is also fairly stable across years. Even so, the estimated impact of DCOVI is modest: a one-standard deviation increase in the dynamic cost of voting index decreases the probability that a respondent indicates that officials very commonly alter vote counts by just over 1% (about a 10% increase relative to the mean of this variable); on the other hand, this small effect is precisely estimated ($p < .01$).

The apparent importance of how questions about vote counting are framed suggests that context matters for public perceptions of the integrity of elections; and as noted above, partisanship

[14] We construct an equally weighted z-score index of confidence in vote counting using standardized measures of confidence in one's own vote and in vote counting at the county, state, and national levels. All components, and the resulting index, are standardized to have mean 0 and standard deviation 1.

is a particularly important contextual factor. For this reason, we re-estimate these models with DCOVI interacted by party and year (see Table 6). This exercise reveals that for Republicans, there is a consistent and positive relationship between DCOVI and confidence in vote counting, no matter how framed.

In Tables 7 and 8, we repeat these analyses, but for dependent variables that indicate the perceived frequency of specific types of illegal activities in elections. Overall, DCOVI is most strongly and negatively associated with double voting, stealing, ballots, and voter impersonation, as well as overall indices of illegal activities. Again, the estimated effects are modest. For example, a one-standard deviation increase in DCOVI reduces the probability that respondents believe voter impersonation is very common by just over 1% (again, about a 10% increase relative to the mean of this variable), although this small effect is also precisely estimated ($p < 01$). These estimated effects of DCOVI are also fairly consistent across years, but again, most evident for Republicans.

In this section, we demonstrate that increases in DCOVI are in general associated with improved perceptions of the integrity of elections, albeit most clearly so for Republicans, or when measured by the frequency of illicit activities (versus questions about the accuracy of vote counts).

5 Discussion

The COVI is a convenient summary measure of state laws that may impact the cost of voting and has become a widely used tool for scholars of state election administration. However, COVI is by design a relative measure across states in a given year, so it is not a reliable measure of within state changes in election laws over time. This is problematic for any evaluation study that aims to understand the effects of state election administration procedures on voter turnout, disparities in turnout, election integrity. and the like, since identifying the effects of state election laws necessitates analyzing within state changes over time. For this reason, we develop a time-consistent or dynamic cost of voting index (DCOVI) that remains as true to the COVI as feasible.

We first demonstrate that DCOVI is indeed a less noisy measure COVI; then we employ DCOVI in a series of regression analyses that demonstrate that this summary measure is associated with lower voter turnout (especially non-Black minorities) and improved perceptions of the integrity of elections (especially for Republicans). These findings suggest that state election administration reforms involve a trade-off between ease of voting access and public confidence in the integrity of elections. However, the magnitude of these effects is not large, so this trade-off is not as stark as it might be otherwise.

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Figure 1: DCOVI versus COVI over Time

