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### Abstract

In the wake of the 2004 presidential election, supporters of Senator John Kerry's candidacy searched for explanations of voter behavior. The Kerry campaign succeeded in turning out record numbers of low-income voters. Kerry strategists predicted that these voters would hold incumbent President George W. Bush responsible for a decline in their personal economic well-being. Kerry attempted to facilitate this electoral behavior by offering what he believed to be an economic plan attractive to low-income voters. The pocketbook theory of voting underpinned this strategy. This theory asserts that voters consider the perceived impact which an incumbent has had on their personal economic well-being when deciding to cast their vote. This paper models the 2004 presidential election to determine if voters considered their personal economic well-being when casting their vote. The results suggest that personal economic well-being was significant in determining vote choice, with lower income voters marginally more likely to cast their vote for Kerry. However, this effect was mitigated by voters' race and gender.

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## **Abstract**

In the wake of the 2004 presidential election, supporters of Senator John Kerry's candidacy searched for explanations of voter behavior. The Kerry campaign succeeded in turning out record numbers of low-income voters. Kerry strategists predicted that these voters would hold incumbent President George W. Bush responsible for a decline in their personal economic well-being. Kerry attempted to facilitate this electoral behavior by offering what he believed to be an economic plan attractive to low-income voters. The pocketbook theory of voting underpinned this strategy. This theory asserts that voters consider the perceived impact which an incumbent has had on their personal economic well-being when deciding to cast their vote. This paper models the 2004 presidential election to determine if voters considered their personal economic well-being when casting their vote. The results suggest that personal economic well-being was significant in determining vote choice, with lower income voters marginally more likely to cast their vote for Kerry. However, this effect was mitigated by voters' race and gender.

## **I. The 2004 Presidential Election**

The 2004 presidential election elicited greater public interest than any other national election in recent memory. Official tallies of voter turnout revealed the highest turnout (60.7%) since the 1968 election, and the proliferation of “527” groups combined with the fever-pitch passions embraced on both sides of the aisle resulted in the most expensive campaigns in political history (Faler, 2005).

The election pitted incumbent Republican President George W. Bush against Democratic challenger Senator John Kerry. Bush campaigned hard on his record in the War on Terrorism, and his image as a strong, resolute leader. A Gallup Poll conducted between November 7-10, 2004, indicates that voters approved of Bush’s performance in the War on Terrorism by a 60% to 37% margin (Gallup, 2004). Bush downplayed economic issues, where voters tended to give him lower marks, attempting to keep the campaign focused on matters of national security where he enjoyed an advantage in the public’s eye.

The Bush administration’s mixed economic record opened the door for criticism. During the Bush administration’s first term, private sector payrolls contracted by 1.6 million jobs, and overall non-farm employment dropped by more than 800,000 jobs. Further, employed workers realized sluggish wage growth, and a decrease in real wages relative to national income. The Congressional Joint Economic Committee reported that wages as a share of national income fell by over two percentage points during Bush’s first term in office. Further, real median household income fell by over \$1,500 over that time period (JEC, 2004).

Relative changes in other contributions to individual economic well-being added to the economic stresses many working-class families experienced. An additional 5.2 million Americans joined the ranks of citizens without health insurance, bringing the total to 45 million Americans lacking coverage (Joint Economic Committee, 2004). Additionally, the Bush administration's fiscal policy strapped the nation with increasingly large budget deficits, including a \$413 billion federal deficit in fiscal year 2004. The Gallup Poll Organization reports that during the election, Americans disapproved of Bush's handling of the economy, 51-47. Further, Gallup reports that Americans disapproved of Bush's health care policy, 57-47 (Gallup, 2004). While these poll results are imprecise tools used to grasp public opinion, they nevertheless suggest a relative dissatisfaction among voters over Bush's handling of the economy.

In an attempt to capitalize on this perceived weakness, the Kerry campaign focused largely on domestic issues. Kerry highlighted the mixed record of the economy under the Bush administration, and its impact on the economic well-being of individual voters. In light of this, the Kerry campaign labored to provide a more economically-attractive alternative to voters. The economic plank of the Kerry platform included tax relief targeted to the working class, health care assistance from the federal government, and an education plan designed to make a college education affordable to more people (Kerry and Edwards, 2004).

Kerry assumed that voters would respond to their individual economic well-being when making their vote choice, and hold President Bush accountable at the polls. The pocketbook theory of voting underlies this assumption. The pocketbook theory of voting asserts that voters consider their individual economic well-being when casting their vote,

and voters will hold incumbents responsible for how their decisions influence voters' expected economic well-being.

Kerry's campaign labored to register and turnout large numbers of working-class voters, with the assumption that these voters would be most responsive to their economic situations, and therefore more easily persuaded by Kerry's campaign message to hold Bush accountable for enacting negative changes to their personal economic well-being. Kerry supporters succeeded in turning out greater numbers of working-class voters to vote than in any other recent election, and early exit polls predicted a Kerry victory (Wiener, 2005).

