Immigration and the Median Voter's Incentive to Redistribute Income in the United States*

Howard Rosenthal, New York University

Christine Eibner, The RAND Corporation*

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Non-citizens quadrupled as a percentage of the voting age population in the United States between 1972 and 2002. During the same period, the non-citizen population went from being reasonably well to do to being disproportionately poor. These changes have had important consequences from the perspective of the basic political economy model where inequality is reduced through redistribution that depends on the ratio of median voter income to mean income. This ratio has remained largely unchanged despite the large increase in inequality in the United States. We decompose the impact of non-citizens in two effects: a "sharing" effect and a "disenfranchisement" effect. Disenfranchisement implies that the median voter is wealthier than the median family. Sharing implies that the median voter turns against redistribution because poor non-citizens reduce what the median voter can gain from redistribution. Our analysis is based on analysis of the biennial November Current Population Survey. We report two additional findings. First, citizen turnout has not become increasingly stratified by income. Thus, the median voter has not become richer because of apathy among poor citizens. Second, there is a midterm cycle in voter turnout where relatively well-to-do non-voters in midterm years turnout in presidential years.

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Non-citizens were, in 1972, a small fraction of the United States population. They were also relatively well to do. In fact the median income of a non-citizen was actually higher than that of citizens who reported themselves as not voting in the presidential race between Nixon and McGovern. Non-citizens today are growing in number and increasingly at the bottom of the income distribution. In contrast, the relative economic position of voters and non-voters shows little change since 1972.

The changing economic position of non-citizens is politically relevant. It is likely to contribute to the failure of the political process in the United States to generate redistribution that would eliminate growing disparities in wage and income inequality. The income of the median voter has *not* declined relatively over the past thirty years. How has the median voter's economic position been sustained while that of the median family has declined? Part of the answer, as we show, is that lower income types are increasingly likely to be non-citizens. The median income of non-citizens has shifted sharply downward, and the fraction of the population that is non-citizen has increased dramatically. From 1972 to 2000, the median family income of non-citizens fell from 82 percent of the median income of voters to 65 percent while the fraction of the population that is non-citizen rose from 2.6 percent to 7.8 percent.[1]

One of the main reasons for the dramatic change in the number and poverty of non-citizens is federal legislation that has opened the doors to increased legal immigration while doing little to control illegal immigration. During the late 19th and early 20th century, immigration was made more difficult for Europeans; Chinese and Japanese were entirely excluded. The immigration acts of 1921, 1924, and 1929 set up permanent quotas by national origin that both restricted total immigration and favored the

relatively wealthy people of northwestern Europe. The barriers of the 1920s were only really broken down by the 1965 amendments to the Immigration and Nationality Act of 1952. The amendments largely ended discrimination on the basis of national origin. Annual immigration quotas were greatly increased by the Immigration Act of 1990.

Economists have recognized that immigration has, through low wage competition, had an effect on inequality. But the effect is estimated to be responsible for only a small portion of the increase in inequality. Borjas et al. (1997) argue that immigration accounts for only a small share of the increase in inequality. Studies by Borjas (1987), Altonji and Card (1989), and Lalonde and Topel (1989) also find only a small effect. Lerman (1999), on the other hand, finds that immigration explains 25-70 percent of the growth in the Gini. Lalonde (1994) finds that immigration may have had a big impact on inequality in western states. More recent work by Borjas (2003) points to a substantial negative impact of immigration on wages for low wage workers after controlling not only schooling but also for experience.

We would stress that the direct economic effects must be combined with the indirect political effects. Changes in such public policies as minimum wages, income taxation, and estate taxation, have, on balance, held the median voter's relative position harmless. More redistributive policies would have been maintained, we conjecture, had there been a sharp deterioration in the position of voters in the middle of the income distribution.

There is a large literature, including the references above, that focuses on immigration. In contrast, this paper emphasizes citizenship because many immigrants eventually become naturalized citizens and are then eligible to vote. Our results suggest

that naturalized immigrants are likely to look, in terms of income, much like native citizens. At least it is clear that the relative income of the median voter has not greatly declined during as waves of immigrants are naturalized. In contrast, as some immigrants have become naturalized, they have been more than replaced by a continuing surge of poor immigrant non-citizens.

The analysis of this paper is all in terms of relative incomes. Only these, and not the real levels, matter in most formal economic models of redistribution. We note, however, that real median income has in fact increased over the period of our study. To the extent that redistribution accomplished by the political process is social insurance (such things as unemployment benefits, old age benefits, and medical benefits), the increase in real income should diminish support for redistribution, complementing the results in this paper.[2] The effects of income inequality, however, are all on relative incomes.

We explore the relationship between income and voting in a way that differs from the standard approach taken by political scientists. (See Brady, 2004 for a recent example.) The usual approach is to see if the rich in fact vote more than the poor. We take a reverse approach, comparing characteristics of the income distribution of voters to the same characteristics for non-voters and non-citizens. We ask how the income characteristics have changed through time. In the standard approach, one is also concerned with seeing if income has an effect when one controls for other demographics. We are less concerned with this because public policy depends less on covariates than on income. One's taxes are not less because one is a college graduate, female, African-American, or an evangelical. (Although one's labor market experience may differ.)