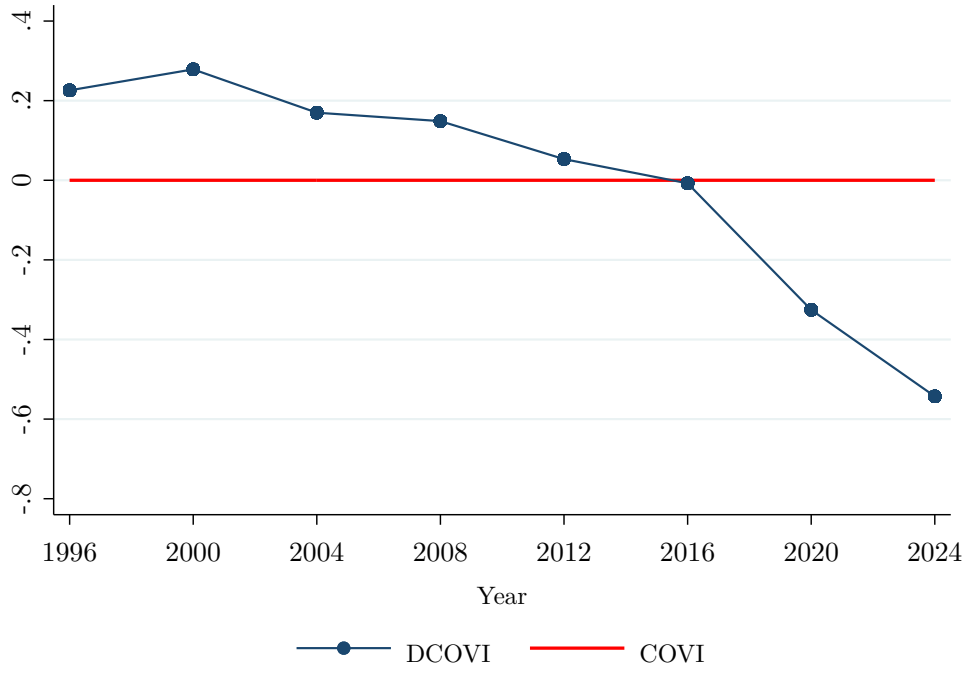
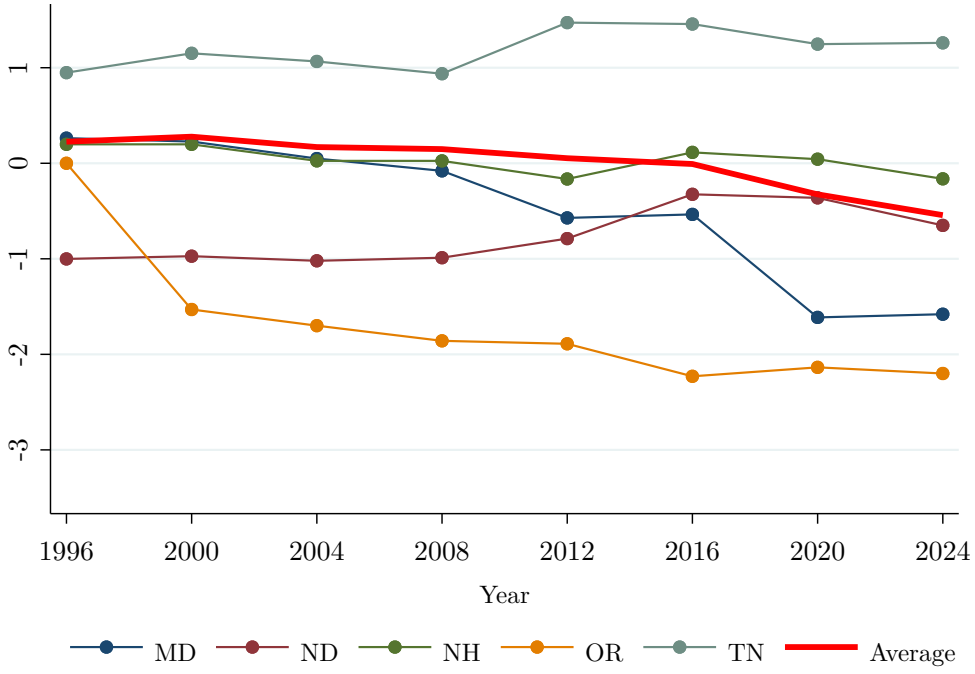


