Election Administration Spending in Local Election Jurisdictions: Results from a Nationwide Data Collection Project

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Abstract:

While policymakers have enabled relatively centralized collection of a variety of election data, the cost of elections in the United States remains a relative unknown. In order to understand the resources required to run elections, and to work toward comparisons both over time and across states, we have begun collecting election expenditure data from audited financial reports. In particular, we have gathered data from Annual Financial Reports and have these data from more than half of the states. We also discuss the measurement and conceptualization of the costs and various ways one can operationalize the "cost" of elections, which we conceptualize as not just the cost of a particular election directly, but also the costs of personnel, voter registration work, and other "between election" costs. At this point, we estimate that the cost per voter is a little over $8/voter for a total local election cost of about $2 billion per year in the United States. While this seems like a significant amount of money, this should be seen as a lower bound estimate of the resources required to conduct elections in the United States.

"It is not known how much we spend on election administration overall in the U.S. each year. It is not known on what funds are spent. There has been little analysis of how and how well local governments provide election services. Each of us has some sense of what we get—a stable and successful democracy. But there are clearly problems that can be remedied. How much will improvements in this system cost?" – Caltech-MIT Voting Technology Project, Voting: What Is? What Could Be? 2001, p. 48

"Moreover, the election administration process must compete with other public goods and services - such as road and bridge infrastructure, infant mortality, and national defense - for government funding. As a result, it is important that EMBs [election management bodies] be able to justify their budgets, be efficient, but have sufficient resources to conduct elections according to international standards and their political environments." –Lopez-Pintor and Fischer, Cost of Registration and Elections (CORE Project) Report, 2005, p. 4.

In the aftermath of the 2000 election, the Caltech-MIT report *Voting: What Is? What Could Be?* estimated the cost of an election at about $1 billion over the entire United States– which they calculated to be about $10/voter (page 50). The report noted localities spent more on solid waste management and parks than elections, but they called that estimate a "ballpark" one, though the report authors reported theirs was similar to at least one other estimate (Hawkins, 2001). Yet, as was the case almost 20 years ago with much election-related data, there was no central location for election cost data, not to mention one standardized way to report such data. The basic research question considered here is how much, per voter, does it cost to run an election? As noted by international election researchers, these data are vital for election management bodies to possess in order to know whether they are running an election that is consistent with international standards.

While U.S. policymakers have provided for more centralized data concerning voter turnout, provisional votes and registered voters, no scholars that we know of have unearthed cost data in a systematic way nationwide. Thus, there are basic questions to which we still have incomplete answers. Election administration spending is important because it can influence the capacity of the local jurisdiction to deal with election issues such as residual votes (Kropf et al

2017), voter turnout (James and Jervier 2017), and election equity (Schur, Ameri, and Adya 2017).

While there have been a few studies examining aspects of spending such as the cost of Colorado's election centers (Stein and Vonnahme 2009), and the factors related to California's (Hill 2012) and North Carolina's (Mohr et al., 2018) spending, scholars are operating with limited data where it concerns costs.

In order to understand the resources required to run an election, and to work toward comparisons both over time and across states, we have begun collecting audited election expenditure data. In particular, we have gathered data from Annual Financial Reports and have these data from more than half of the states.[1] The purpose of the present paper is to discuss findings to date.

This paper first discusses previous research on election administration costs both in the United States and internationally. Second, we discuss the measurement issues inherent in unearthing data concerning costs. In particular, due to potential differences in accounting standards, there are a variety of problems when talking about the amount spent on election administration and the other services that local governments provide. Thus, this paper reviews issues of budgeting, accounting (i.e. accounting standards, basis of accounting, depreciation, pension and other post-employment benefits), and cost accounting for election administration.

Finally, the paper examines spending at the local level based on originally collected expenditure data from local government financial reports and estimates a mixed effect model to

evaluate basic drivers of election administration spending (Caltech-MIT 2001; Hill 2012; Montjoy 2010; Stein and Vonnahme 2009) to extrapolate to the entire country.

With data from twenty-seven states, this is the largest known data collection attempt of election administration cost data in the United States. Some of the states are significantly collected (>90%) and over sufficiently long time periods to begin using election administration expenditures in multilevel models of election spending and outcomes. Ultimately, the researchers will make this database of local election spending data available to election administration practitioners and researchers. In conclusion, we will discuss the new avenues for research that can be pursued with a multi-state, election spending panel.