Taxes may be slightly less is a person is over 65, but the monthly social security check will still depend on pre-retirement earnings and not race, education, or gender. So if we want to study redistribution, we should start with income, at least as a first cut.

Income inequality in the United States has indeed increased over the past three decades.[3] In most political economy models, inequality would self-equilibrate. As inequality increased, there would be more pressure to redistribute. This prediction is apparent in the model of Bolton and Roland (1997). As inequality increased, expressed as a decrease in the ratio of median voter income to mean income, more redistribution should occur. In the United States, however, public policy has veered in an opposite direction. The real value of the minimum wage has been allowed to fall; taxes on income from capital have fallen, as have top marginal income tax rates, and so has the estate tax.[4]

Other industrial nations have been exposed to the same technological change or opportunities as the United States. Although economic inequality might be driven by technological change, the responses elsewhere have not been the same. For example, Piketty and Saez (2003) show that during the last three decades of the twentieth century, the share of national income going to the top 0.1 percent of the population remained unchanged in France but sharply increased in the United States. We also note, in keeping with the theme of this article, that France has had a dramatically different experience with immigration. From 1975 to 1999, roughly the period of our study, French government statistics show that the percentage of non-citizens decreased, falling from 6.5% of the population to 5.6%.[5] France and the United States, thus, have had contrasting trends in income inequality and in citizenship. How might these trends have been reflected in political processes?

In political economy models of redistribution, public policy is determined by the median voter. The United States is not even close to a majoritarian political system. (France is probably closer.) The two political parties are increasingly polarized (McCarty, Poole, and Rosenthal, 1997, Schickler, 2000). Over time, the Republican party has become more conservative and has become more successful in national politics. The Democrats, to a lesser but significant degree, have tended to the left in large part because moderate southern Democrats no longer move the party toward the center. Moreover, affirmative action has become an instrument of redistributive policy and, as argued by Austen-Smith and Wallerstein (2003), the additional instrument, even in the absence of racism, might lead to less redistribution. Rather than explore the complexities of policy determination, however, we want to remain within the standard political economy framework of the median voter. Our major point is that the relative income of the median voter in the United States is in fact not worse today than 30 years ago.

A standard measure of income inequality is simply the ratio of median income to mean income. In the political economy literature, as this ratio falls, redistribution should increase. This observation first appears in the literature in Foley's (1967) model where a linear tax is used to carry out lump sum redistribution. When redistribution is costless, everyone with less than mean income should favor complete redistribution. Since income distributions are skewed, the median is less than the median, implying that redistribution should occur. Romer (1975, 1977), Roberts (1977), and Meltzer and Richard (1981) looked at the case where redistribution reduced labor supply.

A simpler way of looking at costly redistribution was proposed by Bolton and Roland (1997) who assumed that redistribution generated a deadweight loss that is

quadratic in the tax rate. Specifically, they assume that the deadweight loss takes the form αt^2, where α is a parameter and t is the proportional tax rate. In this case, the most preferred tax rate of a citizen is decreasing in the citizen's income—the rich want low taxes. In fact, the desired tax decreases linearly with the ratio of the citizen's pre-tax income to mean pre-tax income. Thus, as the ratio falls—inequality increases—there should be higher taxes and more redistribution. Bolton and Roland work out the model assuming $\alpha=1/2$, in which case the most preferred tax rate of a voter is simply

$$t_{preferred} = 1\text{-(voter income/mean income)}$$

If the ratio of median to mean income is very low, there will be support for redistribution. A shift in the ratio, say from 0.7 to 0.8, has important consequences for policy.

The framework provided by Bolton and Roland indicates that non-citizenship has both a *disenfranchisement* effect and a *sharing* effect.[6]

The *disenfranchisement effect* can be viewed as a change in the numerator of the median/mean ratio. The median income of voters is higher than that of all families. This fact reflects not just that voters have higher incomes than eligible non-voters, but that voters have higher incomes than non-citizens. The effect of disenfranchising non-citizens will increase either if non-citizens become more numerous or if they become poorer.

If all citizens voted, the appropriate ratio would be median citizen income/mean family income. If all those over 18 voted, the appropriate ratio would be median family income/mean family income. By comparing these ratios to median voter income/mean family income, we can study how much "disenfranchisement" is due to non-voting by citizens and how much to the ineligibility of non-citizens.

The presence of non-citizens in the population not only affects the numerator of the median/mean ratio but also changes the denominator. Because non-citizens are poorer than citizens, mean family income is less than mean citizen income. Non-citizens thus increase the ratio, making redistribution less attractive to the median voter. Non-citizens shrink the per capita pie that has to be shared equally with all residents. The sharing of benefits with non-citizens has, of course, become a political hot potato. To assess the *sharing* effect, we will compare redistribution when mean family income for citizens is substituted for mean family income in the ratio. This counterfactual presumes that mean citizen income is unaffected by the presence of non-citizens. Although citizen income may well be affected by immigration, it is hard to argue that it would fall below realized mean family income. Some *sharing* effect must be present.

