CALTECH/MIT
VOTING TECHNOLOGY PROJECT

A multi-disciplinary, collaborative project of
the California Institute of Technology – Pasadena, California 91125 and
the Massachusetts Institute of Technology – Cambridge, Massachusetts 02139

THE INTRODUCTION OF VOTER REGISTRATION AND ITS EFFECT ON TURNOUT

Stephen Ansolabehere
MIT

David M. Konisky
MIT

Key words: *voter registration, voter turnout, introduction of registration, imposition of registration, barriers to voting*

The Introduction of Voter Registration and
Its Effect on Turnout

Stephen Ansolabehere
Department of Political Science
Massachusetts Institute of Technology

David M. Konisky
Department of Political Science
Massachusetts Institute of Technology

February 2004

Abstract

Voter registration, it is widely argued, raises the costs of voting, thereby decreasing turnout. Studies of turnout <u>across</u> states find that states with later registration dates or election day registration have much higher turnout rates. Eliminating registration barriers altogether is estimated to raise voter participation rates by 5 to 10 percentage points. This paper presents panel estimates of the effects of the introduction of registration that exploits changes in registration laws and turnout <u>within</u> counties. New York imposed registration on all of its counties in 1965; Ohio imposed registration in all of its counties in 1977. We estimate that the imposition of registration on counties that did not have registration in these states decreased participation over the long-term by 3 to 4 percentage points. Though significant, this is lower than estimates of the effects of registration from cross-sectional studies.

1

I. Introduction

An extensive scholarly literature identifies registration as a substantial barrier to voting. The logic is simple enough. Crudely put, people weigh the benefits of voting against the cost, and the higher the cost the lower the participation rate (see for example Rosenstone and Hansen, 1993). For some people, registration represents one more hassle that they do not feel strongly enough about to address. Others do not think to register until the final week of campaigning piques their interest in the election, long after registration deadlines have passed. Still others report that, although registered, they could not vote because of errors in the registration system.[1]

Empirical research has sought to measure the magnitude of the effect of registration on the size of the electorate. Nearly all research is based on cross-sectional differences between states. One stream of research examines aggregate turnout rates for states with different registration requirements (e.g., Highton, 1997; Rhine, 1996; Knack, 1995; Knack 2001). A second approach uses survey data to estimate the factors that predict voting, including measures of the stringency of state registration laws and requirements. The survey data is then used to simulate the effects of a uniform liberalization of voter registration requirements to determine what percentage of voters would have voted had registration laws been more permissive (e.g., Wolfinger and Rosenstone 1978, 1980; Rosenstone and Hansen, 1993; Mitchell and Wlezien, 1995). Irrespective of the method, researchers have reached the general conclusion that an easing of registration requirements would result in an increase in turnout of somewhere between 5 to 10 percentage points.

Recently, Michael Traugott (2004) has raised serious doubts about the effects of changes in registration and absentee voting practices on turnout. Surveying recent experience with election reform in many states, he concludes that few reforms have had measurable effects on participation, despite academic findings and reasoning predicting

---

[1] The Current Population Survey asks registered voters who did not vote why they did not vote. Approximately 8 percent state that there was a problem with their registration when they tried to vote or tried to obtain an absentee ballot (Caltech/MIT Voting Technology Project, 2001).

significant changes. Part of the problem may lie with the methodologies used to estimate the effects of election laws.

Cross-state comparisons, used in both aggregate and survey research, may reflect spurious association between turnout and election law caused by an important omitted variable. Specifically, states that have more liberal registration laws may have a different sort of electorate – that is, one more inclined to vote. After all, that electorate or their representatives approved a more "civic minded" or participatory way to run elections. To the extent that the survey does not capture this difficult to measure concept, the registration law itself might. Other omitted variables include the multitude of other important election laws not measured, such as those regulating absentee ballots. Such state-level effects are nearly impossible to hold constant in cross state data analysis because there are only 50 states and a potentially large number of factors.

We correct this problem by studying a panel of counties within states. Several states did not introduce statewide voter registration requirements until relatively recently. Today, North Dakota does not require voters to register, nor do Wisconsin towns of less than 5,000 inhabitants. Seven other states – Iowa, Kansas, Missouri, Minnesota, Nebraska, New York, and Ohio – also did not require statewide personal registration until the late 1960s or 1970s. We measure the effect of registration on turnout by studying how the introduction of registration changed turnout at the county-level in two states, Ohio and New York. We selected these two states because it is clear which counties had registration before the state required the practice for all counties, and because the state election reports disaggregate returns to the county level.

Three important features of these data deserve note.

First, the change in law is much more dramatic than that considered in previous studies. New York and Ohio imposed registration on counties that previously had no such requirement. Even same day registration states still require registration. We expect a much larger change in turnout associated with the introduction of registration than we do with marginal changes in registration dates. Indeed, the states that only recently imposed registration statewide provide an interesting contrast with studies of the introduction of registration in the 19th Century. States introduced registration in the 19th Century to either combat corruption or to limit minority and immigrant voting. Converse

(1974) and Rusk (1974) argue that registration and other institutional changes significantly reduced the size of the American electorate, while Burnham (1974) attributed the reduction to large demographic shifts. We will revisit this matter in the conclusion.

Second, the level of observation is the county, rather than the state. State laws and other state factors are held constant (the states did not significantly change other election administration laws in these years). Also, because we can analyze the immediate change in voting rates within counties, demographic and sociological factors are held constant.

Third, the change in law was exogenous for the counties involved. The states imposed registration on the counties; the counties did not choose to have their practices changed. The New York and Ohio state legislatures amended their voter registration laws in 1965 and 1977, respectively, each imposing registration statewide. In this respect, the change in law is exogenous. The aim of the paper is to refine empirical estimations of the effect of registration on voter turnout, by taking advantage of the natural experiment provided by the changes in these states' laws.