Previous Research on Election Administration Cost

Scholarly research about election costs and spending is ongoing but is tightly focused on either small numbers of jurisdictions (Montjoy, 2010) or certain functions such as the cost of election centers or types of convenience voting (Hamilton, 1988; Burden, et al., 2012; Folz, 2014; Stein and Vonnahme, 2009). Non-profit organizations such as the Brennan Center (2006) have attempted to help election policymakers (both state and local election officials) by estimating costs of particular inputs, such as voting equipment, done in the aftermath of the 2000 elections, when states and localities were making basic decisions about modernizing voting equipment. Other organizations such as the Pew Center for the States have conducted case

studies of various states in order to understand costs.[2] Still others, such as California Forward

and the ACE Project in Colorado have endeavored to make cost data transparent to the public.[3]

Only recently have scholars uncovered election finance panel data for entire states, but

previous published work has only focused on California (Hill, 2012). Kropf et al. (2017) and

Mohr et al. (2018) use North Carolina data to examine election expenditure questions, such as

the effects of amounts of spending and the factors which affect the expenditure amount. The

Caltech-MIT 2001 report examined cost per voter data from North Dakota elections, which the

state has collected since 1980 (NCSL, 2018). While research to date using panel data uses

differing focal independent variables (economic production model versus a political model),

there is general agreement that economies of scale apply for election expenditures. The larger the

population served, the lower the cost per voter.

It is not just in the United States where there is a growing interest in the cost of elections.

Recently, James and Jervier (2017) show that many local election authorities in Great Britain are

over budget. The increasing cost of elections paired with either very small increases in or,

reduced budgets, increases pressure on officials, resulting in cuts to activities perceived as "non-

core" including voter outreach and educational activities. They call for a "fundamental review

of the financing of elections and electoral registration in the UK and in many other countries"

(page 7).

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[2] See for example, http://www.pewtrusts.org/en/research-and-analysis/articles/2013/03/19/the-cost-of-the-2012-general-election-in-wisconsin, last accessed 12 July 2018.

[3] See http://cafwd.org/reporting/entry/website-allows-californians-to-explore-the-costs-of-running-an-election, last accessed 12 July 2018. See also http://www.sos.state.co.us/pubs/elections/ACE/index.html, last accessed 12 July 2018.

Lopez-Pintor and Fischer (2005) provide in-depth research about the costs of elections in various democracies and provide key conceptualization of election costs for those studying budgets. The research shows that there are differing costs depending on the status of the democracy (stable, transitioning, or post-conflict). Other scholars such as Aiyede and Aregbeyen (2012) examine single years in emerging democracies, such as Nigeria. Aiyede and Aregbeyen also examine non-monetary costs such as loss of life due to election administration. Of course the status of democracy is not an issue about which those studying U.S. election costs must worry.

The principal worry among US. scholars studying election costs is not only the hyper-decentralization of elections, but also the great variation in state laws and practices concerning budgeting, expense reports and of course, electoral institutions (that is, for example, that some states have early voting, some have by mail voting, etc. etc.). Not only is that a concern, but also there are differing structures for providing resources for elections. Recently, the National Conference of State Legislatures (2018) identified the responsibilities for payment for elections. About 33 states reimburse localities for some part of the elections. Localities may also "charge" smaller subdivisions within their counties for election as well as specified by state law, but also most likely, through inter-local agreements.

We note that many scholars believe that budget/spending are unavailable or very inaccessible for elections. Even if election administration expenditure data were available, the comparability across states or even localities may be severely limited, because of varying accounting standards and lack of granularity in election spending (see Kropf, 2016: 42-43).

However, we argue that this is an empirical question about which scholars simply had not had enough information. Thus, our current and future work concerns examining the extent to which the election costs in different states may be comparable.

Valid Measurement of Cost

Conceptualizing Cost

The concept of interest herein is the amount that is spent on elections among jurisdictions in the United States. We seek the answer to that question examining elections at their most basic level of administration for most states, the county.[4]

While seemingly a simple question, "cost" is actually quite complicated (see Lopez-Pintor and Fischer, 2005) and comprises both direct and indirect expenses; cost may include equipment depreciation and debt servicing as well. Most local election officials will say that the biggest direct expense of an election is the cost of the poll workers; but in an undetermined number of localities, the regular staff and their benefits can cost much more. The regular staff does the work of elections not just on Election Day, but also between elections.

Because the concept of cost is complicated and because the endeavor to measure cost systematically across the nation is new(ish) endeavor and other groups of scholars and practitioners are beginning to examine costs more systematically, we think it is worth reflecting

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[4] Election expert Kimball Brace estimates there are approximately 10,072 election jurisdictions in the United States. For the vast majority of states, the local election jurisdiction is the county (3,140). In the Northeast (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont), the local election jurisdiction is the township (1,620). Elections are also operated in more than 5,000 townships in the Midwest (Brace, 2013).

on measurement theory in order to obtain some leverage over the topic. For example, Adcock and Collier (2001) encourage not just defining a concept, but creating a systematized concept.[5] There may be many meanings of a concept, and such concepts can/should be defined using the theory and context within which the measurement is considered. So, in terms of theory, what is it the goal of the research? And, in terms of contextual specificity, one should acknowledge that the concept may mean different things to different relevant groups (e.g., state lawmakers versus scholars versus local election officials). Adcock and Collier argue that defining a systematized concept will help scholars distinguish between arguments about measurement itself and disputes about the concept we are trying to measure.

Thus, we should note that there are two key questions: what costs should be included and in whose obligation to pay are we most interested? Herein, we focus more on the first question; the second question becomes more important when considering that county and state policymakers have to make choices among spending options.