The sharing effect will drive all citizens to be less favorable to redistribution. The disenfranchisement effect decreases the political influence of relatively low income families and increases the influence of higher income families. We focus, for convenience, on median incomes but our findings can be viewed as indicative of the incentives to redistribute that face a large segment of the electorate with incomes not very distant from the median. The main point of this paper is that the relative income of the median income *voter* in the United States is in fact not worse today than 30 years ago. The disenfranchisement effect and the sharing effect have contributed to lessening voter support for redistribution despite increasing income inequality.

Although the ratio of family income of the median individual to mean family income has indeed fallen in the United States over the past thirty year, the ratio of the family income of the median *voter* to mean family income has been remarkably constant.

The political process does appear to have equilibrated in the sense that the median voter is not worse off compared to the mean.

How has this distinction between the median voter and the median individual arisen?

First, not every eligible individual votes. United States citizens who do not vote have lower income than those who do. This has always been the case and it does not appear to have shifted much over the past thirty years.[7] An argument that it may have shifted originates in the observation that many states bar voting by convicted felons and that convictions and incarcerations have trended sharply upwards (Uggen and Manza, 2002). Convicted felons - Bernie Ebbers, Michael Milken and Martha Stewart aside - tend to be poor. Making felons ineligible might make non-voters disproportionately poor. But we don't see such effects in our data. It is possible that the census bureau under-samples convicted felons and therefore consistently overestimates the incomes of non-voters. But it is also possible that people susceptible to felony convictions always had very low turnout, so changing conviction rates and eligibility would have minimal impact on the income distribution of non-voters. In any event, the impact of ineligible felons has to be small relative to that of non-citizens. Macdonald and Popkin (2001), for example, estimate that, in 2000, non-citizens outnumbered ineligible felons by over five to one. Uggen and Manza (2003) estimate that 2.3% of the adult population was ineligible felons in 2000 in contrast to the 7.8% of the CPS sample that is non-citizen.

Second, and more important, the fraction of individuals who are non-citizens has risen sharply, tripling between 1972 and 2000. Moreover, as emphasized by Bean and Bell-Rose (1999) and Borjas (1999), the non-citizens are increasingly low wage and poor.

Our most striking observation is the rapid decline of the median income of non-citizens to the median income of voters. In a nutshell, continuing immigration has created a large population of non-citizens. These non-citizens appear to be a leading cause of the fall of median family income relative to mean income. Voters are doing as well as they have ever done.

We have a second interesting finding. There is a midterm cycle in the income of non-voters. The median income of non-voters increases in off years and declines in presidential years. In other words, marginal voters who vote in presidential elections but not in off-years have higher incomes than persistent non-voters. The smaller set of individuals who vote in neither presidential nor off-year elections have particularly low incomes. In presidential elections, then, the median family income of a voter is sharply higher than that of the median income of a non-voter and much, much higher than that of a non-citizen.

In the next section, we discuss the data we use. In succeeding sections, we present our results and then conclude.

Data and Methods

Our data are drawn from the November Current Population Survey (CPS) conducted by the census bureau. In even-numbered years, those with congressional or presidential elections, the CPS asks each respondent whether he or she is a citizen and whether he or she voted in the election held on the first Tuesday in November. The citizenship question has appeared every two years starting in 1972.[8] The CPS has long been used by political scientists and others interested in studying voter turnout, most

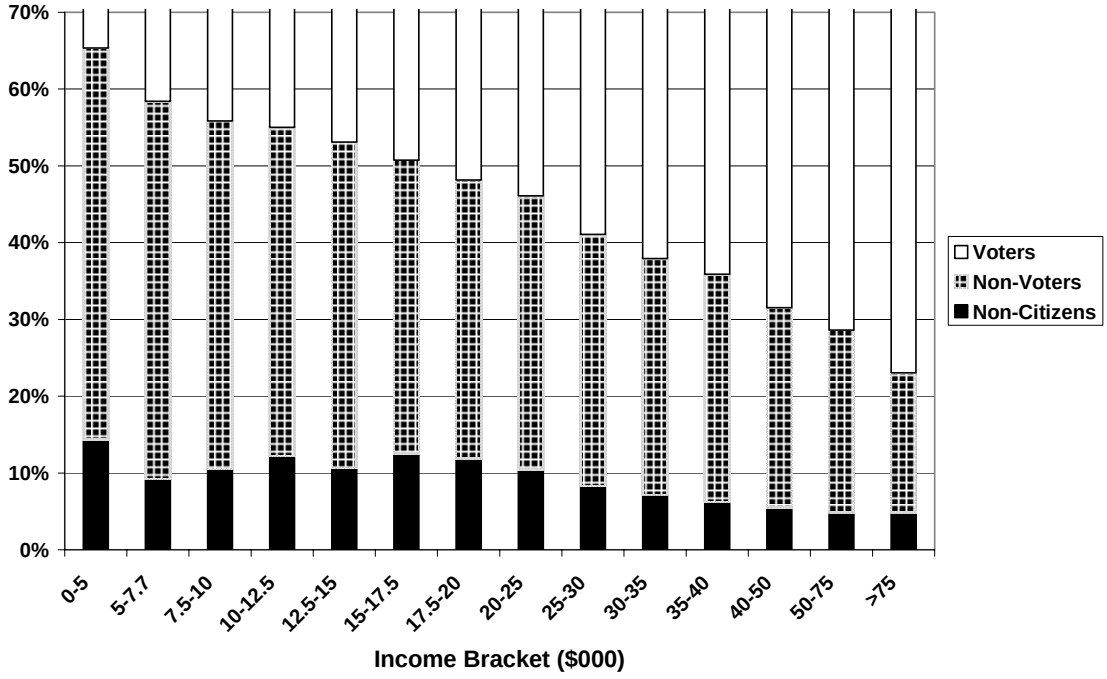
notably by Raymond Wolfinger and Steven Rosenstone (1980) in their classic *Who Votes?*

