

Voting by Mail in a VENMO World: Assessing Rejected Absentee Ballots in Georgia

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Abstract

Due to the COVID-19 threat to in-person voting in the November 2020 election, state and local election officials have turned to mail voting as a potential solution. Vote-by-mail (VBM) may not be a panacea, however. Even though state election codes lay out guidelines and uniform requirements for confirming the eligibility of voters casting mail ballots, some voters may lack information on how to correctly fill out or return a VBM envelope, leaving local election officials considerable discretion when validating mail ballots. This is particularly concerning if under-represented subgroups of the electorate—racial and ethnic minorities, young voters, female, and those newly registered—are disproportionately more likely to have their identifying information on the back of a VBM ballot return envelope challenged. Merging Georgia’s statewide voter files with county-level U.S Census Bureau data, we analyze VBM ballot rejection rates in the state’s 2018 General Election. Using Heckman sample selection models, we find that newly registered, young, female, and minority voters have rejection rates that are higher compared to their counterparts, varying from 4 to 7 percentage points.

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In recent elections, in a growing number of states, voters have cast their ballots by mail ([United States Election Assistance Commission 2017](#); [Mann 2014](#)). Despite most states having uniform election codes regulating vote by mail (VBM) ballots, local election officials have considerable discretion over the standards by which they evaluate mail ballots. In contrast to voting in person, when voters can respond in real-time to questions about their eligibility to vote, the identity of voters casting ballots by mail is evaluated remotely by election administrators, leaving little recourse for voters to easily rectify any problems with their ballots. With the push for mail voting as a response to the coronavirus pandemic, we are interested in understanding whether there are any existing inequities in which voters have their VBM ballots rejected.

Generally speaking, there are two reasons why a VBM ballot might be rejected: an error committed by a voter, or the discretion of an election official remotely confirming a VBM voter's eligibility. While voters may make mistakes in the process of returning their ballot, for their part, local election officials have considerable leeway in how they interpret statutes for confirming voter eligibility ([Kimball and Kropf 2006](#)). Indeed, in other election administration venues, there is evidence that street-level bureaucrats may discriminate against racial and ethnic minorities when providing public services ([White, Nathan and Faller 2015](#); [Butler and Broockman 2011](#)).

The challenges of verifying VBM ballots were on full display during the Georgia's November 2018 election. The state received national attention for their rejection of VBMs, after high numbers of ballots were rejected from Gwinnett County, a suburban county with a growing population of racial and ethnic minority voters. More recently, in the midst of the coronavirus pandemic that upended primary elections held in Spring 2020, Georgia's Secretary of State opted to mail every *active* registered voter an absentee ballot application, in addition to giving them the option of casting an in-person ballot. During an election year where the use of mail in ballots is being discussed as an alternative to in-person voting, understanding discrepancies in how VBM ballots are verified is vital to electoral democracy.

This paper assesses the challenges associated with the verification of VBM ballots, develops a set of theoretical expectations for whether certain groups of voters are more likely to cast a ballot that is rejected, and tests these expectations using VBM ballots and statewide voter

file data from the 2018 midterm election in Georgia. To preview our findings, our Heckman sample selection models show that younger voters, female, minority, and recent registrants were more likely to have their ballots rejected (both on-time and late ballots). We argue a combination of individual-level and systemic factors play a role in rejection rates. Young voters and new registrants, may lack familiarity with the voting process and be more apt to make mistakes leading to ballot rejection (Bennett 1991; Shino and Smith 2018). For racial and ethnic minority voters, we suggest limited access to accurate information about how to properly cast a mail ballot makes them more likely to make mistakes (Barreto, Cohen-Marks and Woods 2009; White, Nathan and Faller 2015). More systemically, it is possible that racial and ethnic minority voters have their ballots rejected for reasons related to implicit “taste-based” discrimination by local election officials (White, Nathan and Faller 2015).

While our findings do not directly test for the causal pathways explaining VBM ballot rejections, they align with our assumptions that there may be both individual-level and systemic factors explaining why these groups of voters are more likely to cast ballots that are rejected for mistakes, even if received on time, or timeliness. Our findings raise the concern that not all VBM voters are treated equally, one that is all the more acute in the context of widespread discussion about the expansion of mail balloting in response to the COVID-19 pandemic.

1 Why Might Mail Ballots be Rejected?

The decision at the center of whether a VBM ballot is counted is inherently subjective. The validation of mail ballots rests in the hands of local election officials who are charged with determining whether an eligible voter has met the criteria to have their mail ballot counted. Like most aspects of election administration in the United States

, the process by which ballots are counted varies from state to state, and even from local jurisdiction to jurisdiction within states.¹ Explanations for why some VBM ballots are rejected in a subjective administrative process, then, rest on both individual-level and systemic factors, and they are not necessarily mutually exclusive.

¹See “All-Mail Elections (aka Vote-by-Mail),” National Conference of State Legislatures, available at <https://www.ncsl.org/research/elections-and-campaigns/all-mail-elections.aspx> (last accessed March 24, 2020).

1.1 Individual-Level Explanations

A prospective VBM voter needs to know where, when, and how to request a mail ballot application, how to fill out the ballot, how to complete the voter’s certificate and other information on the return envelope, possibly provide postage, and have a sense of how long it will take for the ballot to make it to the local election office. While these steps may be commonplace to some, it is possible that certain voters are more predisposed to making mistakes in the process of requesting and casting a mail ballot.

Because they are new to the voting process, young voters and new registrants may be more prone to make mistakes when voting a mail ballot. For young voters, the art of signatures may not be held in high regard. Online, touch-screen, and scratch pad authentication has supplanted the need for honing one’s signature. VBM, though, requires voters sign the back of the official return VBM ballot envelope for their vote to count. Not all voters have equally stable signatures, making it more likely for some registrants to have a signature on file in their local elections office that may not match their current signature ([Suttman 2020](#)). Advocates of VBM systems like Neal Kelley, a former president of the California Association of Clerks and Election Officials, does admit that there “are difficulties on occasion” with poor penmanship, and forensic experiments have found a non-zero chance of real signatures being rejected as not matching and forged signatures being accepted as valid ([Herbst and Liu 1977](#)). Even in states that have transitioned to all-mail voting systems, election officials concede that not every voter sign their ballots legibly. “Penmanship oddly enough is pretty consistent throughout a person’s life,” Washington Secretary of State Kim Wyman has claimed, “and election administrators get training from signature experts at our State Patrol” in order to decipher cast ballots, yet “[s]ometimes we’ll see our younger voters change their signature style when they move into a professional setting”([Moretti 2014](#)).

Millennial and generation-Z cohorts might also have less familiarity with the U.S. Postal Service. Knowing where to buy stamps or drop-off letters, for example, may be a barrier unique to these voters, as they have less experience with, or even preference for, using “snail mail” to communicate ([USPS 2018](#)). There is a Venmo world—communication or transactions via email seem archaic. As such, it would not be surprising if young voters have more difficulty negotiating the arrival, or the return, of a VBM ballot through the Postal Service, as they are less engaged with the “old-fashioned” technology used to vote by mail ([Delli Carpini 2000](#)).