The election results stunned the Kerry campaign. Despite appealing to voters' pocketbooks, and turning out record numbers of working-class voters, Kerry failed to win the election. Bush won re-election by a margin of 51% to 48%, carrying the Electoral College with 286 of its 538 delegates.

The fervor with which many Kerry supporters worked during the campaign fed a search for explanations. This paper attempts to explain the choices of voters in the 2004 presidential election, focusing on the performance of the pocketbook theory of voting as the primary tool for analyzing voter behavior.

## **II. Pocketbook Theory of Voting**

At the conclusion of the Constitutional Convention in 1787, a reporter asked Benjamin Franklin, "Mr. Franklin, sir, what have you wrought?" Franklin replied, "A republic, if you can keep it." With these immortal words, Franklin charged the American public with the task of maintaining the nascent nation. For more than two centuries, the

American people have fulfilled their obligation, flocking to the polls every four years to elect a new president, and keep alive the American republic.

That process by which voters sustain the republic has elicited a yawning volume of academic literature. While political scientists and theorists assumed center stage in the early debate surrounding the democratic process, the academic world is slowly granting greater deference to the lessons suggested by economic theory.

Economic theory first emerged on this shelf of literature in 1957 when Anthony Downs published his seminal work, “An Economic Theory of Democracy” (Downs, 1957). The introduction of the rational actor model into the study of the democratic process proved to be Downs’ lasting contribution. Downs asserted that both governments and voters are rational actors attempting to maximize utility with respect to their constraints.

The assumption of the rational voter sparked a flurry of economic analysis of elections. While Downs asserted that voters were attempting to maximize their overall general welfare, many scholars streamlined his hypothesis to predict that individuals would vote to maximize their personal financial well-being.

This streamlined hypothesis gained the monicker the pocketbook theory of voting. This theory refers to the propensity to cast a vote for or against an incumbent based upon his perceived impact on one’s personal economic well-being (Sigelman, 1991). The academic literature discusses two methods of measuring the pocketbook theory’s implications, with some studies employing experimental evidence, and others examining observed voting behavior.

Sigelman, Sigelman and Bullock find experimental evidence in support of economic voting and the pocketbook theory. In this study, the authors asked 288 undergraduate students how they would cast their vote for an incumbent presidential candidate. The authors presented participants with different circumstances under which the incumbent president's policies had impacted their personal financial situation in different ways. The authors elected to use undergraduate students for the study, because previous literature found that many undergraduate students do not often consider personal economic interest when considering political issues. Therefore, the authors argued that this experimental test would subject the pocketbook theory to its most difficult subjects.

The study reported that respondents behaved consistently with the pocketbook theory. "Pocketbook voting was very much in evidence in our factorial survey—extraordinarily in evidence, when it is considered that our experimental subjects were given only hypothetical economic motivations to vote for one candidate or the other" (Sigelman, Sigelman, and Bullock, 1991).

David W. Romero and Stephen J Stambough use survey data on respondents' actual vote choice from congressional elections from 1980 through 1990. Romero and Stambough control for respondent partisanship, and find that evaluations of personal economic circumstances exerted a significant influence over a respondent's decision to vote for the incumbent. More specifically, they found that when voters believed that an incumbent had negatively affected their economic well-being, they were marginally less likely to vote for them, *ceteris paribus*. This finding was statistically significant, and lends further support to the pocketbook theory (Romero and Stambough, 1996).



In a separate article, Sigelman finds evidence of pocketbook voting across all major religious groups-Catholics, Protestants and Jews, during the 1980, 1984 and 1988 presidential elections (Sigelman, 1991). Sigelman models vote choice in these elections to determine if a perceived change in a respondent's financial situation influenced their decision to vote for or against the incumbent. Sigelman controls for different demographic and political variables that have an independent effect on vote choice, including respondents' gender, age, education, income, political ideology and party identification (Sigelman, 1991).

Clem Brooks and David Brady model the presidential elections from 1952 to 1996, to determine whether household income is a significant factor in explaining vote choice. The authors analyze data from the National Election Studies' surveys of voting behavior during these presidential elections. They control for demographic, political and regional variables that independently affect vote choice, including respondent race (a dummy variable assuming a value of one if the respondent is African American, and zero otherwise), gender, age, education and region. The authors find that household income is statistically significant in explaining vote choice, and suggest that their findings lend further support to the pocketbook theory. Moreover, Brooks and Brady find that, *ceteris paribus*, an increase in respondent household income increases their likelihood of voting for a Republican presidential candidate (Brooks and Brady, 1999).