To preview our results, we find that the imposition of registration had a noticeable effect on turnout, but much smaller than what is commonly estimated. The imposition of registration in New York and Ohio accounts for about a 3 to 4 percentage point difference in voter turnout. Additionally, we estimate that the introduction of voter registration to counties in New York and Ohio led to a short-term decline in voter turnout of up to 7 percentage points, but that effect vanished after one election. Thus, reformers' disappointment about the modest impacts of the National Voter Registration Act of 1993 (NVRA) and other electoral reforms (Traugott, 2004), might reflect biases in previous statistical estimates of the effects of registration on turnout, rather than failures of the laws.

The balance of this paper is organized as follows. In section II, we describe the voter registration laws in New York and Ohio. In section III, we explain our methods and present our estimates of the effects of registration on voter turnout. Last, in section IV, we discuss the implications of our results.

II. Registration Laws in New York and Ohio

The 1960s and 1970s was a period of considerable voter registration reform. The 1970 Voting Rights Act Amendments and a subsequent Supreme Court decision resulted in an effective federal mandate of a maximum thirty-day residency requirement for participation in federal elections in the fifty states (Hansen, 2001). Several states also made significant changes to their voter registration laws. Five states – Maine, Minnesota, Ohio, Oregon, and Wisconsin – adopted election-day registration, although voters in Ohio (by constitutional amendment in 1977) and Oregon (by ballot initiative in 1985) repealed it soon after. Often overlooked, however, is the fact that, for some parts of Minnesota and Wisconsin, the move to election-day registration meant shifting from no registration to registration. In other words, even though election-day registration is a relatively minor barrier to voting, voters in some parts of these states were required to register for the first time. In fact, as late as 1972, voter registration was not required in portions of Iowa, Kansas, Missouri, Minnesota, Ohio, and Wisconsin (Smolka, 1977; Council of State Governments, various years). In two other states, New York and Nebraska, state laws did not include statewide personal registration provisions until 1965 and 1967, respectively.

We exploit the variation in registration requirements within states to improve estimates of the effects of registration on turnout. Prior research has recognized the variation in registration requirements within these states (e.g., Smolka, 1977; Rosenstone and Wolfinger, 1978; Knack, 2001), but few have explicitly studied them.[2] Variation in registration laws within states allows us to hold constant state-level factors and to better control for demographics. Unfortunately, we cannot study all seven states. It is difficult to piece together the specific laws governing voter registration below the state level. For most states, this information is simply not available.[3] Some states allowed counties and

---

[2] Burnham (1974) who utilized this within-state variation in Missouri, New York, Ohio, and Pennsylvania for a period around the turn of the 20th century. Two unpublished studies – Martin, (1998) and Anderson (1983) have considered the Ohio case discussed in this paper, though they do not estimate the full panel model.
[3] We contacted state election officials, state research and law libraries, and other resources in the states in an effort to collect such information, but none of the states had compiled these data. We also reviewed past state statutory code, state legislature session laws, state publications, and the existing voter registration

towns the option of requiring registration, and there is no official record of which areas actually used registration. As a result, except in New York and Ohio, it does not appear possible to determine with any confidence which required and which did not require voters to register.[4]

In a couple of states, however, we are able to determine county-by-county voter registration information. In New York, past editions of a now obsolete annual publication, *The Manual for the Use of the Legislature of the State of New York*, indicate the number of election districts in each county that required personal registration and the number that did not. Similarly, for Ohio, the bi-annual publication *Ohio Election Statistics*, contains county-by-county (in fact, town-by-town) statistics on voter registration. Here too, data are provided indicating the number of precincts in each county that required personal registration. We recorded whether each county required, partially required (that is, required registration for only some towns in the county), or did not require personal registration in a given election year.[5] We compiled these data for the years 1954 through the year that the state imposed mandatory registration – 1965 in New York (effective 1967) and 1977 in Ohio (effective 1978).[6] As evidence of the extent of the within-state variation in registration laws, in the election year immediately prior to the law changes, 5 counties in New York and 22 counties in Ohio did not require registration, while an additional 37 and 4 counties, respectively, only required registration in parts of the county. Counties with partial registration ranged from requiring as few as 2% of voters to register to up to about 80% of voters.

Although our sample is unfortunately limited to New York and Ohio, studying the relationship between registration and turnout in these two states still provides us with

literature in attempt to assemble a list of which counties and cities did and did not have registration requirements prior to the state making them mandatory. Complicating our efforts for most of these states were provisions in their statutory code which allowed counties and cities to adopt registration voluntarily, either by resolution of local election officials or by ballot initiative.

[4] Rosenstone and Wolfinger (1978) reached a similar conclusion regarding the difficulty of disentangling registration laws below the state level (see footnote, 28).

[5] For Ohio, we corrected discrepancies in the number of precincts requiring registration. In several cases, the total number of precincts reported as requiring registration exceeded the total number of precincts in the county or under-counted – almost always by one or two precincts – the number of precincts requiring registration. The latter was evident by the fact that in election years immediately prior or succeeding the year in question, the county required full registration.

[6] In the case of New York, there was an interim period from 1965 to 1966 in which counties had the option of putting in place mandatory registration, before the state law enacted in 1965 came into effect for the entire state in 1967.

distinct methodological advantages compared to most previous analyses. Our panel data allows us to control for any unobserved, county-level effects that might bias estimations. The fact that registration requirements varied within these states at the county level allows us to hold constant state-level factors (e.g., candidates, economic conditions) that vary across states and are unaccounted for in cross-sectional studies. Moreover, the changes in state election law put in place by the state legislatures are exogenous to county-level phenomena, thereby enabling us to generate unbiased estimates of the effects of registration on county-level turnout.

