THE PEW CHARITABLE TRUSTS

Elections Performance Index

Methodology

April 2014

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Introduction

The Elections Performance Index, or EPI, is the first objective measure created to comprehensively assess how election administration functions in each state.

The EPI is based on 17 indicators:

- Data completeness.
- Disability- or illness-related voting problems.
- Mail ballots rejected.
- Mail ballots unreturned.
- Military and overseas ballots rejected.
- Military and overseas ballots unreturned.
- Online registration available.
- Postelection audit required.
- Provisional ballots cast.
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- Registration or absentee ballot problems.
- Registrations rejected.
- Turnout.
- Voter registration rate.
- Voting information lookup tools.
- Residual vote rate.
- Voting wait time.

By analyzing quantifiable data on these indicators, the EPI makes it possible to compare election administration performance across states, from one election cycle to the next, and to begin to identify best practices and areas for improvement.

The 17 indicators can be used by policymakers, election officials, and others to shed light on issues related to such areas as voter registration, turnout, waiting times, absentee ballots, use of online technology, military and overseas voters, provisional ballots, access for people with disabilities, and the impact of voting machines or ballot design.

The online EPI interactive report presents these indicators in a format that allows a user to dig deeper and find the context behind each measurement. Using this tool, the user can see individual state pages that tell the stories about the state and individual indicator pages that explain what each indicator means and how to interpret differences.

Although we are transparent about the assumptions we make, we understand that people may disagree about what ought to be included in such an index. Our tool provides users with the functionality to adjust the indicators to create their own index.

The EPI presented here is based on data measuring the 2008, 2010, and 2012 general elections.

How the EPI was developed

The Pew Charitable Trusts worked with Professor Charles Stewart III of the Massachusetts Institute of Technology to convene an advisory group (see Appendix for list of members) of leading state and local election officials from 14 states, as well as academics from the country's top institutions, to help guide the initial development of an Elections Performance Index.

The EPI advisory group met five times between July 2010 and July 2012 in the development phase of the project, and once in August 2013, after the first edition of the EPI had been released, to review its progress. In developing the index, the group borrowed the best ideas from indices in other public policy areas, identified and validated existing data sources, and determined the most useful ways to group these data.

To be useful, the right data must be married to an understanding of how elections function. Along with our advisory group, we surveyed a range of data sources to find approximately 40 potential indicators of election administration that could be used to understand performance or policy in this field. The challenge of identifying these data and compiling measurements resulted in Pew's February 2012 report "Election Administration by the Numbers," which provides an overview of elections data and how to use them.

We submitted these initial 40 measurements to strong validity and reliability tests and worked with the advisory committee to narrow them down from July 2010 to July 2012. After the initial launch of the index, the indicators were reviewed again for their performance and three more indicators were discussed for possible inclusion in the current edition of the Index. The 17 indicators presented here are the final measurements as decided in consultation with the advisory committee. We describe in more detail below how these indicators were chosen, where these data came from, how they were prepared, and how they are used in the indicators.

Choice of indicators

The Elections Performance Index is built on 17 indicators, with an overall score that represents the average of all indicator rankings for each state.

Deciding which indicators to include in the EPI was an iterative process, in which two broad considerations were kept in mind.

1. Any performance index, regardless of the subject, should reflect a comprehensive understanding of all salient features of the policy process being assessed.
2. Any indicator in the index must conform to a set of quality standards.

In developing the EPI, the staff at Pew—in consultation with Professor Stewart and its advisory committee—pursued a systematic strategy to ensure that both of these considerations were given due weight.

Comprehensive understanding of election policy and administration

The initial conceptualization of election administration drew upon Heather Gerken's *Democracy Index.*[1] Building on this work, it became clear that a well-run election is one in which all eligible voters can straightforwardly cast ballots (convenience) and *only* eligible voters cast ballots, which are counted accurately and fairly (integrity).

Elections can further be broken down into three major administrative phases: registration, voting, and counting.

Combining these two ideas, we conceptualized a rather simple yet powerful rubric to use in making sure all important features of election administration are accounted for in the construction of an index. This rubric can be summarized as shown in Table 1.

Table 1: Election Administration Features in the EPI

	Convenience	Integrity
Registration		
Voting		
Counting		

Each of the six cells in this table reflects a feature of election administration we sought to capture in the EPI. For instance, an EPI should strive to assess how easy it is for eligible voters to register (registration convenience) and how well registration lists are maintained, to ensure that ineligible voters are removed (registration integrity).

This rubric was used throughout the development process to help understand which aspects of elections were well-covered by the available indicators and to illuminate areas in which further work to develop indicators was needed.

Throughout the development process, it was apparent that indicators measuring the convenience of voting were much more abundant than indicators measuring security and integrity. This fact represents the current state of election data. Because of the intense policy interest in the security and integrity of elections, working with the elections community to develop a more robust set of integrity-related indicators is a priority of the EPI project moving forward.

It was also apparent that the row depicting "voting" is the phase in which there is the most objective information to help assess the performance of U.S. elections. The mechanics of voting produce copious statistics about how many people engage in different modes of voting (in person on Election Day, in-person early voting, and absentee/vote by mail), along with subsidiary statistics about those modes (for example, how many absentee ballots are requested, how many are returned, how many are rejected and for what reason, etc.). A close second is "registration," which also produces many performance statistics as a byproduct of the administrative workflow.

"Counting" is an area where high-quality measures of election performance remain in relatively short supply. The measures that do exist—such as whether a state required postelection audits—tend to reflect *inputs* into election administration, rather than *outputs* of the process. By inputs, we mean that the measures reflect the presence of "best practices" set into law by the state, rather than outputs that assess the data produced by the performance of a particular election practice. As with the issue of voting security and integrity, the area of vote counting is one in which effort must be expended in the future so that the EPI might cover the process of voting more comprehensively.

Quality standards

The first step of developing the EPI involved taking the conceptualization of election administration and policy reflected in Table 1 and brainstorming about the measures that could be associated with each of the six cells.[2] That process, done in collaboration with the advisory committee, initially yielded more than 40 indicators. Some were well-established and easy to construct, such as a state's turnout rate. Others were less so, such as the correlation between canvassed vote counts and audited vote counts.

To move from the list of "candidate indicators" to those that currently appear in the index, we developed criteria for judging whether an indicator was valid and reliable enough to include. Most policy indicator projects think about this issue; with the advisory group, we surveyed the criteria behind many of today's leading policy indices. These included projects such as the Environmental Performance Index,[3] the County Health Rankings & Roadmaps,[4] the World Justice Project Rule of Law Index,[5] the Doing Business project of International Finance Corp. and the World Bank,[6] and the Annie E. Casey Foundation's Kids Count Data Book.[7]

Drawing on these efforts, the EPI adopted the following criteria for helping to decide which candidate indicators to include in the current release of the Elections Performance Index.

1. ***Any statistical indicator included in the EPI must be from a reliable source.*** Preferably, the source should be governmental; if not, it should demonstrate the highest standards of scientific rigor. Consequently, the EPI relies heavily on sources such as the U.S. Election Assistance Commission, the U.S. Census Bureau, and state and local election departments.
2. ***The statistical indicator should be available and consistent over time.*** Availability over time serves two purposes. First, from a methodological perspective, it allows us to assess the stability of the measure, which is a standard technique for assessing reliability. Second, it allows the index to evolve to reflect developments with the passing of elections; states should be able to assess whether they are improving and benchmark their most recent performance against past performance, overall goals, and perceived potential. The issue of consistency is key because we want to make sure that an indicator measures the same thing over time, so that changes in a measure reflect changes in policy or performance, not changes in definition.
3. ***The statistical indicator should be available and consistent for all states.*** Because the EPI seeks to provide comparable measurements, it is important that the measures included in the index be available for all states. However, this is not always possible, given the variation in some state election practices. For instance, some states with Election Day registration do not require the use of provisional ballots; therefore, provisional balloting statistics may not be available for these states. With this in mind, some candidate indicators were excluded because data were available for too few states or because state practices varied so widely that it was impossible to form valid comparisons.
4. ***The statistical indicator should reflect a salient outcome or measure of good elections.*** In other words, the indicator should reflect a policy area or feature of elections that either affects many people or is prominently discussed in policy circles. An example of a policy area that is salient but affects relatively few voters concerns overseas and military voters, who comprise a small fraction of the electorate but about whom Congress has actively legislated in recent years.
5. ***The statistical indicator should be easily understood by the public and have a relatively unambiguous interpretation.*** That an indicator should be easily understood is an obvious feature of a policy index. The desire to include indicators with unambiguous interpretations sometimes presented a challenge, for at least two reasons. First, values of some indicators were sometimes the consequence of policy *and* demographic features of the electorate. For instance, academic research demonstrates that registration rates are a result of both the registration laws enacted by states and factors such as education and political interest. In these cases, if it could be shown that changes in policy regularly produced changes in indicators, we included the indicators. Second, some features of election administration—such as the rejection rates of new voter registrations and absentee ballots—can be interpreted differently. A high rejection rate of new voter registrations could represent problems with the voter registration process or large numbers of voters who were attempting to register but were not eligible. Indicators that were deemed highly ambiguous were removed from consideration; indicators with less ambiguity were retained, but more discussion and research are warranted.
6. ***The statistical indicator should be produced in the near future.*** Because the EPI is envisioned as an ongoing project, it is important that any indicators continue in the future. In addition, because one function of the EPI is to document changes in policy outputs as states change their laws and administrative procedures, it is important to focus on indicators that can document the effects of policy change. There is no guarantee that any of the indicators in the EPI today will remain in the future. However, the indicators that were chosen were the ones *most likely* to continue, because they are produced by government agencies or as part of ongoing research projects.

Aggregation of indicators

The EPI is built on 17 indicators of electoral performance. Because election administration is so complex and involves so many activities, it is illuminating to explore each indicator separately, with an eye toward understanding how particular states perform, both in isolation and in comparison with one another.

However, another way to use the EPI is to combine information from various indicators to develop a summary measure of the performance of elections. It is useful to know how a state performs on most measures, relative to other states.

The overall state percentiles and "performance bars" used in the EPI interactive report are based on a method that essentially calculates the average of all indicator rankings for each state. This, by nature of averages, weighs the indicators equally.[8] In addition, the summary measurement, which is calculated using the same basic averaging, is what drives the performance bar chart, whether a user selects all of the indicators in the interactive report or only a few.

However, implementing this method required adjustment for two reasons: missing values and the issue of scaling.

Missing values

For many measures, especially those derived from the Election Administration and Voting Survey, or EAVS, states had missing data due to the failure of a state—or its counties—to provide the information needed to calculate the indicator.[9] The question arises as to how to rank states in these circumstances. For instance, nine states (Alabama, Arkansas, Connecticut, Minnesota, Mississippi, New Mexico, New York, Tennessee, and West Virginia) did not report enough data to calculate the percentage of mail ballots that were not returned in 2008. Therefore, we could compute the mail ballot non-return rate for only 42 states. (We included the District of Columbia as a state for this and similar comparisons.)

In situations such as this, we decided in general to first generate the ranking among the states for which we had data. We "normalized" the ranking, setting the top-ranked state for 2008 and 2012 combined to 1 (or 100 percent) and the bottom-ranked state to zero. Doing so allowed us to make comparisons based on the same scale between 2008 and 2012. In this example, for instance, New Jersey, with a 43.4 percent non-return rate in 2008, would be set to zero, while Indiana, with a 0.65 percent non-return rate in 2012, would be set to 1. The 100 remaining states and the District of Columbia in those two years would then be set to values that reflected their ranking relative to the distance between the high and low values.[10] After the 2014 election, the 2010 data will be scaled using data from 2010 and 2014, again allowing us to compare like elections.[11]

Scaling

Another issue that had to be addressed in constructing the EPI was how to scale the indicators before combining them into a summary measure. As discussed, the general strategy was to construct a scale that ran from 0 to 1 for each indicator, with zero reserved for the state with the lowest performance measure in 2008 and 2012, and 1 reserved for the state with the highest measure.

Because many of the indicators are not naturally bound between zero and 1, it is necessary to estimate what the natural interval is. Based on an indicator's high and low values for 2008 and 2012 combined, states would receive a score between zero and 1 that proportionately reflected their position between the high and low values. In the residual vote rate indicator, we use data from 2000, 2004, 2008, and 2012. As an example of this scaling, we know that the highest residual vote rate since 2000 was 3.85 percent in 2000 in Illinois, while the lowest was 0.17 percent in 2012 in the District of Columbia.

Therefore, the lowest residual vote rate found between 2000 and 2012 (0.17 percent) would be set to 1—a lower residual vote rate indicates fewer voting accuracy problems—and the highest residual vote rate (3.85 percent) would be set to zero. All of the remaining states would receive a score between zero and 1 that reflected proportionately how far within this range each state's value was.

A shortcoming of this approach is that it may make too much of small differences in performance, especially when most states perform at the high end of the range, with only a few at the low end. An example is data completeness, on which many states had rates at or near 100 percent. Thus it seems more valid to use the raw value of the indicator in the construction of a composite index score, rather than the rank.

Data overview

The Elections Performance Index relies on a variety of data sources, including census data, state-collected data, The Pew Charitable Trusts reports, and public surveys. The data sources were selected based on significance at the state level, data collection practices, completeness, and subject matter. Although we present an introduction to these data sources, additional information on their strengths and limitations can be found in Section 1: Datasets for Democracy in the 2012 Pew report "Election Administration by the Numbers: An Analysis of Available Datasets and How to Use Them."

The U.S. Census Bureau

In November of every federal election year, the U.S. Census Bureau conducts a Voting and Registration Supplement, or VRS, as part of its Current Population Survey, or CPS. The VRS surveys individuals on their election-related activities. The EPI includes three indicators from this data source: disability- or illness-related voting problems, registration or absentee ballot problems, and the voter registration rate.

The CPS is a monthly survey, but the VRS is biennial, conducted every other November following a federal election. In 2012, the VRS interviewed approximately 133,000 eligible voters.[12] While on occasion special questions are included in the VRS, the core set of questions is limited and ascertains whether the respondent voted in the most recent federal election and had been registered to vote in that election. Eligible voters who reported they did not vote in the most recent federal election are asked why they failed to vote.

The Survey of the Performance of American Elections

The Survey of the Performance of American Elections, or SPAE, is a public interest survey. SPAE surveyed 10,000 registered voters (200 from each state) via Internet in the week after the 2008 presidential election, and 10,200 voters following the 2012 presidential election. The District of Columbia was added in 2012. Data from this survey were used to create an indicator measuring waiting time to vote.

The Election Administration and Voting Survey

The U.S. Election Assistance Commission administers EAVS, a survey that collects jurisdiction-level data from each state and the District of Columbia on a variety of topics related to election administration for each federal election. EAVS data make up the majority of the EPI's indicators and are used for indicators related to turnout, registration, absentee ballots, military and overseas ballots, and provisional ballots.

The United States Elections Project

The United States Elections Project provides data on the voting-eligible population and turnout for presidential and midterm elections. Michael McDonald, an associate professor at George Mason University who holds a doctorate in political science, conducts the research for the project.

Being Online Is Not Enough and Being Online Is Still Not Enough

The Pew Charitable Trusts' reports *Being Online Is Not Enough* (2008), *Being Online is Still Not Enough* (2011), and "Online Election Tools for Voters" (2013) reviewed the election websites of all 50 states and the District of Columbia. The reports examined whether these sites provide a series of lookup tools to assist voters. The 2008 report identified whether states had online tools for checking registration status and locating a polling place in time for the November 2008 election. The 2011 and 2013 reports identified whether states provided those two as well as three others—for finding absentee, provisional, and precinct-level ballot information—in time for the November 2010 and November 2012 elections. The tool scores for both years were used to evaluate states on their election websites.

Data cleaning and modification of the EAVS

The Election Assistance Commission's EAVS data had substantial missing or anomalous information. To ensure that the EAVS data included in the EPI were as accurate and complete as possible, we conducted a multistep cleanup process.

Missing data

In some cases, states lacked responses for all of their jurisdictions; in others, data were missing for only a few jurisdictions. If a state lacked data for all jurisdictions, we attempted to gather the missing information by contacting the state or counties directly. If a state lacked data for just some jurisdictions, we decided whether to follow up based on the percentage of data missing and the distribution of that data throughout the state. If a state's data total was 85 percent or more complete, we did not follow up on the missing data unless it contained a high-population jurisdiction whose absence meant that a state-level indicator might not representatively reflect elections in that state. If a state's data were less than 85 percent complete, we always followed up on missing data.

We used several strategies to collect missing data. In all cases, we contacted the state to confirm that data from the EAVS were correct and to see if additional information was available. We contacted a state at least four times and reached out to at least two staff people before giving up. In specific cases, we contacted local election officials to obtain missing data.

In some cases, we succeeded in gathering missing data. For example, we found the number of voters from each jurisdiction who participated in the election on various state election websites, even if it had not been submitted to the Election Assistance Commission.

Finally, we imputed some of the missing data when the EAVS survey asked for the same information in different places throughout its questions. If the missing data could be found in another question, we would replace the missing value with this question's value.

When missing data were found, either from the state or through our own efforts, the data were added to the EAVS data set and used to calculate the indicators.

Anomalous data

Two primary strategies were used to identify anomalous data. First, each of the EAVS-based indicators used a pair of questions to develop the indicator value, such as the number of absentee ballots sent to voters and the number of absentee ballots returned. We looked at each question pair and identified instances where one value contradicted the other—for example, the number of absentee ballots returned exceeded the number of absentee ballots sent out. In these cases, we marked both questions as missing.

For the second strategy, we identified cases where a county's response to a question was statistically improbable ($p < 0.0005$), given the responses provided to related questions and the responses provided by other counties in that state. The potentially anomalous values were examined individually, and a decision was made on whether a clear flaw existed in the data reporting. If the response was identified as having an obvious flaw, given the context of other response values, it was set to missing. If examination did not clearly reveal the response to be anomalous as the result of a reporting issue, the response was left as originally reported.

If there were anomalous data, we contacted the state and imputed values using the same procedure used for missing data. If we were able to gather any new data to replace the anomalous information, we included the new information in the data set and used it to develop the indicators.

Indicators and data sources

Table 2 provides information about the normalization of the indicators that went into constructing the Elections Performance Index. As mentioned above, the index is constructed by first normalizing all indicators to be within the [0,1] interval. The normalization is constructed so that values of 1 are given to states that have the best empirically observed measure on any particular indicator. This means that for indicators in which a low value is considered to constitute better performance, the naturally occurring scales are reversed before the normalization.

The most important column in the table, from the perspective of understanding the normalization, is Scaling Anchors. For each indicator (and for on-years and off-years separately), we report the original value that was assigned a scale value of 0 and the original value that was assigned a scale value of 1. For instance, for voter registration rate, the highest on-year value observed was 0.925 by the District of Columbia in 2012; in the normalization, this is the value that gets assigned a 1. The lowest on-year value observed was 0.696 by Hawaii in 2008; in the normalization, this is the value that gets assigned a 0. All other states are then assigned a score between 0 and 1, depending on how far along this interval the individual state is located, given its observed value. For instance, a state with an on-year registration rate of 0.811 would be assigned a normalized score of 0.50 because it is half-way between the district and Hawaii values.

The registrations-rejected indicator is an example of a measure in which the empirically observed values are reversed before normalization. The best on-year value in this case was a rejection rate of nearly zero (New Hampshire 2012), which is assigned a value of 1 in the normalized scale The highest on-year value observed was 0.369 (Pennsylvania 2008), so that is assigned a normalized value of 1.

Table 2: Indicators and Data Sources

Indicator	Data source	Years	Scaling anchors	Percent of missing data	Minimum and maximum observed values
		Online capabilities			
Voting information lookup tools	*Being Online is Not Enough* (Pew, 2008) and *Being Online is Still Not Enough* (Pew, 2011), Online Lookup Tools for Voters (Pew, 2013)	2008, 2010, 2012	On-year 0: 0.000 1: 1.000 Off-year 0: 000 1: 1.000	08: 0.00 10: 0.00 12: 0.00	08: [0,1] 10: [0,1] 12: [0,1]
Online registration available	State election division information	2008, 2010, 2012	On-year 0: 0.000 1: 1.000 Off-year 0: 000 1: 1.000	08: 0.00 10: 0.00 12: 0.00	08: [0,1] 10: [0,1] 12: [0,1]

Indicator	Data source	Years	Scaling anchors	Percent of missing data	Minimum and maximum observed values
Registration and voting					
Registrations rejected	EAVS	2008, 2010, 2012	On-year 0: 0.369 1: 0.000 Off-year 0: 0.555 1: 0.000	08: 29.00 10: 29.09 12: 17.95	08: [0.0004,0.3686] 10: [0.0003,0.5546] 12: [0.00001,0.2090]
Registration or absentee ballot problems	VRS	Off-years (2002, 2006, 2010) vs. on-years (2004, 2008, 2012)	On-year 0: 0.138 1: 0.008 Off-year 0: 0.102 1: 0.007	08: 0.00 10: 0.00 12: 0.00	08: [0.0082,0.1336] 10: [0.0075,0.1021] 12: [0.0122,0.1378]
Disability- or illness-related voting problems	VRS	Off-years (2002, 2006, 2010) vs. on-years (2004, 2008, 2012)	On-year 0: 0.260 1: 0.035 Off-year 0: 0.187 1: 0.057	08: 0.00 10: 0.00 12: 0.00	08: [0.0642,0.2601] 10: [0.0467,0.1866] 12: [0.0345,0.2476]
Voter registration rate	VRS	2008, 2010, 2012	On-year 0: 0.696 1: 0.925 Off-year 0: 0.658 1: 0.868	08: 0.00 10: 0.00 12: 0.00	08: [0.6961,0.9181] 10: [0.6577,0.8679] 12: [0.7092,0.9246]
Turnout	United States Elections Project	2008, 2010, 2012	On-year 0: 0.445 1: 0.781 Off-year 0: 0.296 1: 0.560	08: 0.00 10: 0.00 12: 0.00	08: [0.4904,0.7810] 10: [0.2957,0.5600] 12: [0.4447,0.7611]

Indicator	Data source	Years	Scaling anchors	Percent of missing data	Minimum and maximum observed values
Voting wait time	SPAE	2008, 2012	On-year 0: 61.5 1: 1.96 Off-year N/A	08: 0.00 12: 0.00	08: [2.48,61.50] 12: [1.96,44.98]
Voting technology accuracy (residual vote rate)	State election division records	2008, 2012	On-year 0: 0.0385 1: 0.0017 Off-year N/A	08: 13.73 12: 9.80	08: [0.0022,0.0317] 12: [0.0017,0.0224]
Military and overseas voters					
Military and overseas ballots rejected	EAVS	2008, 2010, 2012	On-year 0: 0.206 1: 0.002 Off-year 0: 0.253 1: 0.000	08: 12.37 10: 2.86 12: 7.14	08: [0.0067,0.1286] 10: [0,0.5156] 12: [0.0017,0.2058]
Military and overseas ballots unreturned	EAVS	2008, 2010, 2012	On-year 0: 0.535 1: 0.115 Off-year 0: 0.868 1: 0.258	08: 8.39 10: 0.61 12: 5.39	08: [0.1471,0.5354] 10: [0.2581,0.8683] 12: [0.1145,0.5151]
Postelection audit requirements					
Postelection audit required	EAVS Statutory Overview	2008, 2010, 2012	On-year 0: 0.000 1: 1.000 Off-year 0: 000 1: 1.000	08: 0.00 10: 0.00 12: 0.00	08: [0,1] 10: [0,1] 12: [0,1]

Indicator	Data source	Years	Scaling anchors	Percent of missing data	Minimum and maximum observed values
Provisional ballots					
Provisional ballots cast	EAVS	2008, 2010, 2012	On-year 0: 0.131 1: 0.000 Off-year O: 0.0519 1: 0.0000	08: 5.66 10: 5.31 12: 4.36	08: [0.00007,0.0654] 10: [0.00003,0.0519] 12: [0.00004,0.1313]
Provisional ballots rejected	EAVS	2008, 2010, 2012	On-year 0: 0.019 1: 0.000 Off-year 0: 0.00826 1: 0.00000	08: 7.89 10: 5.99 12: 4.80	08: [0.000009,0.0192] 10: [0,0.0083] 12: [0,0.0181]
Mail ballots					
Mail ballots rejected	EAVS	2008, 2010, 2012	On-year 0: 0.010 1: 0.000 Off-year 0: 0.013 1: 0.000	08: 9.61 10: 6.95 12: 4.89	08: [0.00018,0.0104] 10: [0.0001,0.0134] 12: [0.0002,0.0093]
Mail ballots unreturned	EAVS	2008, 2010, 2012	On-year 0: 0.434 1: 0.007 Off-year 0: 0.516 1: 0.025	08: 7.63 10: 5.22 12: 3.67	08: [0.0164,0.4337] 10: [0,0.5156] 12: [0.0066,0.2937]
Data transparency					
Data completeness	EAVS	2008, 2010, 2012	On-year 0: 0.000 1: 1.000 Off-year 0: 000 1: 1.000	08: 0.00 10: 0.00 12: 0.00	08: [0,1] 10: [0.5943,1] 12: [0.5825,1]

Indicators in detail

Data completeness

Data source: Election Administration and Voting Survey

The starting point for managing elections using metrics is gathering and reporting core data in a systematic fashion. The independent U.S. Election Assistance Commission, or EAC, through its Election Administration and Voting Survey, or EAVS, has established the nation's most comprehensive program of data-gathering in the election administration field. The greater the extent to which local jurisdictions gather and report core data contained in the EAVS, the more thoroughly election stakeholders will be able to understand key issues pertaining to the conduct of elections.

The nature of the items included in the EAVS makes it the logical choice of a source for assessing the degree to which election jurisdictions gather and make available basic data about the performance of election administration in states and local voting. The EAVS is a comprehensive survey consisting of six sections: voter registration, the Uniformed and Overseas Citizens Absentee Voting Act, or UOCAVA, voting, domestic absentee voting, election administration, provisional ballots, and Election Day activities. The EAVS asks states and localities for basic data associated with each federal election: how many people voted, the modes they used to vote, etc. The survey is responsive to EAC mandates to issue regular reports, given in the National Voter Registration Act, or NVRA, the UOCAVA, and the 2002 Help America Vote Act, or HAVA. The EAVS survey instrument is 29 pages long, and the data set produced by the 2012 instrument amounted to 413 variables.

While states are required to provide some of the information requested in the EAVS, other items are not mandatory. Therefore, in using the EAVS to measure the degree to which states report basic data related to election administration to the public, it is important to distinguish between what is basic among the data that are included in the EAVS and what may be considered either secondary or (more often) a more-detailed look at basic quantities. The data completeness measure is based on the reporting of basic measures.