1.2 Systemic Explanations

In addition to some individuals not being as fluent in the mail voting process, which may lead to a VBM ballot being rejected, there may also be systemic factors conditioning the rejection of mail ballots. Election officials may differ not only in the administration of VBM ballots, mail delivery services that transport ballots to and from voters may differ, too. As such, the context in which a voter casts a VBM ballot may help to explain why certain groups of voters are more likely to cast a ballot that is late or rejected.

Research on services in the welfare state provide insight to these disparities in administrative processing of VBM ballots. Racial and ethnic minority constituents, on average, receive lower quality service in their interactions with bureaucratic entities. Nonwhite recipients of Temporary Assistance for Needy Families (TANF) benefits are penalized for violating rules more than White recipients (Keiser, Mueser and Choi 2004). White applicants also tend to receive higher quality information when inquiring about welfare benefits (Ernst, Nguyen and Taylor 2013), and White applicants for public assistance tend to receive more than their minority counterparts (DeSante 2013).² Perhaps not surprisingly, scholars have found these patterns extend to administrative services provided by election officials. Questions about how absentee ballots are counted fit within a broader literature that considers whether local election officials treat certain groups of voters differently in their implementation of election laws and provision of election related services (Kimball and Kropf 2006; White, Nathan and Faller 2015; Butler and Broockman 2011).

Much of this research focuses on whether racial and ethnic minority voters face stricter scrutiny in their interactions with election administration. There is a range of evidence suggesting these voters may face greater barriers when voting in person as a function of their racial and ethnic background and discrepancies in election administration (King and Barnes 2019; Pettigrew 2017). Evidence from New Mexico, for example, shows that Hispanic, male, and Election Day voters were more likely to be asked for identification by poll workers when none was required (Atkeson et al. 2014). Racial and ethnic minority voters are also more likely to experience longer lines at polling places a pattern that is likely the result of how election

²When it comes to how these structural condition affect an individual’s political participation, there is ample scholarship, as Michener (2018, p.29) observers, documenting “institutionally embedded contexts affect individuals’ experiences with policies, which can in turn affect their political capacity and shape a wide range of participatory actions.”

administrators allocate resources (Pettigrew 2017). Evidence from Los Angeles reveals that nearly 30 percent of poll workers incorrectly told observers it was the law in California to show identification (Barreto, Cohen-Marks and Woods 2009). Moreover, the percentage of poll workers who made these claims were higher in precincts that had more minority voters. Research from other electoral jurisdictions also shows that Black and Hispanic registered voters reported they were more likely than White voters to be asked to show identification (Ansolabehere 2009; Cobb, Greiner and Quinn 2010).

Fewer studies have directly considered whether younger voters face systematic bias in the voting process. Yet, there are several barriers these voters face in the electoral process. They are more likely to face structural barriers as a result of changes in election administration: they experience longer lines at polling places (Herron and Smith 2013; Cottrell, Herron and Smith N.d.), and are more likely to be negatively affected by polling location changes (Amos, Smith and Ste.Claire 2017; Shino and Smith 2020). They are also less likely to have information about how to vote, as young registrants are not as frequently contacted and mobilized by campaigns (Bennett 1991; Michelson 2005) and are not yet conditioned to be habitual voters (Shino and Smith 2018; Highton and Wolfinger 2001). As a result, they might be less familiar with the ins-and-outs of the mechanics of how to cast a ballot (Franklin 2004).

As with in-person voting at local polling sites, research on mail voting suggests that young and racial and ethnic minorities may also face additional barriers when casting a ballot that is processed and tabulated remotely. For example, in their study of mail voting in Los Angeles County, Alvarez, Hall and Sinclair (2008) found that language minority voters who requested non-English ballots had a much lower likelihood of their ballots being counted compared to other absentee voters. Although not central to their theoretical expectations and analysis, Alvarez, Hall and Sinclair (2008) also find that younger voters— those between the ages of 18 and 24— are more likely to fail to return their ballot, and of those that are returned, theirs are less likely to be counted.

Another structural condition to consider is that some voters may be less likely to receive high quality information about voting by mail. Local election officials play an important role in educating voters about all facets of the voting process. There is considerable variation, however, in the lengths local election administrators will go to in order to ensure every eligible voter who wants to cast a ballot is able to do so (Merivaki and Suttman-Lea 2019). In Georgia, the State Election Board has a duty to “formulate and conduct” voter education programs about

procedures for voting by absentee ballot and at the polls. These activities are, however, subject to funds being appropriated by the state's General Assembly. Georgia's election code does not lay out more specifics about what such a program should look like.³ In short, while voters may make mistakes in the process of returning absentee ballots, local election officials also play a role in educating voters about the correct way to return an absentee ballot (Adona et al. 2019).

Scholars have found that Hispanic and Black voters are more likely to receive no or lower quality responses relative to their White counterparts when inquiring about the voting process, and precincts in minority neighborhoods are more likely to be of low quality, be difficult to find, and have long lines (Butler and Broockman 2011; White, Nathan and Faller 2015; Barreto, Cohen-Marks and Woods 2009). This evidence is in line with the literature documenting bias in the provision of welfare services to racial and ethnic minorities. In short, these voters may be more likely to make mistakes on VBM ballots, but there may also be systematic differences in the type of information available to them about how to properly process a mail ballots.

Furthermore, evidence from Florida that young and racial and ethnic minority voters cast absentee ballots that are disproportionately rejected. Smith (2018) finds that in the 2016 general election, voters under the age of 30 made up only 9.2 percent of all absentee ballot voters in Florida, but accounted for 30.8 percent of all rejected mail ballots. Similarly, absentee ballots cast by Black, Hispanic, and other racial and ethnic minorities were at least two and a half times as likely to be rejected as those cast by White absentee ballot voters. During the 2016 general election, rejection rates in Florida for these groups were not uniform across the state's 67 counties, suggesting a lack of uniformity in the state's mail ballot counting practices. Research on the counting of provisional ballots in Florida and North Carolina, another area of election administration that involves a remote interaction between voters and election officials, echoes these patterns of ballot rejections for young voters (Merivaki and Smith 2016, 2020).

Summing up, there is good reason to expect that both individual-level and systemic factors condition whether a mail ballot will be accepted as valid or not. Because the process of authenticating an voter's identity who casts a VBM ballot is inherently subjective, both factors likely influence whether a ballot is accepted as valid.

³See GA Code § 21-2-31(9)

2 Expectations

The central question when evaluating why some VBM ballots are rejected turns on with whom the responsibility for a rejected ballot lies. At the individual level, voters can make mistakes that can be cause for election officials to reject a mail ballot. In Georgia, when voters fill out their absentee ballots, the information on the envelope includes an oath, the name of the elector, and any other “required identifying information.” This includes the voter’s residence and address, the year of the voter’s birth, and a voter’s signature or mark. Voters fill out this information and swear to the oath printed on the envelope.⁴ If this information is missing, incorrect, or if the voter’s signature does not match what is on file with a voter’s registration record, it is grounds for rejection by election administrators. Moreover, if the ballot is not returned by the close of the polls on Election Day, that is also grounds for rejection.⁵