We estimate voter turnout in the usual way by dividing the total number of votes in the highest office at stake in each election by the number of eligible voters.[7] For our vote data, we use county-level election returns compiled by Clubb, et al. (1986) for the years 1954 to 1968. From the period beginning with the 1970 election, we use data from the *New York Red Book*, election returns provided by the New York State Board of Elections, and *Ohio Election Statistics*. To estimate county-level voting-age population, we use data collected by the U.S. Census Bureau and reported in various editions of its *City and County Data Book*. While the Census Bureau regularly estimates voting-age population at the state level, it only does so at the county-level for decennial census years. To estimate the number of eligible voters in each county in non-census years, we impute the voting-age population for non-census years using a commonly employed linear interpolation method.[8]

III. The Effects of Registration on Voter Turnout

We provide three different estimates of the effects of the introduction of registration on turnout. First, following much of the literature, we analyze the difference in turnout between counties that had registration and counties that did not. This serves as a base case with which we establish the result one would get from cross-sectional

---

[7] We use total votes for presidential election years. For non-presidential years, we use total votes in senatorial election, if available, and total votes in gubernatorial elections otherwise.
[8] This approach, for instance, is used by Clubb, et al. (1986) in their compilation of county-level electoral data. The 1970s editions of the *County and City Data Book* do not provide an estimate of the voting-age population in 1970, but instead do for 1972. We use the 1972 data in our imputations.

analysis. Second, we present a panel model with fixed-effects for each county. Third, we present an analysis of "differences on differences": the short-term change in turnout among counties on which registration was imposed versus the short-term change in turnout among counties that already had registration. Both of these statistical models hold the county constant. Differences on differences reflects short-run changes in turnout, while fixed effects captures longer-term changes in counties' turnout rates when the registration law changes.

Cross-Sectional Analysis

The cross-sectional analysis is presented in Table 1. Here we estimate the effect of registration on voter turnout by contrasting turnout in counties with registration and counties without registration from 1954 through the election prior to the change in state law.[9]

[Table 1 here]

The difference between these two types of counties is considerable. In presidential-year elections, New York counties with registration had rates of turnout that were, on average, 13 percentage points lower than the New York counties without registration. In Ohio, the difference is approximately 10 percentage points. A difference of means test indicates that the differences are statistically significant. These estimates are on the high end of the range of estimates resulting from previous analyses. A third type of county had partial registration – some towns have registration, but not all. Predictably, mean turnout in partial registration counties rests between that full and non-registration counties.[10]   We find similar results for non-presidential-year elections. Mean turnout in counties with registration was 10 and 5 percentage points lower than in non-registration counties in New York and Ohio, respectively. A difference of means tests indicates that these results are also statistically significant at conventional levels.

---

[9] We begin our analysis with 1954 because both the New York and Ohio legislatures amended their election laws in this year, including sections pertaining to voter registration.

[10] These results hold when we use a less stringent standard for classifying counties as full registration. For instance, when coding any county with at least 80% of its election districts or precincts requiring registration as full registration counties, there remains a difference of about 10 percentage points in the mean turnout differential counties between full registration and non-registration counties.

These differences are also apparent in Figures 1 and 2. Noteworthy from these graphs is the fact that the observed differences in the mean turnouts are not simply a function of us having pooled elections for the purpose of analysis. In each election, for both states, the mean turnout for non-registration counties exceeded that of full registration counties.

[Figures 1 and 2 here]

Controlling for demographic characteristics of these counties lowered the estimated effect of registration, but only slightly. We performed two regression analyses for each state. In one analysis we pool all presidential elections; in the other analysis we pool all mid-term elections (excluding partial registration counties). We include dummy variables for years as well as county-level measures of percent of the population over 65 years old, percent with high school education, median family income, and percent African-American. The coefficient on registration (measured as the percent of the county registered) equals -.06 in Ohio presidential elections and -.01 in Ohio congressional elections; standard errors are .01 for each. The first effect is statistically significant; the latter is not. The coefficients on registration for New York are of about the same size, but are not statistically significant; the coefficient is -.05 and -.02 in New York presidential and congressional elections, respectively, with standard errors of .03 for each. In sum, for presidential elections, counties with registration have turnout rates 5 to 6 percent lower than counties without registration, controlling for income, education, race, and age.

Panel Model Estimates

The panel structure of the data allow us to examine how turnout changes when laws change. Also, because the New York and Ohio imposed registration on counties that had not yet adopted it, we can use the panel to estimate how an exogenous change in the registration law affects turnout. The structure of the panel data, moreover, allows us to control for time-invariant, county-level idiosyncrasies that might also help to explain variation in voter participation rates, but that we cannot measure using the census data.

Specifically, we compute the change in turnout from one election prior to the law change to one election after the law change for counties that did not have registration

before it was imposed by the states. As a contrast or control group, we measure the change in turnout in counties that had registration throughout for the same set of elections. The estimated effect of the law change is the change in turnout in the counties that previously had no registration minus the change in turnout in counties that had registration. As before, we make separate estimates for presidential and congressional election years.

As is shown in Table 2, turnout did decline with the introduction of registration. In New York presidential elections, mean turnout in counties required to register their voters for the first time was 7 percentage points lower than in the previous presidential election year. The decline in turnout in the counties with registration, though, was 5 percentage points. The net effect equals 2 percentage points and is statistically distinguishable from 0. In non-presidential years, the effect is less than one percentage points and not significant. In Ohio presidential elections, turnout declined 8 percent in counties without registration and grew 1 percent in counties with registration, for a net effect of 9 percentage points. In non-presidential elections in Ohio, turnout declined 11 percentage points among the counties on which registration was imposed. Average turnout fell 4 percentage points among counties that already had registration, with a net effect of 7 percentage points.

[Table 2 here]

We can introduce demographic controls and refine these estimates further by modeling the panel structure more explicitly. Two different sorts of panel estimates are possible. First, fixed effects regressions hold constant the unit of observation (i.e., a dummy variable for each county) by subtracting the unit-level average value of each variable. In essence, this estimator measures the effect of changing registration laws on long-term average turnout. Second, differences on differences regressions, a commonly employed approach for studying the effect of a major change in government policy (Angrist and Krueger, 1999), capture the immediate short-term effect of the policy innovation.