The central idea of this measure is to assess states according to how many counties report core statistics that describe the workload associated with conducting elections. The completeness measure starts with 15 survey items that were considered so basic that all jurisdictions should be expected to report them, for the purpose of communicating a comprehensive view of election administration in a community:

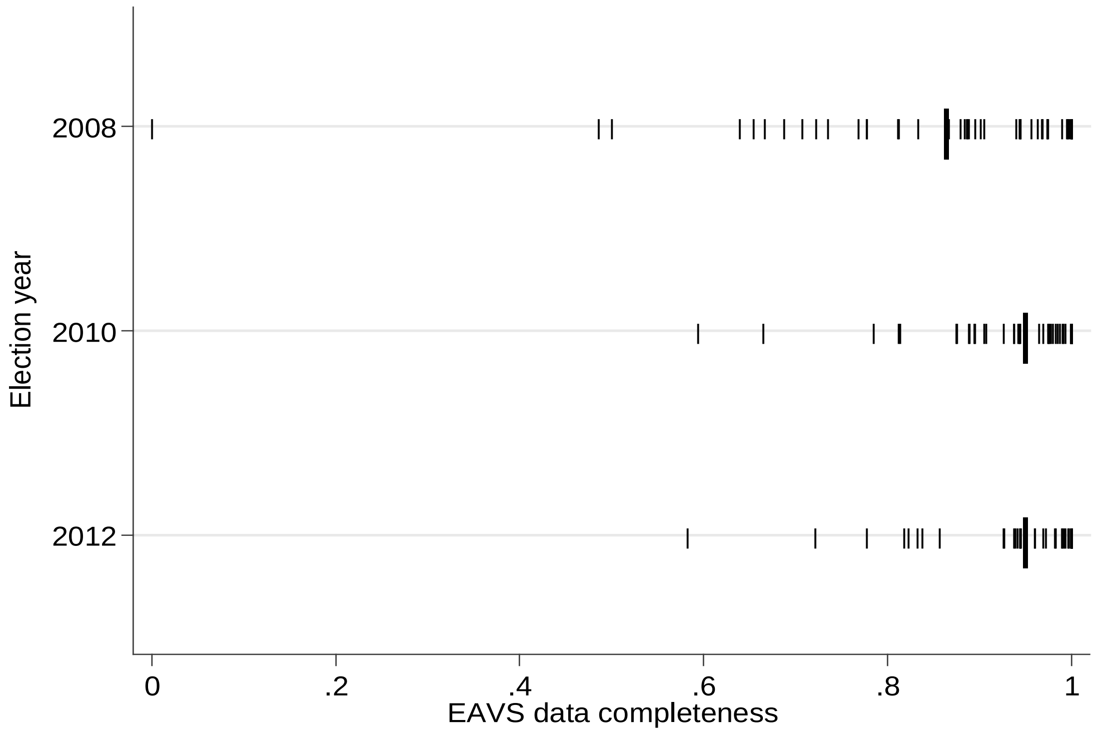
1. New registrations received.
2. New valid registrations received.
3. Total registered voters.
4. Provisional ballots submitted.
5. Provisional ballots rejected.
6. Total ballots cast in the election.
7. Ballots cast in person on Election Day.
8. Ballots cast in early voting centers.
9. Ballots cast absentee.
10. Civilian absentee ballots transmitted to voters.
11. Civilian absentee ballots returned for counting.
12. Civilian absentee ballots accepted for counting.
13. UOCAVA ballots transmitted to voters.
14. UOCAVA ballots returned for counting.
15. UOCAVA ballots counted.

Added to these 15 basic measures are three that help construct indicators used in the election index:

16. Invalid or rejected registration applications.
17. Absentee ballots rejected
18. UOCAVA ballots rejected.

As illustrated by Figure 1, which plots completeness rates for all the states in 2008, 2010, and 2012, the completeness rate of these 18 items has risen over the past three election cycles, from an average of 86 percent in 2008 to 95 percent in 2012. (The smaller vertical lines indicate the completeness rate of a particular state. The larger lines indicate the average for the year.)

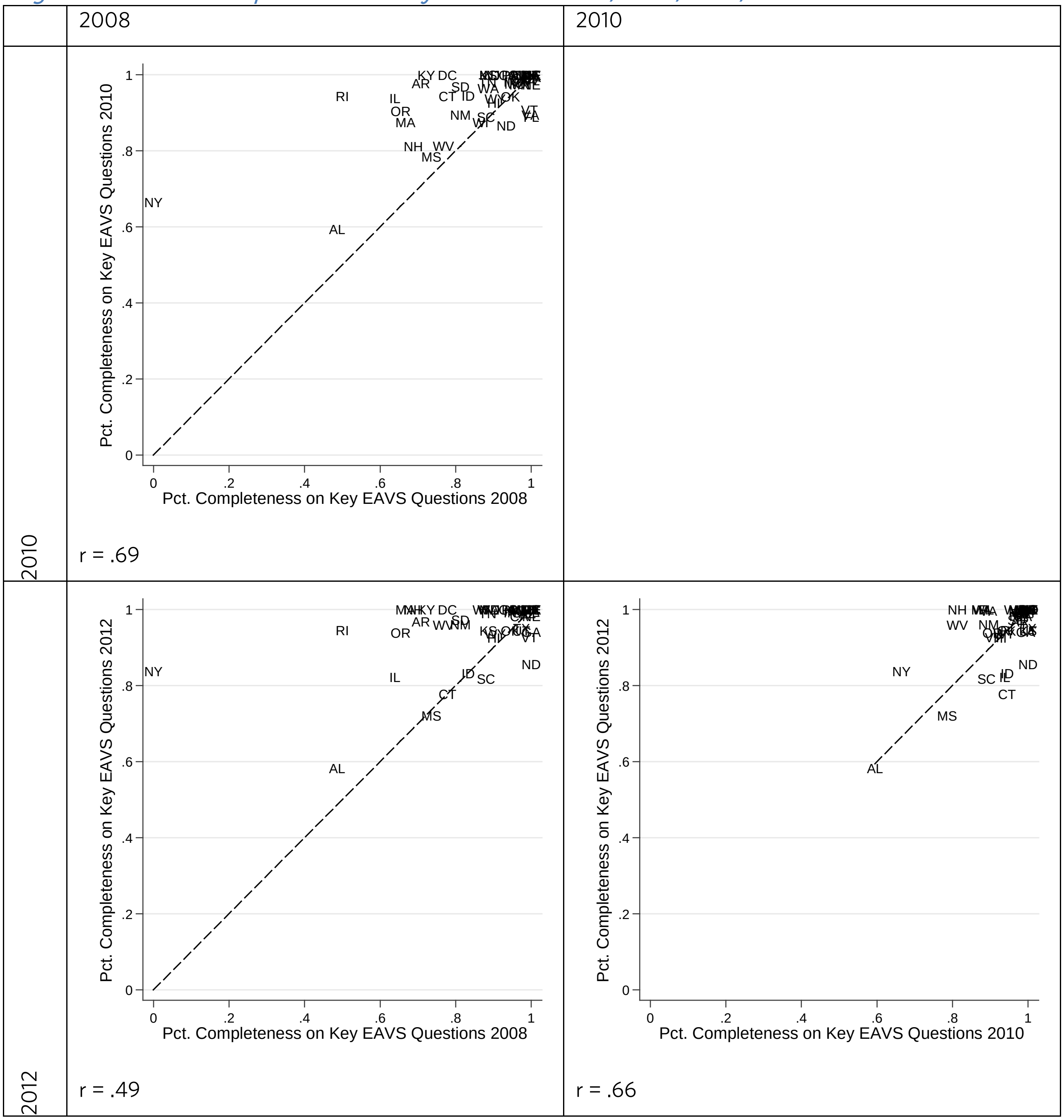
Figure 1: EAVS Data Completeness



The big jump in average completeness occurred between 2008 and 2010, when New York state went from reporting no data at the county level to reporting county-level statistics for about two-thirds of the items.

Figure 2 compares completeness rates across the three election cycles covered by the EPI.

Figure 2: Percent Completeness on Key EAVS Questions, 2008, 2010, and 2012



Note: Dashed lines indicate where observations for the two years are equal.

As the graphs illustrate, overall completion levels of the key EAVS items improved considerably from 2008 to 2010, with nearly every state reporting more data in 2010 than in 2008. With many states reporting data at (or near) 100 percent, improvement slowed between 2010 and 2012. The graphs also indicate that only a handful of states are significantly below the 100 percent completeness rate.

Disability- or illness-related voting problems

Data source: Voting and Registration Supplement of the Current Population Survey

Access to voting for the physically disabled has been a public policy concern for years. The federal Voting Accessibility for the Elderly and Handicapped Act, passed in 1984, generally requires election jurisdictions to ensure that their polling places are accessible to disabled voters. The Voting Rights Act of 1965, as amended, and the HAVA, also contain provisions that pertain to ensuring that disabled Americans have access to voting. HAVA, in particular, established minimum standards for the presence of voting systems in each precinct that allow people with disabilities the same access as those without disabilities.

Studies of the effectiveness of these laws and other attempts at accommodation have been limited. On the whole, they confirm that election turnout rates for people with disabilities are below those for people who are not disabled and that localities have a long way to go before they meet the requirements of laws such as the Voting Accessibility for the Elderly and Handicapped Act and the HAVA.[13] Investigations into the participation of the disabled and the accessibility of polling places have, at most, been conducted using limited representative samples of voters or localities. As far as can be ascertained, studies comparing jurisdictions have not been conducted.

Coding convention

This indicator is based on responses to the Voting and Registration Supplement of the Current Population Survey, which is conducted by the U.S. Census Bureau. Specifically, it is based on responses to item PES4, which asks of those who reported not voting: "What was the main reason you did not vote?" Response categories include the following:[14]

Table 3: Reasons for Not Voting

Response category	Percent of respondents in 2012[15]
Illness or disability (own or family's)	14.4%
Out of town or away from home	8.3%
Forgot to vote (or send in absentee ballot)	4.0%
Not interested, felt my vote wouldn't make a difference	16.2%
Too busy, conflicting work or school schedule	19.5%
Transportation problems	43.4%
Didn't like candidates or campaign issues	13.1%
Registration problems (i.e., didn't receive absentee ballot, not registered in current location)	5.7%
Bad weather conditions	0.8%
Inconvenient hours or polling place, or hours or lines too long	2.8%
Other	11.5%

The first response category forms the basis for this indicator. Note that it includes both individuals who say they were disabled and those who say they were ill. Furthermore, it includes disability or illnesses for either the respondent or a member of the family. A more precise measure of the degree to which disabled voters have access to voting would include information about which respondents were disabled. Unfortunately, only in 2010 did the VRS begin asking respondents if they, themselves, were disabled. Therefore, it is not possible to construct a measure that focuses only on disabled respondents. However, it is possible to use information about the disability of respondents in 2010 to test the validity of the measure.

The 2010 CPS asked respondents if they had one of six disabilities. The following table lists those disabilities, along with the percentage of nonvoters who reported having that disability *and* stated that the primary reason they did not vote was due to illness or disability. In addition, it reports the nonvoting rates due to illness or disability among respondents who reported no disabilities.

Table 4: Percent Not Voting Due to Disability

Disability	N (weighted)	Percent not voting due to illness or disability
Difficulty dressing or bathing	461	62.8%
Deaf or serious difficulty hearing	643	35.7%
Blind or difficulty seeing even with glasses	377	44.5%
Difficulty doing errands	936	58.3%
Difficulty walking or climbing stairs	1,531	49.2%
Difficulty remembering or making decisions	775	43.2%
[Any one of the above disabilities]	2,386	39.5%
[No disabilities reported]	13,968	7.2%

Thus, a nonvoter with any one of the disabilities is almost four times more likely to give the "illness or disability" answer to the question of why he or she did not vote, compared with someone without any of these disabilities. Furthermore, the more disabilities a nonvoter lists, the more likely he or she is to give this response, as the following table demonstrates.

Table 5: Nonvoting Due to Number of Disabilities

	Number of disabilities						
	0	1	2	3	4	5	6
Percent blaming illness or disability	7.2%	25.2%	43.9%	53.5%	70.6%	73.8%	67.9%
N	13,968	1,157	557	376	191	70	35

Finally, it should be noted that respondents to the VRS who reported that they had one of these disabilities were less likely to report that they had voted in the first place, as is illustrated in the following table. However, the differences in voting rates between those who report a disability and those who do not are not as great as the differences seen in the reasons for not voting.

Table 6: Percent Voting With a Disability

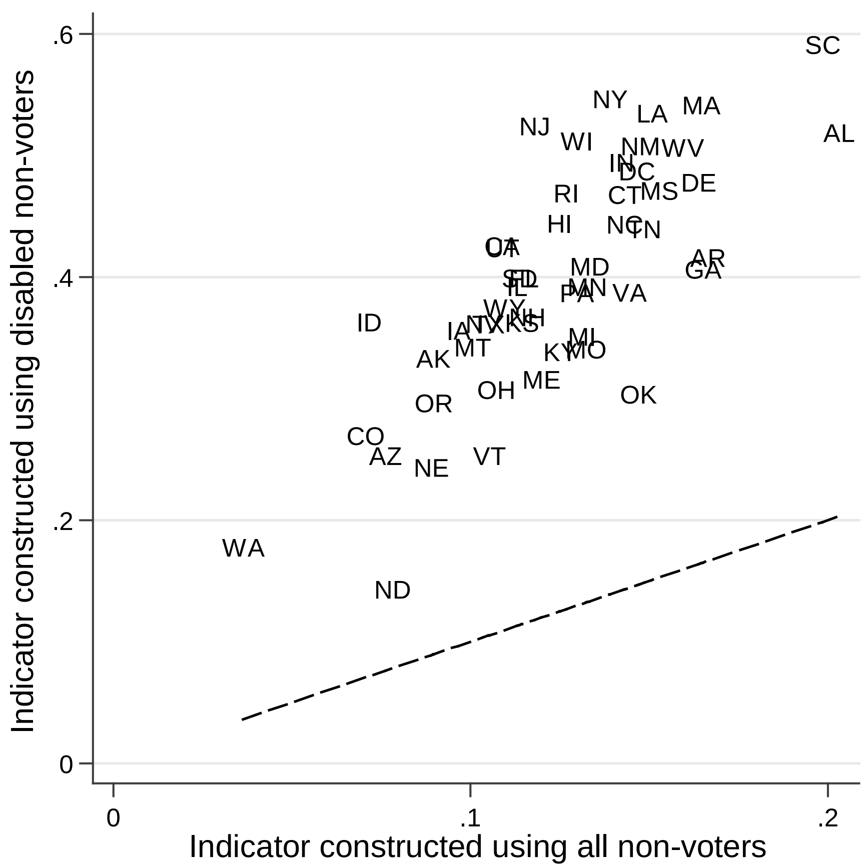
Disability	N (weighted)	Percent voting
Difficulty dressing or bathing	1,621	38.0%
Deaf or serious difficulty hearing	3,108	56.6%
Blind or difficulty seeing even with glasses	1,489	44.8%
Difficulty doing errands	3,407	38.2%
Difficulty walking or climbing stairs	6,290	49.8%
Difficulty remembering or making decisions	2,974	34.6%
[Any one of the above disabilities]	10,533	49.2%
[No disabilities reported]	69,286	54.9%

We are using answers to this question as an indicator of how difficult it is for disabled voters to participate in elections. It would be ideal to measure this variable by considering only the responses of disabled voters. Unfortunately, before 2010, the CPS did not ask respondents if they had a physical disability. Therefore, the indicator mixes the responses of disabled and nondisabled individuals. In 2010, the CPS began asking directly about disability status. This means that it will become possible to construct this indicator by relying solely on the answers of disabled respondents.

In the interim, it is important to know whether the relative ranking of states on this indicator is the same if we confine ourselves to disabled respondents, compared with constructing the indicator using the responses of all respondents. We are able to answer this question using the data after 2010, because we can construct the indicator both ways—using answers from all respondents *and* using answers from only disabled respondents.

Figure 3 illustrates how this indicator changes as we narrow the respondents from the complete nonvoting population to the disabled nonvoting population, pooling together the data from the 2010 and 2012 studies. The x-axis represents the indicator as it is currently constructed for the EPI. The y-axis represents the indicator as it is constructed if we used only the self-identified disabled population in the data set.

Figure 3 Nonvoting Due to Disability Indicator With Disabled Nonvoting Population Only



When we confine the calculation of this indicator to self-identified disabled nonvoters, values of this indicator are generally greater than if we calculate it using responses from all nonvoters.[16] This is what we would expect if disabled respondents are more likely to give this answer than are nondisabled respondents. At the same time, the two methods of constructing this indicator are highly correlated—the Pearson correlation coefficient is 0.77. Therefore, we have confidence that constructing this indicator using the entire nonvoting population as a base should yield a valid measure. However, a better measure would be one constructed solely from the responses of disabled voters, which is a strategy we anticipate eventually.

Stability of rates across time

The rate at which nonvoters report they failed to vote because of illness and disability will vary across time, for a variety of reasons. On the one hand, some of these reasons may be related to policy—for instance, a statewide shift to all vote-by-mail balloting (such as in Oregon and Washington) may cause a reduction in the percentage of nonvoters giving this excuse for not voting. On the other hand, some of these reasons may be unrelated to election administration or policy, and therefore can be considered random variation.

One advantage of an indicator based on VRS data is that the survey goes back for many elections. The question about reasons for not voting has been asked in its present form since 2000. Therefore, it is possible to examine the intercorrelation of this measure at the state level across seven federal elections—2000, 2002, 2004, 2006, 2008, 2010, and 2012—to test its reliability.

Table 7 is the correlation matrix reporting the Pearson correlation coefficients for values of this indicator across these seven elections.

Table 7: Pearson Correlation Coefficients, Reason for Not Voting

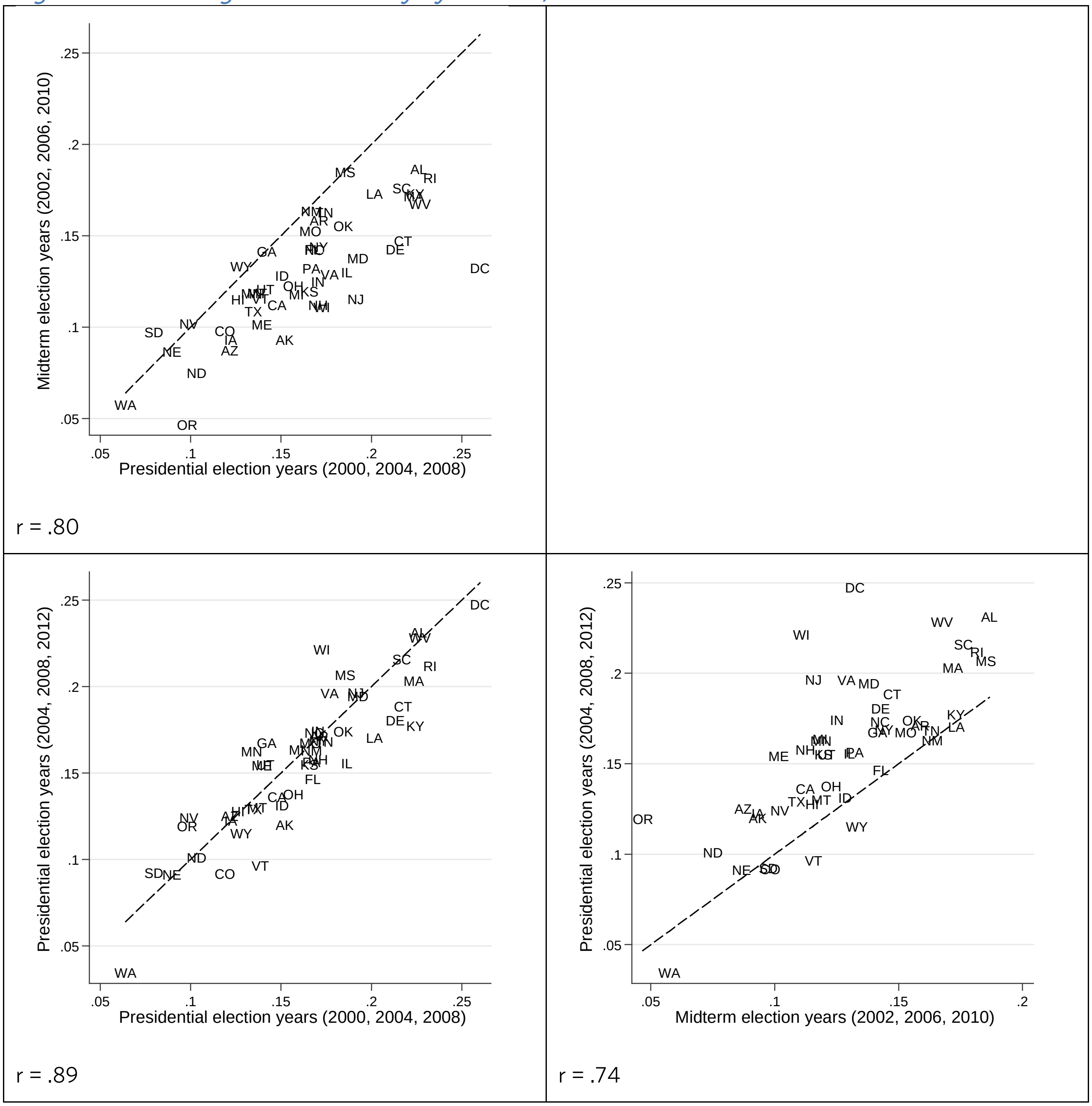
Year	2000	2002	2004	2006	2008	2010	2012
2000	1.000						
2002	0.589	1.000					
2004	0.318	0.499	1.000				
2006	0.451	0.593	0.565	1.000			
2008	0.526	0.553	0.503	0.613	1.000		
2010	0.536	0.645	0.523	0.561	0.598	1.000	
2012	0.313	0.336	0.504	0.441	0.554	0.540	1.000

The correlation coefficients between pairs of elections are moderately high. The fact that the coefficients do not decay across the decade's worth of data suggests the underlying factor being measured by this indicator is stable within individual states; therefore, there is strong reliability to the measure. As a result, it may be prudent to consider combining data across years so that the reliability of the measure can be improved.

It is tempting to consider creating a single scale from this set of data (considering the observations from all of the elections, 2000 to 2012, together) because of the moderately high overall intercorrelations. However, comparing the averages for each year reveals that more nonvoters give the "illness or disability" excuse in presidential election years (16.1 percent national average) than in midterm election years (13.3 percent national average). Consequently, a more prudent strategy is to treat presidential and midterm election years separately.

We created two scales from the data set, one consisting of the average rates for the most recent three presidential election years, and the other consisting of the average rates for the three most recent midterm election years. In the previous version of the EPI, we constructed the presidential election year measure using data from 2000, 2004, and 2008. For the current version, we dropped the data from the most distant presidential election year, 2000, and substituted data for the most recent year, 2012. Thus, we can examine two measures drawn from slightly different presidential election years, and one measure drawn from the most recent midterm election. Figure 4 shows the correlations across these three measures.

Figure 4: Nonvoting due to disability by election, 2000-12



Note: Dashed lines indicate where observations for the two years are equal.

The Pearson correlation coefficients quantifying these relationships range from 0.74 to 0.89, which are significantly higher than any of the coefficients in the correlation matrix shown above, which rely on data from only one year. Not surprisingly, the intercorrelation of the two presidential election year data is the highest of all. By combining midterm and presidential election data across several election years, we are able to create measures in which random noise is reduced.

Mail ballots rejected

Data source: Election Administration and Voting Survey

The use of mail ballots has grown significantly over the past two decades as states have expanded the conditions under which absentee voting is allowed. However, not all mail ballots returned for counting are accepted for counting. Mail ballots may be rejected for a variety of reasons; the two most common, by far, are that the ballot arrived after the deadline (approximately one-third of all rejections in 2012) or that there were problems with the signature on the return envelope (at least 17.6 percent of all rejections in 2012).[17]

Coding convention

Expressed as an equation, the domestic mail ballot rejection rate can be calculated as follows from the EAVS data sets:

$$\textbf{Mail ballot rejection rate} = \frac{\textbf{Domestic absentee ballots rejected in the general election}}{\textbf{Total participants}}$$

Data will be missing if a county has failed to provide any of the variables included in the calculation.

Table 8: Correspondence Between Variable Definition and EAVS Variable Names

Descriptive name	2008 EAVS	2010 and 2012 EAVS
Domestic absentee ballots rejected	c4b	qc4b
Total participants	f1a	qf1a

Table 9: Data Availability, County Data

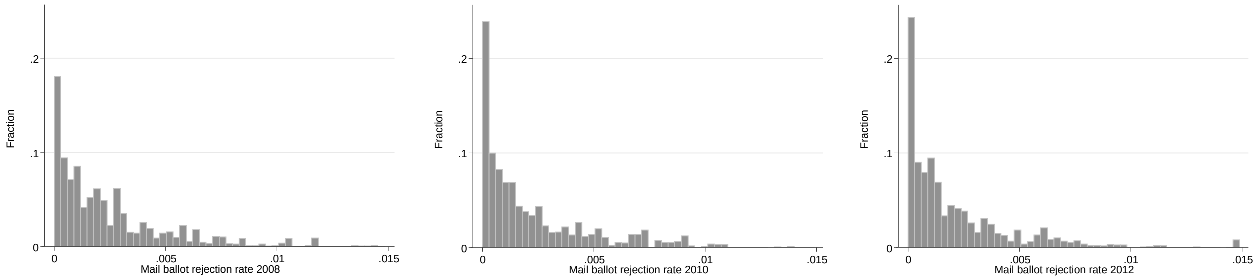
	2008 EAVS			2010 EAVS			2012 EAVS		
Descriptive name	Var. name	Missing cases, raw	Missing cases, weighted by registered voters	Var. name	Missing cases, raw	Missing cases, weighted by registered voters	Var. name	Missing cases, raw	Missing cases, weighted by registered voters
Domestic absentee ballots	c4b	440 (9.66%)	378.96 (8.45%)	qc4b	270 (5.84%)	319.57 (6.84%)	qc4b	169 (3.65%)	225.24 (4.87%)
Total participants	f1a	144 (3.16%)	61.94 (1.38%)	qf1a	32 (0.69%)	4.91 (0.11%)	qf1a	19 (0.41%)	13.95 (0.30%)
Overall		450 (9.87%)	431.05 (9.61%)		275 (5.94%)	320.07 (6.95%)		171 (3.70%)	225.92 (4.89%)

Because of missing data, it was not possible to compute domestic mail ballot rejection rates for Alabama, Arkansas, Illinois, Indiana, Mississippi, New York, South Dakota, and West Virginia (2008); Alabama, Massachusetts, Mississippi, New Mexico, and New York (2010); and Alabama, Mississippi, New York, and Vermont (2012). Oregon is included in this indicator, using data provided by the state that describes its vote-by-mail system. Washington is similarly included using data from its vote-by-mail system starting in 2010.