James E. Campbell models presidential elections from 1948 through 1988. While Campbell does not test for evidence of the pocketbook theory, his model nevertheless provides a helpful framework for modeling a presidential election. Campbell observes percentage of the two-party statewide vote as his dependent variable. Campbell controls

for many of the independent variables discussed in the other studies, including state partisanship and ideology. However, Campbell employs a broad range of regional variables in his model, including the South, New England, Rocky Mountain, North Central and the President's home-state as different regional dummy variables in his model (Campbell, 1992). This model emphasizes the importance of regional characteristics on determining voter behavior. This paper draws heavily from Campbell's discussion of regional influences, and builds upon his regional observations.

The predictions of the pocketbook theory hold significant implications for public policy and the political landscape of the United States. First, if the electorate evaluates political leaders based upon the impact their policies have on voters' individual economic well-being, then that will influence the incentives for political leaders when crafting public policy and their campaign strategy. Politicians will have increased incentives to implement more proactive policies, designed to improve the economic well-being of individual voters, and ultimately win their electoral support. Furthermore, the pocket book theory may aid politicians in identifying sympathetic constituencies according to socio-economic status.

The theoretical legitimacy of the pocketbook theory of voting attracts widespread academic support. However, its relevance in the 2004 presidential election is thus far unclear. In building upon the existing body of literature concerning the pocketbook theory of voting, this paper tries to explain voter behavior in the 2004 presidential election, and provide an additional empirical test of the theory's implications.

### III. Model

$$\begin{aligned} \text{Vote for Kerry} = & \beta_0 + \beta_1 \text{Adjhhincome} + \beta_2 \text{African American} + \beta_3 \text{Asian} + \beta_4 \text{Male} + \\ & \beta_5 \text{Ideology} + \beta_6 \text{Religiosity} + \beta_7 \text{Urban} + \beta_8 \text{Northeast} + \beta_9 \text{Westcoast} + \beta_{10} \text{South} + \\ & \beta_{11} \text{Mid-Atlantic} + \beta_{12} \text{Southwest} + \beta_{13} \text{Plains} + \beta_{14} \text{Rocky Mountain} + \\ & \beta_{15} \text{WildWest} + \beta_{16} \text{Education} + \beta_{17} \text{Adjhhincome} * \text{White} + \beta_{18} \text{Adjhhincome} * \text{Male} \end{aligned}$$

My model attempts to test the extent to which voters behaved consistently with the predictions of the pocketbook theory in the 2004 presidential election. The pocketbook theory suggests that voters who perceived that President Bush's policies had a negative impact on their economic well-being would be marginally less likely to vote for his re-election. I predict that this effect would be aided by the Kerry campaign's strategy of appealing to voters' "pocketbooks", and making economic well-being a marquee election issue.

My model assumes that voters with lower incomes experienced a general decline in economic well-being during Bush's first term. The reasons for this assumption were discussed earlier in the paper, and concern relative changes to assumed inputs of low-income voters' personal welfare functions. This paper does not attempt to assign blame to Bush for these trends, that is beyond the scope of this paper. Rather, this paper assumes that low-income voters held these perceptions of Bush's impact on their personal economic situation, and does not attempt to explain whether these perceptions were indeed justified. Therefore, my model predicts that, *ceteris paribus*, as a voter's income goes down, they would be marginally more likely to vote for Kerry.

Furthermore, my model assumes that voters had perfect information of the two candidate's economic policies, and possessed the ability to discern which candidate's

economic policies would benefit them more directly. Essentially, I assume the Downsian notion that voters are rational actors with perfect information.

The dependent variable in my model is the percentage of the two-party vote in the 2004 presidential election going to Senator John Kerry. I decided to use the percentage of the two-party vote to eliminate the influence of third-party candidates. Due to the minimal influence of third-party candidates in the 2004 election, this approach does not present significant problems when estimating the model, and allows for easier interpretation of its results. Further, using the two-party vote is a widely-accepted practice throughout the academic literature predicting presidential elections. Daniel Eisenberg and Jonathan Ketcham model every presidential election from 1972 through 2000 to find evidence of economic voting. Eisenberg and Ketcham also use percentage of the two-party vote as their dependent variable in their model (Eisenberg and Ketcham, 2004). Additionally, James E. Campbell employs this method when he models presidential elections from 1948 through 1988 (Campbell, 1992).

I gathered data on election results from the personal website of Massachusetts Institute of Technology Professor Charles Stewart III. Stewart is a well-respected source on voting data, and makes available for public use his own collection of data. I observed this variable at the county-level, measuring what percentage of the two-party vote Kerry received in each county in the U.S. This is the smallest level at which I can collect voting data, and it allows for the highest degree of micro-level analysis of voting behavior. While observing this variable at the individual voter level would be ideal, these data are not available.

My model employs a host of independent variables to explain the myriad influences affecting vote choice in the presidential election. This model loosely follows the frameworks set forth by Brooks and Brady (1999), Campbell (1992) and Sigelman (1991). All data for the independent variables are taken from the 2000 United States Census Statistical Abstract unless otherwise noted.