Our first regression model is a fixed effects specification that enables us to make use of both over-time and cross-section variation. The dependent variable is county-level turnout, and we consider elections from 1954 through 2000. Thus, for the 149 counties in

our dataset (61 in New York and 88 in Ohio), we have 24 observations (i.e., turnout in the 24 elections from 1954 through 2000).[11] The specification is as follows:

$$T_{it} = \alpha + \beta X_{it} + \gamma_1 R_{it} + \gamma_2 L_{it} + \delta Y_t + \mu_i + \varepsilon_{it} \tag{1}$$

where i indexes counties, t indexes years, T is turnout, X is a vector of demographic variables, R is the registration status of each county, L is a variable representing the effect of the state law change, Y is a vector of year dummies, μ is a variable representing any time-invariant, unobserved county-level effects, and ε is a stochastic error term.

The independent variables of primary interest include the registration status of each county, R, by which we mean the percentage of election districts in each county requiring registration. Additionally, we are particularly interested in L, our measure of the direct impact of the state's adoption of statewide registration requirements. The variable L captures the short-term effect of the law change. For the impacted counties, the effect will vary since counties ranged from having no election districts with prior registration to those having over 80% already requiring registration. This variable is created by multiplying a dummy variable indicating the first election in which the counties were required to register voters due to the change in state law (coded 1 for counties affected by the law change in first election after state law change, and 0 otherwise) with the percentage of the county requiring registration before the law change. The coefficient on this term can be interpreted as the impact of registration specifically due to the law change, and, thus, it is distinct from the impact of registration itself. Theoretically, this measure captures the possibility that voters in counties required to register for the first time, may have faced complications in casting a ballot due to the newly-introduced requirement to register. Our expectations are that $\gamma_1 < 0$ and $\gamma_2 < 0$, and their sum can be interpreted as the total immediate impact of the introduction of voter registration in New York and Ohio.[12]

---

[11] We exclude Hamilton County from the analysis because reported turnout is skewed by the fact that voting residence extended beyond the boundaries of residence defined by the U.S. Census Bureau, so data on voting-age population is too low (see p. 336 of the 1977 County and City Data Book). We also drop observations for Putnam County for 1950-1960 due to the Census Bureau's underestimation of the county's voting-age population.

[12] We should note that we originally tried to isolate the effect of the registration close date by including a separate "days" variable for this effect in our model. We did this in recognition of the consistent finding in the literature about the importance of the number of days before an election in which registration closes (e.g., Wolfinger and Rosenstone, 1980; Gilliam, 1985). In both New York and Ohio, the registration close date varied during the period of our time series, and, in New York, the close date often varied across

Also included in our model are a set of county-level demographic variables to control for other possible influences on county-level turnout.[13] We compile these data from various editions of the U.S. Census Bureau's *County and City Data Book*. These data are only available at the county-level for decennial-census years so we impute the data for non-census years using linear interpolation.[14] The demographic variables included are median family income (we use the log value for numerical stability), the percentage of the population (25 years and older) having completed at least high school, and the percentage of the population that is African-American.[15] We expect positive coefficients for each of these demographic variables (after undoing the log on the income variable) except for the percent of population that is African-American.

We also include year dummy variables to account for ballot effects (i.e., whether the election includes a presidential, senate, and/or gubernatorial election; electoral competitiveness) and other possible election-year shocks, as well as a time variable to control for any trend effects (coded 1 for year one in the series, 2 for year two in the series, etc.). Finally, we employ county-level fixed effects when estimating this equation, which enables us to remove any time-invariant, unobserved county-level factors that might too influence turnout. These fixed effects will also capture other county-level demographic variables not included in the model. Descriptive statistics for all of the variables included in the model are presented in the top portion of Table A in the Appendix.

---

counties until the early 1990s.[12] However, inclusion of a registration close date variable introduced multicollinearity into our equation, inhibiting our ability to judge the statistical significance of the estimated coefficients. Thus, when interpreting the coefficient on the registration variables, part of the effect likely captures that of the registration close date found in other studies.

[13] Typically in this type of analysis, it is necessary to include dummy variables for each state to take into account any unobserved state-specific variation. In this case, however, since only two states are included in our dataset, these state-level effects are already captured by our specification.

[14] Linear interpolation might introduce measurement error for these variables, thereby biasing our estimated coefficients. Measurement error, if present, would attenuate the effects of our coefficients (i.e., bias them toward zero) – that is, in this case, the actual negative coefficients on the registration variables would be larger. We check for this possibility by estimating the same fixed effects model for only those election years for which we have data from the Census Bureau (1960, 1970, etc.). The coefficient estimating the effect of registration on turnout is slightly *smaller* (about .02), but still statistically significant, providing some evidence that measurement error is not biasing the results in our previous analyses.

[15] Other possible demographic correlates of turnout are not available for our complete time-series. The 1994 edition of the *County and City Data Book* which contains data for 1990 does not include data for the median age of the population and the percent of the population living in urban areas.

The results of our fixed effects regression model are presented in the first three columns of Table 3. The first column of coefficients presents the results from estimating model (1) for the years 1954 through 2000. The effect of registration on turnout is clear. The coefficient on the percent of county required to registration is -.037, which suggests about a 3.5 percentage point decline in turnout for counties moving from no registration to registration. The effect for counties already requiring some voters to register, of course, would have been smaller. The coefficient of about -.02 for the law change variable indicates an additional effect of registration on turnout for those counties impacted by the states' adoption of statewide registration. This means that, for those counties without registration prior to the law change, turnout suffered a cumulative decline of about 5 to 6 percentage points in the first election after the law came into effect. But the long-term difference in turnout before the law change and after the law change was only 3.5 percentage points.