The first key question is how does one define the concept of interest—how much it costs to run an election and thee associated administrative office. This is a different question from how much different inputs cost or how much all inputs totaled may cost. Thus, we explicitly take a top-down perspective, looking at total costs during a particular fiscal year, whether there is an election or not, or even where there are multiple elections.

The Caltech-MIT report considered inputs in order to determine cost including "labor, maintenance, storage, and acquisition of equipment, supplies (such as printing), information systems, and rental space" (page 49). Democracy Fund's Tammy Patrick noted that there are a

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[5] For an excellent discussion of measurement of election quality in the United States, see Burden and Stewart, 2014.

variety of direct election expenses that many do not consider such as "processing of write-in candidates on ballots, a county deputy on call for potential election security calls, and troubleshooting hotlines and other communications in case of troubles on Election Day" (Kropf, 2016: 43).

But what about the expenses of keeping the election office open on a daily basis? Paying salary and benefits for the various employees on staff in the election office (FICA, workers' comp, retirement, medical insurance, etc.)? What about office supplies?

We hope this top-down view would take all of those expenses into account. But even having settled the question that our work is considering not just running an election, but also keeping the associated office open and conducting the day to day operations that will some day result in an election running (hereafter we'll shorten this to simply, "the cost of elections"), there are at least two different sources from which a researcher may obtain the top-down data—either budgets or from audited financial statements of expenditures. In the following section, we consider each of these measurement approaches, and explain why it is that we choose to utilize the audited expenditure statements.

Budget

The budget is the most basic estimate of the cost of elections. Every government in the United States does either an annual or biennial budget, and they usually make the budget easily available on a website or in an archive. The availability of budgets make them attractive options for getting a quick estimate of how much is spent on elections. They are also attractive for election administration because the way they are formulated is often by department and this

means that the election administration department/office/board often has a budget. In contrast with the accounting records, where the cost of elections may get totaled with other governmental functions making analysis of cost impossible, the budget is likely to give us a budgeted cost of elections.

In spite of the availability of budget documents and the likely separation of election administrative activities from other governmental activities, we argue that departmental/office or board budgets are not perfect for estimating the cost of elections. First, the budget is short term focused (either one or two years) and so the cost of equipment like voting machines may have been purchased in previous years and so the often substantial expense of equipment and other long lived assets is not shown in the budget. Another problem is that some costs such as employee benefits (pension, medical insurance, etc.) and possibly other resources such as information technology might be included in other parts of the budget. To get estimates of the cost of these resources, we are likely to need more extensive accounting or cost accounting. Finally, and perhaps most importantly, the actual expenditures can vary from the budget (James and Jervier, 2017). For example, Kropf (2016) gives a quote from a county commissioner that said that potholes are more pressing than providing election administration. So, it is possible that county commissions and county leadership can budget for a certain amount for election administration, but if other more pressing priorities arise they can shift resources to other areas. Because departmental budgets are not the legally enacted budget[6], there may not even be a need to amend the budget. If the legally enacted budget just reports an expenditure for general

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[6] In the legally enacted budget, most general government functions get budgeted in a single fund, the general fund, which can have resources shifted within the fund without the need of a budget amendment.

government, where election administration is usually totaled, the amount that actually gets spent on election administration could vary significantly from the departmental budget.

A summary of the pros and cons of using the annual or biennial budget for estimates of election costs are summarized in Table 1. Looking at the preliminary data that we have seen on this issue and the research by James and Jervier (2017) on recessions' impacts on election spending, we believe there are strong reasons not to use budgeted costs when looking at elections administration costs in the aggregate. If researchers want to drill down into specific aspects of election costs such as the amount spent on technology or training (as was done in the Caltech-MIT 2001 report), they may need to use the election administration budget. For purposes of research on the total cost and the total resources that an election office or board had at their disposal for conducting an election, we believe that a better estimate would be based on the actual expenditures or expenses.

Pros	Cons
Required	Short term focused
Easily Available	Departmental/fund structure may hide expenditure
May be more detailed than financial statements	**Actual expenditure may systematically vary from budget**

Table 1: Pros and Cons of Using Budgeted Costs for Elections Administration Cost Estimates

Accounting Financial Statements and Annual Financial Reports

Given that budgets can vary systematically from actual spending, a much better case can be made for using the actual amounts spent on elections administration that can often be found in the financial statements of governments[7].

One of the limitations of estimates of cost based upon the final actual expenditures and expenses is that there are not uniform standards for the election jurisdictions, most often counties, in the United States. In spite of the lack of a required standard, a sufficient number of states do require that their counties follow uniform accounting principles, or Generally Accepted Accounting Principles[8] (GAAP), to facilitate comparison. Also, due to the fund where election costs are normally held, the differences between GAAP and non-GAAP expenditure may not be that great. What follows in the rest of this section is a key distinction that needs to be made between GAAP accounting and non-GAAP accounting. Also, for GAAP accounting we discuss the two ways that costs are measured. In the end, we discuss the pros and cons of accounting for establishing the cost of elections administration.