Figure 2: Comparing DCOVI and COVI in Selected States

(a) DCOVI



(b) COVI

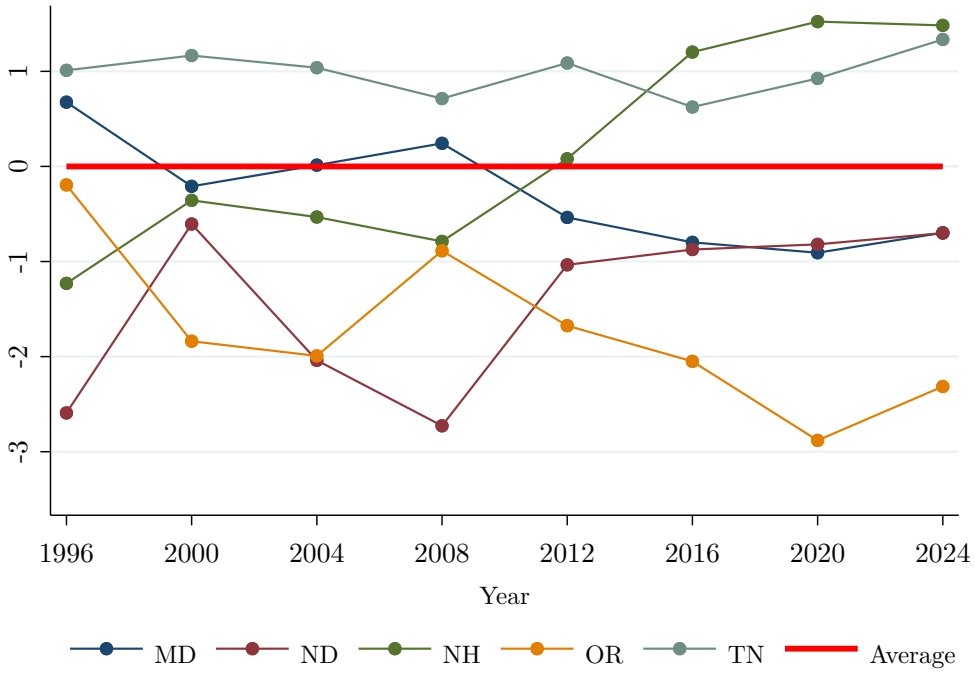
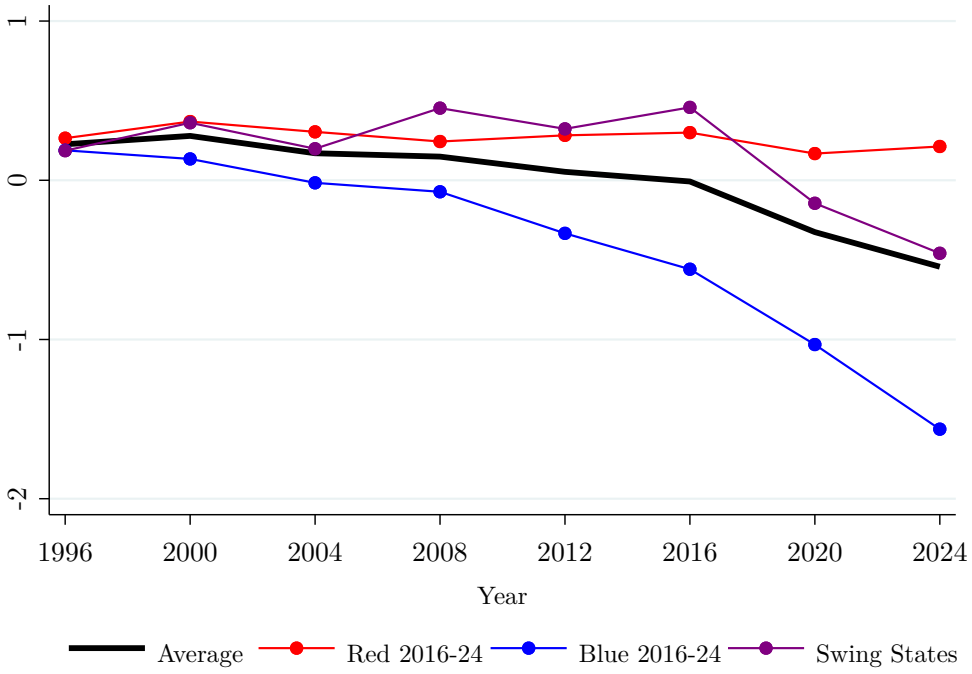
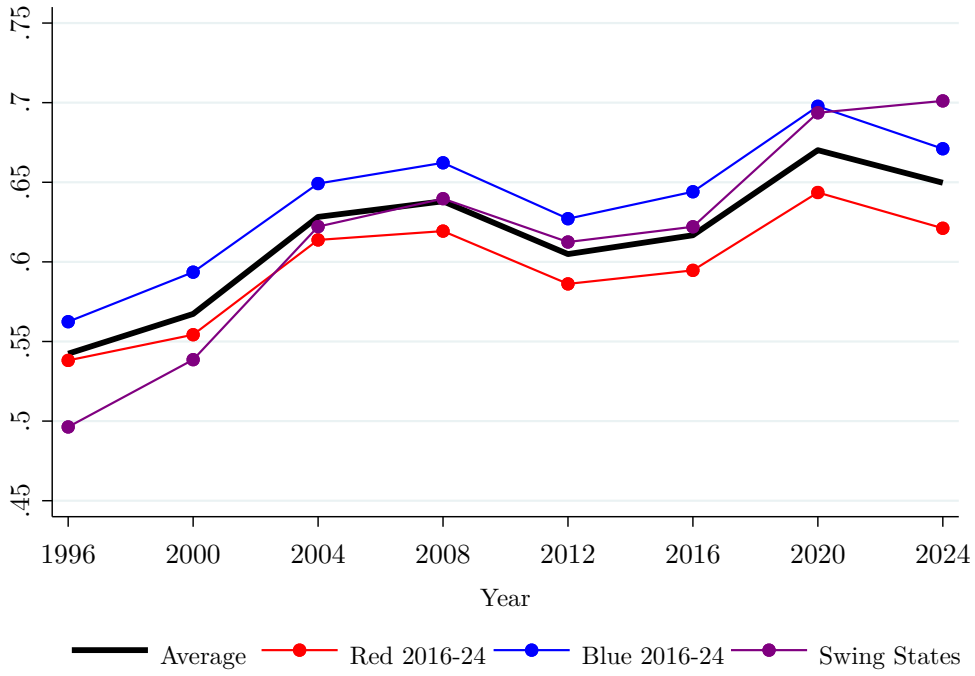