The CPS contains no information about voter behavior other than turnout. Its advantage is that the sample sizes are far larger than in most surveys, such as the National Election Study. We analyze all respondents 18 and over who provide information about income and citizenship and who, if they are citizens, provide information about voting. Respondents with complete information on citizenship, voting, and income range from a low of 69,584 in 2000 to a high of 110,588 in 1980.

In figure 1, we show, for each income category, the 2000 distribution of respondents by citizenship and voting. The figure illustrates the strong relationship between income and voting. In the lowest income category used by the CPS, nearly two-thirds of the respondents are either non-citizens or non-voters. In contrast, of those respondents who report themselves to be in the highest income category, over three-fourths also report having voted. The figure also indicates that non-citizens are far more likely to appear in the lower income categories than in the higher ones.

There are, however, many negatives that detract from using this data and that from earlier years, despite the large N.

Figure 1: Citizenship, Voting and Income in 2000



First, people lie. We know that voting is over-reported. When we compare actual voter turnout data from the Federal Election Commission to self-reported turnout data in the CPS, we find that individuals overstate voter participation by 7 to 12 percentage points (See appendix 1 for details). We suspect that citizenship is over-reported as well. If the set of non-voters who lie and claim to be voters had an income distribution identical to that of voters, we would still get correct estimates of the median and mean income of voters but underestimate the median income of non-voters. This effect would make the income contrast between voters and non-voters less stark than the data indicate.. If on the other hand, the income distribution of non-voters who lie is identical to that of honest non-voters, we will underestimate the median and mean income of voters, implying that the true differences are even stronger than those we report. One hopes that lying non-voters have an income distribution somewhat in between honest non-voters and true voters, in which case the bias will not be too severe.[9] An encouraging observation is that more voting is reported for presidential years than for off-years, paralleling actual turnout. We also hope that there are not severe problems of bias generated by those who lie about their citizenship and, a fortiori, by non-citizens who claim to be voting citizens. People, of course, also lie about their incomes, a nasty problem swept under the rug by those who analyze census data.

Second, there are sampling problems with the census. The two-tails, particularly the lower tail, of the income distribution are likely to be undercounted. We acknowledge the potential for bias here and move on.

Third, there is a top-coding problem. The census bureau adopted 14 categories for reporting income in 1982 and has left them unchanged since. The top category is

incomes of $75,000 and over. (For 1974-1980, the top coding was at $50,000. In 1972, the top coding was at $25,000 and there were only 11 categories.) Economic growth and inflation have combined to sharply increase the fraction of the sample in that category. In 1982, only 2.41 percent of the voters were in the top category. In 2000, 28.2%, and in 2002, 31.3% were there. The top-coding reduces the accuracy of our estimation of the income distribution, particularly for voters. Although more detailed data on individual income can be found in the March CPS, these data cannot be linked to the November survey.[10] It is regrettable that the Federal government has both somewhat curtailed the size of the CPS and failed to adjust the income brackets in the November CPS, but we have to live with the cards as they are dealt.

To use the CPS data, we first cross-tabulated income with citizenship and voting to obtain the income distributions of voters, non-voting citizens, and non-citizens. These three categories are important to our purposes. For each of the three groups and for the entire sample, we used maximum-likelihood to estimate the parameters of a two-parameter log-normal distribution. The method is described in detail in McCarty, Poole, and Rosenthal (2003); summary statistics for the estimates appear in Appendix 2. Our estimates of the median and the mean then follow directly from the estimates of the maximum-likelihood estimates of the mean and variance of log income. As there were at most 14 categories in a given year, we chose parsimony and did not estimate a richer distribution with a larger number of parameters. The accuracy of the estimates is very likely to deteriorate with the top-coding problem that grows in more recent years. For centiles of the income distribution, we can, in contrast, obtain highly accurate estimates (except for centiles above the top code) by interpolation from category bounds.[11] The

large N of the CPS makes interpolation accurate. We therefore can make very accurate comparisons of, say, median non-citizen income to median voter income or median non-citizen income to the 72nd percentile of all families income.

The 2002 data are particularly problematic. We exclude them from all centile comparisons because of the top-coding. In addition, contrary to expectations, (1) the fraction of non-citizens fell slightly from 2000 to 2002 (see table 2) and (2) among non-citizens, the proportions of Hispanics and "Other" non-Hispanics fell slightly from 2000 to 2002 (see figure 6). These differences might be sampling variation, but they might also reflect more wary non-citizen respondents in the wake of 9/11. A change in over-reporting citizenship of low-income non-citizens could explain the occurrence, once 2002 data are introduced, of a slight deterioration in our results based on median/mean comparisons.