We tested the robustness of these results several ways: (1) different time periods, (2) excluding partial registration, and (3) separate estimates for New York and Ohio.

We estimate the same fixed effects model for a period of time (1960-1986) more closely around the years of the state law changes of interests. Our model yields similar coefficients for this shorter time-series; these are presented in the second column of Table 3. The impact of registration on turnout is again about 3 to 4 percentage points, with an additional negative effect on turnout due to the state law change of about 2 to 3 percentage points.

The results are also stable when we consider only "pure cases." The third column of estimates in Table 3 shows the estimates when we exclude counties with partial registration. The decline in turnout for just those counties shifting from no registration to registration is approximately 3 to 4 percentage points. The coefficient on the law change variable is again about 2 percentage points.

Finally, New York and Ohio differed somewhat, but the differences are not statistically significant. We ran the analyses reflected in the first, second, and third columns of estimates for New York and Ohio separately. The coefficient on L does not differ between the states. The coefficient on R is around -.05 in Ohio, and -.03 in New York.

[Table 3 here]

The differences on differences estimates build on the fixed effects specification. Taking first differences in equation (1) leads to the following equation:

$$T_{it} - T_{it-1} = \alpha + \beta(X_{it} - X_{it-1}) + \gamma(1 - R_{it-1}) + \delta Y_{it} + \varepsilon_i \qquad (2)$$

where i indexes counties, t indexes years, T is county-level turnout, X is a vector of county-level demographic variables, R is the percentage of election districts in the county requiring registration, Y is a year variable to capture election-specific shocks, and ε is a stochastic error term. In the election following the imposition of registration all counties and towns required registration so $R_t = 1$ and the difference is $1 - R_{t-1}$.

The variable of primary interest in our model is the registration status of each county, R, which we again operationalize as the percentage of each county requiring registration. The model is constructed such that, in election year t, all counties are required to register their voters. Thus, for counties requiring all their voters to register at $t-1$ (that is, before the state made it compulsory), the change in R will be zero. For counties that previously did not require registration, the change in the registration variable is $1 - R_{t-1}$, because once registration is required $R_t = 1$. Our expectation is that $\gamma < 0$, because the introduction of registration is expected to lower turnout.

We also include the same set of demographic control variables as in the fixed effects model, as well as the percent of county population that is urban and the median age of the county population, since these data are available for the years we consider. We also include year dummies (at year t only) to control for ballot effects and other possible election-year shocks that influenced turnout. Last, the first-differencing process removes any unobserved county-level effects that do not vary over time. Descriptive statistics for these variables for each set of elections we analyze below are presented in the bottom portion of Table A in the Appendix.

We first consider the differences on differences model using data from the elections immediately before and after the law change in each state – that is, 1966 and 1970 for New York and 1976 and 1978 for Ohio. It did not matter that we mixed presidential and congressional elections for these estimates, since they were similar for presidential election to presidential election and congressional election to congressional election. We present the pooled analysis here for simplicity.

The results are presented in the last two columns of Table 3. The coefficient on the registration variable is -.085, which suggests that the states' imposition of registration requirements had a large effect on county-level turnout. This estimate is driven entirely by the Ohio data, for which the coefficient equaled -.095 and was highly significant. The estimate for New York was not statistically different from 0. This might reflect idiosyncrasies in the specific elections at stake.

More reliable estimates emerge when comparing two elections before the law and two elections after. The final column of Table 3 presents the estimated effect of the registration law using a two-election window. The coefficient on the registration variable is approximately -.04, which suggests that the impact of New York and Ohio introducing voter registration requirements on a statewide basis led to about a 4 percentage point drop in voter turnout for counties not previously having personal registration laws in effect. The estimated effects for New York and Ohio separately in this model are quite similar – approximately -.05 for Ohio and -.03 for New York. So, the estimates appear stable.

In sum, the estimates from the fixed effects and differences on differences models suggest a clear conclusion: personal registration requirements led to a decline in county-level turnout in New York and Ohio. Our panel estimates suggest an effect of about 3 to 4 percentage points, with an additional one-time drop in turnout of about 2 to 3 percentage points in the first election for those counties required for the first time to register all of their voters.

IV. Conclusions

Registration laws exist to ensure the integrity of the electoral process. In most states, they were introduced in the 19th Century to combat widespread corruption, but they have also been used to exclude voters, as Key (1949) describes. Today, reforms such as same day registration and later registration dates seek to lessen the obstacle to voting posed by registration. The critical questions are how large is the effect of registration on participation, and how should we weigh that problem against the potential problem of vote fraud?

The relatively recent introduction of voter registration into all counties in Ohio and New York provides a powerful means through which to estimate the magnitude of the effect of registration itself on participation. As with many other studies, we have found a highly statistically significant drop in turnout in counties on which registration was imposed compared with counties that had already chosen to use registration. The effect we observe, however, is approximately half as large as the effect commonly estimated.

The reason is methodological. Cross-sectional studies find effects of registration on participation rates in the range of 5 to 10 percent. In New York and Ohio, we find that as well. During the 1950s and 1960s (and the early 1970s in Ohio), counties with registration had turnout rates roughly 10 percentage points lower than counties without registration. Half of that effect, though, seems to be due to features of the counties other than the registration law. When we use the panel of observations to estimate the effect, we find that the introduction of registration within counties dropped turnout immediately by 4 to 7 percentage points, and that over the longer term, the change in turnout attributable to the introduction of registration is approximately 3 to 4 percentage points.