Stability of domestic mail ballot rejection rates across time

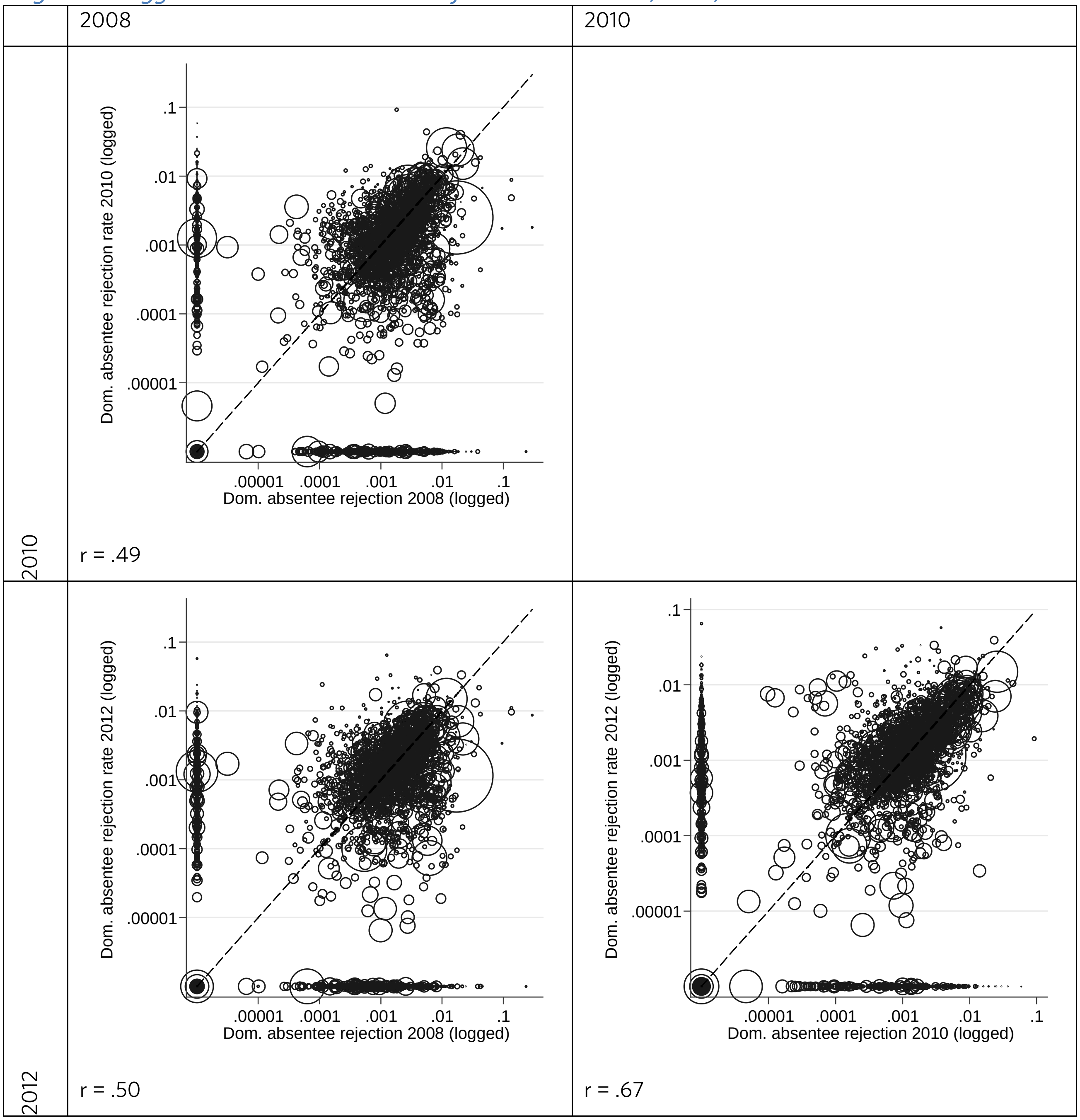
We begin by comparing domestic mail ballot rejection rates, measured at the county level, for 2008, 2010, and 2012. The raw data exhibit what is known as a pronounced "right skew"; that is, most counties have very low rejection rates, while a few have relatively high rates. This is illustrated in Figure 5: three histograms that show the distribution of rejection rates for 2008, 2010, and 2012 for each county for which we have the relevant data.[18]

Figure 5: Domestic Mail Ballot Rejection Rates by County, 2008, 2010, and 2012



Because of this pronounced right skew, any scatterplot that compares values across years will be misleading—the bulk of observations will be clumped around the origin, with our eye drawn toward the small number of outliers with extremely large values. To deal with this pronounced right skew, it is common to transform the measures by taking logarithms. One problem this creates is that a large fraction of counties had zero domestic mail ballots rejected, and the logarithm of zero is undefined. Therefore, in the scatterplot in Figure 6, counties with zero rejected ballots have been set to 0.00001, which is slightly below the smallest nonzero usage rate that was actually observed. Finally, so that the influence of larger counties is visually greater than that of smaller counties, we weight the data tokens in proportion to the size of the county.

Figure 6: Logged Domestic Mail Ballot Rejection Rates 2008, 2010, and 2012



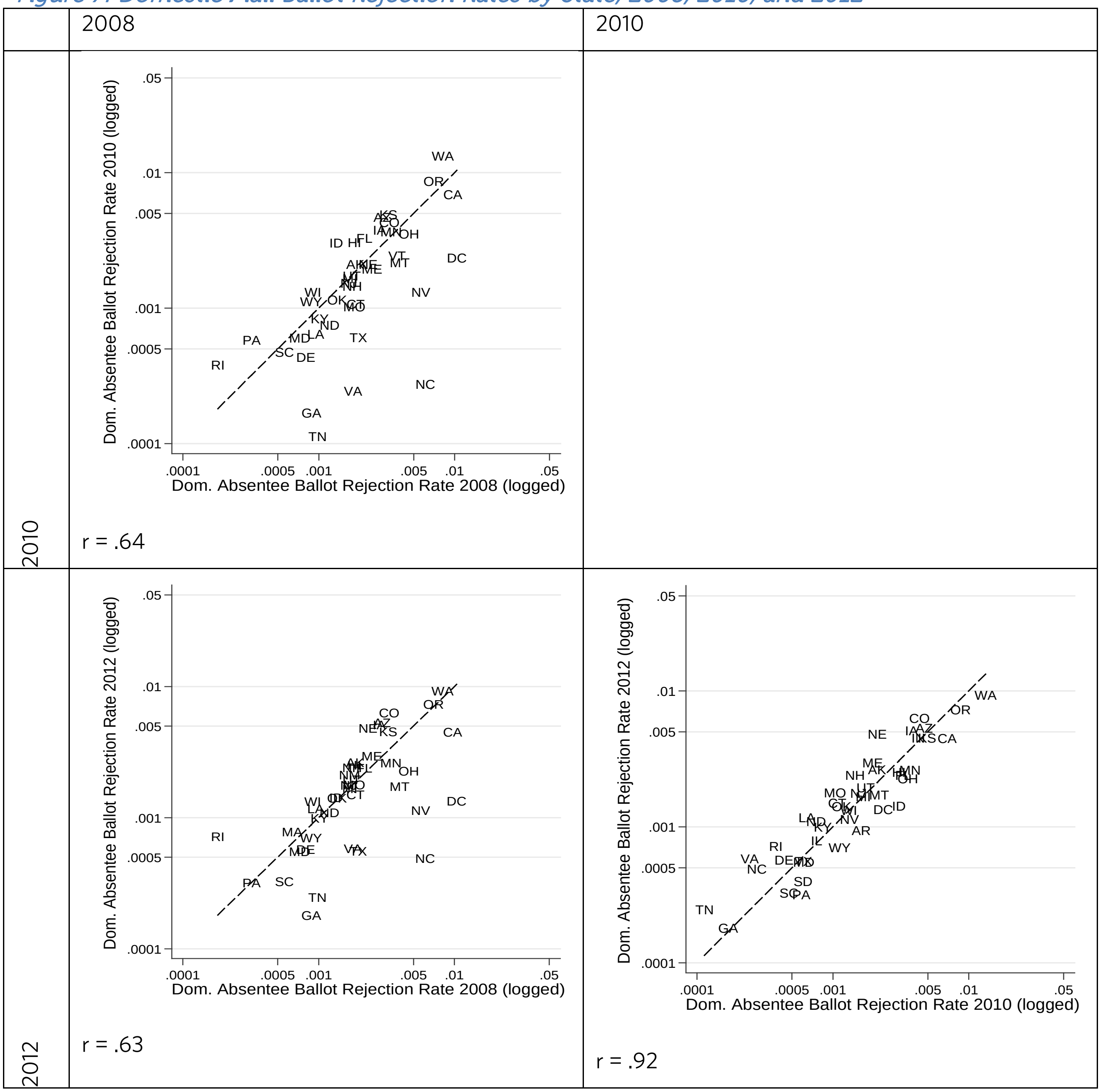
Note: Dashed lines indicate where observations for the two years are equal.

As these graphs illustrate, for counties that reported the necessary data, rejection rates from one year to another are roughly similar. The Pearson correlation coefficients, which measure the degree of similarity across two election cycles, are relatively low for comparisons involving 2010 (0.49 and 0.50, respectively), but are much higher for the 2010-12 comparison. The earlier correlations are generally below the countywide correlations we observe for the other EAVS-based indicators. The 2010-12 comparison is in keeping with other countywide correlations.

These graphs also illustrate how counties that report no rejected domestic mail ballots one election cycle often report a considerably greater rejection rate the next cycle. Sometimes this is because the county is very small. With domestic mail ballot rejection rates overall being relatively low (ranging between 0.2 and 0.3 percent of all ballots cast), a county with only a few hundred voters might experience an election cycle in which no domestic mail ballots were rejected. However, relatively large counties will sometimes report zero mail ballots in one election cycle and a relatively large number the next. This sort of pattern calls for further investigation and research. Until then, this pattern alerts us to the need to be cautious when using data about the rejection of mail ballots.

The EPI reports mail ballot rejection rates at the state level. The statewide rejection rates are similarly right-skewed; therefore, it is necessary to translate the rejection rates into logarithms before plotting the rejection rates across years.

Figure 7: Domestic Mail Ballot Rejection Rates by State, 2008, 2010, and 2012



Note: Dashed lines indicate where observations for the two years are equal.

As with the measure calculated at the county level, the indicator calculated at the state level is stable across years, especially comparing 2012 with 2010. However, the case of West Virginia's mail ballot rejection rate stands out for 2012. We double-checked the ballot rejection statistics with the state, which confirmed that the numbers reported to the EAC were the ones reported by the counties. However, it seems unlikely that 46 of the state's 55 counties rejected precisely zero mail ballots in 2012 for any reason, as is indicated by the data submitted to the EAC. (One of the counties reporting zero rejected mail ballots was the state's largest, Kanawha.) Therefore, for purposes of the EPI, we set the value of this index component to missing for 2012.

Mail ballots unreturned

Data source: Election Administration and Voting Survey

Although use of mail ballots has grown as states have loosened the conditions under which voters may vote by mail, not all mail ballots that are sent to voters are returned to be counted. In states that maintain permanent absentee lists, which allow voters to receive mail ballots automatically for all future elections, some of this is understandable in terms of voter indifference to particular elections.

It is not hard to imagine that some voters who request a mail ballot either decide to vote in person[19] or not at all. However, because there is generally no chain of custody maintained for mail ballots from the point when they are mailed to voters until election officials receive them to be counted, it is possible that ballots mailed back may be lost in transit.

Coding convention

Expressed as an equation, the domestic mail ballot non-return rate can be calculated as follows from the EAVS data sets:

$$\textbf{Percent of domestic absentee ballots transmitted not returned} = 1 - \frac{\textbf{Returned ballots}}{\textbf{Ballots transmitted}}$$

Data will be missing if a county has failed to provide any of the variables included in the calculation.

Table 10: Correspondence Between Variable Definition and EAVS Variable Names

Descriptive name	2008 EAVS	2010 and 2012 EAVS
Total returned absentee ballots	c1b	qc1b
Total absentee ballots sent out	c1a	qc1a

Table 11: Data Availability, County Data

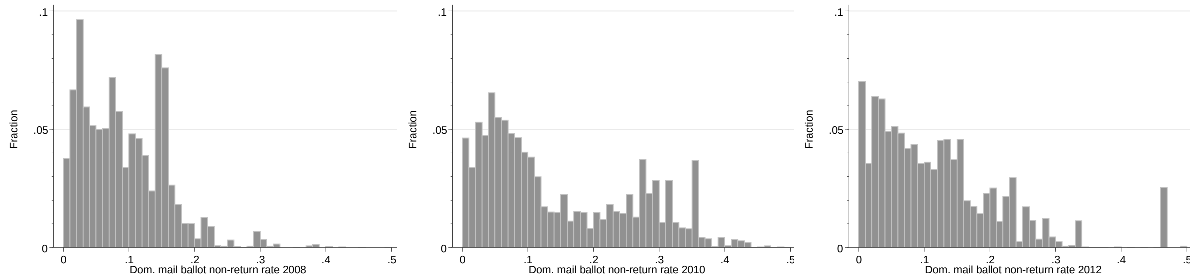
	2008 EAVS			2010 EAVS			2012 EAVS		
Descriptive name	Var. name	Missing cases, raw	Missing cases, weighted by registered voters	Var. name	Missing cases, raw	Missing cases, weighted by registered voters	Var. name	Missing cases, raw	Missing cases, weighted by registered voters
Total un-returned absentee ballots	C1b	324 (7.11%)	235.14 (5.17%)	Qc1b	131 (2.83%)	198.11 (4.42%)	Qc1b	87 (1.88%)	162.95 (3.52%)
Total absentee ballots sent out	C1a	344 (7.55%)	238.07 (5.17%)	Qc1a	126 (2.72%)	251.78 (5.61%)	Qc1a	92 (2.00%)	168.34 (3.64%)
Overall		445 (9.77%)	342.47 (7.63%)		145 (3.13%)	240.65 (5.22%)		98 (2.12%)	169.52 (3.67%)

Because of missing data, it was not possible to compute domestic mail ballot non-return rates for Alabama, Arkansas, Connecticut, Minnesota, Mississippi, New Mexico, New York, Tennessee, and West Virginia (2008); Alabama, Indiana, Mississippi, and New York (2010); and Alabama, Kansas, Mississippi, and New York (2012). Oregon is included in this indicator, using data provided by the state that describes its vote-by-mail system. Washington state is similarly included using data from its vote-by-mail system starting in 2010.

Comparison of domestic mail ballot non-return rates across time

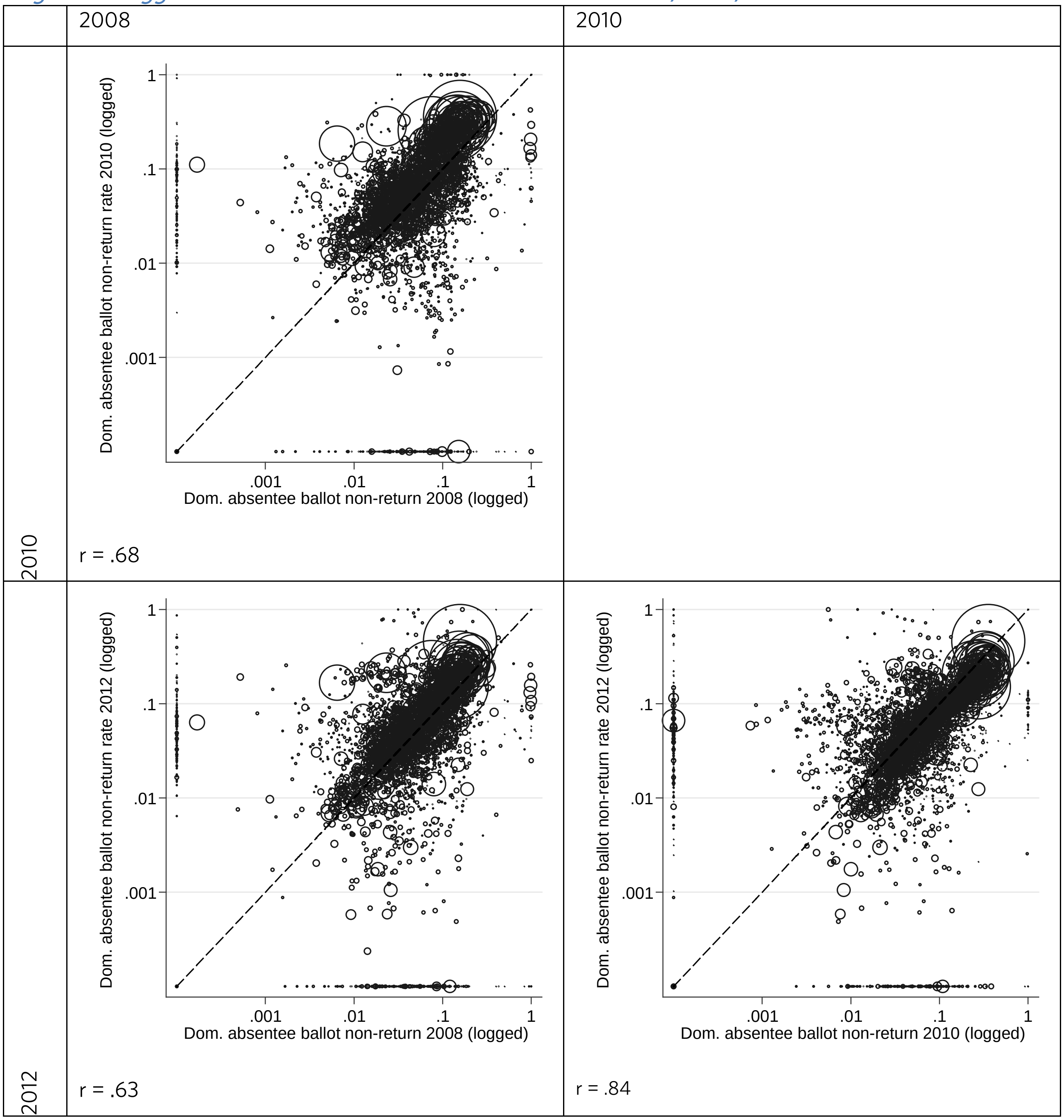
We begin by comparing domestic mail ballot non-return rates, measured at the county level, for 2008, 2010, and 2012. The raw data exhibit a pronounced right skew; that is, most counties have very low non-return rates, while a few have relatively high rates. This is illustrated in Figure 8 three histograms that show the distribution of non-return rates for 2008, 2010, and 2012 for each county for which we have the relevant data.[20]

Figure 8: Distribution of Domestic Mail Ballot Non-return Rates, 2008, 2010, and 2012



Because of this right skew, any scatterplot that compares values across years will be misleading—the bulk of observations will be clumped around the origin, with our eye drawn toward the small number of outliers with extremely large values. To deal with this right skew, it is common to transform the measures by taking logarithms. One problem this creates is that a large fraction of counties had zero domestic absentee ballots rejected, and the logarithm of zero is undefined. Therefore, in the scatterplot in Figure 9, counties with zero rejected ballots have been set to 0.0001, which is slightly below the smallest nonzero usage rate that was actually observed. Finally, so that the influence of larger counties is visually greater than that of smaller counties, we weight the data tokens in proportion to the size of the county.

Figure 9: Logged Domestic Mail Ballot Non-return Rates 2008, 2010, and 2012



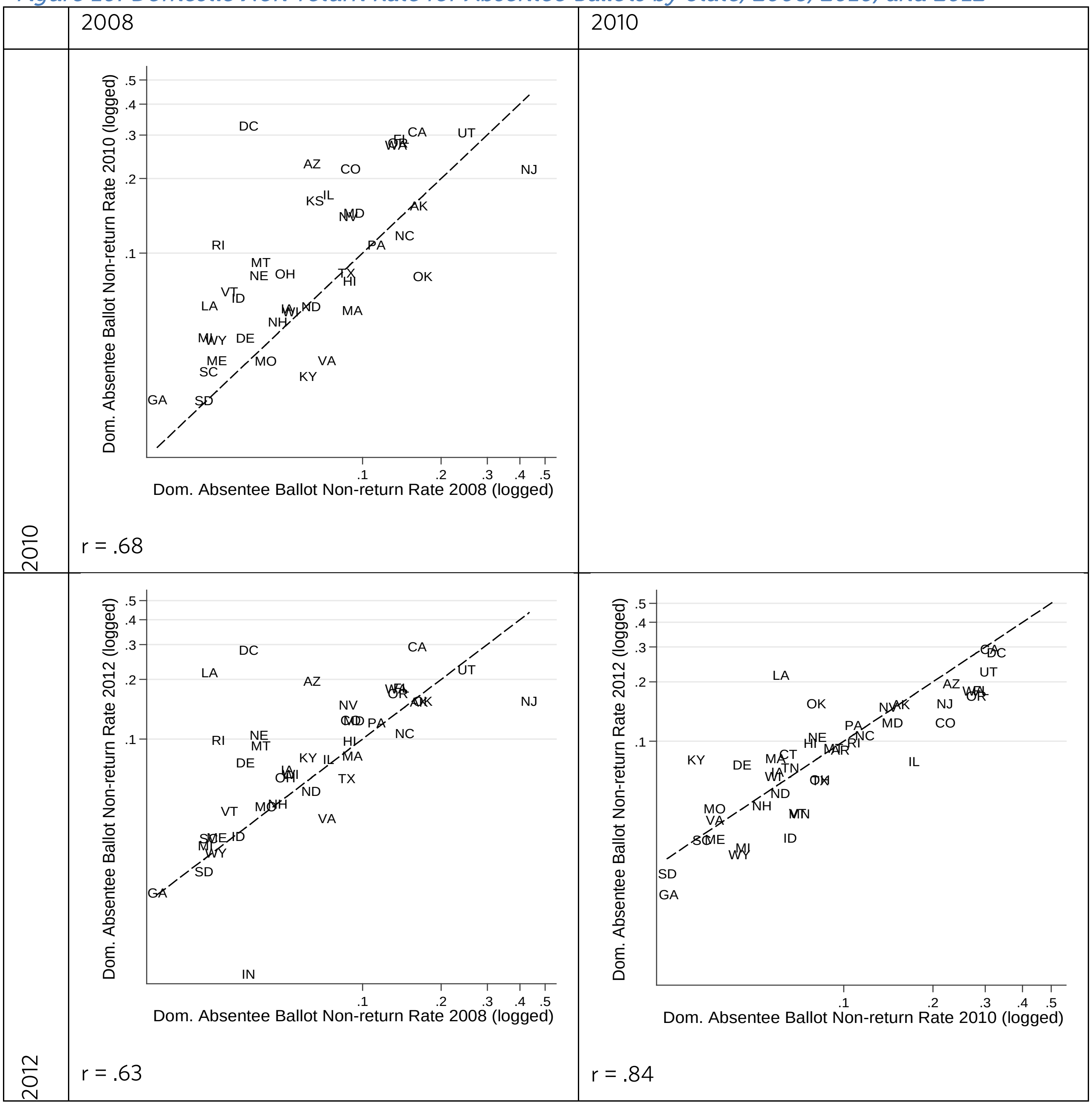
Note: Dashed lines indicate where observations for the two years are equal.

As these graphs illustrate, for counties that reported the necessary data, the non-return rates are similar when they are compared across years. The Pearson correlation coefficients, which measure the degree of similarity across these two election cycles, range between 0.63 and 0.84.[21]

These graphs also illustrate how counties that report no unreturned domestic absentee ballots one election cycle sometimes report a considerably greater non-return rate the next cycle. Non-return rates are relatively high when we combine data nationwide—10.2 percent in 2008, 22.2 percent in 2010, and 16.3 percent in 2012. Therefore, it is unusual for a county to report precisely zero unreturned absentee ballots. Indeed, most counties reporting zero unreturned absentee ballots are very small, with very low numbers of absentee ballots sent out in the first place.[22]

The EPI reports absentee ballot non-return rates at the state level. The statewide non-return rates are similarly right-skewed; therefore, it is necessary to translate the non-return rates into logarithms before plotting them across years.

Figure 10: Domestic Non-return Rate for Absentee Ballots by State, 2008, 2010, and 2012



Note: Dashed lines indicate where observations for the two years are equal.

As with the measure calculated at the county level, the indicator calculated at the state level is stable across years, especially comparing 2012 with 2010.

Military and overseas ballots rejected

Data source: Election Administration and Voting Survey

In recent years, increasing attention has been paid to the ability of overseas voters, especially those serving in the U.S. military, to vote in federal elections. Military and overseas voters face a number of obstacles to voting. A measure of these obstacles is the fraction of ballots returned by military and overseas voters that are then rejected.

By far, the principal reason ballots sent to UOCAVA voters are rejected is that the ballots are received by election officials after the deadline for counting. The fraction of these ballots rejected for this reason has varied from 43.7 percent of submitted ballots in 2008 to 32.4 percent in 2010 and 40.4 percent in 2012.[23] However, reporting about why UOCAVA ballots are rejected is lacking. The percentage of rejected UOCAVA ballots that were accounted for by an undefined and undifferentiated "other" category was 31.2 percent in 2008, 49.0 percent in 2010, and 25.4 percent in 2012. The percentage of rejected ballots not categorized at all was 12.2 percent in 2008, 11.4 percent in 2010, and 18.4 percent in 2012. It is thus possible that the actual fraction of UOCAVA ballots rejected for lateness is even higher than indicated in the EAVS UOCAVA report.

Coding convention

Expressed as an equation, the UOCAVA absentee ballot rejection rate can be calculated as follows from the EAVS data sets:

$$\textbf{Percent of returned UOCAVA ballots rejected} = \frac{\textbf{UOCAVA ballots rejected in the general election}}{\textbf{Returned by voters and submitted for counting}}$$

Data will be missing if a county has failed to provide any of the variables included in the calculation.

Table 12: Correspondence Between Variable Definition and EAVS Variable Names

Descriptive name	2008 EAVS	2010 and 2012 EAVS
UOCAVA ballots rejected	b13	qb13a
Total UOCAVA ballots submitted for counting	b3	qb3a

Table 13: Data Availability, County Data

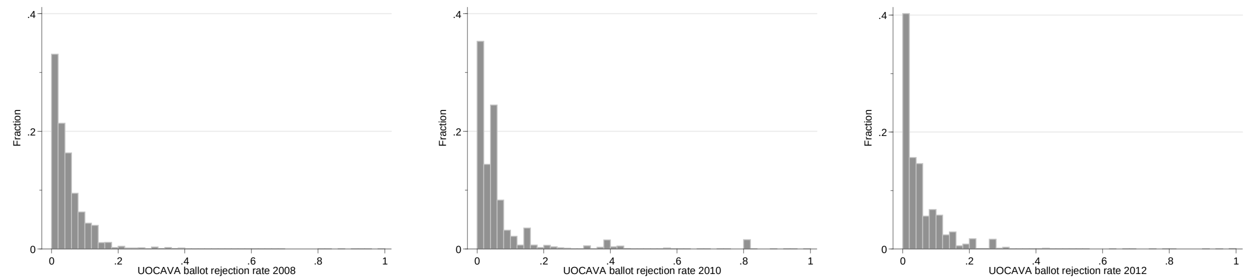
	2008 EAVS			2010 EAVS			2012 EAVS		
Descriptive name	Var. name	Missing cases, raw	Missing cases, weighted by registered voters	Var. name	Missing cases, raw	Missing cases, weighted by registered voters	Var. name	Missing cases, raw	Missing cases, weighted by registered voters
Total UOCAVA ballots rejected	B13	486 (10.66%)	555.08 (12.37%)	Qb13a	112 (2.42%)	24.43 (0.53%)	Qb13a	133 (2.88%)	176.05 (3.81%)
Total UOCAVA ballots returned for counting	B3	781 (17.14%)	287.02 (6.40%)	Qb3a	236 (5.10%)	115.67 (2.51%)	Qb3a	133 (2.88%)	216.76 (4.69%)
Overall		781 (17.14%)	555.08 (12.37%)		272 (5.88%)	131.59 (2.86%)		241 (3.00%)	330.13 (7.14%)

Because of missing data, it was not possible to compute UOCAVA ballot rejection rates for Alabama, Arkansas, Connecticut, District of Columbia, Hawaii, Indiana, Kentucky, Mississippi, New York, Oregon, Rhode Island, South Dakota, West Virginia, and Wyoming (2008); Maine, Mississippi, New Mexico, South Dakota, Vermont, Virginia, and West Virginia (2010); and Illinois, Mississippi, and South Carolina (2012).