Results

In political economy models of voting on taxation and redistribution, the ratio of median to mean income is frequently the key characteristic used to express income inequality. We previously illustrated why this ratio is central to the Bolton and Roland (1997) model. (See also Roemer, Benabou (2000), Benabou and Ok (2001), Persson and Tabellini). As this ratio falls, there should be more pressure to redistribute. To put it simply, as the median voter's income falls relative to the mean, the voter's share of the initial pie falls and the voter will seek to get a larger piece, even if the total pie shrinks somewhat as a result of changes in labor supply, deadweight loss from tax collection, and

so on. We focus first on the disenfranchisement effect by making all families the baseline for comparison.

Using the ratio of the median to the mean as our measure of inequality, we find that income inequality significantly increased in the United States in the last three decades. The lower line of figure 2 shows a decrease from 0.75 in 1972 to under 0.7 in 2000. A linear regression of the ratio on trend shows an estimated yearly decrease of 0.00189 ($t=4.21$, $R^2=0.56$, one-tail p-value = 0.0004). Contrast the lower line with the upper one in figure 2, which shows the same ratio when we substitute the median income of *voters* for the median income of *all families* but still keep mean income in the denominator. Notice that this ratio is always substantially higher than that for the median individual in the entire sample. That is, the median voter has sharply less incentive to redistribute than does the median individual. Moreover, there is no trend. There is no significant increase in inequality. The linear regression shows an estimated yearly decrease of only 0.00078 ($t=1.37$, $R^2=0.12$, p-value=0.10) less than half of the decrease that occurred in the entire population.

If we compare median *citizen* income to mean family income we find an intermediate situation, shown as the middle line in figure 2. The linear regression now shows a yearly decrease of 0.0012, only two-thirds of the decrease for the entire population. The decline has only borderline statistical significance ($R^2=0.30$, $t=1.640$, p-value=0.015). If median citizen income deteriorated, the deterioration has been minimal. The big drop is in median family income. The difference between citizens and all families is, of course, non-citizens.

We should point out that the contrasts are much sharper if we exclude the 2002 data. Moreover, the trend for voters is not even borderline significant. Although, conservatively, we give detailed results for the full time series, we are more inclined to believe the results without 2002. Without 2002, the decline in the ratio for families is three times what it is for voters. What is clear, in any case, is that the median voter's situation has deteriorated much less than has the median family's.

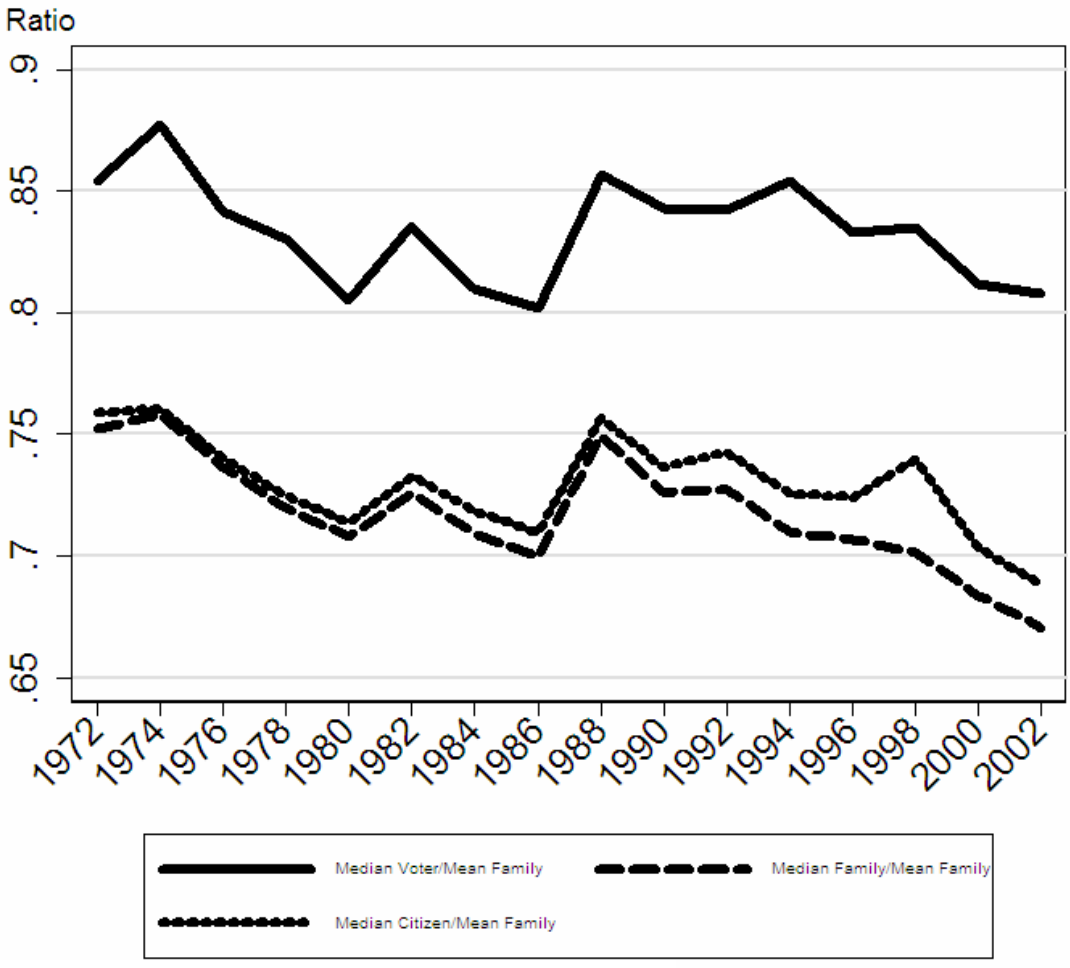
The information displayed in figure 2 permits us to calculate the disenfranchisement effect implied by the Bolton and Roland model. We will work with $\alpha = ½$. The preferred tax rates of the median voter calculated from this assumption average to 16.5 percent over the 15 CPS biennial samples from 1972 to 2000. The federal income tax has averaged about 14 percent of total Adjusted Gross Income (AGI). But since most voters also pay state and local income taxes, the $\alpha = ½$ assumption looks fairly reasonable. It is straightforward to explore the sensitivity of the results to variation in α.