For ballots returned on time but nevertheless rejected, the possibility that election administrators may be more likely to reject ballots cast by racial and ethnic minorities, young voters, and new registrants depends, in part, on the information provided by the voter on the VBM ballot return envelope. When the ballot is received, a voter registrar or absentee ballot clerk compares the identifying information on the oath on voter’s return envelope with the information on file under the voter’s registration. They also compare the signature on the oath with the signature on the voter’s voter registration card. If a signature is missing, “does not appear to be valid,” if the ballot return envelope is missing information, or if the information provided by the voter does not match what is in the voter’s registration file, the official may reject the ballot. Some jurisdictions will document the reason for rejection on the ballot itself. In Georgia, there is little guidance in election code as to what constitutes a “valid” signature, and it is largely left up to the determination of the official counting the ballot. Georgia election code states that “the board of registrars or absentee ballot clerk shall promptly notify the elector of such a rejection,” although it does not specify what is meant by “promptly” nor the means through which the voter should be notified.⁶

We expect that new registrants, to be both more likely to cast a late absentee ballot, and also more likely to have even on-time ballots rejected for mistakes made in the process of

⁴See GA Code § 21-2-384 (c)(1)

⁵See GA Code § 21-2-386 (a)(1)(F)

⁶See GA Code § 21-2-386 (a)(1)(B)(C)

filling out their ballot because they are less familiar with the voting process. They also are not seasoned voters, we also suspect that young voters in particular—because they are more prone to procrastination and less likely to be familiar with using traditional mail—are more likely to cast a late absentee ballot and, if they do get their ballot in on time, more likely to make mistakes that lead to ballot rejection (Bennion and Nickerson 2011; USPS 2018).

We rely on individual-level data to examine the rejection of mail ballots in the 2018 General Election. The systematic disparities that racial and ethnic minorities experience in other areas of bureaucratic services and interactions with election officials elsewhere lead us to expect that these voters who cast mail ballots may be less likely to have access to the information needed to cast a correctly filled out and timely mail ballot (Barreto, Cohen-Marks and Woods 2009; DeSante 2013; Keiser, Mueser and Choi 2004; Pettigrew 2017). Moreover, we expect that minority voters may also face systemic—albeit presumably implicit—biases as local election officials evaluate their ballots. The causal pathway through which this discrimination might occur in the context of verifying absentee ballots is based on the names of voters listed on ballot envelopes. While there is no direct information about a voter’s racial or ethnic background on return VBM ballot envelopes, first names and surnames can be revealing of racial and ethnic identity (Butler and Homola 2017). This theoretical expectation is supported by causal evidence that local election officials and elected state legislators provide constituents with Latino and African-American names with either no response or lower quality responses when they are e-mailed with questions about the voting process (White, Nathan and Faller 2015; Butler and Broockman 2011). It is possible that similar dynamics are at play in the evaluation of mail ballots by some election officials.

Generally, there are two possible explanations for why these discrepancies exist. One is on the basis of “taste-based” discrimination, a more traditional form of discrimination based on dislike for members of certain groups. The other is on the basis of strategic discrimination. Local election officials may draw assumptions about candidate or party preferences based on the putative race of the voter and more closely scrutinize those ballots. While there is some evidence that local election officials implement elections in ways that favor their party (Kropf, Vercellotti and Kimball 2013), a nationwide field experiment with local election officials suggests “taste-based” discrimination is likely at play when it comes to differences in the rate of ballot rejections between White and racial and ethnic minorities (White, Nathan and Faller 2015). Overall, a combination of systemic differences in access to quality information about the voting

process shaping individual-level mistakes, and systemic biases in the evaluation of VBM ballots cast by putative racial and ethnic minorities, lead us to expect that such voters will be both more likely to cast late ballots, and that those who return ballots on time will be more likely to have those ballots rejected.

While it is possible that there is also implicit bias operating in local election officials' evaluation of ballots cast by young voters, there is less evidence that young voters consistently experience discrimination when they engage with election officials. In short, we have less reason to believe there is strategic, or "taste-based," discrimination at play with mail ballots cast by young voters. However, in Georgia, beginning in the 2018 General Election, identifying information on the outer absentee ballot return envelopes was changed to include birth year, whereas previously it had been birth month and day⁷. This simple cue of a voter's age through their birth year on the envelope could be a possible mechanism through which election officials tasked with evaluating ballot information, more closely scrutinized the VBM ballots of young voters. There may be strategic reasons, for example, for some local election officials to be wary of VBM ballots cast by young voters under, the assumption they may be more likely to support progressive candidates, and for these same reasons, for other local election officials to be more permissive in accepting such VBM ballots. Local election officials in Georgia are not officially affiliated with a political party, so it is not possible to test this mechanism along partisan lines. Moreover, despite the change in the law, only some counties used new outer envelopes that asked for voters' birth year. Others continued to use old VBM return envelopes, meaning the key source of voter information that might offer a jurisdiction level explanation for differences in youth rejections was not present across all counties (Joyner and Peebles 2018).

While the data we use do not allow us to directly test for the mechanisms that explain rejection rates of absentee ballots by different voters, it is important to consider both how individual voter behavior and local election official decisions may explain the rejection of absentee ballots (Hood III and Bullock III 2011). Given the previous literature demonstrating bias against racial and ethnic minority voters in other areas of election administration, as well as in the administration of voter identification laws, our *first hypothesis* is that racial and ethnic minority voters are more likely to have had their ballot rejected than White voters. Our *second hypothesis* draws from evidence that younger voters face greater barriers in the voting

⁷See GA Code § 21-2-384 (c)(1)

process and are more likely to have absentee ballots rejected. We expect that younger voters to be disproportionately more likely to have their absentee ballots rejected relative to older voters. Our *third hypothesis* is that individuals who registered to vote in 2018 are more likely to have their ballot rejected compared to their counterparts because of their lack of familiarity with the vote by mail process as new registrants. We expect all three of these hypotheses to hold for VBM ballots irrespective of whether they are rejected because they were received *after* the state’s Election Day deadline for absentee ballots to reach the local election office, and for VBM ballots received on time but that rejected for other reasons.

3 Data and Empirical Framework

We utilize individual-level administrative data from the Georgia Elections Division, and county level data from the U.S. Census Bureau and Bureau of Labor Statistics. Using voter’s unique registration ID number, we merge the October 2018 snapshot of the statewide voter list to the October 17, 2019 statewide voter history file and the January 2, 2019 statewide absentee file.⁸ First, we look at a series of descriptive statistics, and then estimate Heckman sample selection models to analyze ballot rejection patterns while correcting for the self-selection bias of those voters who chose to opt-in and vote by mail. Our main dependent variable is ballot status, which is coded 1 if the VBM ballot was rejected and 0 if it was coded as accepted. We introduce two new dependent variables, differentiating by timing of when the VBM ballots were received by local election officials: rejected absentee ballots that were received before or on Election Day (on-time), and rejected absentee ballots that were received after the Election Day (late).

Our primary independent variables are a registrant’s race, age, and registration year. In our estimations, registrant’s race is a dummy variable indicating whether a voter is Black, Hispanic, Asian, or other race/ethnicity, with White registrants excluded as the base category. The age of the voter is a categorical variable for the following age groups: 18-22, 23-29, 30-34, 35-44, 45-59, and 60 and older. To account for a voter’s familiarity with the absentee voting process

⁸The snapshot of the absentee file of January 2, 2019 had 37,913 duplicates, meaning that unique registrants had two or more entries. We removed duplicated entries by keeping only the record identifying the ballot status as an A (accepted; 17,202 registrants) or R (rejected; 336 registrants), discarding the C (canceled) and S (spoiled) cases.

in Georgia, we include a variable for the voter’s registration year, under the assumption that voters who are more recently registered may be more likely to make a mistake that would lead to their VBM ballot being rejected by local election authorities.