The first independent variable in my model serves as a proxy for economic well-being. This variable measures the median household income of a county, measured in constant 1999 dollars. This variable is also adjusted for average household size of a county, to control for variance in number of persons occupying a household across different counties. Brooks and Brady use household income as their measure of economic well-being in their 1999 study of presidential election. Brooks and Brady assert, “household income is a preferable starting point given that individual household members benefit by the presence of income earned by other members (individuals’ earnings may underestimate their available income and thus the political effects of income)” (Brooks and Brady, 1999).

I would expect that as adjusted median household income of a county increases, the percentage of the two-party vote going to Kerry will decrease. Therefore, I expect this variable to have a negative sign. The Kerry campaign deliberately crafted economic proposals designed to improve the economic well-being of lower-income voters. Assuming that these voters are rational actors, and respond according to the predictions of the pocketbook theory of voting, lower-income voters will be marginally more likely to vote for Kerry, *ceteris paribus*.

The next independent variable in my model controls for the influence of African American voters in a county. This variable measures the percentage of the total population of a county that is African American. Brooks and Brady include a measure of percentage of African Americans in their model as well. Historically, African Americans have comprised a more liberal block of voters, and they have formed one of the core constituencies of the Democratic Party. Therefore, I expect that as the percentage of African Americans within a county increases, the percentage of the two-party vote going to Kerry will also increase.

The third independent variable in my model controls for the number of Hispanics in a county. This variable measures the percentage of the total population of a county that self-identifies as Hispanic. While most of the academic literature discussing presidential election models does not include a measure of Hispanics, I felt that the changing national political landscape warranted inclusion of this variable. Hispanics comprise one of the fastest-growing minority groups in the United States, and both parties have actively sought to court their votes. I expect that as the percentage of Hispanics in a county increases, the percentage of the two-party vote going to Kerry will likewise increase. The Democratic Party traditionally adopted a more liberal stance toward immigration and civil rights. Therefore, I expect Hispanics to be marginally more likely to support Kerry.

The fourth independent variable in my model controls for the number of Asians in a county. This variable measures the percentage of the total population of a county that self-identifies as Asian. The academic literature discussing presidential election models does not include a measure of Asians. However, I felt that the growing Asian population

comprises an increasingly important voting block. I expect that like Hispanics, Asian voters will be marginally more sympathetic to the civil rights stances of the Democratic Party. Therefore, I decided to include a variable controlling for the relative Asian population of a county, and I expect that as the percentage of Asians in a county increases, the percentage of the two-party vote going to Kerry will likewise increase.

The fifth independent variable in my model controls for the relative number of males in a county. This variable measures the percentage of a county's total population that is male. Sigelman, as well as Brooks and Brady both include measures of gender in their models. Female voters typically vote more Democratic than their Republican-leaning male counterparts. In the 2000 election, Democratic nominee Al Gore carried women by 11 points. Furthermore, female voters are traditionally more responsive to pocketbook issues (Romano, 2004). Therefore, I expect that as the percentage of a county's population that is male increases, the share of the two-party vote going to Kerry will decrease.

The measurement of this variable presents some problems for the model. Due to the availability of these demographic data only on the county-level, there is very little variance in this variable across counties. Furthermore, due to the county-level measurement of this variable, it is impossible to observe intra-county variations of voting between the two genders. Still, this was the best means of measuring this variable with the given data, and I include this variable in my model with the caveat that its results should be interpreted cautiously.

The sixth independent variable in my model controls for the political ideology of a county's voters. This variable measures a composite political ideology score of each

state's two senators from the National Journal magazine. The National Journal rates every senator based on their votes cast on economic, social, and foreign policy. I created a composite score of these three evaluations, and averaged the scores of the two senators from each state. The scale ranged from most conservative (0) to most liberal (100) (National Journal, 2005). The vast majority of voters perceived Kerry to be the more liberal candidate, and Bush to be the more conservative candidate. Therefore, I would expect that as the ideology variable increased, the percentage of the two-party vote going to Kerry will also increase.

The measurement of this variable presents several problems for the model. First, while theory predicts that the votes cast by a state's senators should appropriately reflect the political ideology of the state's electorate, this ideal is often not realized in the U.S. Senate. Rather, senators frequently stray from the ideological preferences of their voters to capture interest group money, earn favors from other elected officials, and express their personal ideological preferences. Furthermore, the measurement of this variable treats the political ideology of voters as homogenous across every county within a state. This is obviously inaccurate. However, this is the most accurate way that I could measure this variable given the available data.

The seventh independent variable in my model controls for the religiosity of a county's population. This variable measures the percentage of people within a county who adhere to a religion. Data for this variable are taken from researchers at the Glenmary Research Center in Nashville, TN. Researchers surveyed 149 religious bodies in every county across the US, and had them self-report as to the number of adherents each organization had within each county. While the study's reliance upon self-reporting



introduces the opportunity for error and inconsistency within the study, the Glenmary Research Center is widely held up as a respectable source on national religious data. David Card and Enrico Moretti model the 2004 presidential election to test the reliability of touch-screen voting. Card and Moretti control for the religiosity of states, and use the same data set from the Glenmary Research Center in constructing their variable measuring religiosity data (Card and Moretti, 2005).