Most of the disenfranchisement effect comes from the failure of all citizens to vote. Were the median citizen decisive, the tax rates would average 10.2 percent higher than in the median voter model, increasing from 16.4 percent to 26.7 percent. But as we have seen, this difference is fairly constant across time. In 1996, 1998, and 2000, the median citizen, with respect to the median voter, would have raised taxes more than in 1974. The additional increases brought about by the disenfranchisement of non-citizens, while smaller, show an important trend in time. From 1972 through 1988, the median family would have desired a tax less than 0.1 percent more than the tax desired by the

median citizen. From 1992 through 2000, the increase would have been in excess of 1.5 percent.

Actual tax policy since 1972 has clearly headed in a direction opposite to that implied by these calculations but certainly is more akin to median voter preferences than to median citizen or median family preferences.

Figure 2: Mean-Median ratios.



We are concerned, however, with the accuracy of our lognormal estimates of mean and median income.[12] Standard alternative measures used by economists compare ratios of centiles of the income distribution. We can compute centiles with reasonable accuracy by using loglinear interpolation from the categorical data.[13] A common ratio is 50-90, the ratio of the median to the 90th centile. We can't use this because of top-coding. We can look at the 50-80 ratio for 1972-1996. This is shown in figure 3.

Figure 3: Ratio of Median Income in Categories to 80th Centile, All Families

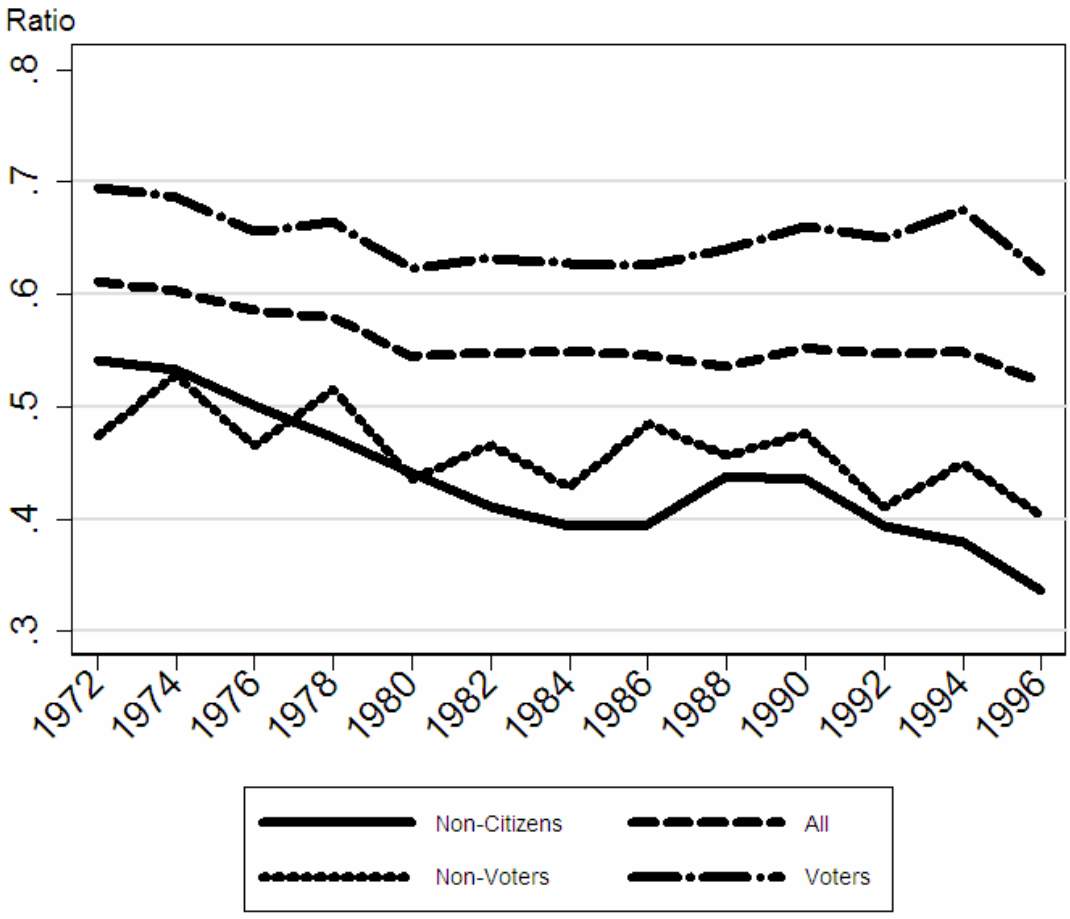


Figure 3 shows a different and more complex picture than figure 2. Overall, in terms of 50-80 ratios, income inequality does increase for all families and all citizens. But the damage here is done by 1980, before Reaganomics takes hold in the United States. From 1980 through 1994, all families and non-voters basically trod water. Except for the aberrant data point represented by 1996[14], the relative situation of the median voter markedly improves after 1980. As the median voter improves, the position of the median non-citizen continues to deteriorate. The presence of increasing numbers of relatively poor non-citizens bumps up voters in the overall income distribution.