While GAAP for US businesses requires the accrual basis[9] of accounting that includes both direct expenditures and depreciation costs to develop the full expense of providing a specific service, government GAAP requires that government expense/expenditures are accounted for on both a full accrual basis (i.e. government-wide funds) and on a modified

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[7] Usually, local government budget on an annual basis for governmental expenditures and provide corresponding financial statements at the end of the year per state requirements. However, for some very small jurisdictions this may not be required.

[8] GAAP accounting is the uniform basis of accounting generally recognized in the United States. States are allowed to prescribe their own basis of accounting and state prescribed principles are generally referred to in the literature as *regulatory basis*. States can also allow localities to follow whatever accounting principles that they choose and these are referred to here as other comprehensive basis of accounting or OCBOA.

[9] According to Granof and Khumawala (2013 p. 775) accrual basis is "A method of accounting that recognizes revenues when earned and expenses when incurred regardless of when cash is received or paid." For example, the "cost" of the voting machines is not an expense in the year it is purchased, but the expense is incurred over the useful life of the machine. If the machine has a useful life of 8 years, then 1/8th of the cost of the machine is the expense of the machine in each of the eight years of the machine.

accrual basis (governmental funds). The full accrual basis would be the preferred method of accounting for the cost of election services because the cost of equipment would be depreciated over the life of the equipment. In contrast, the modified accrual basis recognizes the full cost of the equipment in the year in which it was purchased and then no cost thereafter. To be clear, budgets also have this short term focus and election jurisdictions will have to budget for the full cost of the equipment in their annual or biennial budgets. To get around this problem, the jurisdiction may finance the purchase of equipment through a variety of mechanisms such as sinking funds, debt, or lease arrangements. However, in the budget and in the modified accrual basis of accounting, these expenditures are paid for in a single year and may not be associated with the depreciation costs of the equipment. The modified accrual basis is the direct link to the annual budget.

Because accrual is a more complete measure of the cost and it inherently has less variance, accrual basis costs are strongly preferred (Granof and Khumawala 2013; Mead 2001). Unfortunately, the government-wide statements are very often the broadest categories and programs for expenditure. So public safety might include police, fire, jails, and emergency management. Election administration is almost always a category of general government. Therefore, it is not possible to pull out the full accrual expense of elections from the CAFRs.

The modified accrual basis used for the governmental statements has more categories of expenditures.[10] Therefore, it is more likely that we observe the election administration cost in the modified accrual format. Additionally, the supplementary information also includes a comparison of budget to actuals for the governmental funds. This is where actual election costs

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[10] Note that full accrual cost estimates are called expenses and modified accrual and cash basis are called expenditures.

can most often be found. It is important to note that election administration costs are found in the governmental funds and are thus short term focused on expenditures. The costs for equipment are, therefore, lumpy and come in a single fiscal year. This is why we can observe election expenditures spiking after the passage of HAVA[11]. If it were on a full accrual basis, these costs would have been spread over the estimated useful life of the equipment, but on the modified accrual basis the costs were recognized when the equipment was purchased. Also, other long term liabilities such as pension and other post-employment benefits that are earned during the period may not be accounted for in the fund. The picture that emerges when we look at the modified accrual expenditures is that they are likely a lower limit estimate of the resources that can be used to finance elections. The key benefit is that they are the actual amounts that were spent and correspond with the resource control purposes of the annual budget.

It should be easy to see that full accrual would be strongly preferred as a measure of the full resources consumed in the production of election administration because it would spread out the capital costs of election equipment over the useful life of the equipment. However, the amount spent on election administration in a jurisdiction are never recognized in the government-wide statements.[12] It is also important to note that governments are often not required to split out the costs for elections administration. While some states have financial reports for jurisdictions to fill out that make local jurisdictions report their election administration expenditures,[13] the majority of states leave the governmental funds detail to the discretion of the local jurisdiction. Therefore, many jurisdictions simply roll the election

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[11] In North Carolina, this was 2006 and 2007.
[12] That we have seen looking in looking at over 10,000 annual financial reports.
[13] i.e. North Carolina, New York, and California

administration expenditures into a broader category of general government expenditures and do not report election administration separately.[14]

While it is disappointing that we can only find election administration spending reported in the governmental funds and on a modified accrual basis for local governments in the US, one benefit is that it is more likely to be like other non-GAAP based financial statements. In our experience, the regulatory basis of accounting used in most states that do not require GAAP are current resources focused to match their cash based budgets. While it is an empirical question for future research, we will want to see if the expenditures in cash basis, regulatory basis, and other comprehensive basis of accounting are equivalent to the expenditures recognized in GAAP based financial statements.