Comparison of UOCAVA ballot rejection rates across time

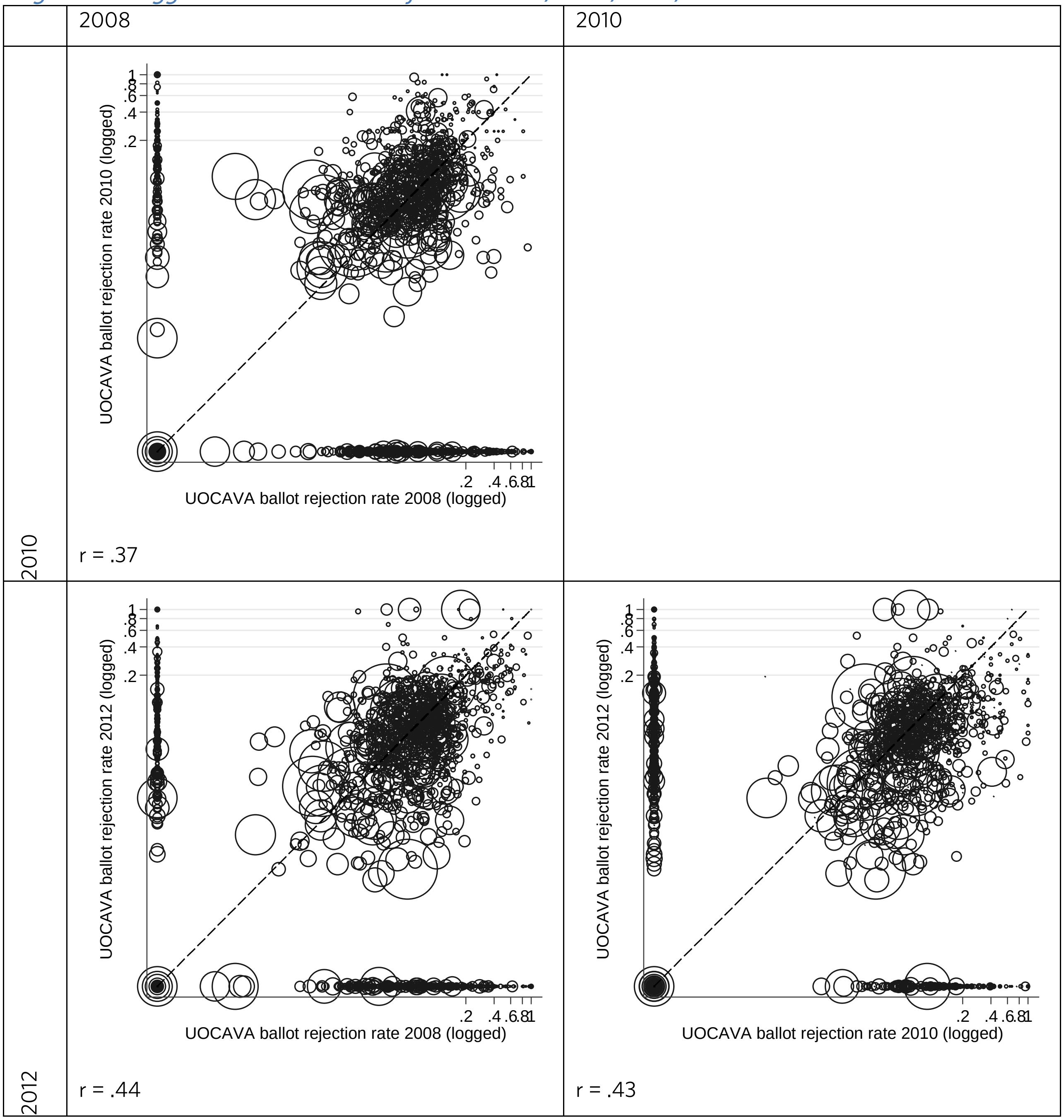
We begin by comparing UOCAVA ballot rejection rates, measured at the county level, for 2008, 2010, and 2012. The raw data exhibit a pronounced right skew; that is, most counties have very low rejection rates, while a few have relatively high rates.[24] This is illustrated in the following histograms, which show the distribution of rejection rates for 2008, 2010, and 2012 for each U.S. county for which we have the relevant data.[25]

Figure 11: UOCAVA Ballot Rejection Rates, 2008, 2010, and 2012



Because of the right skew in the distribution of rejection rates, any scatterplot that compares these rates across years will be misleading—the bulk of observations will be clumped around the origin, with our eye drawn toward the outliers with extremely large values. To deal with this right skew, it is common to transform the measures by taking logarithms. One problem this creates is that a large fraction of counties had zero UOCAVA ballots rejected, and the logarithm of zero is undefined. Therefore, in the scatterplots in Figure 12, counties with zero rejected ballots have been set to 0.0001, which is slightly below the smallest nonzero non-return rate that was actually observed. Finally, so that the influence of larger counties is visually greater than that of smaller counties, we weight the data tokens in proportion to the size of the county.[26]

Figure 12: Logged UOCAVA Ballot Rejection Rates, 2008, 2010, and 2012



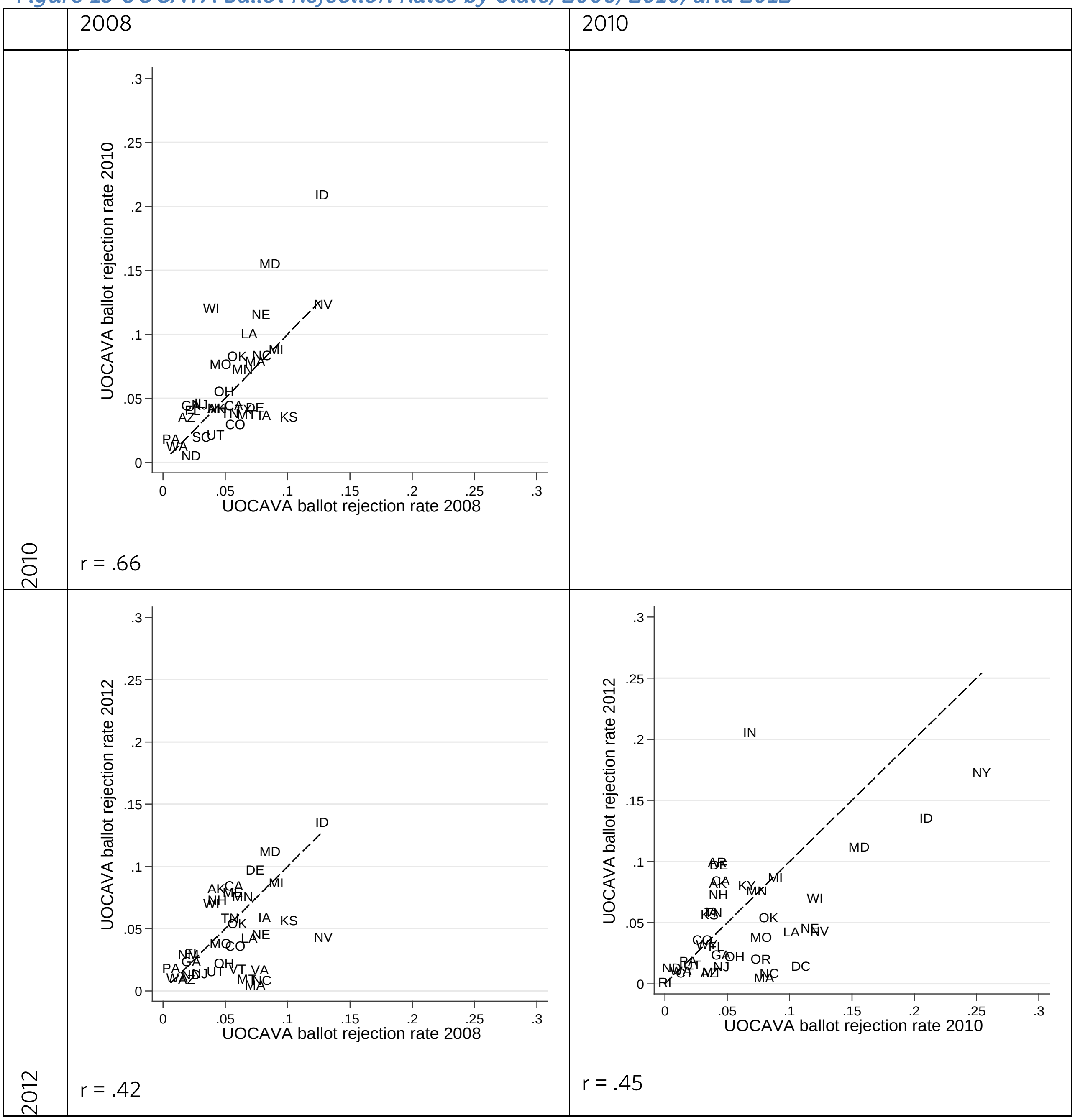
Note: Dashed lines indicate where observations for the two years are equal.

As Figure 12 illustrates, for counties that reported the data necessary to calculate rejection rates in 2008, 2010, and 2012, rates are weakly correlated across years. The Pearson correlation coefficient, which measures the degree of similarity across these two election cycles, ranges from 0.37 to 0.43.[27]

The relatively small correlation in this measure across years is likely explained by several factors. A major issue is the evolving nature of laws related to UOCAVA ballots. The Military and Overseas Voter Empowerment, or MOVE, Act of 2009, which requires election officials to transmit requested UOCAVA ballots at least 45 days before a federal election, was implemented in time for the 2010 general election, but several states were given waivers for that election. Further, difficulties in meeting the demands of the act were reported in many states that had not been given waivers. However, the MOVE Act was fully implemented in 2012, and the county-level correlations in rejection rates from 2010 to 2012 were still relatively low. While this may still reflect the unsettled nature of the law's implementation, we cannot rule out the possibility that these low correlations reflect inadequate recordkeeping of UOCAVA statistics at the local level. This is clearly a matter that demands further research.

The EPI reports UOCAVA ballot rejection rates at the state level. Unlike many of the other measures that are derived from the EAVS, statewide UOCAVA ballot rejection rates are not right-skewed. Therefore, the plot of statewide rejection rates across years uses the raw percentages rather than logarithms of the rates.

Figure 13 UOCAVA Ballot Rejection Rates by State, 2008, 2010, and 2012



Note: Dashed lines indicate where observations for the two years are equal.

The UOCAVA rejection rate measure exhibits a relatively low interyear correlation at the state level, much as it does at the local level. While the Pearson correlation coefficient describing the relationship between 2008 and 2010 was a moderate 0.66, the other interyear correlations are much lower. As noted above, we suspect that these low-to-moderate interyear correlations are due to a combination of unsettled law and unsettled record-keeping.

Military and overseas ballots unreturned

Data source: Election Administration and Voting Survey

UOCAVA ballots are returned by voters at a much lower rate than civilian absentee ballots are. For instance, if we examine the set of counties that reported all the necessary data in 2008 to calculate return rates for both types of ballots—to remove any biases in the analysis that may be introduced because of incomparable samples—the UOCAVA non-return rate was 28.0 percent, compared with 10.2 percent for civilian absentee ballots. These comparisons are 66.4 percent vs. 22.3 percent in 2010 and 31.4 percent vs. 16.6 percent in 2012. In other words, UOCAVA ballots are two to three times more likely not to be returned for counting than civilian absentee ballots.

Laws pertaining to UOCAVA voting are in flux, a factor that may be partially responsible for the very high non-return rates and, as we will see below, the relatively low interyear non-return rate correlations at the county and state levels. One element of UOCAVA and MOVE concerns the period for which a ballot request is in force. Under the original UOCAVA provisions, an application to become a UOCAVA voter could be valid for two federal election cycles. The MOVE Act changed this, allowing states to narrow the period to which a ballot request applied to a single calendar year. The original UOCAVA provision may have resulted in a large number of ballots being mailed that were not needed (or wanted), at a cost to election offices. Although the change in the MOVE Act was intended to reduce the number of unneeded ballots that were mailed, it is unclear whether many states have changed their practices. In any event, the percentage of non-returned UOCAVA ballots has not declined.

It is not well-understood why a large number of UOCAVA ballots are not returned. Is it for the same reasons that civilian absentee ballots are not returned, or are there reasons unique to UOCAVA voting? Clearly, more research is needed in this area.

Coding convention

Expressed as an equation, the UOCAVA ballot non-return rate can be calculated as follows from the EAVS data sets:

$$\textbf{Percent of UOCAVA ballots transmitted not returned} = 1 - \frac{\textbf{Returned ballots}}{\textbf{Ballots transmitted}}$$

Data will be missing if a county has failed to provide any of the variables included in the calculation.

Table 14: Correspondence Between Variable Definition and EAVS Variable Names

Descriptive name	2008 EAVS	2010 and 2012 EAVS
Total returned UOCAVA ballots	b2a	qb2a
Total UOCAVA ballots sent out	b1a	qb1a

Table 15: Data Availability, County Data

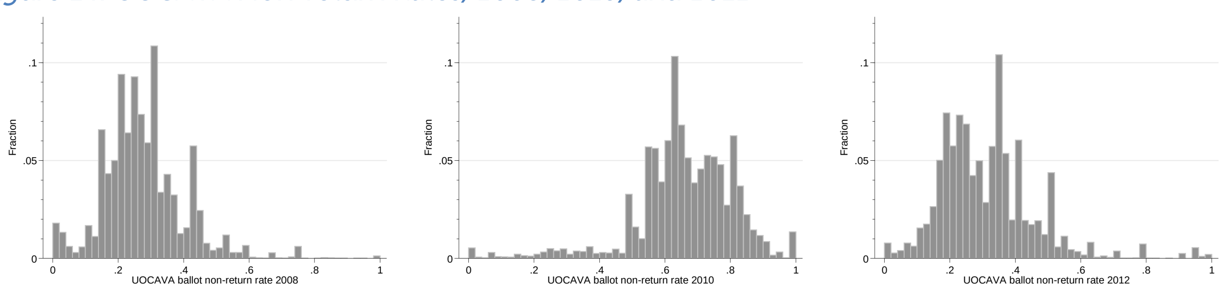
	2008 EAVS			2010 EAVS			2012 EAVS		
Descriptive name	Var. name	Missing cases, raw	Missing cases, weighted by registered voters	Var. name	Missing cases, raw	Missing cases, weighted by registered voters	Var. name	Missing cases, raw	Missing cases, weighted by registered voters
Total unreturned UOCAVA ballots	B2a	486 (10.50%)	287.02 (6.40%)	Qb2a	87 (1.88%)	17.46 (0.38%)	Qb2a	130 (2.81%)	215.76 (4.67%)
Total UOCAVA ballots sent out	B1a	267 (5.86%)	239.70 (5.34%)	Qb1a	95 (2.05%)	18.44 (0.40%)	Qb1a	24 (0.52%)	46.38 (1.00%)
Overall		537 (11.78%)	376.25 (8.39%)		108 (2.33%)	27.99 (0.61%)		139 (3.00%)	249.24 (5.39)

Because of missing data, it was not possible to compute UOCAVA ballot non-return rates for Connecticut, Hawaii, Maine, Mississippi, New York, Oregon, and West Virginia (2008); Mississippi, New Mexico, and West Virginia (2010); and Alabama, Illinois, and Mississippi (2012).

Comparison of UOCAVA ballot non-return rates across time

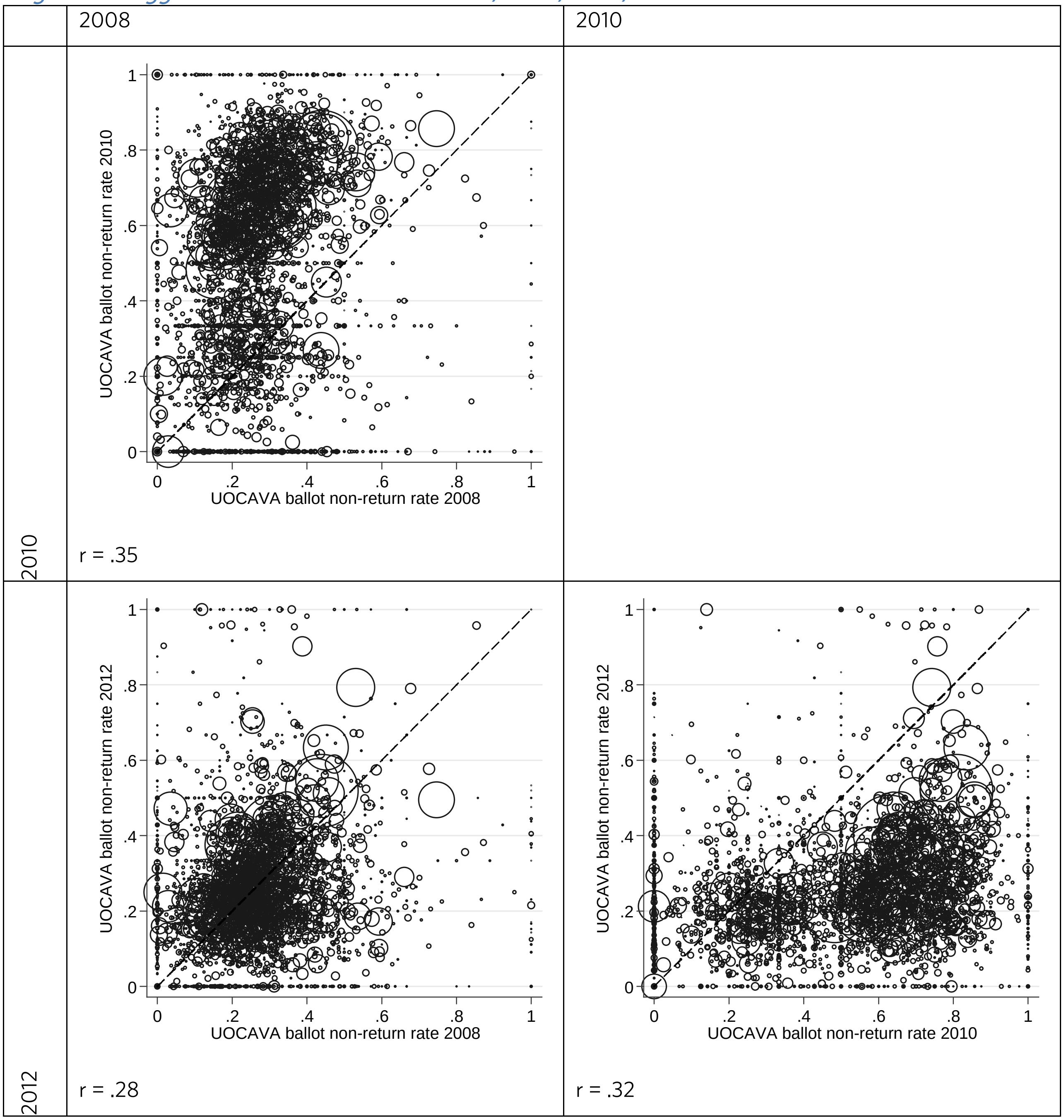
We begin by comparing UOCAVA ballot non-return rates, measured at the county level, for 2008, 2010, and 2012. Although there are outliers for all years, on the whole the data series does not exhibit the pronounced skew that is evident with many indicators based on EAVS data. This is illustrated in the three histograms in Figure 14, which show the distribution of non-return rates for 2008, 2010, and 2012 for each county for which we have the relevant data.[28]

Figure 14: UOCAVA Non-return Rates, 2008, 2010, and 2012



The scatterplots in Figure 15 show the non-return rates measured at the county level from 2008 to 2012 and plotted against each other. Because the data do not exhibit a pronounced skew, we use the raw (rather than logged) rates. So that the influence of larger counties is visually greater than that of smaller counties, we weight the data tokens in proportion to the number of absentee ballots mailed out by the counties.[29]

Figure 15 Logged UOCAVA Non-return Rates, 2008, 2010, and 2012

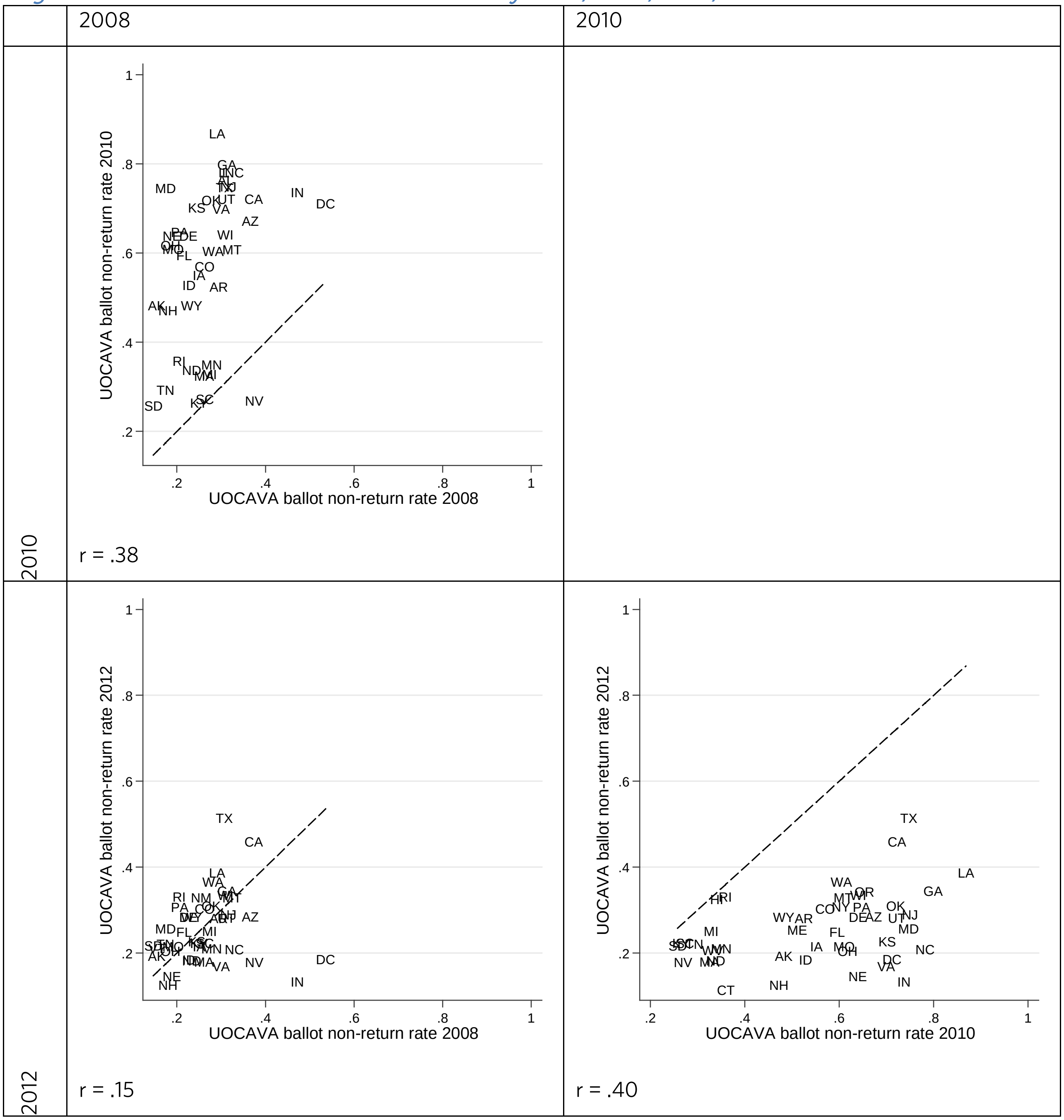


Note: Dashed lines indicate where observations for the two years are equal.

As these graphs illustrate, for counties that reported the data necessary to calculate non-return rates, there is a weak relationship between non-return rates when we compare any two years. (In addition, non-return rates are generally higher in the midterm year 2010 than in the presidential years of 2008 and 2012.) The Pearson correlation coefficients, which measure the degree of similarity across these election cycles, range between 0.28 and 0.35.[30]

The EPI reports UOCAVA ballot non-return rates at the state level. Figure 16 compares non-return rates at the state level in 2008, 2010, and 2012.

Figure 16: UOCAVA Ballots Non-return Rates by State, 2008, 2010, and 2012



Note: Dashed lines indicate where observations for the two years are equal.

As with the measures calculated at the county level, the indicator calculated at the state level is not very stable when we compare across years. The Pearson correlation coefficients describing the relationship ranges from 0.15 to 0.40 across the various comparison years.

Online registration available

Data sources: National Conference of State Legislatures and state election offices

More and more business transactions have migrated toward the Internet, which has resulted in savings for businesses and greater convenience for consumers. Voter registration is one such transaction that can benefit both election offices and voters by moving online. Compared with traditional paper processes, online registration has been shown to save money, increase the accuracy of voter lists, and streamline the registration process. In addition to reducing state expenditures, online tools can be more convenient for voters.[31]

We consider a state as having online voter registration if it offers the option of an entirely paperless registration process that is instituted in time for eligible voters to register online for the corresponding election. If the state has a tool that helps a voter fill out the form online but he or she still has to print it (and possibly physically sign it) before returning it to a local election office, this does not constitute online voter registration. This reasoning applies to states such as Alaska, for example, where a would-be voter needs to mail a signed and printed voter registration form to the elections office to register. States such as Delaware that have an eSignature program that electronically populates the voter registration record from a different state agency list (for example, Department of Motor Vehicles) also are not included.

North Dakota, the only state without voter registration, is not given a score for this indicator.

Postelection audit required

Data source: Statutory Overview of the Election Administration and Voting Survey

One of the lessons learned from careful scrutiny of the 2000 election results is that many states did not have a systematic program of auditing the performance of voting equipment after an election. Auditing the performance of voting equipment requires different procedures and approaches than do counting and recounting ballots, and has different goals. States that have postelection audit requirements should be able to spot emerging problems with voting equipment before they cause crises, allowing election administrators to improve voting equipment.