In the 2004 election, Bush lobbied hard to maintain the support of religious conservatives. Bush took strong stands against gay marriage and abortion. These ideological stances were regarded as more popular with many religious voters. As a result, I would expect that as the percentage of people within a county who adhere to a religion increases, the percentage of the two-party vote going to Kerry would decrease, *ceteris paribus*.

The measurement of this variable also presents some problems for the model. First, as previously discussed, the study's reliance on religious bodies to self-report their number of adherents increases the likelihood of both measurement error and inconsistency, as different bodies undoubtedly maintain different criteria for membership. Furthermore, the measurement of this variable treats all religious persons as being equally and similarly responsive to the religious-based campaign appeals Bush made during the election. However, religious persons possess starkly different social and religious views across religious sects and even within individual religions. Lastly, many individuals do not consider their personal religious beliefs when casting their vote, or at least do not believe that religion should influence public policy decisions.

The eighth independent variable in my model controls for the urban influence of a county. This variable measures the percentage of persons within a county living in an urban area, as defined by the US Census Bureau. I would expect that as the percentage of persons living in an urban area increases, so will the percentage of the two-party vote going to Kerry.

The ninth through sixteenth independent variables in my model control for regional influences. Most academics acknowledge that beyond controlling for various demographic and political variables, it is important to consider inherent differences that different regions of the country possess. These influences can be expressed through prevailing social attitudes of a region, as well as certain advantages that politicians hold due to a personal connection which they may have with a region of the country. Furthermore, these regional variables attempt to capture different partisan preferences which certain regions may have at different levels of representation. For example, voters in North Dakota have reelected two relatively moderate Democratic Senators to represent them in the United States Senate. However, North Dakota has voted for the Republican candidate in every Presidential election since 1968. Campbell breaks down the United States into five different regions in his 1992 model (Campbell, 1992). I decided to add an additional four regions into my model, to reflect changing partisan and social attitudes across the nation. To see a complete list of the regional variables, consult Table 1.

I dropped from my model the dummy variable controlling for regional influences of the upper Midwest. Campbell also includes a dummy variable controlling for regional influences in the upper Midwest. Likewise, Brooks and Brady include a Midwest variable in their model, but decide to drop this variable. Doing so makes the Midwest the

baseline for the regional variables, so the marginal influence of each regional dummy variable is measured with respect to the upper Midwest region. I choose to drop the upper Midwest dummy variable to make it my regional baseline as well. The upper Midwest region is characteristically moderate, and serves as a good middle point from which to evaluate the other more partisan regions of the nation.

I expect the Northeastern regional variable to have a positive sign. In the past four presidential elections, only once has one of these states not cast its electoral votes for the Democratic candidate.<sup>1</sup> Campbell also includes a dummy variable controlling for New England regional influences, due to the Democratic shift experienced throughout this region. Campbell finds that New England states are marginally more likely to vote for the Democratic presidential candidate, and that result is statistically significant (Campbell, 1992). I decided to expand upon Campbell's variable to include New York, New Jersey and Delaware, because these states have likewise grown increasingly Democratic since Campbell's work in 1992.

I expect the West Coast regional variable to have a positive sign. These three states tend to adopt a more socially liberal attitude, and consistently vote Democratic in Presidential elections. Since the 1988 Presidential election, only once has one of these states not cast its electoral votes for the Democratic candidate (Leip, 2005).

I expect the South regional variable to have a negative sign. Since the 1960s, the once solidly Democratic South has grown increasingly Republican. Campbell controls for this partisan realignment with a regional variable for the Southern states. Campbell finds that Southern states are marginally less likely to vote for the Democratic

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<sup>1</sup> In the 2000 Presidential Election, New Hampshire cast its 4 electoral votes for the Republican candidate George W. Bush.

presidential candidate, and that result is statistically significant (Campbell, 1992).

Included in this category are Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina and Tennessee.

I expect the mid-Atlantic regional variable to have a negative sign. These states generally espouse more moderately conservative political views, and they have alternated fairly consistently between Democratic and Republican Presidential candidates over the past six presidential elections (Leip). However, I predict that the mild strain of cultural conservatism present in this region will, on the margin, tip voters slightly more in favor of Bush.

The states included in the Southwestern regional variable tend to be moderately conservative, and almost uniformly favor a smaller role for the federal government. I expect that this variable will have a negative sign.

Plains states vote overwhelmingly Republican in Presidential elections, and have cultivated a very strong streak of social and religious conservatism over the past four decades. I expect that voters in this region will be marginally less likely to vote for Kerry, and I expect this variable to have a negative sign.