Figure 3: Trends in DCOVI for Blue and Red States



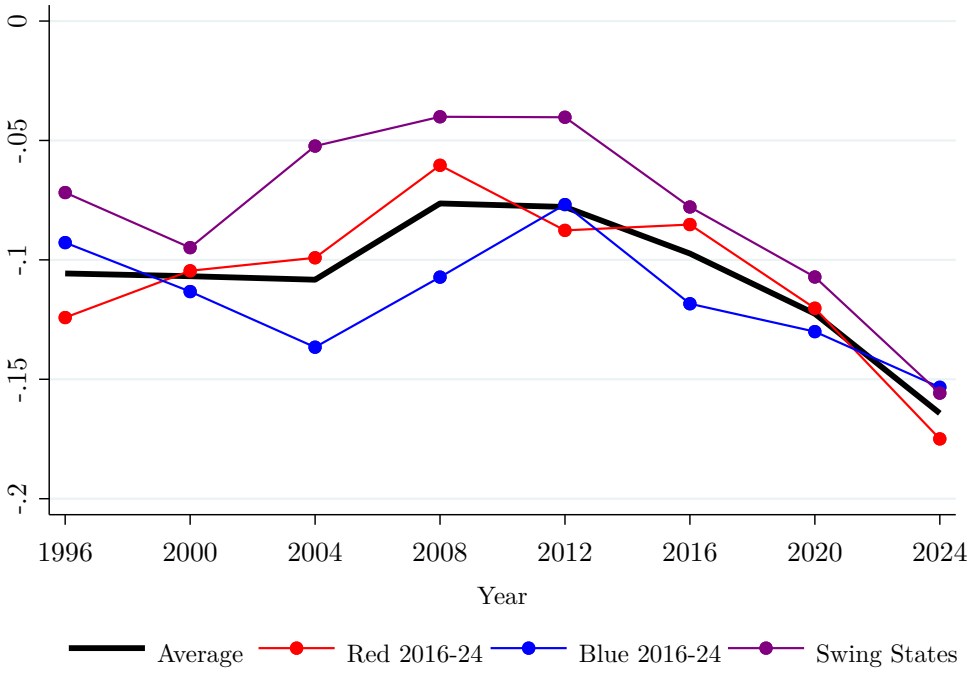
Notes: Classification based on presidential election outcomes in 2016, 2020, and 2024: Red 2016-24 (Republicans won all three); Blue 2016-24 (Democrats won all three); Swing States (neither party won all three).

Figure 4: Voter Turnout Trends for Blue and Red States



Notes: Turnout is measured from state election returns as a percent of Voting Eligible Population; source is the U.S. Elections Project at the University of Florida (McDonald, 2024a,b). Classification based on presidential election outcomes in 2016, 2020, and 2024: Red 2016-24 (Republicans won all three); Blue 2016-24 (Democrats won all three); Swing States (neither party won all three).

Figure 5: Trends in the Minority Voting Gap in Blue and Red States



Notes: Minority Voting Gap = (Black and Hispanic Turnout)-(Non-Hispanic White Turnout]; source is Current Population Survey self-reports on voting (Flood et al., 2025). Classification based on presidential election outcomes in 2016, 2020, and 2024: Red 2016-24 (Republicans won all three); Blue 2016-24 (Democrats won all three); Swing States (neither party won all three).