To control for other unobserved county-level differences, drawing from Census data we include in our model county per-capita income and education as an aggregate-level control variables. We control for county population size to account for the administrative capacities of local election officials; larger counties may be allocated greater resources that could influence the counting of absentee ballots.⁹ All models are estimated with county-fixed effects and robust standard errors clustered by county.

Our analysis begins by mapping the vote by mail rejection rate by county. As shown in Figure 1, the rejection rate varies considerably across Georgia’s 159 counties. For example, counties such as Polk (13.1%), Taylor (13.04%), Pickens (12.45%), Clay (11.32%), Putnam (10.25%), and Gwinnett (6.3%) had higher rejection rates compared to other counties.

[Figure 1 about here]

Figure 1, indicates that there is a high variation of the VBM rejection rates across counties. However, the geographic heterogeneity does not address one of the main concerns during the 2018 Georgia midterm elections, that is, whether absentee ballots cast by minority voters were rejected at a higher rate compared to absentee ballots cast by White voters. Figure 2(a), shows a forty-five degree plot comparing the rejection rate of absentee ballots cast by Blacks and Whites for each county. Counties that fall on the forty-five degree line show no difference on the VBM rejection rate for Black and White voters. However, we observe that the majority of Georgia counties fall above the line. In other words, absentee ballots cast by Black voters were rejected at a higher rate across Georgia’s counties as compared to ballots cast by White voters. For example, Polk county had a rejection rate of about 16 percent for VBMs cast by Black voters, compared to 8 percent for White voters. Similar patterns are observed for other counties such as Taylor, Warren, and Putnam to name a few.

[Figure 2 about here]

⁹For example, according to Georgia’s elections code of the 159 counties in the state, any with a population of over 550,000 are allocated an additional registrar’s or absentee ballot clerk’s office, or place of registration, for the purpose of receiving and voting absentee ballots. See GA Code § 21-2-383(b)

Figure 2(b) shows the absentee ballot rejection rate for Hispanic voters versus White voters across counties. Similar to the patterns of VBMs cast by Black voters, Hispanic voters faced higher rejection rates than White voters. For example, Putnam and Thomas counties had a rejection rate of roughly 20 percent for absentee ballots cast by Hispanic voters. According to Figure 2(b), many more counties rejected VBM votes cast by Hispanic voters compared to White voters.

This descriptive evidence motivates and sets the foundation of our econometric analysis described in the following section. Absentee ballot rejection rates vary across counties, but what explains this variation? Are certain subgroups of registrants more likely than others to be subjected to having their VBM ballots rejected? One confound, however, is that voters who choose to vote an absentee ballot in Georgia may be different than those registrants who vote in-person. As such, to take into account the sample selection bias that may arise to nonrandom sampling of VBM voters, our identification strategy uses Heckman’s sample selection model, which we describe below.

3.1 Sample Selection Model

Let each voter i in our sample be characterized by the vector (r_i, v_i, w_i, ψ_i) which takes values in the set $R \times V \times W \times \Psi$. Here, r_i and v_i are binary variables where the former takes unity if i ’s vote by mail was rejected and the latter takes unity if voter i voted by mail. We cannot observe if a vote was rejected or accepted if the voter chose not to vote by mail, (r_i, v_i, w_i) is only observed for a sample of voters with $v_i = 1$. Here w_i is a vector of voter’s characteristics and ψ_i a vector of unobserved characteristics.

We specify the parametric selection equation of a registrant’s choice to cast a mail ballot (hereon, VBM equation) and the parametric outcome equation of the VBM ballot being rejected (hereon, Rejection equation) as follows,

$$\text{VBM equation : } \quad v_i^* = z_i' \gamma + \epsilon_i, v_i = 1[v_i^* > 0], \quad (1)$$

$$\text{Rejection equation : } \quad r_i = x_i' \beta + \delta \mathcal{R}_i + u_i \quad (2)$$

where v_i^* is a latent variable for voting a VBM ballot; $1[\cdot]$ is an indicator function which equals unity if the bracketed logical condition holds; $w_i \equiv (z_i', x_i')'$ where z_i and x_i are both vectors of the characteristics of the voters and for identifying the estimates in the Rejection equation,

we impose an exclusionary restriction by allowing z_i to have at least one variable that is not contained in x_i . The categorical variable \mathcal{R}_i denotes the race of the voter (baseline White); and δ is our estimand of interest.

The VBM equation captures the selection mechanism of how a voter decides whether to cast a ballot by mail or not. We employ a random utility model. Let each voter i face two alternatives $j = \{a, o\}$, vote absentee ($j = a$) or other ($j = o$). The utility that voter i receives from choice j is decomposed into two components, the systematic observed component \tilde{V}_{ij} that is known up to some parameter and the unsystematic unobserved component ϵ_{ij} , i.e. $\tilde{U}_{ij} = \tilde{V}_{ij} + \epsilon_{ij}$. We let $v_i^* \equiv \tilde{U}_{ia} - \tilde{U}_{io}$. As such, if $\tilde{U}_{ia} > \tilde{U}_{io}$ then the utility that voter i receives from voting absentee, ($j = a$), is higher compared to the other alternative, ($j = o$). As shown in the VBM equation, $v_i^* \equiv \tilde{U}_{ia} - \tilde{U}_{io} = z_i' \gamma + \epsilon_i$, where the systematic component is linear in parameters. In the VBM equation, the vector of individual/county characteristics, z_i , includes voters' age, race, gender, and county-level information for education, per-capita income, and population.

Using ordinary least squares (OLS) to estimate the parameters in the Rejection equation would lead to inconsistent estimates for the subsample of observations with $v_i = 1$. To overcome this misspecification, Heckman (1976, 1979) proposes a two-stage approach. Following Heckman (1976, 1979), we impose the following distributional assumptions on the stochastic components ϵ_i and u_i of equations (1) and (2) respectively. Suppose that u_i and ϵ_i follow a bivariate Gaussian distribution with zero means, standard deviations σ_u and σ_ϵ , and correlation ρ and let (u_i, ϵ_i) be independent of z_i . Using this assumption, and taking conditional expectation on the Rejection equation (2), we have the following

$$\begin{aligned} E[r_i | x_i, \mathcal{R}_i, v_i = 1] &= x_i' \beta + \delta \mathcal{R}_i + E[u_i | x_i, \mathcal{R}_i, \epsilon_i > -z_i' \gamma] \\ &= x_i' \beta + \delta \mathcal{R}_i + \mu \frac{\phi(z_i' (\gamma / \sigma_\epsilon))}{\Phi(z_i' (\gamma / \sigma_\epsilon))} \end{aligned} \quad (3)$$

where $\mu = \rho \sigma_\epsilon / \sigma_v$ and $\frac{\phi(z_i' (\gamma / \sigma_\epsilon))}{\Phi(z_i' (\gamma / \sigma_\epsilon))}$ is the inverse Mills ratio. The inverse Mills ratio is the ratio of the probability density function ϕ and cumulative distribution function of the standard normal distribution. To obtain an estimate of $(\gamma / \sigma_\epsilon)$ in equation (3), we use the distributional assumption and explore the latent structure of the VBM equation (1). Hence, we estimate the parameters of the model using Heckman's two-step approach as follows:

- First step: Estimate the VBM equation over the entire sample using a Probit model to

obtain an estimate for γ/σ_ϵ . Compute the inverse Mills ratio for each voter in the sample who selected to vote by mail.