Pros	Cons
Actual expenditures	Modified accrual still short term focused
Accrual could provide fuller cost estimate	Departmental/fund structure may hide expenditure
	Often less detail than budgets

Table 2: Pros and Cons of Using Expenditures from the Financial Statements for Elections Administration Cost Estimates

Cost Accounting

Another concept that needs to be recognized as we discuss the costs of election administration is that of shared resources or shared costs. Mohr (2017) says that shared resources are fundamentally an issue of cost accounting and the study of shared resources in government is especially important. For example, a county that is required to maintain voter registration files may store them on a secure server that is housed in the police department. What percentage of

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[14] Because there is no way to calculate these expenditures from the financial reports, these amounts are coded as missing in the dataset.

the cost of the server should be split out to election administration? This is especially

problematic in areas that are highly dynamic such as the case of print shops that split their costs

out to their customers. In low volume months, the cost per printing may be high and in high

volume months this cost may be low. Shared space, accounting, human resources, and other

services all have a cost. How these indirect costs get split out is problematic and the methods of

splitting out these costs may vary significantly by jurisdiction if they get split out at all. To get a

full and accurate measure of the organizational costs of elections, these indirect costs will need to

be accounted.

Finally, shared resources and indirect costs are also difficult when we are trying to

compare costs of elections from one state to another. Some states may provide training of

elections officials, provide for reimbursement of training or may simply require training that

must be paid by the local jurisdiction (NCSL 2018a; 2018b). Some states may pay for election

equipment, equipment maintenance, and training. Cost accounting may be needed to standardize

the costs of election administration so that the expenditures that are being observed, most often at

the local level, are apples to apples comparisons. As an intermediate step between the budget

and full cost accounting for election cost, we now consider the expenditures for election

administration as found in the audited financial statements of local governments in the United

States.

Data, Methods, and Analysis

Data

The data for this study come from the annual financial reports (AFRs) of the election jurisdictions in each individual state, which is most often counties. When the annual financial reports use generally accepted accounting principles (GAAP), these financial reports are the Comprehensive Annual Financial Report (CAFR) of the county. All sources, period of collection, and percentage collected can be found in table 3.

In a few states (North Carolina, California, New York, Washington State, and Michigan), the state had already collected the expenditure for elections administration in a larger database of county expenditures. Where the state already had a database of county expenditures and it included election costs, we used the expenditure amount in the state's database. In our data collection process, the most often found source of AFRs was a State or University website that put individual county AFRs, usually in pdf form, on a website. We then downloaded and searched each individual AFR on the State's website for the term "election". If the term was not searchable, we visually reviewed the government-wide statements, the governmental statements, and the governmental detailed statements found in the supplemental information of the AFR. In a few cases, we went to individual jurisdiction websites to find AFR information.[15] Two states, Alaska and Delaware, budget for all elections at the state level. We did collect these costs but have not included them in the dataset.

Finally, Wisconsin was collected from the state elections website and is only the cost of the individual elections. We wanted to include Wisconsin in the discussion for several reasons but the multivariate model does not use data from Wisconsin because it is qualitatively different

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[15] This was particularly used in the northeast where election jurisdictions are not counties and the states often do not post the election jurisdiction's AFR on a website. We also went to individual county websites in the southwest because these states have only a few counties.

than the rest of the data that looks at all of the expenditures on election administration in a fiscal

year.

Table 3: States Collected and Sources

State	Years	Obs collected	Obs Possible	% Collected	Source
Alaska	2004-2017	13	13	100.00%	http://doa.alaska.gov/dof/reports/cafr.html
Arizona	2001-2016	169	240	70.42%	https://www.azauditor.gov/reports
California	2003-2016	806	812	99.26%	https://counties.bythenumbers.sco.ca.gov/#!/year/default
Colorado	2009-2015	121	441	27.44%	https://dola.colorado.gov/lgis/counties.jsf
Delaware	2004-2014	10	10	100.00%	https://accounting.delaware.gov/cafrdefault.shtml
Florida	2003-2016	309	402	76.87%	https://flauditor.gov/pages/counties_efile.htm
Georgia	2003-2016	641	2365	27.10%	https://ted.cviog.uga.edu/financial-documents/financial-reports
Iowa	2008-2016	890	891	99.89%	https://www.iowaonline.state.ia.us/localbudgets/default.aspx?cmd=gotopublicsite
Maine	2000-2017	164	8188	2.00%	Individual websites
Massachusetts	2003-2016	72	4915	1.46%	Individual websites
Michigan	2005-2017	975	1075	90.70%	https://www.michigan.gov/treasury/0,4679,7-121-1751_81132---,00.html
Minnesota	2000-2016	499	1131	44.12%	http://www.osa.state.mn.us/list.aspx?get=8
Missouri	2006 -2016	441	1287	34.27%	https://app.auditor.mo.gov/AuditReports/AudRpt2.aspx?id=4
Nebraska	2008-2017	727	930	78.17%	http://www.nebraska.gov/auditor/reports/index.cgi?audit=1
Nevada	2004 -2017	73	238	30.67%	Individual websites
New Jersey	1999-2017	168	385	43.64%	Individual websites
New Mexico	2009-2017	14	297	4.71%	https://www.saonm.org/audit_reports/search
New York	1995-2016	1269	1269	100.00%	http://wwe2.osc.state.ny.us/transparency/LocalGov/LocalGovIntro.cfm
North Carolina	1994-2016	2364	2400	98.50%	https://www.nctreasurer.com/slg/lfm/financial-analysis/Pages/Analysis-by-Population.aspx
North Dakota	2006-2016	265	265	100.00%	North Dakota Secretary of State
Ohio	1999-2016	569	1583	35.94%	https://ohioauditor.gov/auditsearch/Search.aspx
Oklahoma	2001-2016	690	1232	56.01%	https://www.sai.ok.gov/audit_reports/county_alphabetical.php?action=bycounty
South Carolina	2005-2016	198	468	42.31%	http://www.sccounties.org/budgets-and-cafrs
Tennessee	2005-2016	1124	1140	98.60%	http://www.comptroller.tn.gov/la/CountySelect.asp
Utah	2010-2016	134	196	68.37%	https://reporting.auditor.utah.gov/searchreport
Virginia	2014-2017	301	496	60.69%	http://www.apa.virginia.gov/APA_Reports/localgov_cafrs.aspx
Washington	2007-2016	342	390	87.69%	http://portal.sao.wa.gov/LGCS/Reports/ReportMain.aspx
Wisconsin[1]	*2012-2016*	*9566*	*9566*	*100.00%*	http://elections.wi.gov/publications/statistics/gab-190