Likewise, Rocky Mountain states have also cultivated a fierce social conservatism, as well as adopting a strong belief in a smaller role for the federal government. I expect that voters in this region will be marginally less likely to vote for Kerry, and I expect this variable to have a negative sign.

Campbell includes regional variables accounting for a home-state bonus for a presidential candidate. Further, Campbell includes a “friends and neighbors” variable as well, controlling for the added bonus which presidential candidates often receive from

neighbors of their home states (Campbell, 1992). Bush was fond of discussing his tenure as Governor of Texas, as well as his ranch in Crawford, Texas. I expect that voters in Texas and Oklahoma will respond favorably to this personal connection, and be marginally less likely to vote for Kerry. Therefore, I expect that the Wild West variable will have a negative sign.

I dropped Hawaii, Alaska, Virginia and the District of Columbia from my model. The District of Columbia is almost uniformly dropped from the models discussed in the academic literature, due to its uncharacteristic qualities. The District is overwhelmingly urban, African American and Democratic, and largely considered to be an outlier. Therefore, I did not include it in my model, and do not expect that its exclusion will prove problematic for the model.

The three states dropped from the model were done so when difficulties arose in attempting to match 2000 Census data with 2004 election data. These three states all underwent significant redistricting in this four year period, thereby altering pre-existing boundaries. As a result, it was not possible to match voting data with demographic data on the county level, and they could not be included as observations.

It is unclear precisely what effect excluding these states will have on the results of my model. Omitting these states will decrease the sample size of the model by 181 observations. However, the sample size of the model still includes 2973 observations, providing enough degrees of freedom for estimation, and adequate observations from which to make valid statistical inferences.

However, the question remains whether counties in Virginia, Alaska and Hawaii are qualitatively different from counties in the broader population. If so, omitting these

counties will bias the sample, potentially in a manner that will adversely affect the model's results.

I expect that Alaska and Hawaii will be qualitatively different than states in the mainland United States. The economies of these two states are structurally very different from the other 48 states, and their geographic dislocation likely creates differences in culture and information flows. I expect these two states to be qualitatively different from the other 48, and I expect that dropping these two states will bias my results.

Nevertheless, Hawaii and Alaska are generally considered unimportant states in presidential elections. Hawaii has cast its electoral votes for the Democratic candidate in every Presidential Election since 1988, and Alaska has cast its electoral votes for the Republican candidate in every Presidential Election since 1968 (Leip, 2005).

Furthermore, during the 2004 Presidential Election, neither candidate devoted considerable resources to persuading the voters in either of these states. Therefore, because of its relative political unimportance, I expect that the results of the model will indeed be more politically applicable if I only analyze the lower 48 states.

I do not expect that in dropping the state of Virginia my data set loses very many qualitatively unique observations. Virginia shares economic and cultural similarities with its neighboring states in the South and Mid-Atlantic regions. While losing the well-educated and liberal-leaning counties in northern Virginia may exclude observations of interest, there are several other urban areas with high levels of educated people in the South. For example, the Raleigh-Durham area in North Carolina also acts as a Southern sub-region with high levels of well-educated, liberal people in an urban setting. I expect that losing these observations in northern Virginia will under-represent this type of

county, and I expect that this will bias my results. More specifically, the Southern variable may be marginally less in favor of Kerry than it otherwise would be with the inclusion of these northern Virginia counties.

Nonetheless, I drop these three states-Hawaii, Alaska and Virginia with the caveat that this may bias my results, and future research should strive to include observations in these states to arrive at more conclusive results. However, dropping these observations decreases my data set by only six percent. Therefore, I expect any bias created by omitting these observations to be minimal.

The seventeenth variable in my model controls for the influence of education on vote choice. This variable uses Census data to measure the percentage of a county that has attained a college degree or higher. Both Sigelman and Brooks and Brady include controls for education in their respective models. Sigelman finds that education is significant in explaining Catholic and Protestant vote choice in Presidential Elections in both 1984 and 1988 (Sigelman, 1991). In all cases, higher levels of education were consistent with higher levels of support for the Democratic candidate. Therefore, I expect that higher levels of education will cause voters to be marginally more likely to cast their vote for Kerry.

My model employs two interaction terms to further explore the influence of a voter's economic situation on his vote choice. The first interaction term attempts to measure the indirect effects of race on the pocketbook voting theory. The Glenmary Research Center in Nashville, Tennessee analyzed the major constituencies of Bush and Kerry in the aftermath of the election. The Center found that overall, foreign policy and economic concerns were more important to the electorate. However, among Bush's core

constituents, social and religious issues were most important. Meanwhile, among Kerry's core constituents, economic issues were most important. Also, the Center found that white Evangelical Christians, as well as white "other" Christians formed one of Bush's core constituencies (Green, 2004). Lastly, male voters preferred Bush by a margin of 55 to 44 percent over Kerry (Bennett, 2004).