Generally speaking, a postelection audit involves the close scrutiny of election returns from a sample of precincts and/or voting machines. The audit might involve simply recounting all of the ballots cast among the sample and comparing the recount with the original total. An audit might also involve scrutiny of other records associated with the election, such as logbooks. Sampling techniques can follow different protocols, ranging from simple random samples of a fixed percentage of voting machines to "risk-limiting" audits that select the sample depending on the likelihood that recounting more ballots would overturn the election result.[63]

Although postelection audits are recognized as a best practice to ensure that voting equipment is functioning properly, that proper procedures are being followed, and that the overall election system is reliable, the practice of auditing is still in its relative infancy. Therefore, a consensus has not arisen about what constitutes the necessary elements of an auditing program.

As a consequence, this measure is based simply on the binary coding of whether state law provides for a postelection audit. The data source is the Statutory Overview portion of the EAC's Election Administration and Voting Survey. It is not based on a further coding of the specific provisions in state law, nor is it based on the findings of the audits themselves. (For instance, it is not based on measures of how close audited election results come to the original, certified results.) Future iterations of the EPI may go beyond this simple binary coding.

Provisional ballots cast

Data source: Election Administration and Voting Survey

The provisional ballot mechanism allows voters whose registration status is in dispute to cast ballots, while leaving the registration status question to be resolved after Election Day. Provisional ballots have other uses, too. Some states have begun using them essentially as change-of-address forms for voters who have moved. Some jurisdictions allow provisional ballots cast in the wrong precinct to be counted.

Unless provisional ballots are being given to voters for other administrative reasons, a large number may indicate problems with voter registration records. The meaning of a small number of provisional ballots, from an election administration standpoint, is more open to question. On the one hand, a small number may indicate that registration records are up to date; on the other hand, small numbers may be the result of poll workers not offering voters with registration problems the provisional ballot option when appropriate.

Coding convention

Expressed as an equation, the provisional ballot rate can be calculated as follows from the EAVS data sets:

$$\textbf{Percent turnout that cast a provisional ballot} = \frac{\textbf{Total number of voters who submitted a provisional ballot}}{\textbf{Total number of people who participated in the general election}}$$

Data will be missing if a county has failed to provide any of the variables included in the calculation.

Table 16: Correspondence Between Variable Definition and EAVS Variable Names

Descriptive name	2008 EAVS	2010 and 2012 EAVS
Total who submitted a provisional ballot	e1	qe1a
Total participants in general election	f1a	qf1a

Table 17: Data Availability, County Data

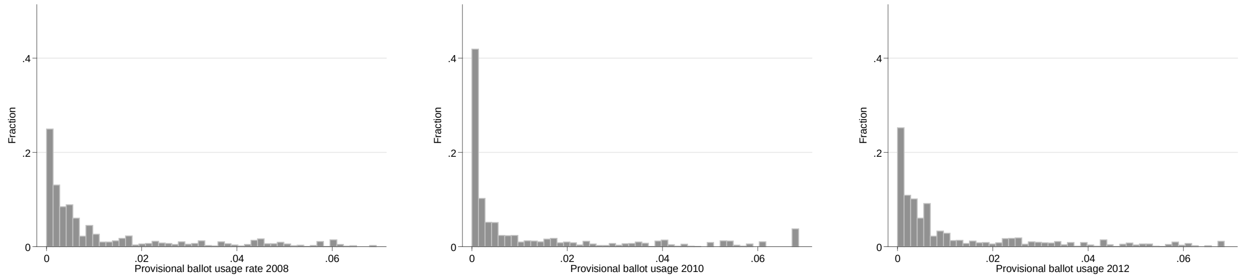
	2008 EAVS			2010 EAVS			2012 EAVS		
Descriptive name	Var. name	Missing cases, raw	Missing cases, weighted by registered voters	Var. name	Missing cases, raw	Missing cases, weighted by registered voters	Var. name	Missing cases, raw	Missing cases, weighted by registered voters
Total provisional ballots	E1	585 (12.75%)	202.67 (4.52%)	Qe1a	129 (2.79%)	243.77 (5.29%)	Qe1a	313 (6.77%)	200.98 (4.34%)
Total participants in general election	F1a	144 (3.14%)	61.94 (1.38%)	Qf1a	32 (0.69%)	4.91 (0.11%)	Qf1a	19 (0.41%)	13.95 (0.30%)
Overall		594 (12.95%)	254.13 (5.66%)		149 (3.22%)	244.67 (5.31%)		315 (6.81%)	201.66 (4.36)

Because of missing data, it was not possible to compute provisional ballot usage rates for Alabama, Illinois, Indiana, Mississippi, New York, West Virginia, and Wyoming (2008); Illinois, Mississippi, New York, South Carolina, West Virginia, and Wyoming (2010); and Mississippi, South Carolina, Vermont, West Virginia, and Wyoming (2012). We also did not include these rates for states that do not use provisional ballots (Idaho, Minnesota, and New Hampshire) because they have Election Day registration or for North Dakota, which does not require voters to register.

Stability of provisional ballot usage across time

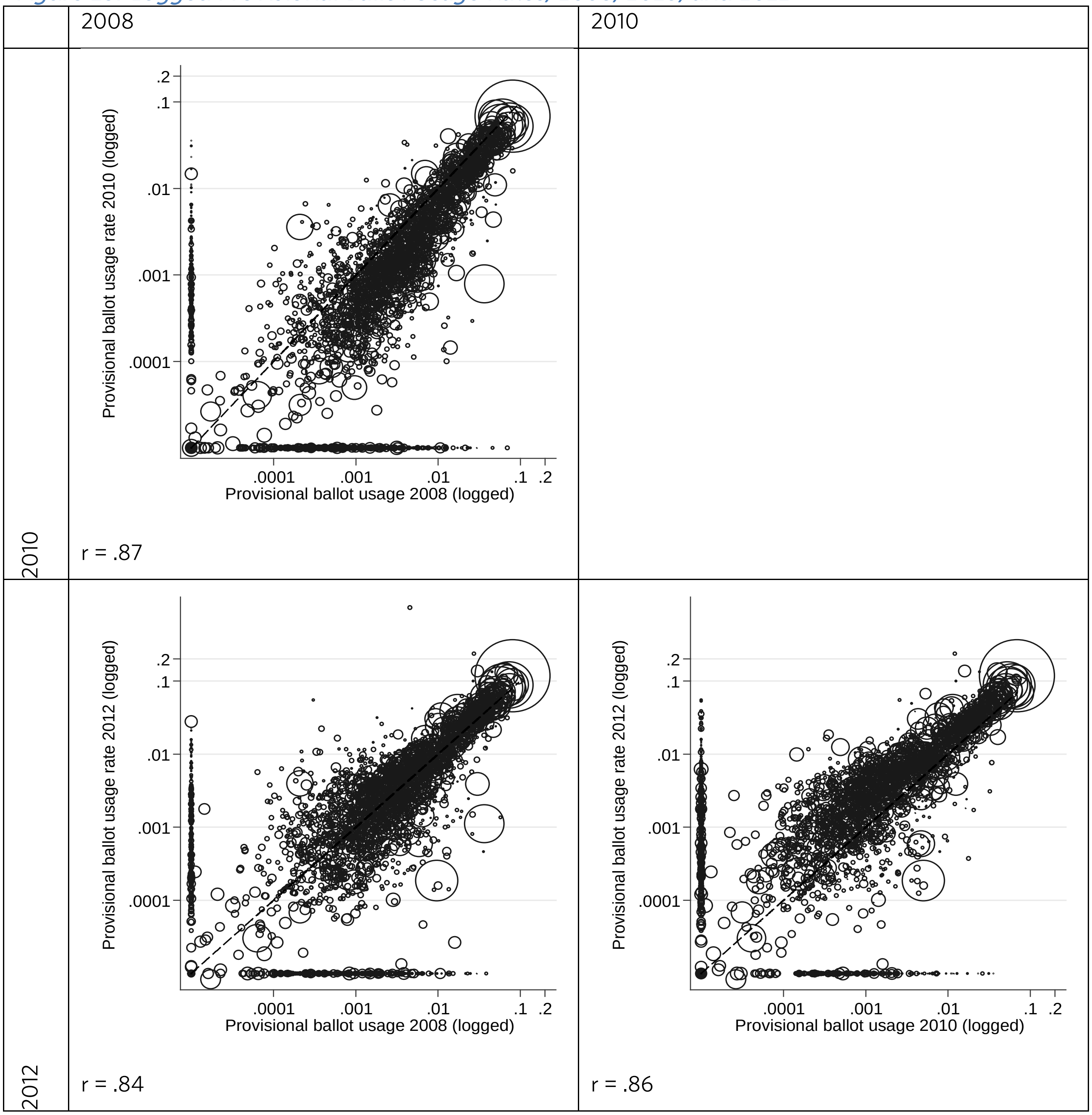
We begin by comparing provisional ballot usage rates, measured at the county level, for 2008, 2010, and 2012. The data are right-skewed; most counties have very low usage rates, while a few have relatively high rates. This is illustrated in Figure 17, which shows the distribution of usage rates for 2008, 2010, and 2012 for each county for which we have the relevant data.[32]

Figure 17: Provisional Ballot Usage Rates, 2008, 2010, and 2012



Because of this pronounced right skew, any scatterplot that compares two years will be misleading—the bulk of observations will be clumped around the origin, with our eye drawn toward the small number of outliers with extremely large values. To deal with this problem, we transform the measures by taking logarithms. One problem that emerges is that a large fraction of counties had no provisional ballots in particular years, and the logarithm of zero is undefined. Therefore, in the scatterplot in Figure 18, counties with zero provisional ballots have been set to 0.00001, which is slightly below the largest nonzero usage rate that was observed. Finally, so that the influence of larger counties is visually greater than that of smaller counties, we weight the data tokens in proportion to the size of the counties.[33]

Figure 18: Logged Provisional Ballot Usage Rates, 2008, 2010, and 2012



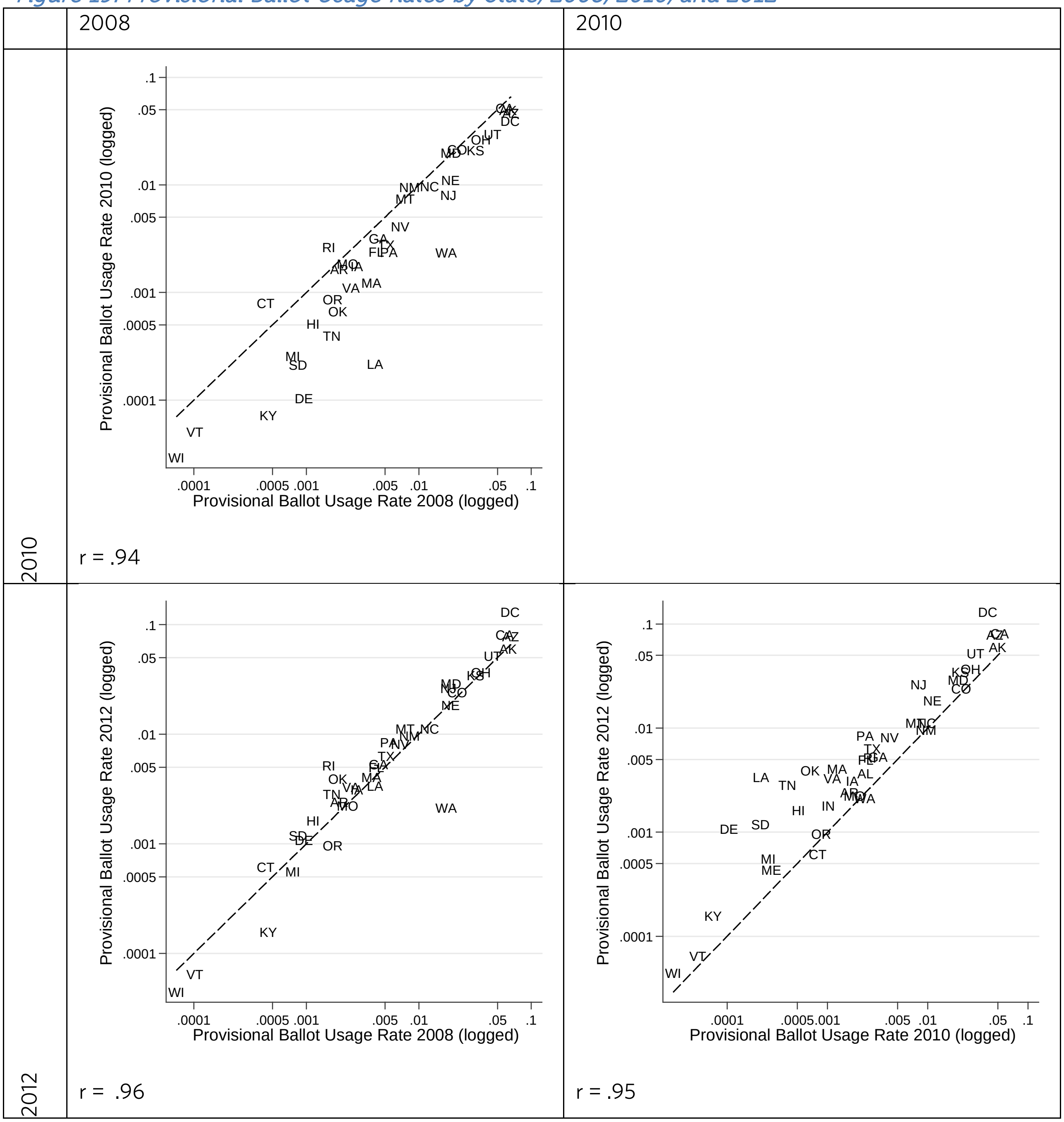
Note: Dashed lines indicate where observations for the two years are equal.

As these graphs illustrate, for counties that reported the necessary data, usage rates are very similar across any pair of compared years. The Pearson correlation coefficient, which measures the degree of similarity across these two election cycles, ranges between 0.84 and 0.87.[34]

These graphs also illustrate how counties that report no provisional ballots one election cycle often report a considerably greater usage rate the next cycle. Sometimes this is because the county is very small. With provisional ballot usage rates overall being relatively low—1.3 percent in 2008, 1.2 percent in 2010, and 2.2 percent in 2012—a county with only a few hundred registered voters might very well experience an election cycle in which no provisional ballots were used. However, relatively large counties will sometimes report zero provisional ballots in one election cycle and a relatively large number in the other cycle. This sort of behavior calls for further investigation. Until such research is conducted, this pattern alerts us to the need to be cautious when using data on the use of provisional ballots.

The EPI reports provisional ballot use at the state level. The statewide usage rates are similarly right-skewed; therefore, it is necessary to translate the rates into logarithms before plotting the usage against each other.

Figure 19: Provisional Ballot Usage Rates by State, 2008, 2010, and 2012



Note: Dashed lines indicate where observations for the two years are equal.

As with the measures calculated at the county level, the indicator calculated at the state level is very stable when we compare across years. The Pearson correlation coefficient describing the relationship across the three election cycles ranges between 0.94 and 0.96, using the values that have been transformed into logarithms.

Provisional ballots rejected

Data source: Election Administration and Voting Survey

Provisional ballots are cast for a variety of reasons. Whether a provisional ballot is eventually counted depends on why the voter was issued such a ballot and the rules for counting provisional ballots in the voter's state.

States vary in the criteria they use to determine if a provisional ballot should be issued and, later, counted. The most significant difference among states is that some reject provisional ballots cast in the wrong precinct, while others count *part* of those ballots.

Coding convention

Expressed as an equation, the provisional ballot rejection rate can be calculated as follows from the EAVS data sets:

$$\textbf{Provisional ballot rejection rate} = \frac{\textbf{Rejected provisional ballots}}{\textbf{Total participants in the general election}}$$

Data will be missing if a county failed to provide any of the variables included in the calculation.

The decision was made to use total participants in the general election as the denominator, rather than number of provisional ballots issued, for two reasons. First, states that issue large numbers of these ballots, measured as a percentage of all votes cast in an election, tend to also accept a large number of those ballots, measured as a percentage of provisional ballots cast. Thus, the percentage of provisional ballots rejected as a percentage of provisional ballots cast measures only the legal context under which provisional ballots are used and does little beyond that to illustrate the health of elections in a state. Second, the number of provisional ballots rejected represents voters who tried to vote and were turned away. Large numbers of such voters relative to the number of total participants in the election represent not only lost opportunities by voters to cast ballots, but also greater opportunities for disputes about an election's results. In other words, a large number of provisional ballots left uncounted for whatever reason, as a percent of total participants, indicates a mix of administrative problems and the potential for litigation, neither of which can be considered positive.

Table 18: Correspondence Between Variable Definition and EAVS Variable Names

Descriptive name	2008 EAVS	2010 and 2012 EAVS
Rejected provisional ballots	e2c	qe1d
Total participants in the general election	f1a	qf1a

Table 19: Data Availability, County Data

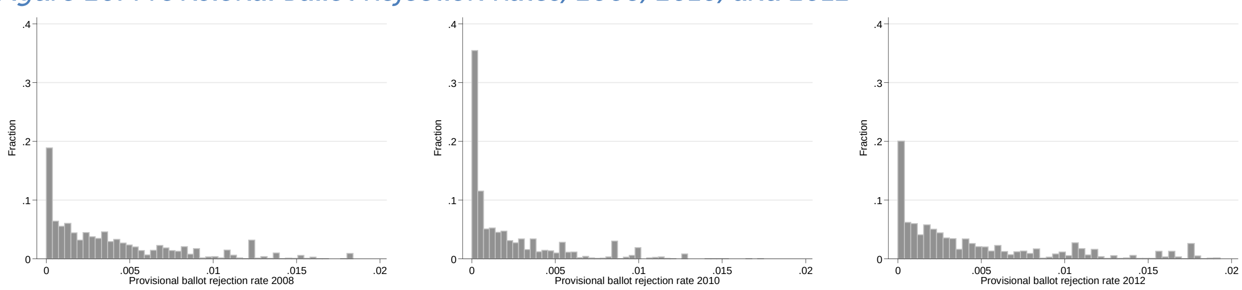
	2008 EAVS			2010 EAVS			2012 EAVS		
Descriptive name	Var. name	Missing cases, raw	Missing cases, weighted by registered voters	Var. name	Missing cases, raw	Missing cases, weighted by registered voters	Var. name	Missing cases, raw	Missing cases, weighted by registered voters
Total provisional ballots rejected	E2c	734 (16.11%)	302.66 (6.75%)	Qe1d	194 (4.19%)	275.24 (5.97%)	Qe1d	448 (9.69%)	221.62 (4.79%)
Total participants in the general election	F1a	144 (3.16%)	61.94 (1.38%)	Qf1a	32 (0.69%)	4.91 (0.11%)	Qf1a	19 (0.41%)	13.95 (0.30%)
OVERALL		734 (16.11%)	354.00 (7.89%)		213 (4.60%)	276.08 (5.99%)		449 (9.71%)	221.90 (4.80%)

Because of missing data, it was not possible to compute provisional ballot rejection rates for Alabama, Arkansas, Illinois, Indiana, Mississippi, New Mexico, New York, Oregon, West Virginia, and Wyoming (2008); Mississippi, New York, South Carolina, and Wyoming (2010); and Mississippi, South Carolina, Vermont, West Virginia, and Wyoming (2012). We also did not include provisional ballot rejection rates for states with Election Day registration that do not use provisional ballots (Idaho, Minnesota, and New Hampshire), or for North Dakota, which does not require voters to register.

Stability of provisional ballot rejection rates across time

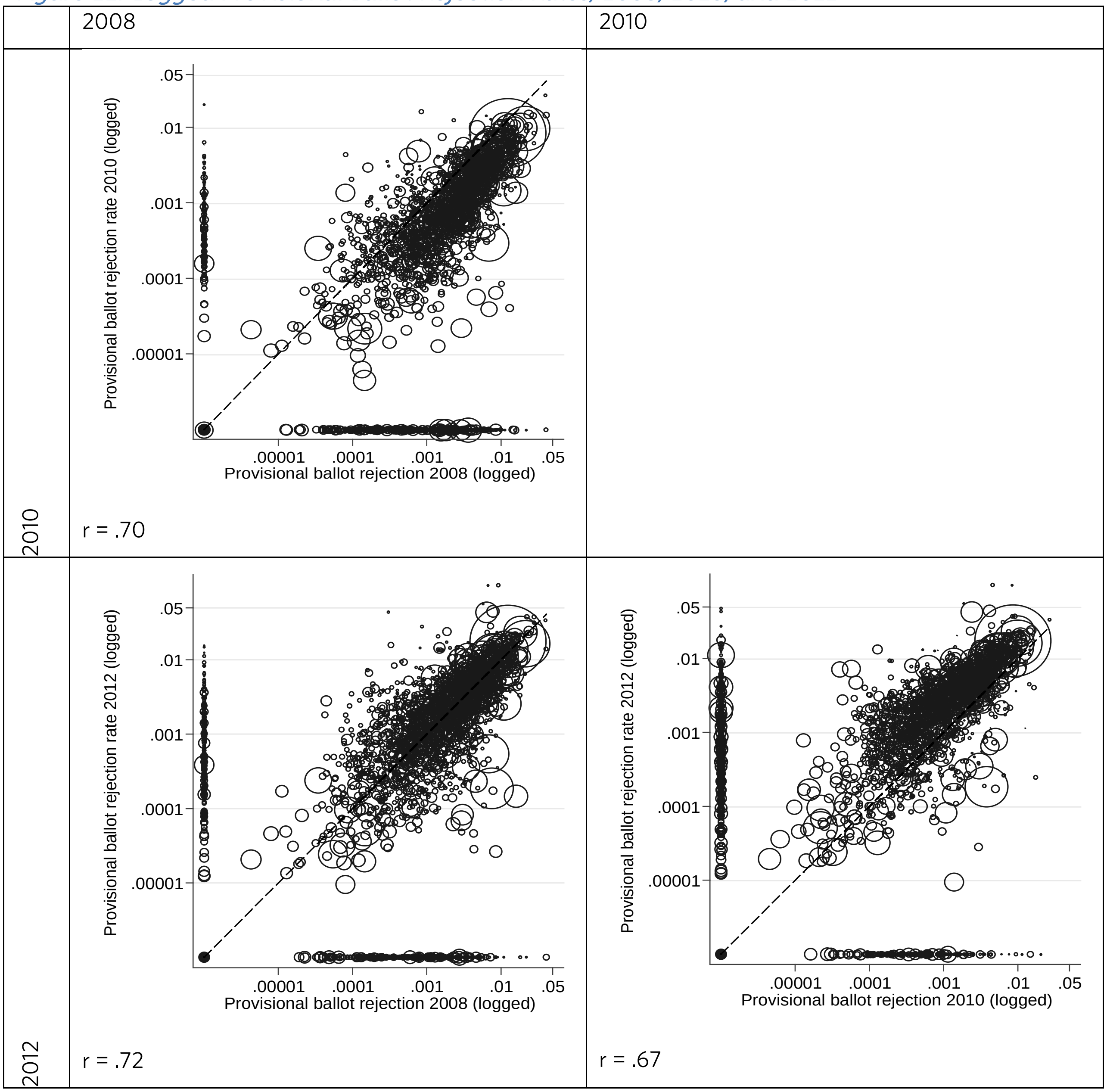
We begin by comparing provisional ballot rejection rates, measured at the county level, for 2008, 2010, and 2012. The raw data exhibit a pronounced right skew. That is, most counties have very low rejection rates, while a few have relatively high rates. This is illustrated in the three histograms in Figure 20, which show the distribution of rejection rates for 2008, 2010, and 2012 for each U.S. county for which we have the relevant data.[35]

Figure 20: Provisional Ballot Rejection Rates, 2008, 2010, and 2012



Because of this pronounced right skew, any scatterplot that compares values across two years will be misleading—the bulk of observations will be clumped around the origin, with our eye drawn toward the small number of outliers with extremely large values. To deal with this pronounced right skew, it is common to transform the measures by taking logarithms. One problem this creates is that a large fraction of counties had zero provisional ballots rejected in these three years, and the logarithm of zero is undefined. Therefore, in the scatterplot in Figure 21, counties with zero provisional ballots have been set to 0.00001, which is slightly below the smallest nonzero rejection rate that was observed. Finally, so that the influence of larger counties is visually greater than that of smaller counties, we weight the data tokens in proportion to the size of the county.[36]

Figure 21: Logged Provisional Ballot Rejection Rates, 2008, 2010, and 2012



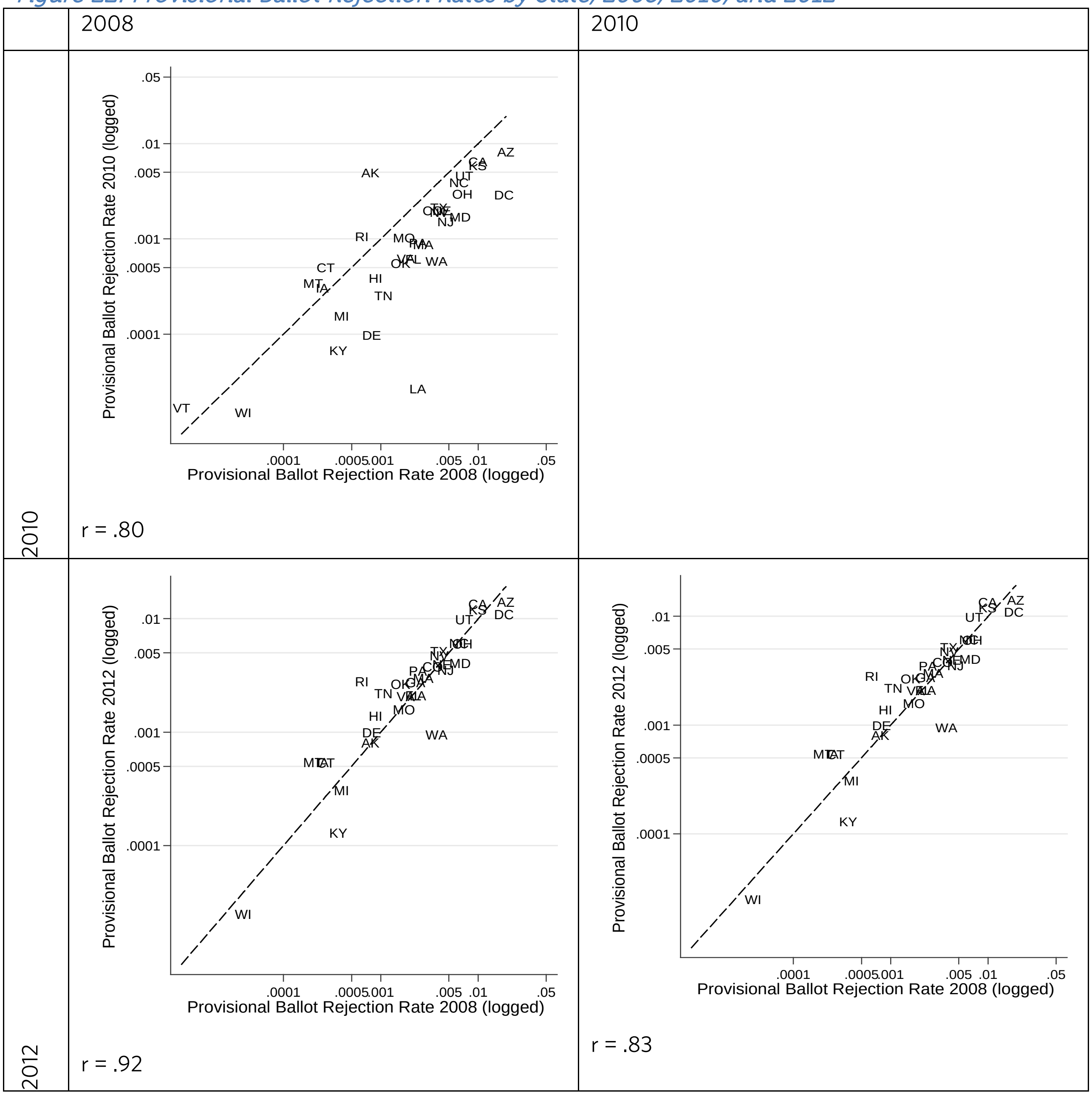
Note: Dashed lines indicate where observations for the two years are equal.