- Second step: Estimate by least squares regression the parameters β and δ in the Rejection equation by including the inverse Mills ratio as a regressor for the subsample of voters who chose to vote by mail (see equation (3)).¹⁰

In the second step, the vector of individual/county characteristics, x_i , includes voters' race, age, gender, and county fixed-effects. Using Heckman's approach, we are able to address the nonrandom "sampling" which is due to a voter's choice (that is, selection) to vote by mail in the 2018 election. Using this framework, we can identify any evidence if VBM votes cast by young, newly registered, or minority voters are more likely to be rejected, compared to those cast by White voters, if the coefficients for age, 2018 registrants, and race/ethnicity, δ , are significantly greater than zero.

4 Empirical Analysis

The descriptive results have shown that VBM ballots cast by minority voters had a higher rejection rate across counties compared to Whites. In Figure 3, we look at the trend of rejections proportionate to the VBM ballots cast within a race/ethnicity group. Figure 3(a), shows that as the percentage of absentee ballots cast by Black voters increases so does the percentage of the rejected ballots cast by Blacks. A different pattern is observed for VBM ballots cast by Whites. While Figure 3(b), shows that as the percentage of absentee ballots cast by Whites increases, the rejection rate for absentee ballots cast by Whites decreases. No clear pattern is observed for Hispanics, Figure 3(c).

[Figure 3 about here]

We now turn to a voter's age and whether the voter was recently registered or not (denoted by those registered in 2018). Figure 4 displays the probability of VBM ballots being rejected across each age group, or date of a voter's registration. We calculate the inverse empirical cumulative distribution function of rejection rates for each age group (registration year) within

¹⁰We also test for selectivity bias using a simple t-test on the estimated parameter of the inverse Mills ratio. That is, using the results from the second step we can infer whether there is evidence of selectivity bias by testing the null hypothesis, $H_0 : \mu = 0$.

each county and their respective probability density functions. The rejection rates are computed using the following formula,

$$p_{ij} = \frac{\sum_{k=1}^{n_j} \sum_{r:r=1} \mathcal{I}_{ijk}r}{\sum_{k=1}^{n_j} \mathcal{I}_{ijk}} \quad \text{for every } i = 1, \dots, N \text{ and } j = 1, \dots, n_i \quad (4)$$

where \mathcal{I}_{ijk} is equal to unity if the VBM ballot of voter k in age group (registration year) j and county i is rejected, $r = 1$, and \mathcal{I}_{ijk} is equal to unity if VBM voter k is in age group (registration year) j of county i . Simply put, the numerator represents the number of VBM ballots *rejected* for each age group (registration year) within each county, and the denominator represents the number of VBM voters in each age group within each county. From Figure 4(a) it is clear that the probability of rejection is higher for the age group 18-22 when compared to all the other age groups. Therefore, we say that the cumulative distribution function of the age group 18-22 first order stochastic dominates (FOSD) all the other age groups cumulative distribution functions. We observe the same pattern in Figure 4(c), where there is a wide gap between the inverse cumulative distribution functions of VBM voters registered to vote for the first time in 2018 and those registered prior to 2018. Figure 4(b) and 4(d) show the difference in probability distributions of VBM rejection rates for age group and registration year.

[Figure 4 about here]

The analysis above uses rejected VBM ballots, which are indicated as such in the statewide voter history file. However, not all rejected ballots are the same or should be treated as such. Some absentee ballots have been rejected due to a missing or mismatched signature, or an unchecked oath box, but others have been rejected because they were received by county registrars *after* the Election Day deadline. In Table 1, we examine the overall rates of rejected VBM ballots, broken down by age group, race, registration time (2018 or before), and gender. According to Table 1 Panel A, younger cohorts were more likely to have their VBM ballots received late compared to older voter cohorts. Referring to Panel B, we observe that minority voters were more likely to have their ballot rejected compared to White voters, regardless of whether their ballot was returned on time or not. Panel C, shows that newly registered (those who registered in 2018) were more likely to have their VBM ballot not be received on time than those who were registered prior to 2018.

[Table 1 about here]

To analyze ballot rejection patterns across racial groups, we estimate Heckman’s two-stage sample selection model, shown in Table 2. In Table 2, only the Rejection equation (outcome equation) estimates are shown. The outcome variable across all three models is ballot status, which in Model 1, is coded 1 if the absentee ballot was rejected and received before or on Election Day by election officials and zero if accepted. In Model 2, the outcome variable is coded 1 if the absentee ballot was rejected and the ballot was received after the Election Day and zero if accepted. In Model 3, the outcome variable is set to unity if the absentee ballot was rejected and zero if accepted, regardless of the time when it was received. From the Georgia voter file, we use individual level information about registrant’s race, sex, age, and registration year. To complement the individual-level analysis, we draw on county-level per-capita income data from the U.S. Bureau of Labor Statistics and data on a county’s education level and population from the U.S. Census Bureau.

[Table 2 about here]

We estimate equations 1 and 3 using Heckman’s two-step approach, explained above. The output in Table 2(1), shows that Black voters who cast an absentee ballot that was received on-time, were 4.3 percentage points more likely of having their ballot rejected compared to White voters. Similar patterns are observed for other minority groups. Also, younger voters 18-22 year-olds had a higher probability of having their ballots rejected compared to the older cohorts. For example, voters age 45-59 years old were 7.5 percentage points less likely to have their ballot rejected compared to 18-22 year-olds. While, female were 0.5 percentage points more likely to have their ballots rejected than male. Interestingly, in Table 2(2), the aforementioned effects are more pronounced. Minority, young, and newly registered voters had a higher probability of having their absentee ballots received late, and therefore rejected, compared to White, older, and voters who registered prior to 2018. Black absentee voters were 7.6 percentage points more likely to have their absentee ballot rejected because they were received late by local officials, compared to White VBM voters. Female voters were 1.5 percentage points more likely to have their ballot rejected compared to male. The same pattern holds true for younger and newly registered voters, as shown in Table 2(3).

The fact that minority, young, female, and recently registered voters have a higher probability of returning their ballots late is an important finding, highlighting that these particular subgroups may be less informed about the voting process or the operations of the postal service

than others. Young and new voters not only are less likely to be accustomed to the voting process, but they might also face additional informational barriers on how to properly cast a valid ballot. Our findings concerning the differential rejection rates of VBM ballots are important, particularly with regard to the calls for the expansion of voting by mail due to the coronavirus pandemic.

5 Discussion

As election administrators across the country move to adapt in response to the COVID-19 pandemic, voting by mail is likely to increase. As such, it is important to highlight one of the liabilities of the VBM system—rejected ballots. Differing from the extant literature, we offer insights into which subgroups of the electorate are more likely to have their VBM ballot invalidated because their ballot was received either on-time or late by election officials. We find that underrepresented groups including young, female, minority, and newly registrants have a higher rate of rejected VBM ballots—both those received on time and those late—compared to their counterparts. While we did not have *a priori* expectations that females would be more likely to have their ballots rejected, it is possible this group, because a majority of them change their names after marriage, have ballots rejected due to administrative errors like mismatches between names on ballots and on voter registration files (Gooding and Kreider 2010).