Table 1: DCOVI Variables

1996	2000	2004	2008	2012	2016	2020	2024
Issue Area 1: Registration Deadlines							
Issue Area 2: Registration Restrictions							
NoSameDayReg	**NoSameDayReg**	**NoSameDayReg**	**NoSameDayReg**	**NoSameDayReg**	**NoSameDayReg**	**NoSameDayReg**	**NoSameDayReg**
NoPollPlaceReg	**NoPollPlaceReg**	**NoPollPlaceReg**	**NoPollPlaceReg**	**NoPollPlaceReg**	**NoPollPlaceReg**	**NoPollPlaceReg**	**NoPollPlaceReg**
NoFelonReg	**NoFelonReg**	**NoFelonReg**	**NoFelonReg**	**NoFelonReg**	**NoFelonReg**	**NoFelonReg**	**NoFelonReg**
NoFelonsRegAfterIncar	**NoFelonsRegAfterIncar**	**NoFelonsRegAfterIncar**	**NoFelonsRegAfterIncar**	**NoFelonsRegAfterIncar**	**NoFelonsRegAfterIncar**	**NoFelonsRegAfterIncar**	**NoFelonsRegAfterIncar**
NoAutomaticReg	**NoAutomaticReg**	**NoAutomaticReg**	**NoAutomaticReg**	**NoAutomaticReg**	**NoAutomaticReg**	**NoAutomaticReg**	**NoAutomaticReg**
		NoOnlineregistration	NoOnlineregistration	NoOnlineregistration	NoOnlineregistration	NoOnlineregistration	NoOnlineregistration
		MentalCompReg	MentalCompReg	MentalCompReg	MentalCompReg	MentalCompReg	MentalCompReg
		NoDriveAllowed	NoDriveAllowed	NoDriveAllowed	NoDriveAllowed	NoDriveAllowed	NoDriveAllowed
				NoSameDayRegPresOnly	NoSameDayRegPresOnly	NoSameDayRegPresOnly	NoSameDayRegPresOnly
						onlineregistrationmedian	onlineregistrationmedian
							AdditionalDocuments4Reg
Issue Area 3: Preregistration							
Issue Area 4: Voting Inconveniences							
AbsenteeExcuseReq	**AbsenteeExcuseReq**	**AbsenteeExcuseReq**	**AbsenteeExcuseReq**	**AbsenteeExcuseReq**	**AbsenteeExcuseReq**	**AbsenteeExcuseReq**	**AbsenteeExcuseReq**
NoAbsenteeInPerson	**NoAbsenteeInPerson**	**NoAbsenteeInPerson**	**NoAbsenteeInPerson**	**NoAbsenteeInPerson**	**NoAbsenteeInPerson**	**NoAbsenteeInPerson**	**NoAbsenteeInPerson**
nostateholiday	**nostateholiday**	**nostateholiday**	**nostateholiday**	**nostateholiday**	**nostateholiday**	**nostateholiday**	**nostateholiday**
NoEarlyVote	**NoEarlyVote**	**NoEarlyVote**	**NoEarlyVote**	**NoEarlyVote**	**NoEarlyVote**	**NoEarlyVote**	**NoEarlyVote**
	noallmailvoting	noallmailvoting	noallmailvoting	noallmailvoting	noallmailvoting	noallmailvoting	noallmailvoting
		mustcastballotinprecinct	mustcastballotinprecinct	mustcastballotinprecinct	mustcastballotinprecinct	mustcastballotinprecinct	novotingcenters
			NoPermanentAbsentee	NoPermanentAbsentee	NoPermanentAbsentee	NoPermanentAbsentee	NoPermanentAbsentee
			NoTimeOffVote	NoTimeOffVote	NoTimeOffVote	NoTimeOffVote	NoTimeOffVote
			NoTimeOffPay	NoTimeOffPay	NoTimeOffPay	NoTimeOffPay	NoTimeOffPay
				allmailnopolllocations	allmailnopolllocations	allmailnopolllocations	allmailnopolllocations
					somepollreductionspost2012	somepollreductionspost2012	somepollreductionspost2012
						ReducePollingLoc50somearea	ReducePollingLoc50somearea
							ExcessiveWaitTime
							MailVotePostagenotpaid
							nofoodordrink
Issue Area 5: Voter ID Laws							
Issue Area 6: Poll Hours							

Table 2: Effects of DCOVI v. COVI on State Voter Turnout (%), 1996-2024 Presidential Elections

	(1)	(2)	(3)	(4)	(5)	(6)
DCOVI	-0.73**	-0.74**	-0.70**			
	(0.36)	(0.34)	(0.32)			
COVI				-0.52*	-0.48	-0.50*
				(0.30)	(0.30)	(0.28)
Observations	400	400	400	400	400	400

Notes: Coefficient estimates for regressions with standard errors adjusted for clustering at the state-level. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. All regressions include indicators for year and state, as well as controls for the log of state population; population shares for: Asian, Black, Hispanic, and Other; under age 18; over age 65; and with a college degree. Models (2) and (5) also include controls for median income and unemployment; Models (3) and (6) also include indicators for concurrent state-wide elections and whether the state is a Presidential battleground state.