As these graphs illustrate, for counties that reported the necessary data in 2008, 2010, and 2012, rejection rates are very similar across these years. The Pearson correlation coefficient, which measures the degree of similarity across these election cycles, ranges between 0.67 and 0.72.[37]

These graphs also illustrate how counties that report no rejected provisional ballots one election cycle often report a considerably greater rejection rate the next cycle. Sometimes this is because the county is very small. With provisional ballot rejection rates overall being relatively low—0.4 percent in 2008, 0.2 percent in 2010, and 0.5 percent in 2012—a county with only a few hundred registered voters might experience an election cycle in which no provisional ballots were rejected. However, relatively large counties will sometimes report zero provisional ballots rejected in one election cycle and a relatively large number in the other cycle. This sort of behavior calls for further investigation. Until such research is conducted, this pattern alerts us to the need to be cautious when using data on the rejection of provisional ballots.

The EPI reports the rates of provisional ballot rejection at the state level. The statewide rejection rates are similarly right-skewed; therefore, it is necessary to translate the rejection rates into logarithms before plotting the rejection rates across time.

Figure 22: Provisional Ballot Rejection Rates by State, 2008, 2010, and 2012



Note: Dashed lines indicate where observations for the two years are equal.

As with the measure calculated at the county level, the indicator calculated at the state level is very stable when we compare across years. The Pearson correlation coefficient describing the relationship across the two years ranges between 0.80 and 0.92, using the values that have been transformed into logarithms.

Registration or absentee ballot problems

Data source: Voting and Registration Supplement of the Current Population Survey

Previous research has indicated that problems with voter registration present the greatest frustrations for voters trying to cast a ballot in an election.[38] Voters often believe they are registered when they are not, registered voters sometimes are not listed in the pollbooks, and voters are sometimes registered in a precinct other than the one where they show up to vote on Election Day. Reducing the number of people who fail to vote due to registration problems was a major goal of the Help America Vote Act.

Coding convention

This indicator is based on responses to the Voting and Registration Supplement of the CPS. Specifically, it is based on responses to item PES4, which asks of those who reported not voting: "What was the main reason you did not vote?" Response categories include the following in Table 20:[39]

Table 20: Main Reason for Not Voting

Response category	Percent of respondents in 2012[40]
Illness or disability (own or family's)	14.4%
Out of town or away from home	8.3%
Forgot to vote (or send in absentee ballot)	4.0%
Not interested, felt my vote wouldn't make a difference	16.2%
Too busy, conflicting work or school schedule	19.5%
Transportation problems	43.4%
Didn't like candidates or campaign issues	13.1%
Registration problems (i.e., didn't receive absentee ballot, not registered in current location)	5.7%
Bad weather conditions	0.8%
Inconvenient hours or polling place, or lines too long	2.9%
Other	12.2%

The eighth response category (registration problems) forms the basis for this indicator.

Stability of rates across time

The rate at which nonvoters report they failed to vote because of registration problems or failure to receive an absentee ballot will vary across time, for a variety of reasons. Some of these reasons may be related to policy—for instance, a shift to a permanent absentee ballot list may cause an increase in the percentage of nonvoters giving this excuse for not voting. Some of these reasons may be unrelated to election administration or policy, and therefore can be considered random variation.

One advantage of VRS data is that they go back many elections. The question about reasons for not voting has been asked in its present form since 2000. Therefore, it is possible to examine the intercorrelation of this measure at the state level across seven federal elections—2000, 2002, 2004, 2006, 2008, 2010, and 2012—to test its reliability.

Table 21 is the correlation matrix reporting the Pearson correlation coefficients for values of this indicator across these six elections.

Table 21: Pearson Correlation Coefficients, Main Reason for Not Voting

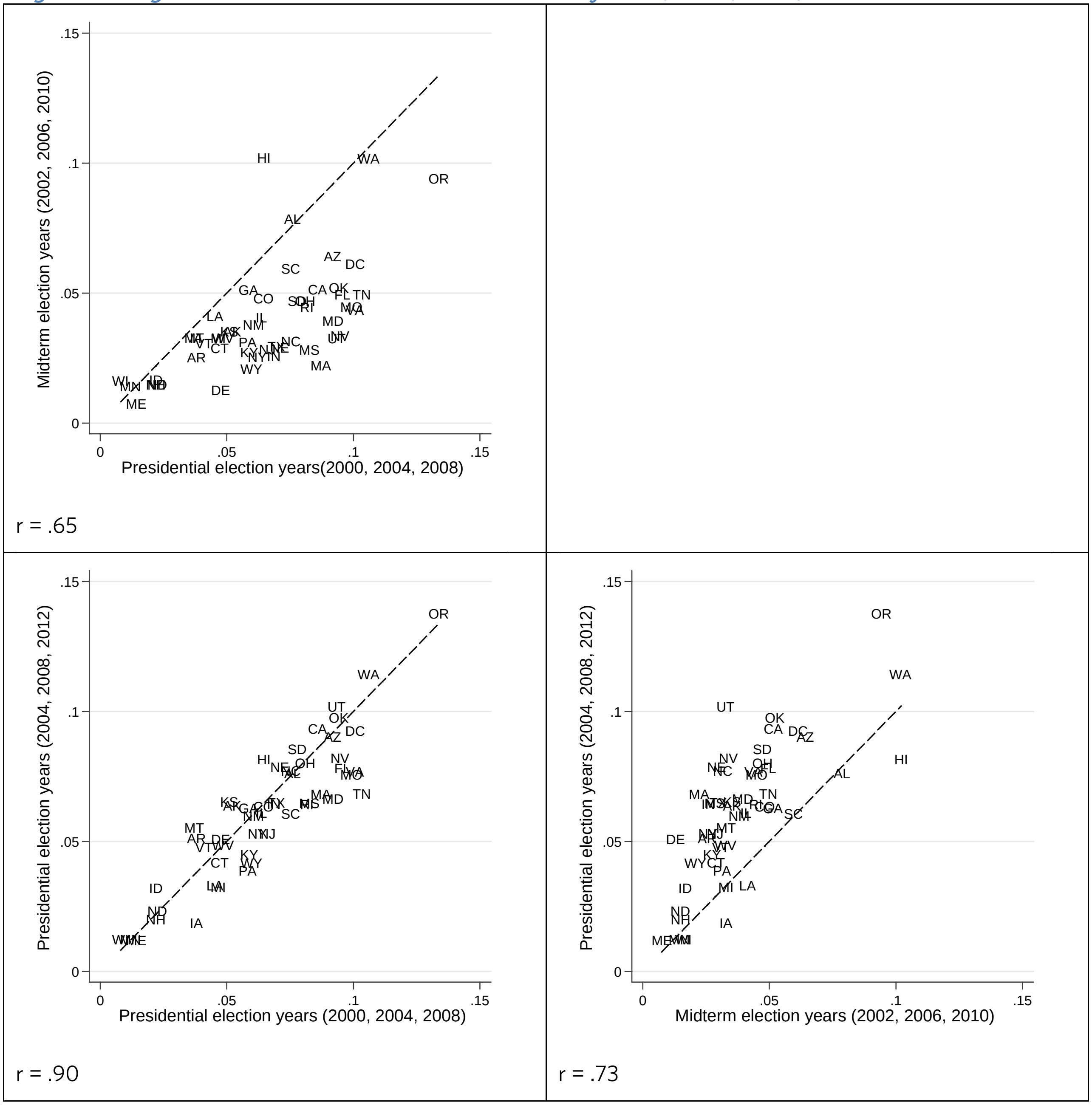
Year	2000	2002	2004	2006	2008	2010	2012
2000	1.000						
2002	0.452	1.000					
2004	0.370	0.634	1.000				
2006	0.287	0.533	0.319	1.000			
2008	0.390	0.295	0.349	0.578	1.000		
2010	0.205	0.462	0.526	0.473	0.318	1.000	
2012	0.432	0.454	0.457	0.528	0.254	0.381	1.000

The correlation coefficients between pairs of elections are moderately high, which suggests the underlying factor that is being measured by this indicator is stable within individual states; therefore, there is strong reliability to the measure. As a result, it may be prudent to consider combining data across years so that the reliability of the measure might be improved.

It is tempting to consider creating a single scale from this set of data because of the moderately high overall intercorrelations. However, comparing the *averages* for each year reveals that more nonvoters give the "registration problem" excuse in presidential election years (6.2 percent national average) than in midterm election years (3.7 percent national average). Consequently, a more prudent strategy is to treat presidential and midterm election years separately.

We created two scales from the data set, one consisting of the average rates for the three most recent presidential election years, and the other consisting of the average rates for the three most recent midterm election years. In the previous version of the EPI, we constructed the presidential election year measure using data from 2000, 2004, and 2008. For the current version, we dropped the data from the most distant presidential election year, 2000, and substituted data for the most recent year, 2012. Thus, we can examine two measures drawn from slightly different presidential election years, and one measure drawn from the most recent midterm election. Figure 23 shows the correlations across these three measures.

Figure 23 Registration or Absentee Ballot Problems by State, 2008, 2010, and 2012



Note: Dashed lines indicate where observations for the two years are equal.

The Pearson correlation coefficients quantifying these relationships range from 0.65 to 0.90, which are significantly higher than any of the coefficients in the correlation matrix shown in Figure 23, which rely on data from only one year. Not surprisingly, the intercorrelation among the two presidential election year data is the highest of all. By combining data across several election years for midterm and presidential elections, we are able to create measures in which random noise is reduced.

Registrations rejected

Data source: Election Administration and Voting Survey

Although in most states it is necessary to register ahead in order to vote, research into voter registration is in its infancy. As a consequence, it is not known how many rejected registration forms are the result of ineligible voters attempting to register and how many are eligible voters who are turned away because of errors made in filling out or processing their registration forms.

Regardless of why registrations are rejected, a state or county that rejects a large fraction of registrations must devote a greater portion of its limited resources to activities that do not lead to votes being counted. This can be particularly challenging as an election approaches, since most registrations are received and processed in the weeks leading up to an election, when election offices also must deal with many other tasks. If a locality has a high rate of rejected registrations because of administrative problems, the situation can lead to other problems such as people who mistakenly think they have registered. This, in turn, could lead to more provisional ballots being cast, longer lines at the polls, and greater confusion on Election Day.

Coding convention

Expressed as an equation, the registration rejection rate can be calculated as follows from the EAVS data set:

$$\textbf{Percent registrations rejected or invalid} = \frac{\textbf{Invalid or rejected (other than duplicates)}}{\textbf{Invalid or rejected (other than duplicates)} + \textbf{New valid registrations}}$$

Data will be missing if a county has failed to provide any of the variables included in the calculation. The data reported for an election year includes applications received from the close of registration for the November of the previous federal election until the close of registration for the election being analyzed. For instance, for the 2008 EAVS, the registration numbers include applications received from after the close of registration for the November 2006 election until the close of registration for the November 2008 election.

Table 22: Correspondence Between Variable Definition and EAVS Variable Names

Descriptive name	2008 EAVS	2010 and 2012 EAVS
Invalid or rejected (other than duplicates)	a5e	qa5e
New valid registrations	a5b	qa5b

Table 23: Data Availability, County Data

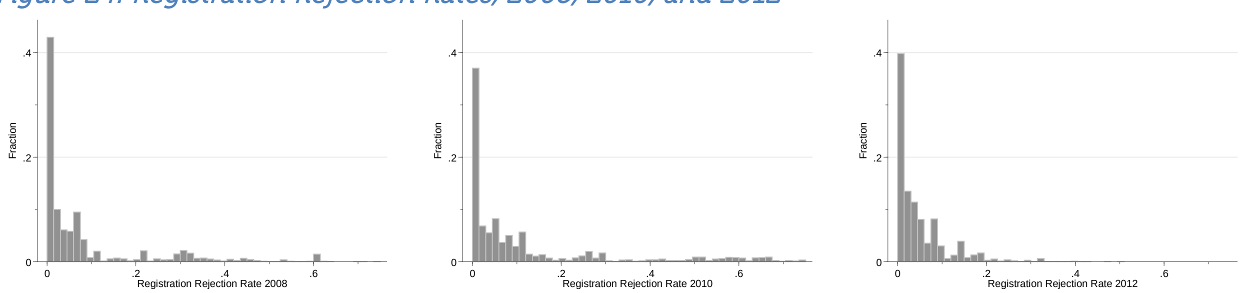
	2008 EAVS			2010 EAVS			2012 EAVS		
Descriptive name	Var. name	Missing cases, raw	Missing cases, weighted by registered voters	Var. name	Missing cases, raw	Missing cases, weighted by registered voters	Var. name	Missing cases, raw	Missing cases, weighted by registered voters
Invalid or rejected (other than duplicates)	a5e	1748 (38.36%)	1181 (26.33%)	qa5e	1,356 (29.31%)	1,338.52 (29.05%)	qa5e	1074 (23.23%)	829.59 (17.94%)
New valid	a5b	1218 (26.73%)	593.72 (13.24%)	qa5b	446 (9.6%)	390.14 (8.47%)	qa5b	59 (1.27%)	68.87 (1.49%)
Overall		1795 (39.39%)	1301.03 (29.00%)		1,358 (29.36%)	1,340.26 (29.09%)		1075 (23.25%)	829.63 (17.95%)

Because of missing data, it was not possible to compute registration rejection rates for the following: Arkansas, Arizona, California, Colorado, District of Columbia, Hawaii, Idaho, Kentucky, Massachusetts, Maryland, Missouri, Mississippi, New Hampshire, New Mexico, New York, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Washington, Wisconsin, West Virginia, and Wyoming (2008); Arizona, California, Connecticut, Florida, Hawaii, Idaho, Missouri, Mississippi, Nebraska, New Hampshire, New Mexico, New York, Oklahoma, Oregon, Rhode Island, South Carolina, Tennessee, Vermont, Washington, Wisconsin, and Wyoming (2010); and Alabama, Arkansas, Arizona, California, Connecticut, Georgia, Hawaii, Idaho, Kansas, Mississippi, New Mexico, New York, Oklahoma, Oregon, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, West Virginia, and Wyoming (2012). North Dakota has no voter registration and therefore was not included in this measure.

Stability of rejection rates across time

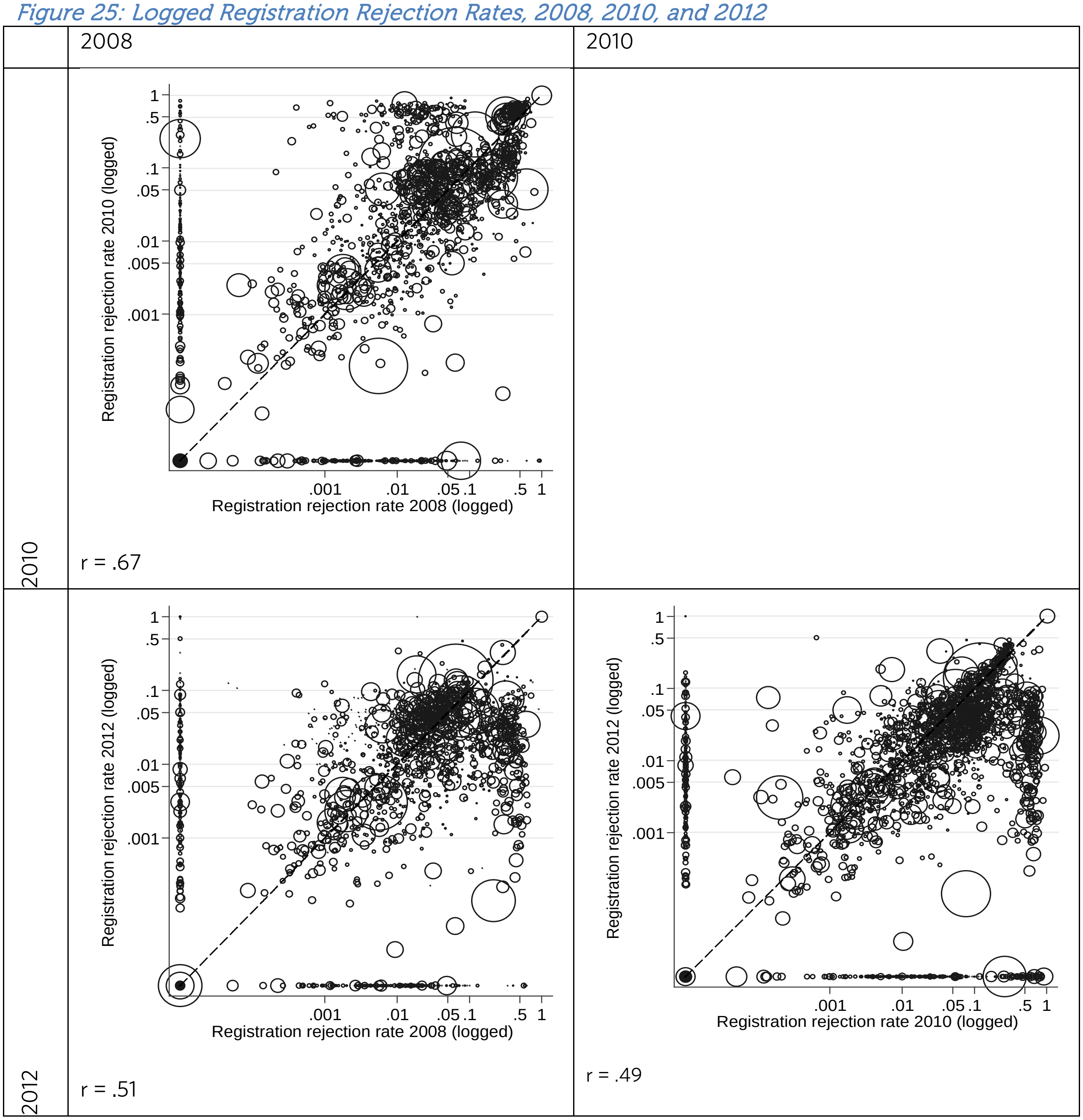
We begin by comparing registration rejection rates, measured at the county level, for 2008, 2010, and 2012. The three histograms in Figure 24 show the distribution of rejection rates for 2008, 2010, and 2012 for each county in the United States for which we have the relevant data.[41] The data exhibit what is known as a pronounced "right skew." That is, most counties have very low rejection rates (with a peak on the left of both histograms representing the large portion of counties with rejection rates at or near zero), while a few have relatively high rates (the small smattering of observations in the right-hand "tail" of each histogram).

Figure 24: Registration Rejection Rates, 2008, 2010, and 2012



Because of this pronounced right skew, any scatterplot that compares values across years will be misleading—the bulk of observations will be clumped around the origin, but the viewer's eye will be drawn to the small number of outliers with extremely large values. To deal with this pronounced right skew, we rely on the common practice of transforming the measures by taking logarithms. However, one problem this creates is that a large fraction of counties had zero rejected registration forms in each year, and the logarithm of zero is undefined. Therefore, in the scatterplot in Figure 25, counties with zero rejected registration forms have their rejection rate set to 0.00001, which is slightly below the lowest nonzero rejection rate that was actually observed. Finally, so that the influence of larger counties is visually greater than that of smaller counties, we weight the data tokens in proportion to the size of the county's registration activity.[42]

Figure 25: Logged Registration Rejection Rates, 2008, 2010, and 2012



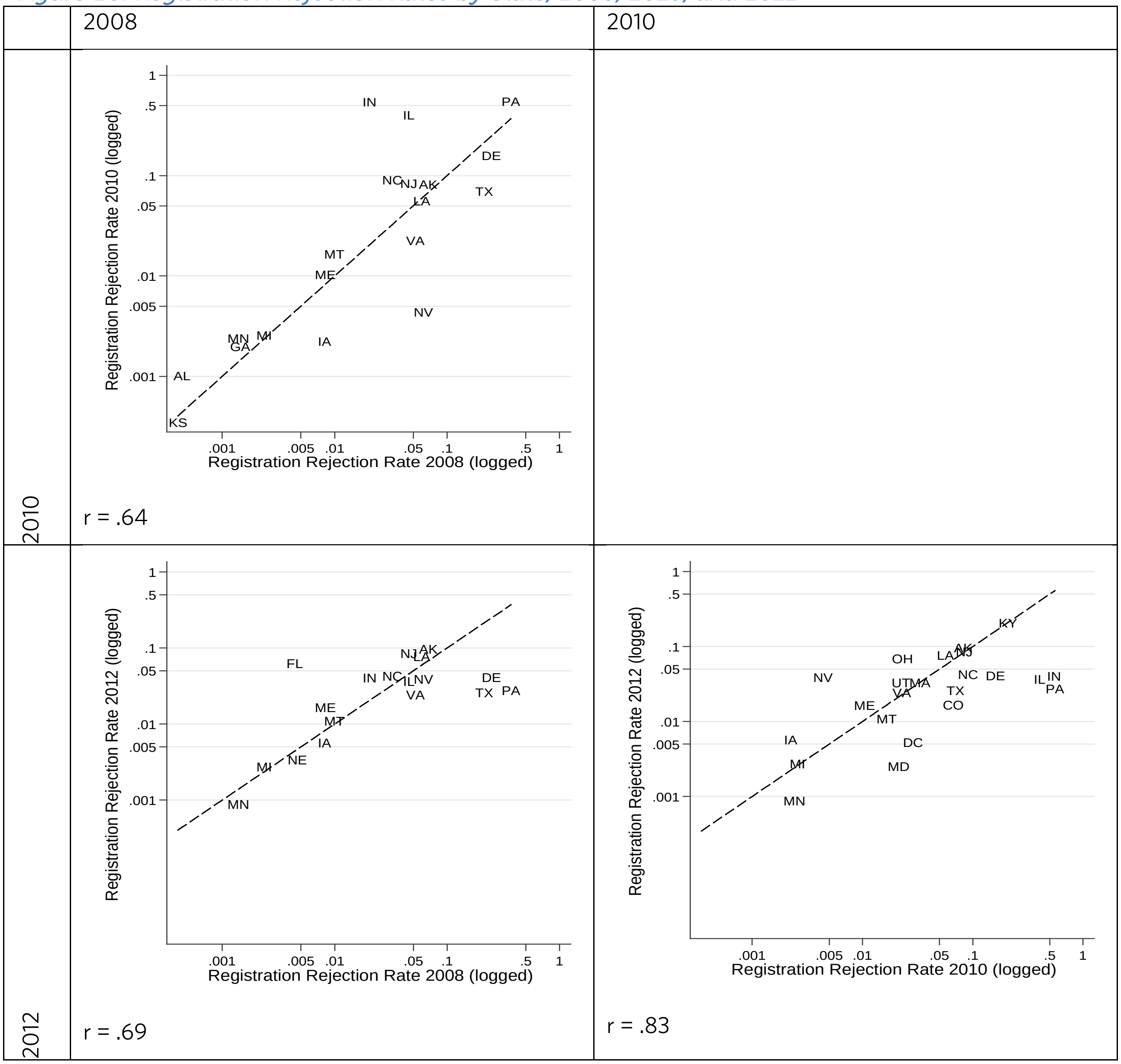
Note: Dashed lines indicate where observations for the two years are equal.

As these graphs illustrate, for counties that reported the data necessary to calculate rejection rates for 2008, 2010, and 2012, rejection rates are very similar across years. The Pearson correlation coefficient, which measures the degree of similarity across two election cycles, ranges from 0.49 to 0.67.[43]

These graphs also illustrate how counties that report zero rejections one election cycle often report a considerably greater rejection rate the next cycle. With rejection rates overall being relatively low (8.6 percent in 2008, 13.4 percent in 2010, and 6.1 percent in 2012), in many cases, the jump in rejection rate between years is simply because a county is very small. For example, a county that receives only 20 new registration applications per election cycle may easily reject none in 2008 but reject two, or 10 percent, in 2010. However, relatively large counties will sometimes report zero rejections in one election cycle and a relatively large number in the other cycle. This sort of pattern calls for further investigation and research. Until such research is conducted, this pattern alerts us to the need to be cautious when using data about the rejection rates of voter registration forms.

The EPI reports rejection rates at the state level. The statewide rejection rates are similarly right-skewed; therefore it is necessary to translate the rejection rates into logarithms before plotting the rejection rates against each other.[44]

Figure 26: Registration Rejection Rates by State, 2008, 2010, and 2012



Note: Dashed lines indicate where observations for the two years are equal.

The registration rejection measure calculated at the state level is very stable. Using the state rejection rates that have been translated into logarithms, the Pearson correlation coefficients describing the relationship across years range from 0.64 to 0.83.

Residual vote rate

Data source: state boards of elections

The controversies surrounding "hanging chads" and "butterfly ballots" after the 2000 election demonstrated to Americans how efforts to vote might be undermined by malfunctioning voting equipment or confusion induced by poor ballot design. The leading way to assess the accuracy of voting technology is using the residual vote rate, which measures votes that are "lost" at the point when ballots are cast for president. Efforts to improve the technology of voting should be evident by the reduction of the residual vote rate, the measurement in the Voting Technology Accuracy indicator.

The residual vote rate can be defined as the sum of over- and undervotes in a particular election, divided by the total number of voters who turned out. Pioneered by the Caltech/MIT Voting Technology Project, this measure has become a standard benchmark in assessing the overall accuracy of machines and documenting the improvement as old machines were replaced by new ones.[45] Although there are other measures of voting machine quality, there is presently no other widely used metric that can be applied uniformly throughout the country.

Coding convention

Expressed as an equation, the residual vote rate can be calculated as follows:

$$\textbf{Residual vote rate} = \frac{\textbf{Reported total turnout— Total votes counted}}{\textbf{Reported total turnout}}$$

The residual vote rate must be calculated with respect to a particular election. The only election that is comparable across the entire country is the race for president, so this indicator is based on the residual vote rate for the president. Therefore, it is calculated only for presidential election years. In midterm elections, there is too much variability, in terms of which races are atop the ticket in each state and in terms of the competitiveness of statewide races, to make the residual vote rate a valid interstate measure of voting machine accuracy.