As an historical and political matter, it is noteworthy that we look at the introduction of registration in an era long after the fall of Tammany and other political machines widely alleged to have won elections by buying votes. The presumption today is that registration systems have been in place for a long time and were introduced to crush the corrupt practices of the 19th century. They may have done just that, but the effects of the introduction of registration in the late 20th century, after machine politics had largely disintegrated, is similar in magnitude to the effects of the introduction of registration in urban areas in the 19th century. The effects in the 19th Century are in the range of a 7 percentage point drop in turnout. Converse (1972 and 1974) and Rusk (1970, 1971, and 1974) suggest that the introduction of registration and other institutional changes which decreased corruption account for the decline of turnout at the beginning of the 20th century. Our findings from late in the 20th Century suggest that a substantial portion of the decrease in turnout attributable to registration at the beginning of the 20th Century likely reflected an actual decrease in voting among legally qualified voters, and not just the elimination of corrupt ballots.

Our findings also temper the contemporary debate over registration reform. Many observers have expressed disappointment with recent registration reforms, such as those in the National Voter Registration Act. The hope was to produce turnout in the range of 60 to 70 percent, rather than 50 percent. Our analysis suggests that expectations should have been lower, perhaps in the range of 53 or 54 percent. This does not reflect the failure of the laws, but bias in statistical estimates of the effects of registration on turnout. Registration does produce lower rates voting, though the effects are smaller than prior research has indicated.

References

Anderson, Dennis M., 1973, "The Impact of Registration Laws on Voting Turnout: Seventy-Five years of Dual Registration in Ohio," Paper delivered at the 1983 Annual Meeting of The American Political Science Association, Chicago, Illinois.

Angrist, Joshua D., and Alan B. Krueger, 1999, "Empirical Strategies in Labor Economics," In: *Handbook of Labor Economics, Volume 3*, eds.: Orley Ashenfelter and Richard Card, New York: Elesvier Science.

Burnham, Walter Dean, 1974, "Theory and Voting Research: Some Reflections on Converse's 'Change in the American Electorate,' *American Political Science Review*, 68(3): 1002-1023.

Caltech/MIT Voting Technology Project, 2001, *Voting: What Is, What Could Be*. Cambridge MA: Department of Political Science, MIT.

Clubb, Jerome, M., William H. Flanagan, and Nancy H. Zingale, 1986, "Electoral Data for Counties in the United States: Presidential and Congressional Races, 1840-1972, ICPSR Dataset #8611.

Converse, Philip E., 1974, "Comment on Burnham's 'Theory and Voting Research,' *American Political Science Review*, 68(3): 1024-1027.
Converse, Philip E., 1972, "Change in the American Electorate," In: *The Human Meaning of Social Change*, eds. Angus Campbell and Philip E. Converse, New York: Russell Sage Foundation.

Council of State Governments, various years, *The Book of the States*, Lexington, Kentucky: Council of State Governments.

Fenster, Mark J., 1994, "The Impact of Allowing Day of Registration Voting on Turnout in U.S. Elections from 1960 to 1992: A Research Note," *American Politics Quarterly* 22(1): 74-87.

Gilliam, Jr., Franklin D., 1985, "Influences on Voter Turnout for U.S. House Elections in Non-Presidential Years," *Legislative Studies Quarterly* 10(3): 339-351.

Highton, Benjamin, 1997, "Easy Registration and Voter Turnout," *Journal of Politics* 59(2): 565-575.

Hansen, John Mark, 2001, "Voter Registration," *To Assure Pride and Confidence in the Electoral Process*, Final Report of the National Commission on Federal Election Reform.

Highton, Benjamin and Raymond E. Wolfinger, 1998, "The Political Implications of Higher Turnout," *British Journal of Political Science* 31: 179-223.

Kelley, Jr., Stanley, Richard E. Ayres, and William G. Bowen, 1967, "Registration and Voting: Putting First Things First," *American Political Science Review* 61(2): 359-379.

Key, V. O., 1949, *Southern Politics*, New York: Vintage Press.

Kim, Jae-On, John R. Petrocik, and Stephen N. Enokson, 1975, "Voter Turnout Among the American States: Systematic and Individual Components," *American Political Science Review* 69(1): 107-123.

Knack, Stephen, 2001, "Election-Day Registration: The Second Wave," *American Politics Research*, 29(1): 65-78.

Knack, Stephen, 1999, "Drivers Wanted: Motor Voter and the Election of 1996," *PS: Political Science and Politics* 32(2): 237-243.

Knack, Stephen, 1995, "Does 'Motor-Voter' Work? Evidence from State-Level Data," *Journal of Politics* 57(3): 796-811.

Martin, Louis V., 1998, *Specification of the Independent Effect of Voter Registration on Turnout, Ohio Presidential Elections, 1888-1976*, Doctoral Dissertation, University of Cincinnati.

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

New York Department of State, various years, *The Manual for the Use of the Legislature of the State of New York*, Albany: New York Department of State.

Ohio Secretary of State, various years, *Ohio Election Statistics*, Columbus: Ohio Secretary of State.

Rhine, Staci L., 1996, "An Analysis of the Impact of Registration Factors on Turnout in 1992," *Political Behavior* 18(2): 171-185.

Rosenstone, Steven J. and John Mark Hansen, 1993, *Mobilization, Participation, and Democracy in America*, New York: MacMillan Publishing Company.

Rosenstone, Steven J. and Raymond E. Wolfinger, 1978, "The Effects of Registration Laws on Voter Turnout," *American Political Science Review* 72(1): 22-45.

Rusk, Jerrold G., 1974, "Comment: The American Electoral Universe: Speculation and Evidence," *American Political Science Review*, 68(3): 1028-1049.

Rusk, Jerrold G., 1971, "Communications," *American Political Science Review*, 65(4): 1152-1157.

Rusk, Jerrold, G., 1970, "The Effect of the Australian Ballot Reform on Split-Ticket Voting: 1876-1908," *American Political Science Review*, 66(4): 1220-1238.

Smolka, Richard G., 1977, *Election Day Registration: The Minnesota and Wisconsin Experience in 1976*, Washington, D.C.: American Enterprise Institute for Public Policy Research.

Teixeira, Ruy A., 1992, *The Disappearing American Voter*, Washington, D.C.: The Brookings Institution.