Table 3: DCOVI Issue Groups and State Voter Turnout (%), 1996-2024 Presidential Elections

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Registration Deadlines	-0.83*	-0.96***					
	(0.49)	(0.36)					
Registration Restrictions	-0.22		-0.86**				
	(0.50)		(0.39)				
Preregistration	-0.47*			-0.58**			
	(0.25)			(0.27)			
Voting Inconveniences	-0.15				-0.34		
	(0.29)				(0.31)		
Voter ID Laws	0.31					0.00	
	(0.25)					(0.23)	
Poll Hours	0.10						-0.12
	(0.18)						(0.18)
Observations	400	400	400	400	400	400	400

Notes: Coefficient estimates for regressions with standard errors adjusted for clustering at the state-level. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. All regressions include the same set of controls as Model 3 in Table 2. DCOVI Issue groups are converted to z-scores within group.

Table 4: Effects of DCOVI on CPS Individual Voting by Race, 1996-2024 Presidential Elections

	Turnout among adult population		Turnout among registered voters	
	(1)	(2)	(3)	(4)
DCOVI	-0.006*		0.001	
	(0.003)		(0.003)	
DCOVI × White - Not Hispanic		-0.005		0.002
		(0.004)		(0.003)
DCOVI × Black - Not Hispanic		0.012		0.007
		(0.009)		(0.006)
DCOVI × Hispanic		-0.011*		-0.006
		(0.006)		(0.006)
DCOVI × Asian - Not Hispanic		-0.019***		-0.001
		(0.007)		(0.004)
DCOVI × Other - Not Hispanic		-0.016**		-0.002
		(0.006)		(0.005)
Observations	607512	607512	494543	494543

Notes: Coefficient estimates for linear probability regression with standard errors adjusted for clustering at the state-level. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Controls include individual age, educational attainment, employment, race/ethnicity, and sex, as well as indicators for concurrent statewide elections or presidential battleground, and indicators for year and state. Voter turnout is a binary indicator based on self-reported voting (or not voting) among eligible voters in the Current Population Survey for Presidential Elections from 1996-2024.

Table 5: Effects of DCOVI on Confidence in Vote Counting, 2012-2024 Presidential Elections

	Confident vote count					Very common officials alter vote count
	Own vote	County	State	Nation	Z-Score Index	
	(1)	(2)	(3)	(4)	(5)	(6)
DCOVI	0.003	0.002	0.005	0.008	0.007	-0.015***
	(0.003)	(0.005)	(0.007)	(0.005)	(0.011)	(0.005)
DCOVI × 2012	0.017**	0.006	0.009	0.016	0.033	-0.011
	(0.007)	(0.009)	(0.013)	(0.010)	(0.025)	(0.008)
DCOVI × 2016	-0.001	-0.008	-0.008	0.017**	-0.028	-0.017**
	(0.006)	(0.007)	(0.009)	(0.007)	(0.021)	(0.007)
DCOVI × 2020	0.022***	0.028***	0.038**	0.000	0.038**	-0.022***
	(0.006)	(0.010)	(0.015)	(0.008)	(0.016)	(0.008)
DCOVI × 2024	-0.000	-0.003	-0.001	0.009*	0.003	-0.013***
	(0.003)	(0.004)	(0.006)	(0.005)	(0.012)	(0.005)
Observations	43363	46271	46175	46130	44411	38184

Notes: Coefficient estimates for linear probability regression with standard errors adjusted for clustering at the state-level. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. We report the coefficients from two different specifications: the first row shows the effect of DCOVI, the following rows show the effect of DCOVI by year. Controls include individual age, educational attainment, employment, race/ethnicity, party ID, and sex, as well as indicators for concurrent statewide elections or presidential battleground, and indicators for state and party × year. The dependent variables in columns 1-4 are binary indicators for whether respondents are confident of the vote count at a particular level. The dependent variable in column 5 is a z-score index aggregating the dependent variables of the previous 4 columns. The dependent variable in column 6 is a binary indicators for whether officials altering vote count is perceived to be very common.