It is important to emphasize that differences in the likelihood of VBM ballots being rejected are not necessarily evidence of explicit voter discrimination against these groups of voters by election officials. Empirically, we are not able to directly observe the determinants of VBM ballot rejections across Georgia’s 159 counties to determine the specific reasons why these groups of voters are more likely to have their ballots rejected by local election authorities. While we offer possible theoretical explanations for these rejections, we do not claim to directly test for the causal mechanisms that connect these groups of voter with higher rates of ballot rejection.

Future research should more directly explore possible mechanisms that explain the disproportionate likelihood of rejection of absentee ballots cast by newly registered, as well as female, young and racial and ethnic minority voters. We suggest exploring individual-level reasons as well as administrative decisions made by election administrators, should be a major focus of future work in this area. A central question scholars should address is how plausible it is that

newly registered, female, young, and racial and ethnic minority voters are more likely to make mistakes in the process of returning their absentee ballot envelopes, relative to other groups of voters. To that end, we have offered explanations for why these groups of voters may be more likely to return mail ballots that have problems, but also account for the potential role of election administrators in evaluating those ballots.

When it comes to policy-making, state and local election officials also should play a more formal role in educating voters casting a mail ballot about the proper way to fill out and return a VBM ballot. Voter education efforts by these officials, as well as parties, interest groups, and voting rights groups regarding the mail voting process will be crucial for young, recently registered, and racial and minority voters to have their VBM ballot count in upcoming elections. While those voters who have a higher incidence of their VBM ballot being rejected may arise from a lack experience or familiarity with the mail voting process, local election officials also have a responsibility—statutorily in the state of Georgia—to inform voters about how to minimize mistakes. Moreover, voters who cast mail ballots only to have them rejected for problems with the return envelope should be informed in a timely manner of the problem and be given an opportunity to cure their ballot.

The individual-level and systemic factors we have identified that lead to a VBM ballot being rejected are not necessarily mutually exclusive. It could be that young, female, recent registrants, and racial and ethnic minority voters are more likely to make mistakes based on a lack of information and experience; but it is also possible that election officials are more likely to closely scrutinize these voters' VBM return envelopes relative to other voters. There are certain elements in the VBM ballot verification process that lend themselves to potentially subjective evaluations—for example the signature-matching process—that might be more closely scrutinized to ensure that the patterns of VBM ballot rejection documented in this paper are not the result of implicit “taste-based” or “strategic” discrimination by election officials.

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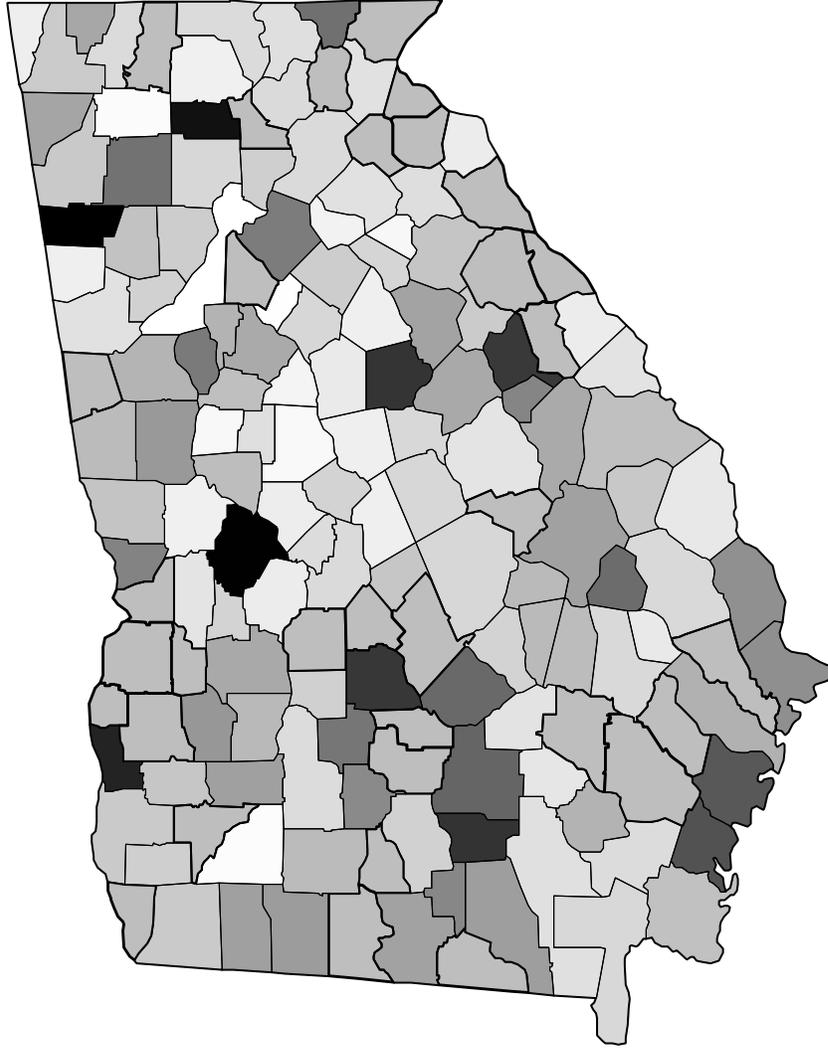
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Figure 1: VBM Rejection Rate by County

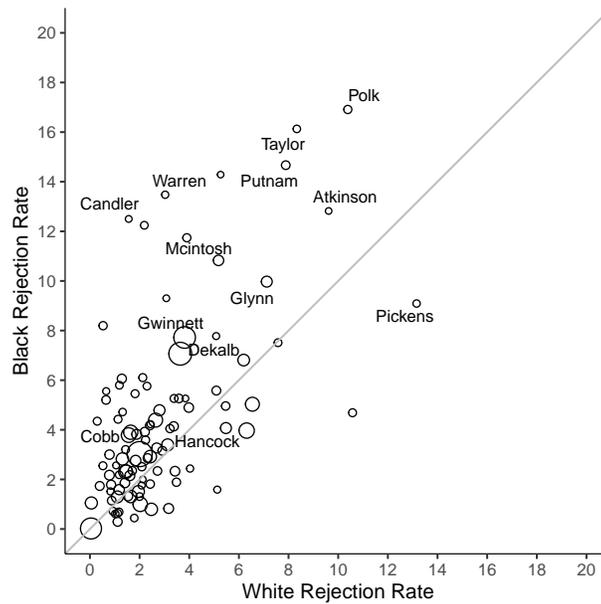


VBM Rejection Rate by County

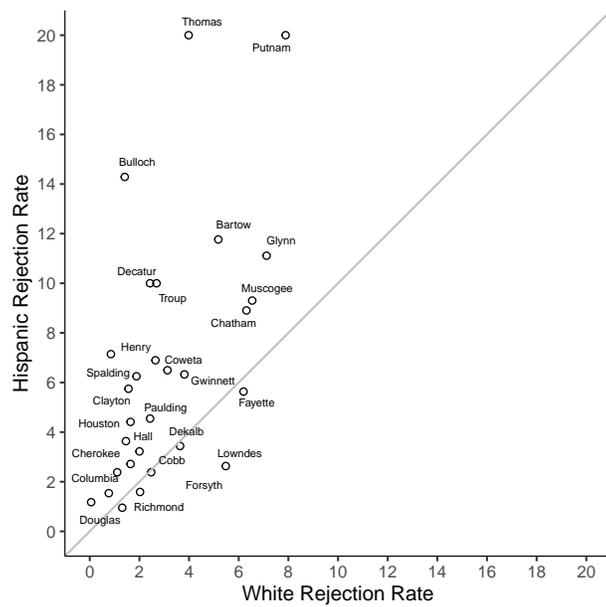


Note: The rejection rate for absentee ballots is calculated as the ratio of the number of absentee ballots rejected over the total number of absentee ballots cast in a county.