Traugott, Michael W., 2004, "Why Electoral Reform Has Failed: If You Build It, Will They Come?" In: *Rethinking The Vote: The Politics and Prospects of American Election Reform*, eds. Ann N. Crigler, Marion I. Just, and Edward J. McCaffery, New York: Oxford University Press.

U.S. Census Bureau, various years, *County and City Data Book*, Washington, D.C.: United States Government Printing Office.

Wolfinger, Raymond E., and Jonathan Hoffman, 2001, "Registering and Voting with Motor Voter," *PS: Political Science and Politics* 34(1): 85-92.
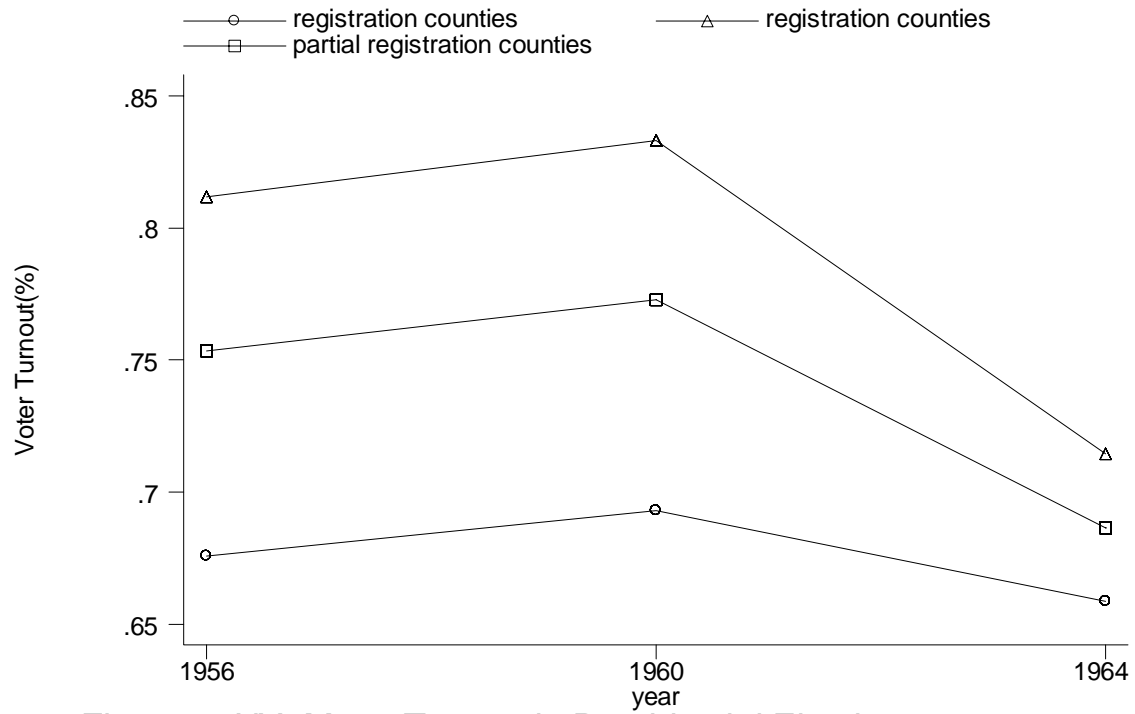
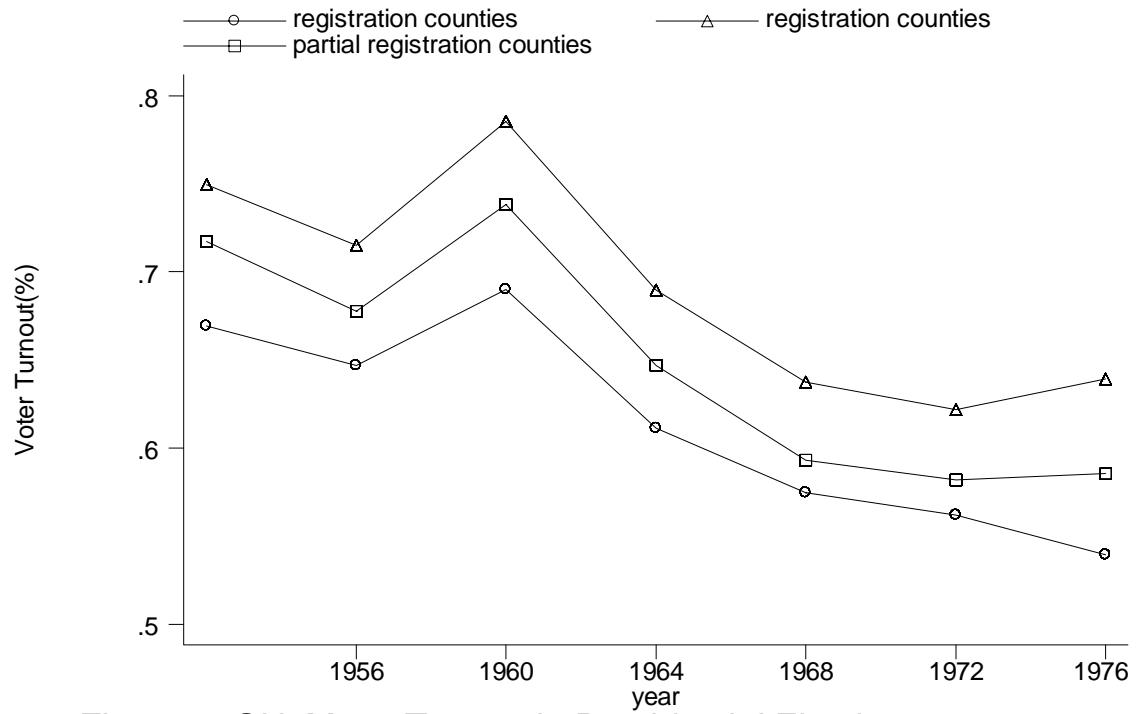Figure 1. NY: Mean Turnout in Presidential Elections, 1956-64