Table 6: Effects of DCOVI on Confidence in Vote Counting by Party × Year, 2012-2024 Presidential Elections

	Confident vote count					Very common officials alter vote count
	Own vote	County	State	Nation	Z-Score Index	
	(1)	(2)	(3)	(4)	(5)	(6)
DCOVI × Democrat × 2012	-0.001	-0.010	-0.026*	0.029**	-0.050	-0.006
	(0.008)	(0.009)	(0.015)	(0.012)	(0.035)	(0.008)
DCOVI × Democrat × 2016	-0.012	-0.020**	-0.052***	-0.003	-0.138***	-0.011
	(0.008)	(0.008)	(0.013)	(0.010)	(0.031)	(0.009)
DCOVI × Democrat × 2020	0.008	0.006	0.001	0.005	-0.013	-0.015**
	(0.006)	(0.010)	(0.015)	(0.007)	(0.026)	(0.007)
DCOVI × Democrat × 2024	-0.006	-0.011**	-0.026***	0.003	-0.044**	-0.009**
	(0.004)	(0.005)	(0.008)	(0.006)	(0.017)	(0.004)
DCOVI × Republican × 2012	0.044***	0.034**	0.062***	0.009	0.140***	-0.018*
	(0.012)	(0.015)	(0.022)	(0.015)	(0.034)	(0.010)
DCOVI × Republican × 2016	0.014**	0.014*	0.046***	0.040***	0.085***	-0.019***
	(0.006)	(0.007)	(0.009)	(0.010)	(0.022)	(0.007)
DCOVI × Republican × 2020	0.045***	0.068**	0.094**	0.003	0.125***	-0.042**
	(0.015)	(0.026)	(0.042)	(0.011)	(0.037)	(0.020)
DCOVI × Republican × 2024	0.009**	0.011**	0.029***	0.020***	0.076***	-0.017**
	(0.004)	(0.005)	(0.007)	(0.007)	(0.018)	(0.008)
DCOVI × All Others × 2012	0.015	0.001	0.005	0.010	0.036	-0.010
	(0.011)	(0.011)	(0.015)	(0.012)	(0.029)	(0.012)
DCOVI × All Others × 2016	0.002	-0.010	0.000	0.020**	0.007	-0.021**
	(0.008)	(0.010)	(0.009)	(0.008)	(0.021)	(0.009)
DCOVI × All Others × 2020	0.020**	0.023*	0.037*	-0.005	0.031	-0.016
	(0.008)	(0.012)	(0.018)	(0.009)	(0.023)	(0.010)
DCOVI × All Others × 2024	-0.000	-0.003	0.007	0.010	0.007	-0.015***
	(0.004)	(0.006)	(0.007)	(0.008)	(0.018)	(0.006)
Observations	43363	46271	46175	46130	44411	38184

Notes: Coefficient estimates for linear probability regression with standard errors adjusted for clustering at the state-level. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Controls include individual age, educational attainment, employment, race/ethnicity, party ID, and sex, as well as indicators for concurrent statewide elections or presidential battleground, and indicators for state and party × year. The dependent variables in columns 1-4 are binary indicators for whether respondents are confident of the vote count at a particular level. The dependent variable in column 5 is a z-score index aggregating the dependent variables of the previous 4 columns. The dependent variable in column 6 is a binary indicators for whether officials altering vote count is perceived to be very common.

Table 7: Effects of DCOVI on Confidence in Election Integrity, 2012-2024 Presidential Elections

	Very common					Perceived Fraud Z-Score Index
	Double voting	Stealing ballots	Voter impersonation	Non-citizen voting	Absentee ballot fraud	
	(1)	(2)	(3)	(4)	(5)	(6)
DCOVI	-0.008**	-0.010**	-0.017***	-0.010	-0.008	-0.039***
	(0.004)	(0.004)	(0.004)	(0.006)	(0.005)	(0.012)
DCOVI × 2012	-0.009	-0.012**	-0.020***	-0.017*	-0.002	-0.030
	(0.007)	(0.006)	(0.007)	(0.010)	(0.009)	(0.026)
DCOVI × 2016	-0.015**	-0.012*	-0.027***	-0.016*	-0.009	-0.059***
	(0.006)	(0.007)	(0.007)	(0.008)	(0.008)	(0.020)
DCOVI × 2020	-0.015**	-0.019**	-0.025***	-0.020***	-0.012	-0.054***
	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)	(0.015)
DCOVI × 2024	-0.007*	-0.008**	-0.015***	-0.008	-0.007	-0.035***
	(0.004)	(0.004)	(0.004)	(0.007)	(0.006)	(0.013)
Observations	39801	39233	39440	39463	38393	33061