Figure 2: VBM Ballot Rejection Rate for Race by County



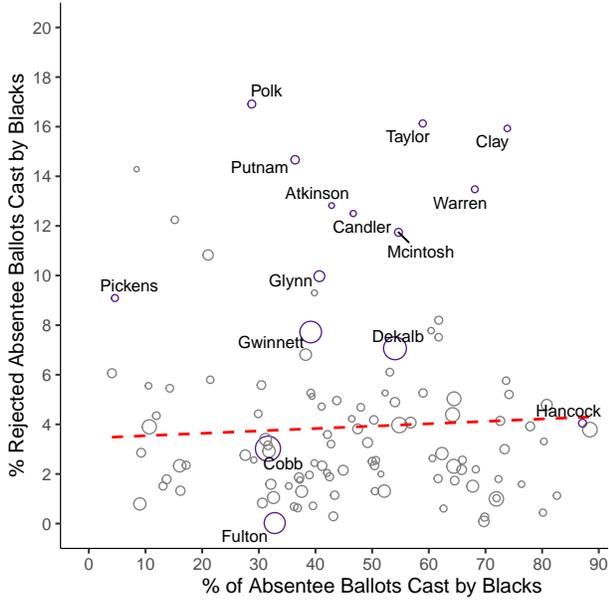
(a) Black vs. White



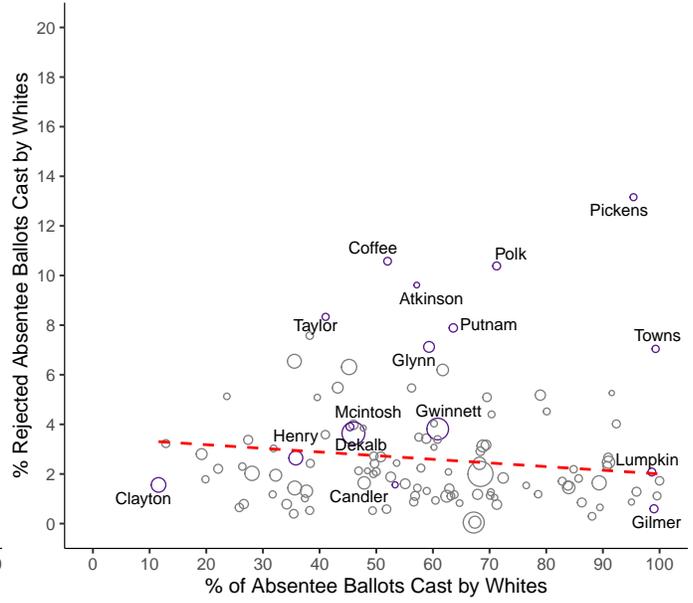
(b) Hispanic vs. White

Note: The rejection rate for each race group is calculated as the number of rejected VBM ballots cast by each race group divided by the total number of VBM ballots cast in a county.

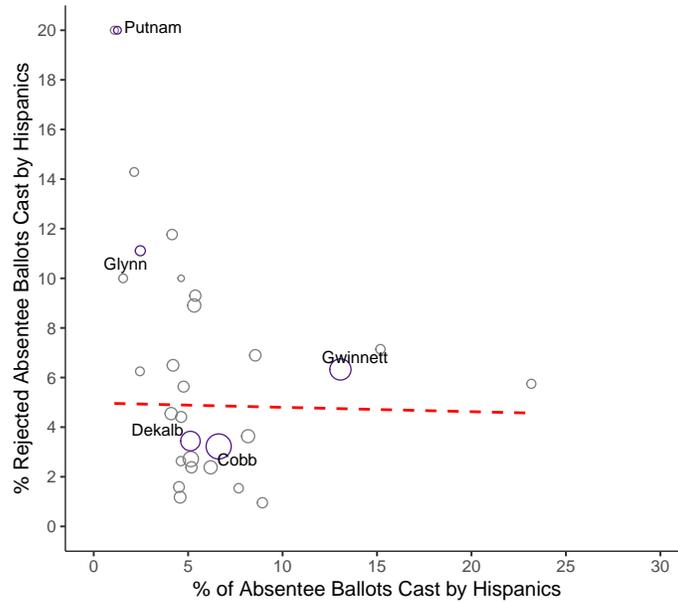
Figure 3: VBM Ballot Rejection by Race and Votes Cast



(a) Black VBM Ballots



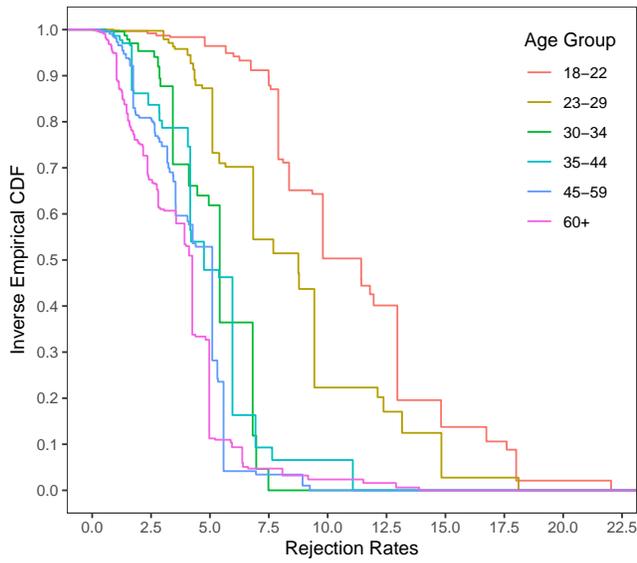
(b) White VBM Ballots



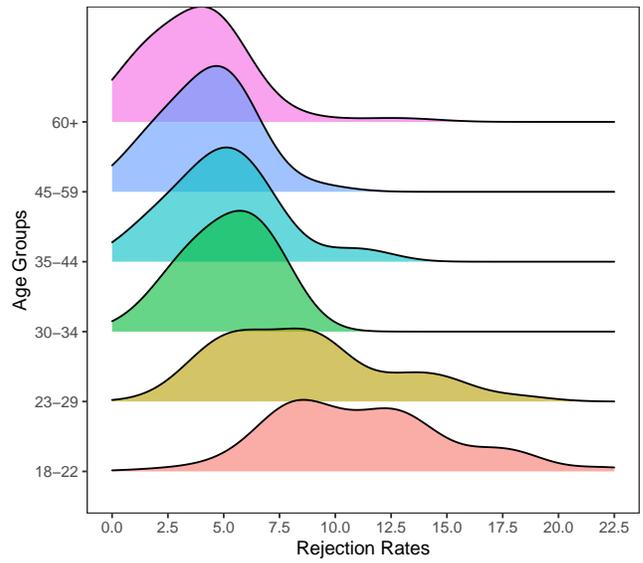
(c) Hispanic VBM Ballots

Note: These plots show the relationship between the percent of absentee ballots cast by a race group and the percentage of absentee ballots rejected from that race group. The circle size shows the number of voters in a county. Larger circles indicate more voters in that county. The red dotted line is the fitted linear regression.