[1] Wisconsin amounts are only the expenditure on the election and not the total expenditure on election administration in the year. Wisconsin is qualitatively different from all other states.

Methods

The methods used to analyze the data are basic descriptive statistics and hierarchical

multivariate models. Because the data are election jurisdictions nested in states, the data have a

hierarchical data structure. We use a multilevel or mixed effects model to test the form of the

economies of scale at the local level between election spending and number of voting age

population (VAP) of the election jurisdiction.[16] Economies of scale have been found in nearly

every state analysis of election cost (Caltech-MIT 2001; Hill 2012; Mohr et al. 2017), but these

economies of scale may only be generalized to the individual states. Hierarchical models can be

generalized to the larger population because they account for state varying effects (Gelman and

Hill 2012). The mixed effects regression equation is as follows:

$$\ln(\text{Total expenditures per VAP}_{j,i,t}) = \alpha_{ji} + \beta_1(\ln[\text{VAP}]) + \lambda_t + \nu_{it}$$

Both the total expenditure for election administration and the VAP have been logged

because these values are positively skewed when not transformed. As is done in other fields that

analyze costs, the natural log of the variable is used in the model (see for example Agrawal, Pan,

and Qian 2015). One benefit of logging the VAP and the total expenditures is that it also

facilitates interpretation as the interpretation of the beta coefficient is a semi-elasticity. λt

represents the time fixed effects . The state effect (j) and county(i) influences the intercept term

in the model (α).[17] Thus, the model is a two level hierarchical model with year fixed effects.

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[16] The estimates of voting age population come from the ACS 5 year population table B05003.
[17] In multilevel models, the intercept is assumed to be approximately normally distributed as indicated : $\alpha_{ji} \sim N(\mu_\alpha, \sigma^2_\alpha)$.

Descriptive Analysis

Total Expenditures

For all collected election administration expenditures the 20,370 valid cases with 21,812

missing (Table 4). The mean of these data was $288,824 with a median of $17,691. This range

between the median and the mean is reflected in the wide range between the minimum of $1 and

that maximum of $119,769,201.

Table 4: Election Administration Expenditures by State

State	N	Minimum	Maximum	Mean	Std. Deviation
AZ	169	663	19693468	1460029	3952743
CA	8	9760000	16905000	12884750	2424958
CO	121	3655	2235830	263747.8	448926.8
FL	311	155.318	18769000	1903155	2769020
GA	692	190	9948000	289217.9	594269.5
IA	890	11859	2064007	190714.6	249836.1
MA	72	13265.56	4248000	666479.1	1074041
ME	164	235	46875	12412.17	10549.32
MI	533	38	2061752	111527.7	235775.5
MN	499	1	699207	50872.54	78737.28
MO	440	162	7740703	82818.04	369341.1
NC	2264	10029	6492927	333040.2	531118.1
ND	318	9359.52	403441.07	40393.5	47471.89
NE	727	1844	2174509	63066.98	202507
NJ	169	23674.97	119769201	2482395	9141994
NM	14	10959	588090	307456.9	229927.7
NV	73	6121	11208212	1231879	2596518
NY	15	44160854	116081409	81875956	23003028
OH	566	4636	14919000	1384105	1913445
OK	703	19155	1902761	116064.4	210673.1
SC	198	31575	1944255	438051.7	345631.1
TN	1124	11539	5136850	314758.3	521326
UT	134	54	5591663	299128.8	960138.1
VA	282	2645	5110511	280160.7	532576.9
WA	340	13782	20731283	1034600	2693186
WI*	9544	17	3005374	3940.164	36011.94

Cost per eligible voter

For the 26 states where we have local election administration expenditures, these data were then paired with demographic data from the U.S. Census American Community Survey.[18] In order to calculate the total number of eligible voters, we added the estimated native males and females 18 years and older and the estimated foreign born and naturalized males and females 18 years and older for the years 2009 to 2016. Both Delaware and Alaska pay for election administration costs at the state level so they have been removed from the calculation bringing the total number of states included to be 26 (CITE NCSL what states pay).