The story told by the picture is echoed by the simple regression analysis shown in table 1. In each column, we regress the 50-80 ratio on a time trend and a dummy for presidential years. The first thing to note from the results is that, parallel to our results for mean/median comparisons, the median voter has much less incentive to redistribute than does the median family. The median voter's income is 67 percent of that of the 80th percentile family while the median family is only at 60 percent, even in 1972, before trend effects kick in. The median voter is also far better off than the median non-voter and the median non-citizen.

A second observation is that the median voter's position is not estimated to deteriorate over time. The trend effect, albeit negative, is small and statistically insignificant. In contrast, there are significant negative trends for all families, non-voters, and especially non-citizens, whose trend coefficient is more than twice in magnitude that of non-voters. A third observation, one we return to later, is that there is a significant midterm cycle in the ratio for non-voters. The cycle is captured in the sawtooth pattern for non-voters shown in figure 3. Non-voters are very significantly poorer in presidential

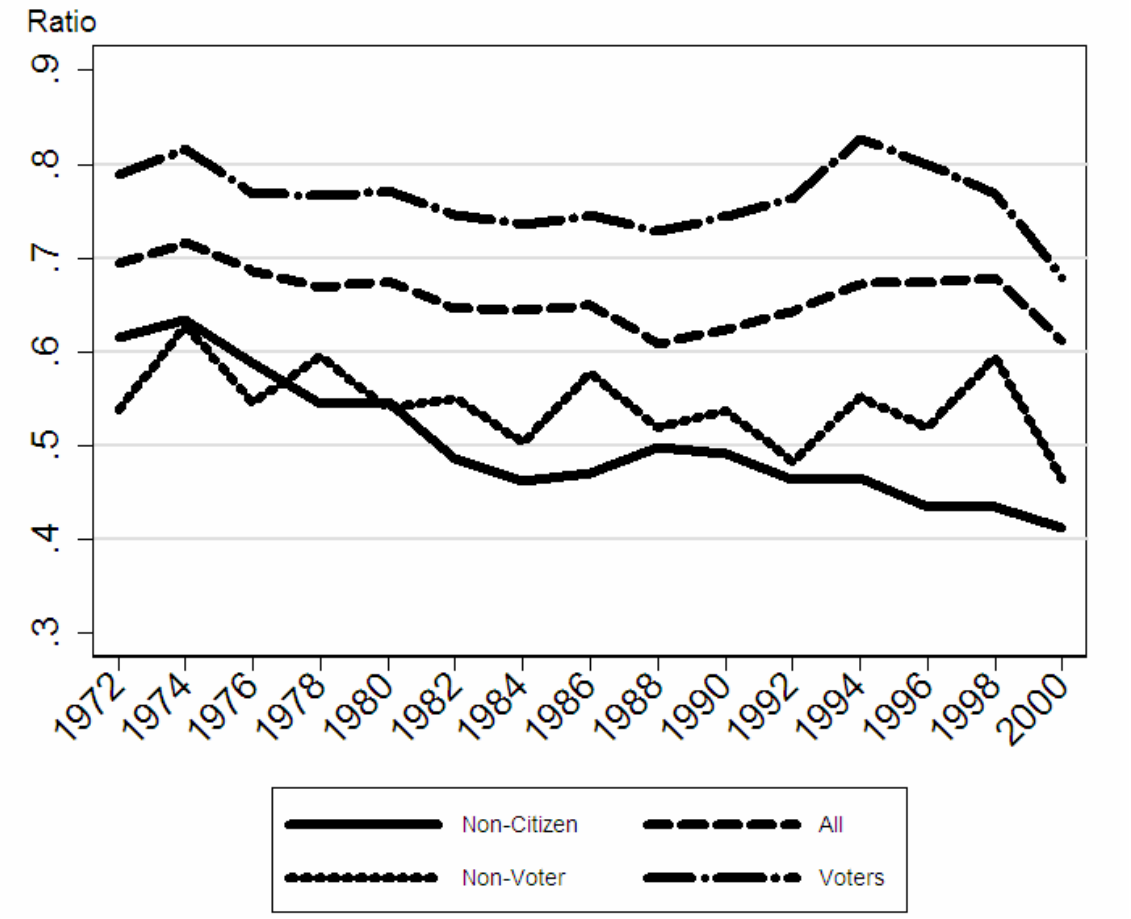
years. This income difference results from the fact that relatively rich non-voters, who have income profiles much like those of midterm voters, turn out in presidential years. In contrast, there is no midterm cycle for voters with an opposite sign, partly because the additional voters are small relative to the pool of midterm voters and partly because the additional voters, albeit well off relative to other midterm non-voters, are not richer than midterm voters.