Notes: Coefficient estimates for linear probability regression with standard errors adjusted for clustering at the state-level. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. We report the coefficients from two different specifications: the first row shows the effect of DCOVI, the following rows show the effect of DCOVI by year. Controls include individual age, educational attainment, employment, race/ethnicity, party ID, and sex, as well as indicators for concurrent statewide elections or presidential battleground, and indicators for state and party × year. The dependent variables in columns 1-5 are binary indicators for whether a particular type of election fraud is perceived to be very common. The dependent variable in column 6 is a z-score index aggregating the dependent variables of the previous 5 columns.

Table 8: Effects of DCOVI on Confidence in Election Integrity by Party × Year, 2012-2024 Presidential Elections

	Very common					Perceived Fraud Z-Score Index
	Double voting	Stealing ballots	Voter impersonation	Non-citizen voting	Absentee ballot fraud	
	(1)	(2)	(3)	(4)	(5)	(6)
DCOVI × Democrat × 2012	-0.004	-0.012*	-0.011	0.001	0.002	0.002
	(0.008)	(0.007)	(0.007)	(0.009)	(0.009)	(0.026)
DCOVI × Democrat × 2016	-0.014	-0.012	-0.022***	-0.009	-0.003	-0.042
	(0.009)	(0.008)	(0.008)	(0.011)	(0.010)	(0.033)
DCOVI × Democrat × 2020	-0.009	-0.011*	-0.016**	-0.010	-0.000	-0.017
	(0.006)	(0.006)	(0.006)	(0.013)	(0.007)	(0.025)
DCOVI × Democrat × 2024	-0.003	-0.004	-0.014***	0.005	-0.004	-0.004
	(0.004)	(0.004)	(0.004)	(0.009)	(0.006)	(0.020)
DCOVI × Republican × 2012	-0.015	-0.018*	-0.041**	-0.034*	0.000	-0.056
	(0.017)	(0.009)	(0.017)	(0.020)	(0.016)	(0.053)
DCOVI × Republican × 2016	-0.016**	-0.020**	-0.034***	-0.025*	-0.020*	-0.092**
	(0.007)	(0.008)	(0.010)	(0.013)	(0.011)	(0.035)
DCOVI × Republican × 2020	-0.029**	-0.037**	-0.039***	-0.040**	-0.035**	-0.121***
	(0.013)	(0.019)	(0.014)	(0.017)	(0.018)	(0.040)
DCOVI × Republican × 2024	-0.013*	-0.016**	-0.017**	-0.025***	-0.015*	-0.111***
	(0.007)	(0.007)	(0.008)	(0.009)	(0.009)	(0.020)
DCOVI × All Others × 2012	-0.011	-0.010	-0.013*	-0.023*	-0.011	-0.055
	(0.009)	(0.008)	(0.007)	(0.012)	(0.012)	(0.033)
DCOVI × All Others × 2016	-0.015*	-0.008	-0.027***	-0.018*	-0.008	-0.062**
	(0.008)	(0.008)	(0.007)	(0.010)	(0.009)	(0.024)
DCOVI × All Others × 2020	-0.010	-0.014*	-0.025***	-0.018**	-0.007	-0.051**
	(0.007)	(0.008)	(0.009)	(0.008)	(0.008)	(0.019)
DCOVI × All Others × 2024	-0.008*	-0.007	-0.016***	-0.013*	-0.005	-0.025
	(0.004)	(0.005)	(0.005)	(0.007)	(0.007)	(0.019)
Observations	39801	39233	39440	39463	38393	33061

Notes: Coefficient estimates for linear probability regression with standard errors adjusted for clustering at the state-level. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Controls include individual age, educational attainment, employment, race/ethnicity, party ID, and sex, as well as indicators for concurrent statewide elections or presidential battleground, and indicators for state and party × year. The dependent variables in columns 1-5 are binary indicators for whether a particular type of election fraud is perceived to be very common. The dependent variable in column 6 is a z-score index aggregating the dependent variables of the previous 5 columns.