From the total 26 states included in this analysis, the mean cost per eligible voter in the US for the years 2009 to 2016 is $8.10 with the median being $7.08 with a standard deviation of $6.50 (Table 5). North Dakota provides the highest cost per vote with $111.57 with New Mexico having the lowest maximum of $7.07.

California, Colorado, Florida, Iowa, New York, Ohio, and Virginia all have an average cost per vote that is above 10 dollars. This exceeds the national average by almost two dollars per eligible voter. Michigan, Minnesota, South Carolina, Nevada, and Wisconsin all fall more than two dollars under the US mean.

Table 5: Cost per eligible voter by state

State	Valid	Missing	Mean	Median	Std. Dev	Minimum	Maximum
US	*8177*	*4110*	*8.10*	*7.08*	*6.50*	*0.00*	*111.57*
AZ	83	37	6.49	5.59	3.42	0.05	16.37
CA	464	0	12.21	10.95	5.66	1.85	48.84
CO	121	327	10.67	7.87	7.46	2.01	40.93

[18] ACS B05003

FL	310	92	15.91	14.53	9.79	0.37	76.42
GA	607	665	7.42	6.13	4.99	0.01	39.13
IA	791	1	10.96	9.66	6.19	1.50	62.74
MI	531	48	2.05	1.47	2.88	0.00	36.32
MN	288	408	3.03	1.63	3.33	0.01	21.17
MO	321	596	5.77	4.54	5.50	0.13	54.68
NC	771	29	7.91	6.99	3.97	0.53	55.42
ND	211	212	8.39	6.48	11.59	0.25	111.57
NE	651	93	6.15	5.44	3.25	0.20	21.72
NJ	130	38	6.76	6.60	2.61	0.48	15.39
NM	13	251	3.78	3.62	2.02	0.79	7.07
NV	58	78	5.06	3.90	4.37	1.06	24.09
NY	448	8	12.95	10.41	8.40	2.37	63.05
OH	281	423	10.01	9.52	3.03	1.04	24.31
OK	293	323	6.40	4.30	5.46	0.72	31.92
SC	153	215	4.59	4.15	2.13	1.39	14.67
TN	752	8	9.72	8.64	4.59	1.15	30.22
UT	58	29	5.73	3.89	6.65	0.01	44.91
VA	220	179	11.02	9.58	6.76	0.05	40.41
WA	277	35	8.08	7.30	3.17	0.51	20.23
WI*	345	15	0.70	0.49	2.94	0.01	54.50

Cost per eligible voter by year

Of the 26 states included in the cost per vote, the mean for 2009 is $8.36 with a median of $7.66 (Table 6). The average 2011 falling slightly to $7.26 with a median of $6.52 both numbers being the lowest over the time frame that was studied. In 2012 to an average of $8.07 and in 2013, the average fell to $7.61 and rise to $8.43 in 2014. In 2015 the average cost per voter was $8.01 and 2016 had the highest average of all the years at $9.33 per vote. Although the election cost per voter does not extend prior to the recession because of data availability for eligible voters, visually inspecting the eight year period suggests that the cost of elections may be influenced by both the election cycle and the general economic cycle.

Table 6: Cost per eligible voter by year

Years	Valid	Missing	Mean	Median	Std. Dev	Minimum	Maximum
2009	760	557	8.36	7.66	5.67	0.02	58.10
2010	920	478	7.38	6.62	5.20	0.04	55.22
2011	890	576	7.26	6.52	5.32	0.00	60.75
2012	1126	411	8.07	6.99	6.09	0.04	68.23
2013	1077	461	7.61	6.81	6.23	0.01	60.32
2014	1164	536	8.43	7.00	8.16	0.04	111.57
2015	1151	548	8.01	7.01	6.54	0.01	60.61
2016	1102	530	9.33	8.24	7.31	0.02	76.42

Multilevel model

As expected, the model shows that economies of scale are significant (p<.01). The interpretation of the beta coefficient on population is that a 1% change in the population is associated with a .3% decrease in the cost per voter.

Both state and county variance estimates have a 95% confidence interval around their variance estimate that is greater than zero and LR tests versus the linear model show that the multilevel model significantly fits the data better than other models. The model is robust to other specifications (i.e. untransformed variables, inclusion of squared terms, inclusion or exclusion of year fixed effects, etc.) and modeling framework (i.e. entity fixed effects). In the conclusion, we examine the benefits of a multilevel modeling framework.