The data were gathered for this measure from the official returns of state election offices. Two special considerations must be kept in mind in calculating this measure.

First, the residual vote rate can be calculated only if a state requires local jurisdictions to report turnout (the number of voters taking ballots in a particular election). In 2012, the most recent presidential election for which the residual vote rate has been calculated, four states were excluded for this reason: Mississippi, Missouri, Pennsylvania, and Texas. Connecticut also was excluded because its turnout report yielded implausible residual vote rates.

Second, the residual vote rate can be influenced by whether states publish tabulations of write-in votes. States that allow but do not publish write-in votes for president can have a higher residual vote calculated for them than is warranted. Therefore, special care was taken to ensure that write-in votes were included in the residual vote calculations reported here.

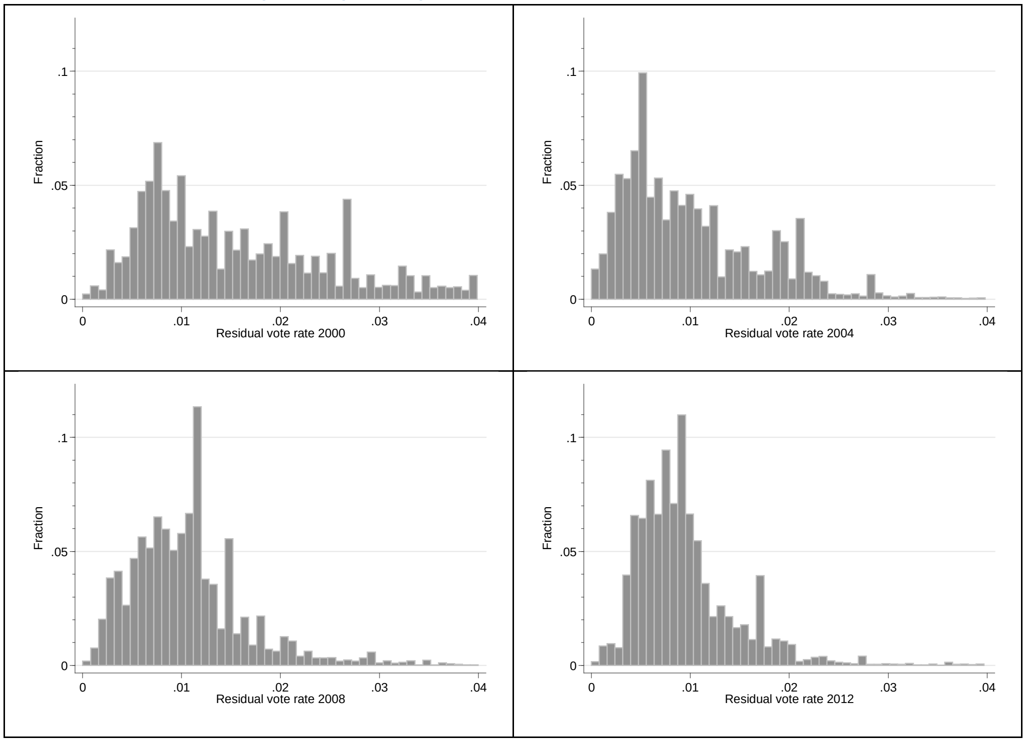
The most serious criticism of the residual vote rate is that it conflates undervotes caused by conscious abstention and inadvertent mistakes. Based on research utilizing various data sources, it appears that 0.5 to 0.75 percent of voters abstain from voting for the office of president each presidential election cycle.[46] The statewide residual vote rate has rarely dipped below 0.5 percent; six states and the District of Columbia had residual vote rates below this benchmark in both 2008 and 2012, for instance.

Finally, in calculating the residual vote rate for a state, counties that reported more votes for president than total turnout were excluded.

Stability of residual vote rates across time

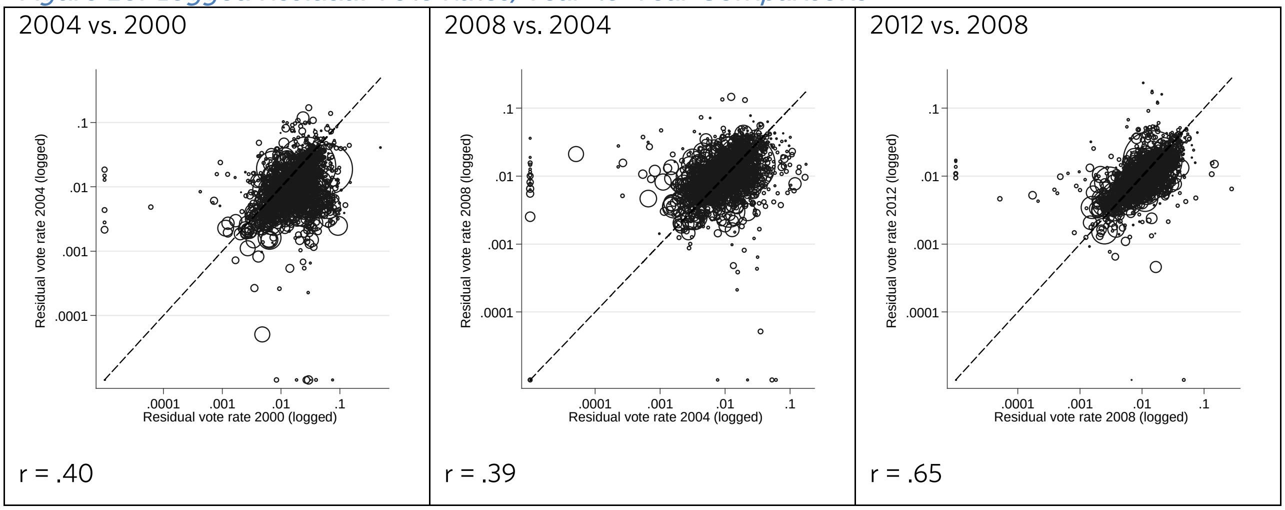
We begin by comparing residual vote rates, measured at the county level, for 2000, 2004, 2008, and 2012. The raw data exhibit a pronounced right skew. That is, most counties have very low residual vote rates, while a few have relatively high rates. This is illustrated in the four histograms in Figure 27, which show the distribution of residual vote rates in 2000, 2004, 2008, and 2012 for each county for which we have the relevant data.[47]

Figure 27: Residual Vote Rate, 2008, 2010, and 2012



Because of this pronounced right skew, any scatterplot that compares values from one year to another will be misleading—the bulk of observations will be clumped around the origin, with our eye drawn toward the small number of outliers with extremely large values. To deal with this pronounced right skew, it is common to transform the measures by taking logarithms. One problem this creates is that some counties (especially small ones) had zero residual votes in particular years, and the logarithm of zero is undefined. Therefore, in the scatterplot in Figure 28, counties with zero residual votes have been set to 0.00001, which is slightly below the lowest nonzero residual vote rate that was actually observed. Finally, so that the influence of larger counties is visually greater than that of smaller counties, we weight the data tokens in proportion to the size of the county.[48]

Figure 28: Logged Residual Vote Rates, Year-to-Year Comparisons

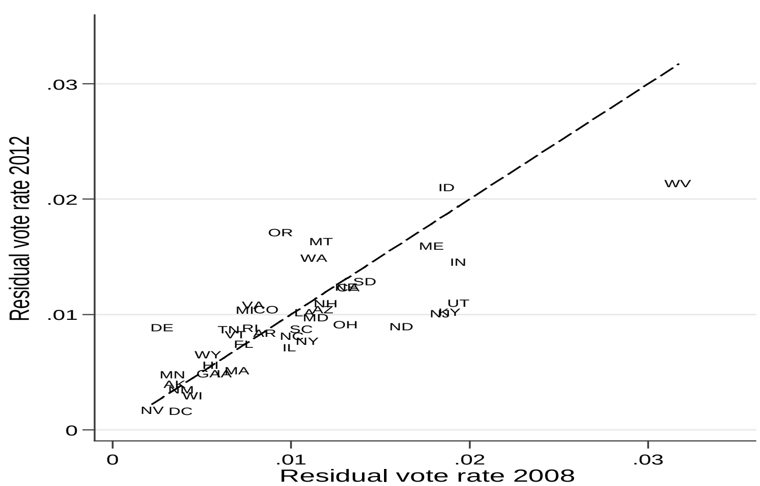


Note: Dashed lines indicate where observations for the two years are equal.

As Figure 28 illustrates, for counties that reported the data necessary to calculate residual vote from 2000 to 2012, residual vote rates are related to a moderate degree from one election to the next. The correlation in rates between 2012 and 2008 is much greater than in the past two election pairs, which likely reflects the fact that localities have settled into a stable set of voting machines, following the rapid upgrading of machines immediately after the 2000 presidential election.[49]

The EPI reports residual vote rates at the state level. The statewide residual vote rates are not especially right-skewed; therefore, the following plot represents the comparison of residual vote rates using raw percentages rather than logged ones.

Figure 29: Statewide Residual Vote Rates, 2008 and 2012



Note: Dashed lines indicate where observations for the two years are equal.

As with the measures calculated at the county level, the indicator calculated at the state level is fairly stable when we compare 2012 with 2008. The Pearson correlation coefficient describing the relationship across the two years is 0.77.

Turnout

Data source: United States Elections Project website (http://elections.gmu.edu)

Perhaps the most highly visible measure of the health of elections is the turnout rate—that is, the percentage of eligible voters who vote. A very large body of academic literature exists on the factors that cause turnout rates to rise and fall, the classic study being *Who Votes?* by Raymond E. Wolfinger and Steven J. Rosenstone.[50] The most powerful predictors of who will turn out are demographic, most notably education and income. However, the presence of certain registration laws has been shown to affect turnout, as demonstrated by Wolfinger and Rosenstone and those who have followed in their footsteps.

Coding convention

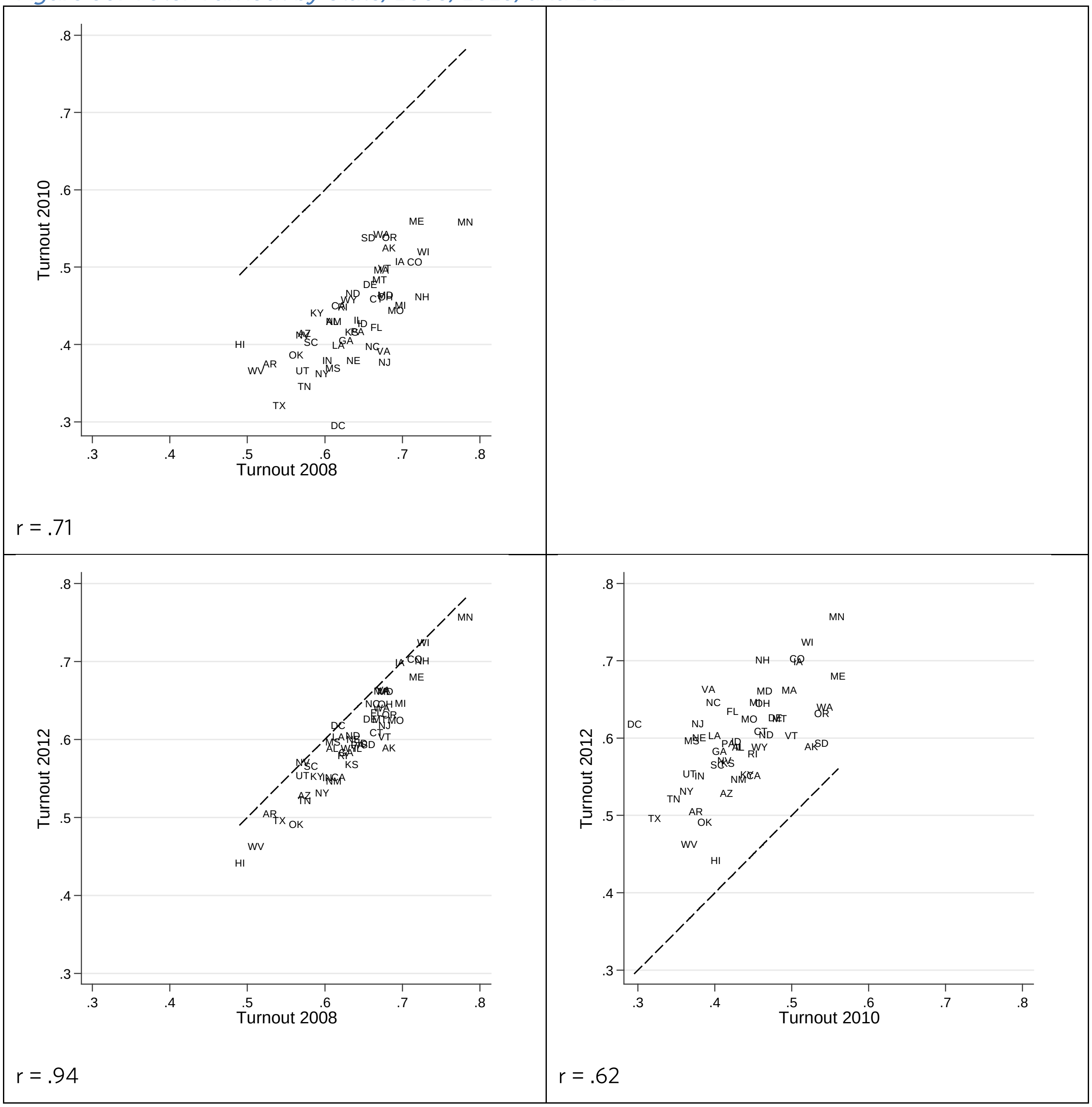
This indicator is based on data collected by George Mason University's Michael McDonald and reported on the United States Elections Project website. The measure of the numerator, turnout, is based on one of two factors. First, for states that report actual turnout, this figure is used. For states that do not report actual turnout, turnout is estimated by taking the number of votes cast for the statewide office receiving the most votes in an election. In presidential election years, this is almost always the presidential election. In midterm election years, this is most often the gubernatorial or U.S. Senate election.

The denominator is *voting-eligible population,* or VEP, as calculated by McDonald. VEP is an improvement on the *voting-age population,* or VAP, which has long been reported by the Census Bureau. While VAP has the virtue of being easily calculated from Census Bureau reports, it is flawed because it includes individuals of voting age who are ineligible to vote, notably convicted felons (in most states) and noncitizens (in all states). Failure to account for ineligible voters among the voting-age population causes the turnout rate to be depressed, because the denominator is too large.[51]

Stability of turnout rates across time

The graphs in Figure 30 show the turnout rate for all states in the 2008, 2010, and 2012 elections plotted against each other.

Figure 30: Voter Turnout by State, 2008, 2010, and 2012



Note: Dashed lines indicate where observations for the two years are equal.

The Pearson correlation coefficients quantifying the relationship of turnout over time are quite high, especially when we compare presidential elections.

Voter registration rate

Data source: Voting and Registration Supplement of the Current Population Survey

In nearly every state, the most basic requirement for voting, once age and citizenship requirements have been met, is registering to vote. Voter registration started becoming common in the late 19th century but often applied only to larger cities and counties in a state. By the 1960s, however, universal registration requirements had become the norm across the United States. Today, only North Dakota does not require voters to register, although it maintains a list of voters, to help with the administration of elections.

If being registered to vote is a prerequisite to voting, then the percentage of eligible voters on the rolls is an important measure of the accessibility of voting. Registration rates vary across the states due to a combination of factors, related to the demographic characteristics of voters and to state registration laws. Although registration is necessary for most Americans to vote, little academic research has been done explaining why individuals register to vote; most studies focus on why registered voters turn out. An important exception is research by Glenn Mitchell and Christopher Wlezien.[52] Their study confirms that the factors influencing turnout are very similar to those influencing registration. Another study finds that the act of registration itself may stimulate turnout;[53] therefore, it is not surprising that the same factors will be found to influence both.

One factor hindering the direct study of voter registration rates, as opposed to using turnout as a proxy, is the inflated nature of voter registration lists. Official lists tend to overreport the number of registered voters because of the lag between the time when registered voters die or move out of state and when those events are reflected in the voter rolls. States differ in their method and frequency of removing dead registrants from the rolls, and many states do not have effective methods for definitively identifying voters who move out of state.[54]

The failure to immediately remove registered voters who have moved or died means that not only will registration rolls generally contain more names than there are actual registrants in a state, but the degree to which the rolls contain "deadwood" will depend on the frequency and diligence of registration roll maintenance across states. The number of people on voter registration rolls will sometimes exceed the number of eligible voters in a state. In the 2012 National Voter Registration Act report issued by the EAC, for instance, the District of Columbia reported more active registrants than the estimated eligible population; and Alaska, California, and Michigan had overall registration rates that exceeded 100 percent, if inactive registrants were included (Table 1d in the NVRA report).

Because of the high variability in the manner in which voter registration lists are maintained, an alternative technique was used to estimate voter registration rates, relying on responses to the Voting and Registration Supplement of the Current Population Survey. As shown below, registration rates calculated using the VRS are more stable over time than those calculated using official state statistics. This does not overcome the problem of overestimating registration rates due to inaccurate responses. However, under an assumption that respondents in one state are no more likely to misreport their registration status than residents of any other state, the registration rates calculated using the VRS are more likely to accurately reflect the relative registration rates across states than are the rates calculated using official reports.[55]

Coding convention

This indicator is based on responses to the VRS of the Census Bureau's CPS. It is based on a combination of three variables:

- **PES1:** In any election, some people are not able to vote because they are sick or busy or have some other reason, and others do not want to vote. Did (you/name) vote in the election held on Tuesday, [date]?
- **PES2: [Asked of respondents who answered no to PES1]** (Were you/Was name) registered to vote in the (date) election?
- **PES3: [Asked of respondents who answered no to PES2]** Which of the following was the MAIN reason (you/name) (were/was) not registered to vote?

Registered voters are those who answered yes to PES1 or PES2 (the latter if the respondent answered no to PES1). In addition, respondents were removed from the analysis if they answered "not eligible to vote" to PES3 as they reason they were not registered.[56]

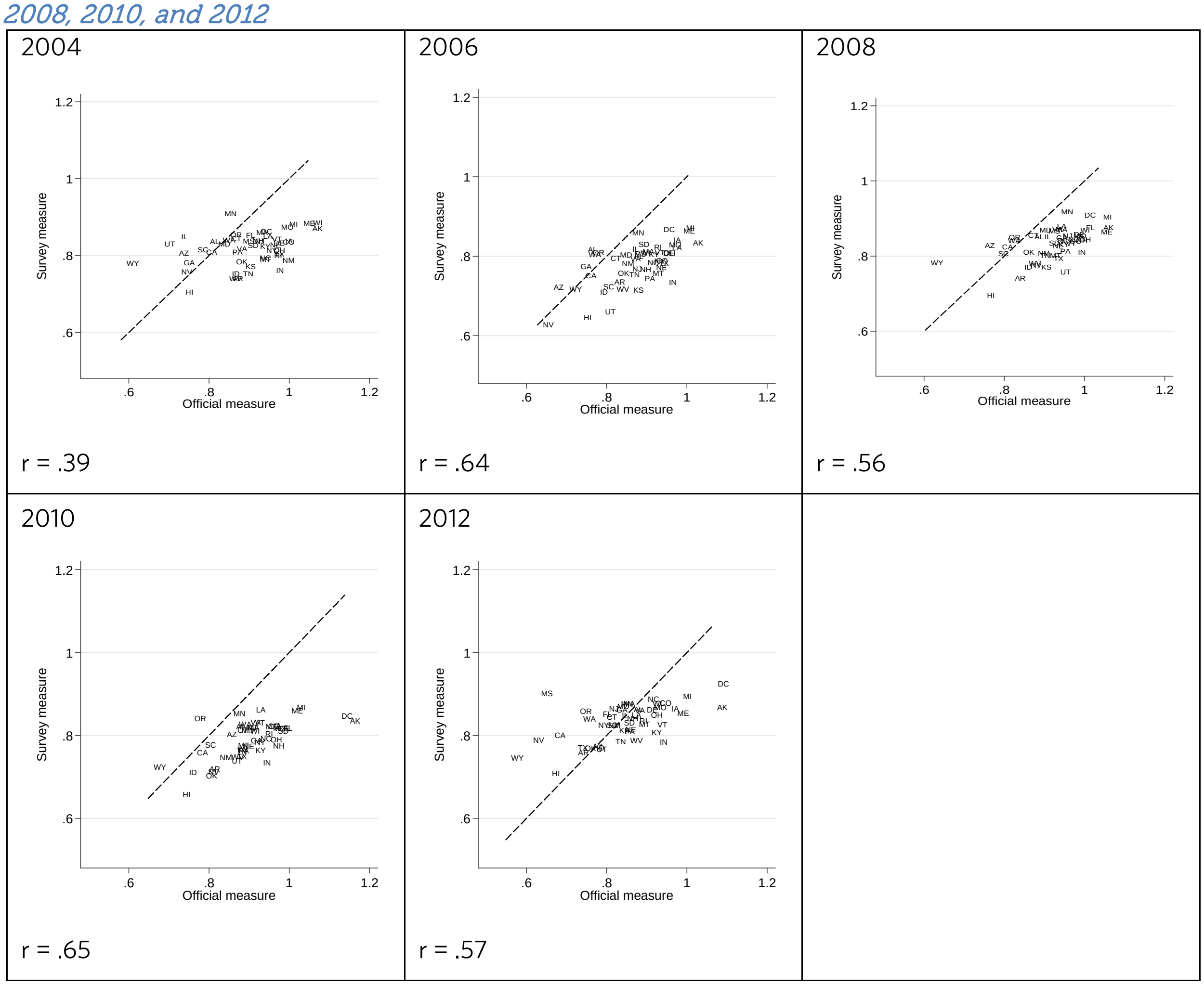
Using the combined answers to these three questions allows one to estimate the percentage of eligible voters in each state who are registered. North Dakota has been removed from this measurement because its citizens are not required to register in order to vote.

Comparison of survey-based registration rates with official rates

We first compare the registration rates calculated from the VRS with rates calculated from official registration rolls. The 2012 EAC National Voter Registration Act report contains an appendix that lists registration statistics from 1992 to 2012, based on state reports derived from their own registration records. The registration statistics we use here are from the "Registration Reported" column of Table 1a in the NVRA report ("Registration History"). The registration rate is calculated by dividing this number by the estimated voting-eligible population reported on the United States Elections Project website.[57]

Figure 31 compares the VRS estimates (y-axis) of registration rates with the official reports' (x-axis). Below each graph is a report of the respective Pearson correlation coefficients for 2004, 2006, 2008, 2010 and 2012.

Figure 31: Comparison of Estimated Versus Official Voter Registration Rates by State, 2004, 2006, 2008, 2010, and 2012



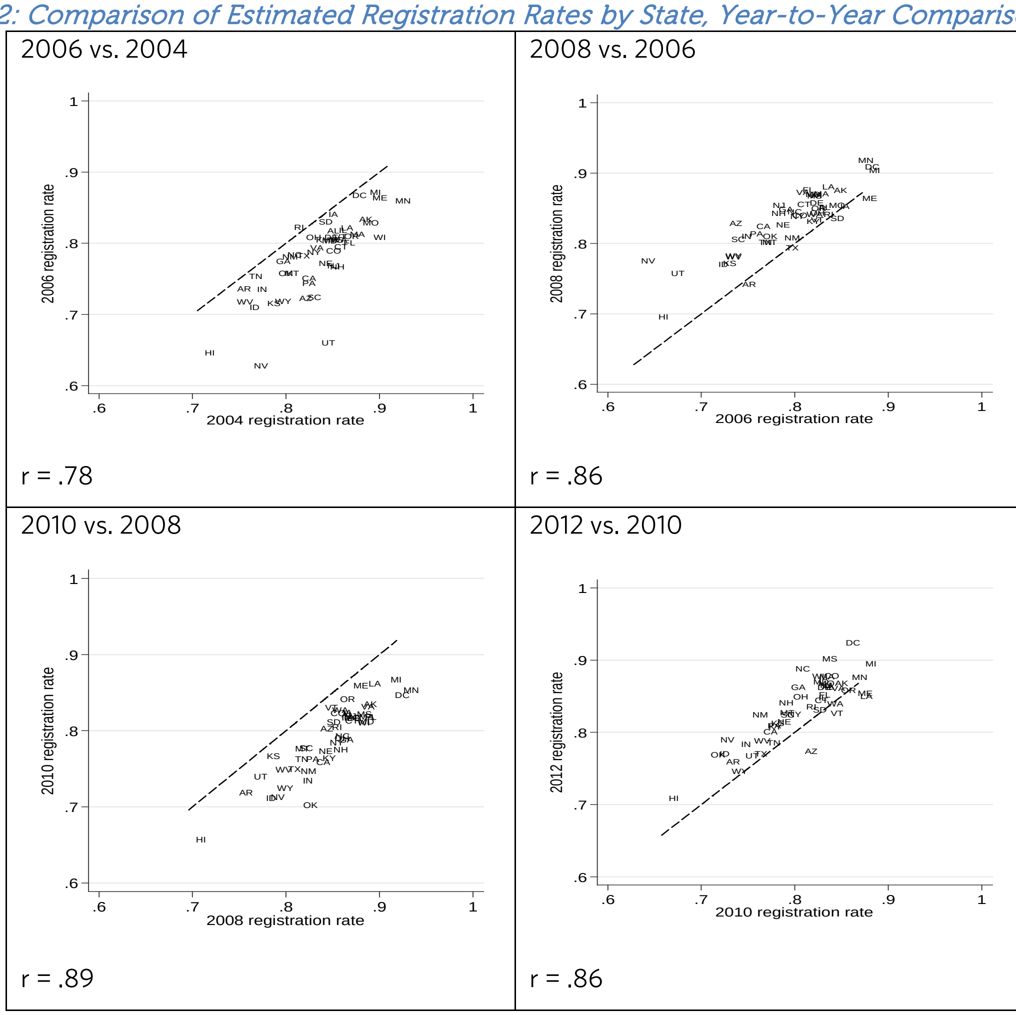
Two things are notable from these relationships. First, the correlations between the two methods of estimating registration rates are higher for midterm election years than for presidential election years. Second, on the whole, estimated registration rates using the VRS are lower than the rates derived from official sources, by 5 to 9 percentage points, on average. If self-reported turnout rates in surveys tend to overreport actual turnout rates, the fact that official registration rates are generally greater than survey-derived registration rates is strong evidence that the actual percentage of eligible voters is significantly below the nationwide 78.7 percent registration rate reported in Table 1c of the 2010 NVRA report.[58]

The significant correlation between the VRS estimate of voter registration rates and the registration rates calculated from the official rolls suggests that each method, in some way, captures the underlying, actual registration rate in each state. These correlations could justify an alternative method of rank-ordering states on their registration rates by taking an average of the two rates, after normalizing the measures to put them on a common scale. That method has not been chosen here, due to a desire to keep the indicator relatively simple.

Stability of registration rates across time

Figure 32 show the estimated registration rate (using the VRS data) for all states across two adjacent election cycles. Below each graph is the corresponding Pearson correlation coefficient quantifying this relationship.