Most of Bush's core constituents placed a lower emphasis on economic issues, and were therefore marginally less likely to act according to the pocketbook theory. As a result, I expect that white voters and male voters will be marginally less likely to respond to their personal economic situation when casting their vote.

To measure this affect, I include two interaction terms. The first measures the joint effect of race and adjusted household income on vote choice. This variable multiplies the two independent variables capturing adjusted household income and percentage of a county's population that is white. I expect that lower-income white voters will be marginally less likely to vote for Kerry, because they do not place great importance on economic matters when casting their vote.

The second interaction term measures the joint effect of gender and adjusted household income on vote choice. This term multiplies the two independent variables capturing adjusted household income and percentage of a county which is male. I expect that lower-income males will be marginally less likely to vote for Kerry, because, like whites, they do not place great importance on economic matters.



#### **IV. Regression Diagnostics**

##### **A. Model Performance**

The F-test evaluates the overall statistical significance of a model. According to an F-test, the model is significant at the 99 percent confidence level. Furthermore, the model's adjusted R-squared value equals 0.472. This result means that the model explains 47.2% of the variation in the dependent variable. These two statistical measurements imply that the model is significant, and demonstrates strong explanatory power (Studenmund, 2006).

##### **B. Heteroskedasticity**

Heteroskedasticity occurs when the error term is not distributed with constant variance (Studenmund 345-6, 2006). Heteroskedasticity frequently arises from a specification error, commonly omitted variable bias. As a result, coefficient estimates may be biased. Furthermore, heteroskedasticity increases the variances of the coefficient estimate distributions. This causes OLS to underestimate the variances of the coefficients, artificially inflating t-scores. As a result, t-tests may not be valid (Studenmund 354, 2006).

The White Test is a general test to see if heteroskedasticity is present in the model. While it reveals nothing about the nature and cause of heteroskedasticity, it is a good starting point for evaluating the presence of heteroskedasticity in the model. To perform the test, the initial regression was run, and then the error terms were collected. Next, an auxiliary regression was constructed, and included the independent variables, their squared terms, and all interaction terms. The White Test attempts to determine if these additional terms will explain the errors. The error terms should never be explained

by any variables, because they should be randomly distributed. Therefore, if these terms do indeed explain the errors, then the model exhibits heteroskedasticity.

My model fails to pass the White Test at the 95 percent confidence level. Therefore, I decided to run my regression a second time, using robust standard errors to estimate my model. This estimation technique employs statistical devices to correct for the heteroskedasticity present in my model. Therefore, I can interpret my coefficient estimates and test-statistics confident that my model does not possess heteroskedastic bias.

### **C. Multicollinearity**

To test for the presence of multicollinearity in my model, I measured the Variance Inflation Factors (VIF) of the independent variables. The VIF measures to what extent each variable is explained by the others, and hence exhibits multicollinearity. VIF scores below 5 are considered to be non-problematic. When I dropped the two interaction terms from my model, then all of the VIF scores were below 5. As a result, my independent variables did not exhibit a significant degree of multicollinearity. Upon including the two interaction terms in my model, the VIF scores of the variables included in the interaction terms increased beyond 5. This result is expected, because the interaction terms are collinear with other included variables in the model by design. Therefore, multicollinearity is not a concern in my model.

### **D. Parameter Estimates**

The coefficient estimates of 18 of the 19 independent variables in the model assumed their expected direction, and were statistically significant at the 99 percent confidence level. For complete parameter results, consult Table 2. The coefficient

estimate of the adjusted household income variable is consistent with the predictions of the pocketbook theory of voting. This estimate implies that, *ceteris paribus*, every one dollar increase in the adjusted median household income of a county will decrease that county's percentage vote for Kerry by .004 points. As a result, we can infer that counties with more lower-income voters voted more strongly for Kerry, *ceteris paribus*. This result also suggests that perhaps lower-income voters voted against the incumbent President Bush based on their perceptions of the incumbent's impact on their economic well-being.

The pocketbook effect was somewhat mitigated, however, by a voter's gender and race. The overall marginal influence of adjusted household income can be found on Table 3. The direct effect of adjusted household income causes lower-income voters to vote more strongly for Kerry. However, when controlling for the indirect effects of gender and race, we see that this effect is mitigated. Table 3 outlines the interaction of these two variables with adjusted household income, and while the mitigation is minimal, it is nonetheless statistically significant at the 99 percent confidence level.

The one coefficient estimate that did not assume the expected sign was the west coast regional variable. Instead, voters in these states were marginally less likely to vote for Kerry, *ceteris paribus*. The results of the rest of the regional variables seem to lend support to the notion of a blue state versus red state divide.