Table X: Multilevel model of population predicting ln(cost per voter)

	Coef.	Std. Err.	95% CI LB	95% CI UB
ln(total voting age eligible population)	-0.30	0.01	-0.32	-0.27
Constant	4.70	0.22	4.27	5.12
State Variance	0.75	0.22	0.42	1.33
County Variance	0.26	0.01	0.24	0.28
Log likelihood	-6737.64			
Wald $\chi 2$	597.99	***		

LR test $\chi2$	10808.81 ***

*** p<.001; year fixed effects not shown

Case Study

The following case study is provided to indicate nuances in the election administration data and to indicate differences between our data and other data that may be available such as can be found through the Colorado Secretary of State's Office.[19]

Colorado: The Cost of an Election Versus the Cost of Election Administration

Some states like Colorado and Wisconsin reimburse their election jurisdictions for the cost of conducting an election (NCSL 2018a). These states will often make the cost of conducting the election available on their website. The media and researchers that are not familiar with election administration may mistake this cost as the cost of elections. While the *cost of an election* is an important part of the cost, it is not the *cost of elections*.[20] The cost of an election is simply the cost of the personnel, equipment, and supplies needed to conduct an election during the relatively brief period of time when people are voting. The cost of elections is the cost of all election administration that includes the cost of the election and the additional costs of maintaining and securing the voter registration database, updating it with DMV and military records, updating, testing, and securing the voting equipment, and training election officials throughout the year. In sum, the cost of elections is greater than the cost of an election.

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[19] http://www.sos.state.co.us/pubs/elections/ACE/index.html
[20] Thanks to Judd Choate for pointing this out to us and using such perfect language. . (From personal interview with Choate, May 10, 2018.

To test this, we compared our data from 2013 to 2015 with the cost of the election as maintained on the Colorado ACE website. We can see that the average cost of election administration ($274,921) is nearly twice the average cost of an election ($142,493). Paired samples t test reveals that this is statistically significant (p<.001).

Table X: Colorado Election Cost versus the Election Administration Expenditures 2013-2015*

	N	Mean	Std. Deviation	Minimum	Maximum
Election Administration - Source: CAFR	54	274921	460544	15117	2235830
Election - Source: ACE	192	142493	267747	3874	1720438

[1.] ACE accessed http://www.sos.state.co.us/pubs/elections/ACE/index.html; *paired t = 4.002 p<.001

We believe that the cost of election administration (or the cost of elections) is a better measure of the resources that are needed to run an election than the cost of an election that can be found on the websites of the state governments that reimburse election jurisdictions for the cost of an election. Interestingly, this analysis shows that states are likely not paying nearly enough for their election services and further research needs to be done on the cost of an election relative to all of the costs of election administration.

Conclusion

Following the 2000 election, Caltech and MIT estimated that election jurisdictions were spending about $10 per voter or about $1 billion on election administration. In the years since that study, the cost per voter based on the where we have local election cost data suggests that the cost per eligible voter is a little over $8 per voter. However, the population has risen significantly since 2000 and the number of adults in the US as of 2017 is about 250 million, which equates to a total local election cost of about $2 billion.

So, how can overall costs be increasing but the average cost be decreasing? Our analysis shows that economies of scale are a significant factor. Unlike earlier estimates of the effect of economies of scale that were based on single state samples (i.e. CO, NC, ND, CA). The new data that we have collected will allow for hierarchical models that can be used to project costs to states outside of the sample. Although we have not done this here, we demonstrate the now generalizable effect of economies of scale on election administration expenditure. Other supply and production variables in the literature (Hill 2012) and political variables (Mohr et al., 2017), should be added into the model to create larger and more generalizable models of election spending. Additionally, state level variables such as state competitiveness can be included in future models. Analysis over time suggests that fiscal cycles may also influence election administration expenditures. Future work should look at the impact of economic conditions on expenditures and budget variances in the US (see James and Jervier 2017 for the case of the UK). Also, expenditures can also be used as a measure of financial resources at the disposal of election administrators and may have important effects on election outcomes like voter turnout, wait times, residual votes, and many other election administration outcomes.

In spite of the potential of these data, some caveats need to be made about the data and the use of local election cost data. First, we have the problem of competing estimates of cost. As we show in the Colorado case study, the cost of an election is significantly less than the cost of elections. In other words, election administration has significant costs that occur throughout the year like keeping and maintaining voter registration files, purchasing and updating equipment, and recruiting, hiring and training staff. These costs do not disappear when there is not an election happening. Colorado's ACE data and the Wisconsin data are cost of an election

and the rest are most likely to be cost of elections.[21] Secondly, costs may systematically vary by state as some of the costs of elections is handled at the state level (NCSL 2018a; 2018b). Future work should look at distributing costs of elections handled at the state level down to the local level to get a more apples to apples comparison of costs (or responsibility for costs) throughout the 50 states. Finally, analysts should also be careful about budgetary and fiscal cycles. North Dakota has elections only every 2 years; so, the cost of elections in this state should reflect a two year cycle. Additionally, some states like Georgia allow the local jurisdictions to set their own fiscal year end. Analysts should bear this in mind when trying to match elections costs to a specific election.

All in all, these data provide a wonderful opportunity for students of elections administration, public budgeting and finance, and general political scientists to look at previously unanswerable questions. We find that the cost of elections has variation from state to state, but our recent estimate of the cost per eligible voter is in-line with previous estimates and common sense. Future research will collect the data in the remaining states and analysts should begin using the data for the many questions that could be addressed by these data.

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[21] However, we do not know what costs are being included even in the financial reports. The expenditures in both GAAP and regulatory basis financial statements may or may not include all of the costs of elections. Future research should do an in-depth budgetary and cost accounting analysis at the local level to find out what all of the costs are for elections administration.

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