Figure 32: Comparison of Estimated Registration Rates by State, Year-to-Year Comparisons



Note: Dashed lines indicate where observations for the two years are equal.

The high interyear correlations show that this method produces estimates of voter registration rates that are reliable across time.

Voting information lookup tools available

Data sources: Pew's "Being Online Is Not Enough" (2008), "Being Online Is Still Not Enough" (2011), and "Online Lookup Tools for Voters" (2013)

Americans are increasingly incorporating the Internet into their daily lives; elections are no exception. These indicators measure whether citizens can find the official election information they need online. Websites that quickly and easily deliver the information citizens seek about an upcoming election can improve the voting experience and ease the burden placed on election officials' limited resources.

For 2008, this indicator combines two measures: whether state election sites have voter registration verification and whether they have polling place locators. Both indicators are binary in nature and can be summed to create a score ranging from a minimum of 0 to a maximum of 2. For a state to receive credit for having any website tool, the resource must be a statewide tool available through an official state website such as the secretary of state's, and it must have been available before the 2008 election.

In 2010, Pew expanded its examination of online tools to five measures, including the two from 2008 (voter registration verification and polling place locators). The new measures were whether state election sites let voters see their precinct-level sample ballots, whether absentee voters can check their ballot status online, and whether voters issued provisional ballots can check their ballot status online. The five indicators are binary and can be summed together to create a score ranging from 0 to 5. As in 2008, for a state to receive credit for having any website tool, the resource must be a statewide tool available through an official state website such as the secretary of state's, and it must have been available before the 2010 election.[59]

Voting wait time

Data source: Survey of the Performance of American Elections

The time voters wait to cast ballots is a highly visible measure of voting convenience. Although long lines can indicate excitement surrounding an election, significant variation in polling place lines across communities can suggest the presence of factors that make it easier or harder for some to vote.

Coding convention

Respondents to the 2008 and 2012 Survey of the Performance of American Elections were asked: "Approximately how long did you have to wait in line to vote?" Answers to the question are given as intervals by respondents. We recode the responses to the midpoint of the respective interval, using the following mapping:

Table 24: Wait Time to Vote Categories

Survey code	Category	Recoded as
1	Not at all	0 minutes
2	Less than 10 minutes	5 minutes
3	10 to 30 minutes	20 minutes
4	31 minutes to 1 hour	45 minutes
5	More than 1 hour	See below
6	Don't know	Missing

The survey contained an open-ended question for those answering "more than 1 hour," requesting the respondent to supply the exact amount of time spent waiting in line. For those who supplied an exact time, we recoded the response to reflect the exact time. For the remaining respondents, we recoded the waiting time answer to be the mean of all the respondents who gave the "more than 1 hour" answer in that particular election year.

Reliability of the measure

Reliability pertains to the ability of a measure to be estimated consistently, when measured at different times or using different methods. The SPAE was first conducted for the 2008 presidential election; it was not conducted for the 2010 midterm election, so the ability to test the reliability of the measure using only the SPAE is limited. Because of the policy interest in the length of waiting times at the polls, we have used other data sources, in addition to the SPAE, to gauge the reliability of this measure.

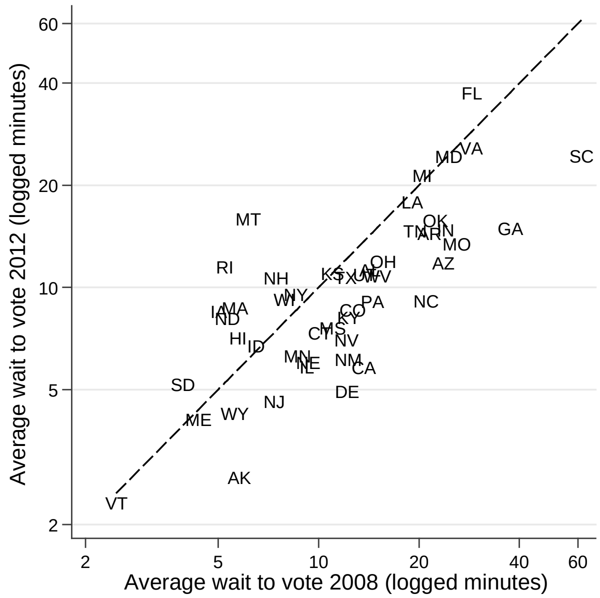
The "waiting time" question was originally asked on the 2006 Cooperative Congressional Election Study, or CCES, and asked again in 2008 and 2012. This allows us to use responses to the CCES to augment our exploration of this measure's reliability.

We begin with the SPAE responses in 2008 and 2012.

The average wait time to vote exhibits a strong right skew for both 2008 and 2012. Because of the right skew in the distribution of wait times, any scatterplot that compares 2012 values with 2008 values will be misleading—the bulk of observations will be clumped around the origin, with our eye drawn toward the outliers with extremely large values. To deal with this right skew, it is common to transform the measures by taking logarithms.

Figure 33 shows the scatterplot among states from the 2008 and 2012 SPAE wait time estimates, plotting the variable on log scales.[60]

Figure 33: Elections Wait Time Estimates by State, 2008 and 2012

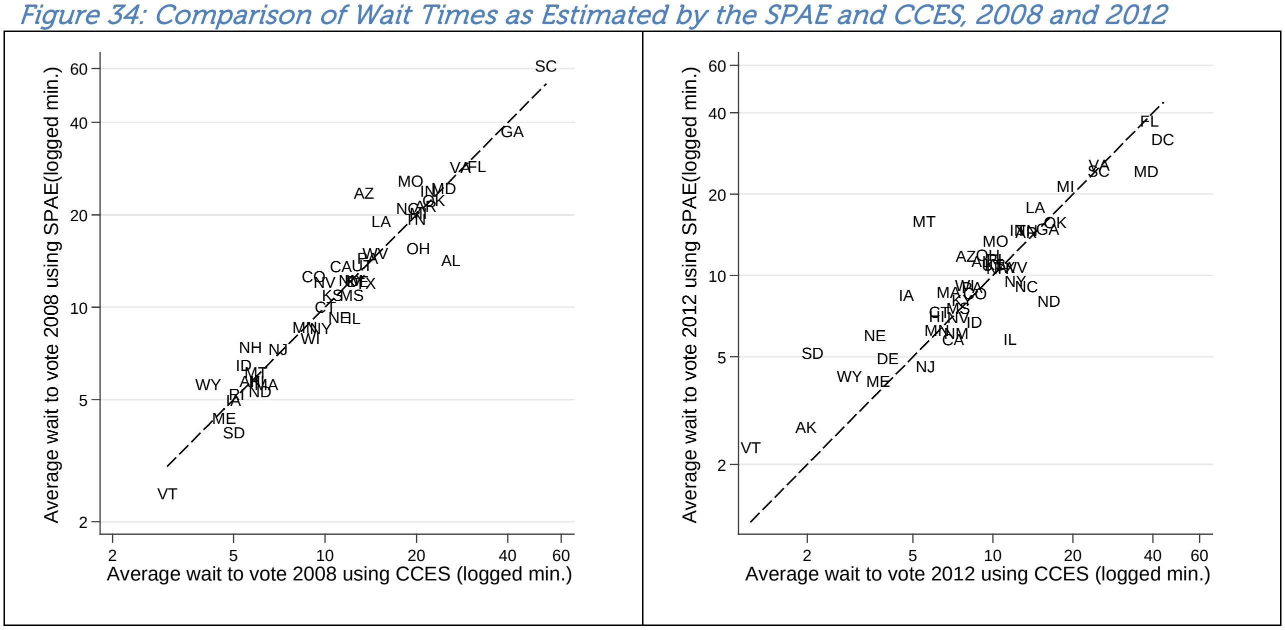


Note: Dashed lines indicate where observations for the two years are equal.

The Pearson correlation coefficient describing the relationship between the two years is 0.75 once the variables have been transformed by taking logarithms, and 0.71 before the transformation. Thus, there is a strong relationship between wait times to vote in the 2008 and 2012 presidential elections.

The wait time question was also asked in the 2008 and 2012 CCES, which allows us to compare results obtained across two different surveys (the SPAE and the CCES) at the same time. The scatterplots in Figure 34 show the different estimates from these two surveys, again after taking the logarithm of both variables.

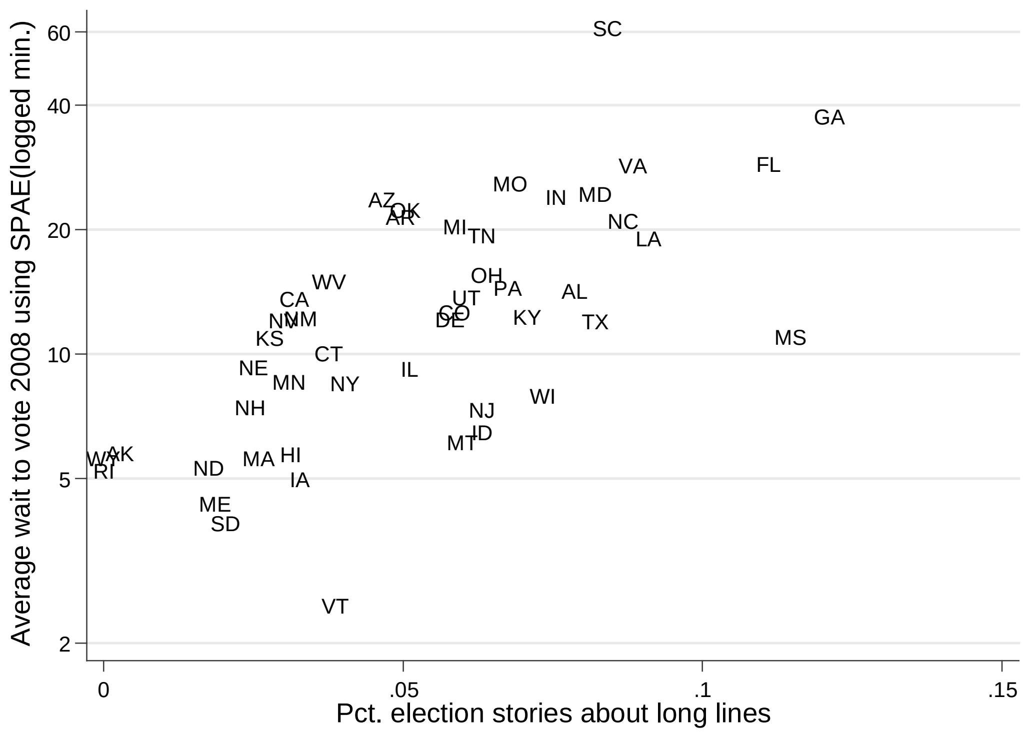
Figure 34: Comparison of Wait Times as Estimated by the SPAE and CCES, 2008 and 2012



The Pearson correlation coefficients describing the relationship between the methods are 0.96 for 2008 and 0.89 for 2012 once the variables have been transformed by taking logarithms, and 0.95 and 0.92, respectively, before the transformation. On the whole, average waiting times are quite similar in the two surveys.

An entirely independent measure of waiting times was provided in 2008 by Michael Peshkin on his website VoteBackHome, which used Google News to count the number of press accounts concerning long polling place lines in each state.[61] Peshkin wrote a program that aggregated all of the news stories about "voters" that appeared on Election Day, and then had the program count the number of articles that mentioned "long lines." The following graph shows the relationship between the logged SPAE estimates of the average wait to vote in each state plotted against Peshkin's estimate of the percentage of election news stories in each state that mentioned long lines.

Figure 35: Logged Average Wait Time Using SPAE Data, 2008



The correlation between these two measurements is quite high: r = 0.67 for the logged values of wait time and r = 0.61 for the raw wait time. South Carolina is a clear outlier, at least in terms of the average wait time. However, it is not an outlier if we look at the rank ordering of states along the two measures; it is in the top 10 in both wait time and election stories about wait time. (The Spearman rank-order correlation coefficient is 0.69.)

The consistency of results across years and across different survey efforts is evidence of the validity of the question.

Validity of the measure

Average wait time is one measure of the ease of voting. On its face, the less time a voter waits to cast a ballot, the more convenient the experience.

However, one issue that might challenge the validity of this measure is whether survey respondents correctly recall how long they waited in line to vote. Thus far, there have been no studies that relate perceived time waiting in line with actual waiting time. However, the psychological literature on time perception is considerable. McMaster University Professor Lorraine Allan's 1979 literature review on time perception concluded that, in general, the relationship between perceived and actual time is linear, although the actual parameters describing the relationship vary across settings.[62] These results suggest that respondents who report waiting in line longer actually did wait in line longer, and that the averages of self-reported waiting times of different groups (race, sex, state of residence, etc.) in the survey are likely to reproduce the same relative ranking of the waiting times that were actually experienced by members of those groups.

Appendix: Advisory group

The members of the advisory board were instrumental in thinking through how to create the Elections Performance Index. However, neither they nor their organizations necessarily endorse its findings or conclusions.

James Alcorn, former deputy secretary, Virginia State Board of Elections (2010-12)

Pam Anderson, clerk and recorder, Jefferson County, CO (2010-12)

Stephen Ansolabehere, professor of government, Harvard University (2010)

Barry Burden, professor of political science, University of Wisconsin, Madison (2010-13)

Matthew Damschroder, director of elections, Ohio Secretary of State's Office (2010-11)

Lori Edwards, supervisor of elections, Polk County, FL (2013)

Heather Gerken, professor of law, Yale Law School (2010-13)

Paul Gronke, professor of political science, Reed College (2010-13)

Carder Hawkins, former director of elections, Arkansas Secretary of State's Office (2010-11)

Kevin Kennedy, director and general counsel, Wisconsin Government Accountability Board (2010-13)

David Kimball, professor of political science, University of Missouri, St. Louis (2013)

John Lindback, executive director, Electronic Registration Information Center (2010-13)

Dean Logan, registrar-recorder/county clerk, Los Angeles County (2010-13)

Christopher Mann, assistant professor of political science, University of Miami (2010-12)

Joseph Mansky, elections manager, Ramsey County, MN (2010-13)

Conny McCormack, elections consultant (2010-12)

Ann McGeehan, former director of elections, Texas Secretary of State's Office (2010-12)

Brian Newby, election commissioner, Johnson County, KS, Election Office (2013)

Don Palmer, secretary, Virginia State Board of Elections (2013)

Tammy Patrick, federal compliance officer, Maricopa County, AZ, Elections Department (2010-13)

Nathaniel Persily, professor of law and political science, Columbia Law School (2010-12)

Peggy Reeves, director of elections, Connecticut Secretary of the State's Office (2013)

Angie Rogers, commissioner of elections, Louisiana Secretary of State's Department (2013)

Kathleen Scheele, director of elections, Vermont Secretary of State's Office (2010-12)

Daron Shaw, professor of political science, University of Texas, Austin (2013)

Robert Stein, professor of political science, Rice University (2010-12)

Charles Stewart III, professor of political science, Massachusetts Institute of Technology (2010-13)

Daniel Tokaji, associate professor of law, Ohio State University, Moritz College of Law (2010)

Kimberley Wyman, secretary of state, Washington (2010-12)

Endnotes

[1] Heather K. Gerken, *The Democracy Index: Why Our Election System Is Failing and How to Fix It* (Princeton, N.J.: Princeton University Press, 2009).
[2] In doing this brainstorming, it immediately became apparent that some indicators could arguably occupy different cells of the table.
[3] Environmental Performance Index, http://epi.yale.edu.
[4] County Health Rankings & Roadmaps, http://www.countyhealthrankings.org.
[5] The World Justice Project Rule of Law Index, http://worldjusticeproject.org/rule-of-law-index.
[6] The Doing Business Project, http://www.doingbusiness.org.
[7] Kids County Data Center, http://datacenter.kidscount.org.
[8] In developing the EPI, the issue of using other aggregation methods was explored with the advisory committee. Among these were methods that gave different weights to different indicators, and methods based on data reduction techniques such as factor analysis. In the end, it was decided that a method that relied on simple averages was the most robust and straightforward. Having all indicators contribute an equal influence to the overall rating is the cleanest approach. It is also the clearest to implement when the data consist of a nontrivial amount of missing data. As the science of election administration develops a more robust empirical basis, and as data collection becomes more complete, there may come a time when the accumulated knowledge could guide alternative approaches to aggregating the data into a bottom-line index number, or even separating out indicators into subindices.
[9] As a general matter, we adopted the following rule to decide whether a state would be regarded as missing for the purpose of reporting the value of an indicator: A state was included only if the counties reporting the data necessary to calculate the indicator constituted at least 85 percent of the registered voters in the state. (For North Dakota, which does not have voter registration, we substituted the voting-age population of counties.) We picked the 85 percent threshold to ensure that if we were to include data from counties that did not report the necessary data, the overall result for the state would change by only a small amount. In other words, we are confident that the statistics reported here are not overly influenced by the inclusion or exclusion of counties due to concerns about missing data. For states with more than 15 percent missing data (weighted by county registration), we concluded it would be better to exclude them from the presentation than to report an estimated value for these states that was subject to significant revision if the missing data were presented.
[10] The primary alternative to this approach that we considered was to rank all states for which we had data and then place those states missing data immediately below the state with the lowest ranking. We decided against this strategy for two reasons. First, to do so would overly weight the consideration of missing data in the index. The EPI already has one indicator of the completeness of election administration data that was reported, and it seemed excessive to have this measure intrude into the other measures. Second, after simulating different results that varied different rules about handling states with missing data, we discovered that placing states with missing data tended to elevate the ranking of states with a lot of missing data, which would entirely undo the effect of the data-completeness measure.
[11] This is a change since the last iteration of the EPI. In the last version, we normalized values over 2008 and 2010, however given that midterm and presidential election years behave differently, it made sense to change the scale. Consequently, some of the 2008 and 2010 overall EPI averages and rank order of states may be slightly different from in the last release.
[12] A high percentage of respondents are "informants," that is, respondents within a household who report about the voting behavior of the individual in question.
[13] Government Accountability Office, *Voters With Disabilities: Additional Monitoring of Polling Places Could Further Improve Accessibility*, GAO-09-941 (September 2009), http://www.gao.gov/assets/300/296294.pdf.
[14] In addition to the following categories, there are provisions in the data for "no response," "refused," "don't know," and "blank or not in universe."
[15] Based on weighting by variable PWSSWGT, which is the "final weight" given to each individual in the survey and is constructed to be proportional to the inverse probability of being included in the survey. Percentages are based on respondents who gave one of these answers, excluding those who refused or said they did not know, did not respond, or were not in the sample universe.
[16] Because of the relatively small number of disabled nonvoters in each states, this statement is less likely to be true if we confine this analysis to just one year's worth of data.
[17] These figures are taken from the 2012 *Election Administration and Voting Survey Report* issued by the U.S. Election Assistance Commission, Table 33C. The percentages quoted here for rejection rates due to late arrival and signature problems are clearly underestimates, because more than half of rejections are attributed to an "other" or "not categorized" category.

[18] The counties have been weighted by the number of general election participants.
[19] According to the *2012 Election Administration and Voting Survey* issued by the Election Assistance Commission, at least 1.4 percent of rejected provisional ballots were because the voter had already voted. The actual percentage is likely much higher because fewer than one-third of counties report provisional ballot rejections for this reason.
[20] The counties have been weighted in proportion to their size or the total ballots mailed.
[21] The correlation coefficient was calculated on the logged values, weighting each county by the number of absentee ballots mailed out.
[22] The average county with no unreturned absentee ballots in 2008 mailed out 323 absentee ballots; the average county overall mailed out more than 6,700. The average county with no unreturned absentee ballots in 2010 mailed out only 25 absentee ballots; the average county overall mailed out more than 5,000. The average county with no unreturned absentee ballots in 2012 mailed out only 207 absentee ballots; the average county overall mailed out nearly 7,500.
[23] U.S. Elections Assistance Commission, Uniformed and Overseas Citizens Absentee Voting Act (2008 Survey Findings), 10, http://www.eac.gov/assets/1/Page/2008%20Uniformed%20and%20Overseas%20Citizens%20Absentee%20Voting%20Act%20Survey.pdf.; U.S. Elections Assistance Commission, Uniformed and Overseas Citizens Absentee Voting Act (2010 report), 8, http://www.eac.gov/assets/1/Documents/EAC%202010%20UOCAVA%20Report_FINAL.pdf; and U.S. Elections Assistance Commission, Uniformed and Overseas Citizens Absentee Voting Act (2012 report), 9, http://www.eac.gov/assets/1/Documents/508compliant_Main_91_p.pdf.
[24] The raw data for 2010 reveal a clear outlier, Queens County, NY. Queens County reported receiving back more UOCAVA ballots than any other county in 2010 (2,649), rejecting 80 percent of them. Queens County is represented by the tall peak on the right side of the 2010 graph.
[25] The counties have been weighted in proportion to the number of UOCAVA ballots returned for counting.
[26] More precisely, we weight the counties by the number of returned UOCAVA ballots.
[27] The correlation coefficient was calculated on the logged values, weighting each county by the number of returned UOCAVA ballots.
[28] The counties have been weighted in proportion to their size (the number of UOCAVA ballots sent out).
[29] More precisely, we weight the counties by the number of UOCAVA ballots transmitted.
[30] The correlation coefficient was calculated weighting each county by the number of UOCAVA ballots mailed out.
[31] The Pew Charitable Trusts, "The Real Cost of Voter Registration: An Oregon Case Study" (2009), http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Election_reform/The_Real_Cost_of_Voter_Registration.pdf.
[63] See Mark Lindeman and Philip B. Stark, "A Gentle Introduction to Risk-Limiting Audits," *IEEE Security and Privacy* (March 2012), http://www.stat.berkeley.edu/~stark/Preprints/gentle12.pdf.
[32] The counties are weighted in proportion to their general election participation.
[33] More precisely, we weight the counties by the number of general election participants.
[34] The correlation coefficient was calculated on the logged values, weighting each county by the number of general election participants.
[35] The counties have been weighted in proportion to the number of general election participants.
[36] More precisely, we weight the counties by the number of general election participants.
[37] The correlation coefficient was calculated on the logged values, weighting each county by the number of general election participants.
[38] Steven J. Rosenstone and Raymond E. Wolfinger, "The Effect of Registration Laws on Voter Turnout," *American Political Science Review* 72 (1) (1978): 22–45; and G. Bingham Powell Jr., "American Voter Turnout in Comparative Perspective," *American Political Science Review* 80 (1) (1986): 17–43.
[39] In addition to the following categories, there are provisions in the data for "no response," "refused," "don't know," and "blank or not in universe."
[40] Based on weighting by variable PWSSWGT, which is the "final weight" given to each individual in the survey, which is constructed to be proportional to the inverse probability of being included in the survey. Percentages are based on respondents who gave one of these answers, excluding those who refused or said they did not know, did not respond, or were not in the sample universe.
[41] The county-level rejection rates have been weighted by the total number of valid and invalid registration forms submitted.
[42] More precisely, we weight the counties by the number of valid and invalid registration forms submitted.
[43] The correlation coefficient was calculated on the logged values, weighting each county by the number of valid and invalid forms submitted.
[44] New Hampshire reported no rejected registrations to the EAVS in 2012. Upon contacting the state, officials confirmed that only three new registrations had been rejected in the 2012 election cycle. The administrative barriers are very high in New

Hampshire to rejecting a new registration, which explains why, for all practical purposes, no new registrations are rejected in that state.

[45] For a review of the use of the residual vote rate, see Charles Stewart III, "Voting Technologies," *Annual Review of Political Science* 14 (2011): 353–378. A book that makes extensive use of this measure is Martha Kropf and David C. Kimball's *Helping America Vote: The Limits of Election Reform* (New York: Routledge, 2011).

[46] Charles Stewart III, "The Performance of Election Machines," in *The Measure of American Elections,* Barry C. Burden and Charles Stewart III, eds. (New York, Cambridge University Press: forthcoming).

[47] The counties have been weighted in proportion to turnout.

[48] More precisely, we weight the counties by turnout.

[49] The correlation coefficients reported in the graphs were calculated on the logged values, weighting each county by turnout in the first election of the pair.

[50] Raymond E. Wolfinger and Steven J. Rosenstone, *Who Votes?* (Yale University Press: 1980).

[51] As Michael P. McDonald and Samuel L. Popkin show in their research introducing the idea of the voting-eligible population (VEP), much of the so-called decline in turnout rates reported over the past several decades is due to the growth of the ineligible population included in the voting-age population (VAP). Once the inflation of the ineligible population in the VAP is accounted for, the decline in voter turnout that began in the late 1960s is not so pronounced, and the rebound that began in 2000 is more pronounced. See McDonald and Popkin, "The Myth of the Vanishing Voter," *American Political Science Review* 95 (4) (2001): 963–974.

[52] Glenn E. Mitchell and Christopher Wlezien, "The Impact of Legal Constraints on Voter Registration, Turnout, and the Composition of the American Electorate," *Political Behavior* 17 (2) (1995): 179–202.

[53] Robert S. Erikson, "Why Do People Vote? Because They Are Registered," *American Politics Research* 9 (3) (1981): 259-276.

[54] According to the EAC's 2009–10 NVRA report, 25.2 percent of removals from voter registration lists during the 2009–10 election cycle were due to voters "moving from jurisdiction" (Table 4b). This is in contrast with 40.7 percent of removals being because of "failure to vote."

[55] For more information about the difference between the VRS numbers and state-reported numbers of registered voters, see the Pew Charitable Trusts report *Election Administration by the Numbers,* http://www.pewstates.org/research/reports/election-administration-by-the-numbers-85899377331.

[56] In 2012, 7.3 percent of nonregistrants stated they were unregistered for this reason. Although respondents are screened for citizenship status before being asked the questions in the VRS, it is likely that some noncitizens made it past this screen and then reported not registering because they were ineligible. The other main reason for giving this answer is likely that the respondent was unable to register because of a felony conviction.

[57] United States Elections Project, http://elections.gmu.edu.

[58] We have investigated the states that showed the greatest deviation between the survey measure of the registration rate and the official registration rate. With the exception of Wyoming, we could not detect a clear reason for the large deviation. In the case of Wyoming, it appears that the state's practice has been to report to the EAC registration statistics from immediately before Election Day, without new registrations that are added via Election Day registration.

[59] North Dakota has no voter registration, and provisional ballots are not issued in the state, so it is not evaluated for either the voter registration lookup tool or the provisional ballot lookup tool. Provisional ballots also are not issued in Idaho, Minnesota, and New Hampshire, so they are not evaluated for the provisional ballot lookup tool.

[60] Respondents from Oregon and Washington have been excluded from the analysis, despite the fact that a few respondents reported waiting in line to vote in these vote-by-mail states. They are excluded because the number of available observations is so small that the waiting time estimates are very imprecise.

[61] VoteBackHome, http://www.votebackhome.com/longlines.

[62] Lorraine G. Allan, "The Perception of Time," *Perception & Psychophysics* 26 (5) (1979): 340–354, http://link.springer.com/article/10.3758%2FBF03204158#page-1.