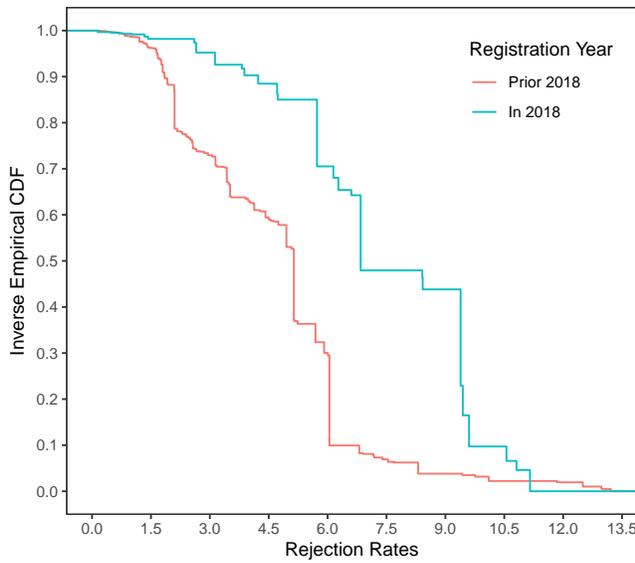
Figure 4: VBM Rejection Probabilities by Age Group and Registration Time



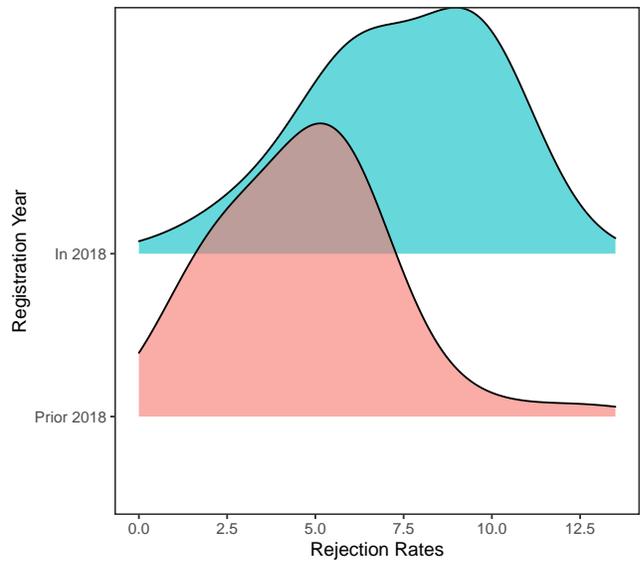
(a) Inverse empirical CDF by Age Group



(b) Kernel Density by Age Group



(c) Inverse empirical CDF by Registration Year



(d) Kernel Density by Registration Year

Note: Plots (a) and (c) show the inverse empirical cumulative distribution functions of rejection rates, while plots (b) and (d) show their respective kernel density functions. The rejection rates are calculated as the number of rejected VBM ballots cast by each category of the age group (or those registered in 2018) in a county divided by the total number of VBM ballots cast by each category of the age group (or those registered in 2018) in that county.

Table 1: VBM Ballots by Rejection Category

Panel A												
	Age Group											
	18-22		23-29		30-34		35-44		45-59		60+	
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent
On-time VBM	223	1.29	189	1.2	109	1.33	232	1.4	654	1.57	1,481	1.21
Late VBM	1,222	6.69	804	4.9	217	2.6	323	1.94	566	1.36	1,004	0.82
All VBM	1,445	7.81	993	5.98	326	3.86	555	3.28	1,220	2.89	2,485	2.01

Panel B											
	Race										
	White		Black		Hispanic		Asian		Other race		
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent	
On-time VBM	716	0.67	1517	1.82	121	2.05	292	3.53	242	1.38	
Late VBM	1,752	1.62	1,645	1.97	133	2.25	194	2.38	412	2.32	
All VBM	2,468	2.26	3,162	3.72	254	4.21	486	5.75	654	3.63	

Panel C											
	Registration Time				Gender						
	Prior 2018		2018		Female		Male				
	N	Percent	N	Percent	N	Percent	N	Percent			
On-time VBM	2,731	1.31	157	1.11	On-time VBM	1,668	1.25	1,207	1.36		
Late VBM	3,562	1.7	574	3.96	Late VBM	2,502	1.87	1,621	1.81		
All VBM	6,293	2.97	731	4.98	All VBM	4,170	3.08	2,828	3.12		

Note: Descriptives for different types of VBM ballot rejections for each demographic group and voter registration time. The “on-time VBM” includes those rejected VBM ballots that were received before or on Election Day by election officials. The “late VBM” group includes those rejected VBM ballots that were received after the Election Day. And the last group, “All VBM”, includes all rejected VBMs regardless of the time when they were received.

Table 2: Heckman Sample Selection Model for Rejected VBM Ballots

	(1) Received On-Time $\beta(se)$	(2) Received Late $\beta(se)$	(3) Both $\beta(se)$
(Intercept)	-0.187*** (0.071)	-0.390*** (0.080)	-0.525*** (0.102)
Black	0.043*** (0.012)	0.076*** (0.014)	0.109*** (0.017)
Hispanic	0.060** (0.020)	0.117*** (0.022)	0.163*** (0.028)
Asian	0.100** (0.031)	0.188*** (0.035)	0.264*** (0.044)
Race other	0.027*** (0.008)	0.053*** (0.009)	0.074*** (0.012)
Registration year 2018	-0.002 (0.001)	0.008*** (0.002)	0.007*** (0.002)
Age 23-29	-0.038** (0.014)	-0.101*** (0.016)	-0.128*** (0.020)
Age 30-34	-0.066** (0.025)	-0.194*** (0.028)	-0.240*** (0.036)
Age 35-44	-0.082** (0.031)	-0.236*** (0.035)	-0.293*** (0.044)
Age 45-59	-0.075* (0.030)	-0.233*** (0.033)	-0.285*** (0.042)
Age 60+	-0.028** (0.011)	-0.125*** (0.012)	-0.144*** (0.016)
Female	0.005* (0.002)	0.015*** (0.003)	0.018*** (0.003)
Gender other	0.037** (0.013)	0.056*** (0.013)	0.086*** (0.017)
Inverse Mills Ratio (λ)	0.125** (0.048)	0.298*** (0.054)	0.387*** (0.070)
County fixed-effects	✓	✓	✓
Observations	222,284	223,532	226,420

Note: Table 2 shows output for the Rejection equation (outcome equation) only (VBM equation not shown). The dependent variable for the first model is coded 1 if the VBM ballot was received on-time and was rejected. For the second model, the dependent variable is coded 1 if the VBM ballot was received late and was rejected. In the third model, the dependent variable is coded 1 if the VBM ballot was noted as rejected in the voter file. All models are estimated with county fixed-effects and Huber-White robust standard errors clustered by county. In the VBM equation (selection equation), not shown in Table 2, we control for individual level characteristics such as registrant's age, gender, race, and aggregate county characteristics such as education level, per-capita income, and population. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$