## **V. Discussion**

The model's results are generally consistent with the pocketbook theory of voting. In the aggregate, lower-income voters were marginally more likely to cast their vote for Kerry. However, this effect was neither absolute nor universal. Rather, both the gender

and ethnicity of a voter exerted an indirect influence over the effect of personal economic well-being on vote choice. White voters and male voters were both marginally less responsive to the pocketbook influence. Additionally, these voters were generally more responsive to religious and social concerns in casting their vote (Green, et al, 2004).

The results of this model suggest that the Kerry campaign's strategy of appealing to the pocketbooks of all lower-income voters may have been appropriate as a broad theme. However, the results of the model suggest that not all lower-income voters share similar policy preferences, and respond to their personal economic well-being in varying levels. Therefore, future campaigns would be wise to target their pocketbook themes to specific sub-groups of voters. The results suggest that non-white and female voters will be marginally more responsive to pocketbook appeals than other members of the electorate.

The model possesses numerous shortcomings, and future empirical research is necessary before any firm campaign prescriptions may be offered. First, the measurement of several variables casts doubt on the validity of the results. The measurement of the male variable at the county level limited the variance of this variable, and prohibited intra-county analysis of voting trends. The measurement of the political ideology variable at the state-wide level introduces numerous problems previously discussed in this paper. Lastly, the measurement of the religiosity variable introduces the possibility for significant error and inconsistency.

The voting data are all observed on November 4, 2004. However, the demographic data are all taken from the 2000 US Census Statistical Abstract. As a result, this four year mismatch will not capture demographic and population changes in the US

since the 2000 Census. While I do not expect that there have been any significant large-scale trend changes in the past four years, this mismatch is nonetheless problematic at the margin.

Every presidential election features unique candidates with their own set of personal qualities. This model analyzes one specific presidential election with its two unique candidates. Therefore, any efforts to apply these results to other national elections should be done so cautiously, for it is unclear to what extent these results are dependent upon the unique qualities of Bush and Kerry.

Lastly, the model assumes that voters are rational actors with perfect information, and that Kerry's economic platform was more attractive to lower-income voters. These assumptions are necessary in order to test the pocketbook theory, though they undoubtedly introduce a degree of uncertainty regarding the model's results.

Table 1. Regional Variables

Region	States Included	Expected Sign
Northeast	MA, ME, NH, VT, CT, RI, NY, NJ, DE	Positive
West Coast	CA, OR, WA	Positive
South	AL, AR, FL, GA, LA, MS, NC, SC, TN	Negative
Mid-Atlantic	KT, MD, PA, WV	Negative
Southwest	AZ, CO, NV, NM	Negative
Plains	KS, MO, NE, ND, SD	Negative
Rocky Mountain	ID, MT, UT, WY	Negative
Wild West	TX, OK	Negative
Dropped from model: HI, AK, VA, DC		

Table 2. Parameter Estimates of Model  
(Standard Error)

Independent Variable	Coefficient	Test-Statistic
Adjhhincome	-0.0042 (0.0009)	-4.89***
African American	0.5231 (0.0412)	12.70***
Hispanic	0.2824 (0.0391)	7.25***
Asian	1.5030 (0.01808)	8.31***
Male	-1.4589 (0.2990)	-4.88***
Ideology	0.1004 (0.0089)	11.17***
Religiosity	-0.0649 (0.0103)	-6.26***
Urban	0.0278 (0.0071)	3.92***
Northeast	2.8589 (0.8656)	3.30***
West Coast	-6.9515 (0.9822)	-7.08***
South	-9.2150 (0.6720)	-13.71***
Mid-Atlantic	-3.0166 (0.7352)	-4.10***
Southwest	-4.5835 (1.0685)	-4.29***
Plains	-9.9932 (0.6703)	-14.91***
Rocky Mountain	-13.5572 (0.9987)	-13.57***
Wild West	-13.25447 (0.8913)	-14.87***
Education	0.7247 (0.0686)	10.56***
Adjhhincome*White	0.00001 (0.0000034)	4.65***
Adjhhincome*Male	0.00006 (0.000017)	3.74***
Constant	117.7974 (14.8838)	7.91***
Adjusted R <sup>2</sup>	0.4724	
F-Statistic	141.05***	

\*p&lt;.05, \*\*p&lt;.01, \*\*\*p&lt;.001

Table 3. Marginal Influence of Adjusted Household Income

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$Kerry = \beta_1 Adjhhincome + \beta_2 Adjhhincome * White + \beta_3 Adjhhincome * Male$	
Partial Derivative of <i>Kerry</i> with respect to <i>Adjusted Household Income</i> :	
$\beta_1 + \beta_2 White + \beta_3 Male$	
Marginal Influence = $-0.0042 + 0.0000158 * White + 0.0000658 * Male$	
Marginal Influence when Male, White=0	-0.0042
Marginal Influence when Male=1, White=1	-0.0041432
Marginal Influence when Male=0, White=1	-0.0041842
Marginal Influence when Male, White=1	-0.0041184

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