Figure 2. OH: Mean Turnout in Presidential Elections, 1956-76

Table 1. Cross-Sectional Results: Mean Turnout Across Counties in Period Before Statewide Registration		
	New York[a]	**Ohio**
Presidential Years	*1956-1964*	*1956-1976*
Full registration (NY=40; OH=245)	.67 (.02)	.59 (.05)
Partial registration (NY=125, OH=60)	.74 (.04)	.66 (.06)
No registration (NY=16, OH=223)	.80 (.05)	.69 (.06)
Difference of means t-test	*Effect = .13*	*Effect = .10*
	t = 5.58	*t = 15.74*
Non-Presidential Years	*1954-1966*	*1954-1974*
Full registration (NY=56; OH=221)	.54 (.03)	.46 (.04)
Partial registration (NY=166, OH=68)	.58 (.02)	.49 (.05)
No registration (NY=20; OH=239)	.64 (.04)	.51 (.05)
Difference of means t-test	*Effect = .10*	*Effect = .05*
	t = 5.45	*t = 9.05*

[a] Excludes Hamilton County and Putnam County for years 1954-1960 (see footnote 11).
Standard errors in parentheses.
Effect and *t*-statistic is for difference of means test between full registration and no registration counties.

Table 2. Panel Results: Comparison of Mean Turnout in Election Year Prior to Law Change to Election Before Law Change		
	New York[a]	**Ohio**
Presidential Years	*1968 vs. 1964*	*1980 vs. 1976*
Effect of statewide registration		
counties impacted (NY=41; OH=26)[b]	-.07 (.003)	-.08 (.001)
counties not impacted (NY=20; OH=62)	-.05 (.01)	.01 (.003)
Difference of means t-test	*Effect = -.02*	*Effect = -.09*
	t = -3.84	*t = 14.8*
Non-Presidential Years		
Effect of statewide registration	*1970 vs. 1966*	*1978 vs. 1974*
counties impacted (NY=41; OH=26)[b]	-.03 (.003)	-.11 (.01)
counties not impacted (NY=20; OH=62)	-.03 (.004)	-.04 (.003)
Difference of means t-test	*Effect = -.001*	*Effect = -.07*
	t = -.023	*t = -11.0*

[a] Excludes Hamilton County (see footnote 11).

Standard errors in parentheses.

[b] Includes counties in which some parts already had registration requirements in place (36 counties in New York and 4 counties in Ohio).

Table 3. Registration Effects on Turnout in New York and Ohio					
Dep. Var. = County-Level Turnout					
	Fixed Effects			*Differences on differences*	
	1954-2000	*1960-1986*	*1954-2000 (excluding partial registration counties)*	*One Election Before and After Law Change*	*Two Elections Before and After Law Change*
% of county with registration	-.037** (.003)	-.033** (.003)	-.035** (.003)	-.085** (.008)	-.044** (.007)
Law change	-.022** (.005)	-.027** (.005)	-.018** (.005)		
Log median family income	-.094** (.010)	-.079** (.017)	-.117** (.010)	-.010 (.019)	.035* (.016)
% Population with h.s. education	.048* (.021)	-.047 (.031)	.053* (.021)	.250 (.311)	.066 (.126)
% Population African-American	-.814** (.044)	-.746** (.073)	-.855** (.044)	-2.08** (.542)	.059 (.291)
% Urban				-.311 (.202)	.056 (.091)
Median Age				.005 (.009)	.006 (.004)
Year dummy[a]				.264** (.023)	.233** (.019)
Constant	1.28** (.079)	1.57** (.132)	1.44** (.082)	-.087 (.148)	-.408** (.126)
R^2	.89	.92	.88	.94	.96
# Obs.[b]	3572	2085	3150	149	149

Standard errors in parentheses.

* Statistically significant at the .05 level; ** Statistically significant at the .01 level.

Fixed effects models included year dummy variables and a time trend variable.

Independent variables in differences on differences model represent Δ.

[a] 1978, 1970, and 1970 respectively, is the year dummy omitted.

[b] Hamilton County is excluded in differences on differences model (see footnote 11).

Appendix: Descriptive Statistics of Variables

Table A. Descriptive Statistics of Variables Included in Regression Models				
Fixed Effects Model (n = 3572)				
Variable	*Mean*	*Standard Deviation*	*Minimum*	*Maximum*
County-level turnout	.53	.11	.17	.92
% of county with registration	.78	.39	0	1
Law change	.02	.14	0	1
Log median family income	9.6	.80	7.7	11.3
% Population with h.s. education	.49	.11	.20	.87
% Population African-American	.04	.05	0	.38
Differences on differences Model (n = 149)				
One Election Before and After Law Change				
Variable	*Mean*	*Standard Deviation*	*Minimum*	*Maximum*
Δ County-level turnout	-.09	.13	-.36	.11
Δ % of counties with registration	.37	.43	0	1
Δ Log median income	7.5	.19	6.9	7.9
Δ % Urban	.-002	.01	-.05	.08
Δ % Population with h.s. education	.005	.04	-.05	.08
Δ % Population African-American	.002	.01	-.002	.05
Δ Median Age	-.20	.72	-1.9	.86
Two Elections Before and Two Elections After Law Change				
Variable	*Mean*	*Standard Deviation*	*Min.*	*Max.*
Δ County-level turnout	.01	.14	-.23	.20
Δ % of counties with registration	.39	.43	0	1
Δ Log median income	8.3	.48	7.3	9.0
Δ % Urban	-.01	.03	-.07	.12
Δ % Population with h.s. education	-.02	.08	-.15	.11
Δ % Population African-American	.003	.01	-.01	.08
Δ Median Age	-.03	1.4	-4.3	2.6

Hamilton County is excluded in differences on differences model (see footnote 11).