Table 1. 50-80 Comparisons
(t-statistics in parentheses)

Variable	Median Non-Citizen /80th Family	Median Non-Voter /80th Family	Median Voter /80th Family	Median Family /80th Family
Constant	0.5219 (28.66)	0.5226 (56.79)	0.6742 (47.50)	0.5976 (65.99)
Presidential Year	-0.0026 (-0.160)	-0.0477 (-5.626)	-0.0127 (-0.969)	-0.0063 (-0.750)
Year - 1972	-.00070 (-6.273)	-0.0030 (-5.316)	-0.0014 (-1.619)	-0.0029 (-5.249)
R^2	0.797	0.856	0.263	0.685

Very much the same story is told by figure 4. When we drop down from the 80th centile to the 72nd, we can cover all years through 2000. Now 1996 becomes a more normal data point but 2000 is aberrant.[15] A main theme carries over directly from figure 3—the relative position of non-citizens has deteriorated sharply over time. Similarly, the sawtooth pattern of the midterm cycle for non-voters repeats in figure 4. In distinction to the 80th centile comparison, however, 50-72 ratios continue to decline after Reagan takes office but then start to recover in the mid to late 1980s. In fact, the ratio is best for voters in 1994, when they put Newt Gingrich and the Republicans in power in Congress. As a whole, putting aside 2000, citizen families look just a little worse off, in terms of 72-50 ratios, in the late 90s than they did in the early 70s.

Figure 4: Ratio of Median Income in Categories to 72nd Centile, All Families



The relative decline in median family income, as shown most strongly by figures 2 and 3, has in large part been the result of the substantial immigration that has flowed into the United States every year since the passage of the Immigration Act amendments of 1965. As table 2 shows, non-citizens as a percentage of our sample has steadily increased, tripling from less than three percent in 1972 to nearly eight percent in 2000.[16] Changes like these mean a lot in an electorate that is divided nearly 50-50. It is

comforting to see that, whatever the bias in reporting of citizenship, the bias appears to be fairly constant and unaffected by whether the year is presidential or not.

Table 2. Sample Percents

Year	Non-Citizens	Non-Voters	Voters
1972	**2.63**	**32.21**	**65.16**
1974	**2.86**	**49.82**	**47.32**
1976	**3.04**	**34.24**	**62.72**
1978	**3.38**	**47.43**	**49.18**
1980	**3.79**	**33.09**	**63.12**
1982	**3.96**	**43.35**	**52.70**
1984	**4.19**	**31.84**	**63.97**
1986	**4.40**	**45.79**	**49.81**
1988	**4.03**	**34.06**	**61.90**
1990	**5.47**	**44.87**	**49.66**
1992	**6.21**	**28.00**	**65.79**
1994	**6.36**	**44.22**	**49.42**
1996	**6.31**	**34.02**	**59.67**
1998	**6.82**	**45.86**	**47.33**
2000	**7.76**	**30.28**	**61.96**
2002	**6.89**	**43.3`**	**49.79**

In contrast to the rapidly increasing non-citizen population, the percentage of the over 18 population that votes has been remarkably constant. In contrast, turnout is strongly affected, as we would expect, by whether the election is midterm or presidential. A regression of the percent voters among *citizens* in table 2 on a time trend (1972=0) and a presidential year dummy gives (with t-statistics in parentheses):

$$\underset{\quad\quad(46.33)\ \ (0.97)\quad\quad\quad\quad\quad(14.42)}{\text{Voters} = 51.18 + 0.052(\text{Year} - 1972) + 14.27(\text{Pres. Year}),\ R^2 = .94}$$

Thus, as first observed by Macdonald and Popkin (2001), there has been no decline in turnout.[17] It is hard to blame increasing inequality on citizen apathy at the

polls. Although it is not statistically significant, there is a small upward trend in the fraction of those respondents who claim citizenship who also claim to have voted. Reported citizen turnout in presidential years in fact peaked at over 70 percent of citizens in 1992, when Ross Perot enriched the choice set, and hit a low of 63 percent in 1996, when Bob Dole produced about as much excitement as a Viagra ad. Similarly, congressional year turnout hit a low of 48.7 percent in 1974, when Watergate drove away Republicans and hit a high of 54.9 percent in 1978. In a nutshell, the rise in inequality and polarization in the last three decades of the twentieth century was not accompanied by a reduction in reported turnout of reported United States citizens.

So what sustained the ratio of the median income of voters to the mean income of the population? Certainly not that the voters had become a narrow slice of the eligible population. Figure 1, however, demonstrates that turnout is strongly correlated with income. Has voting just become more correlated with income, with apathetic poor citizens sitting it out?

We can begin to answer this question by comparing the median incomes of voters to the median incomes of non-voters and non-citizens. If low income citizens had become apathetic and failed to vote, while overall citizen turnout remained roughly constant, we would expect to find the median income of non-voters to have declined relative to voters. This decline didn't happen. What did happen is that the median income of non-citizens relative to the median income of voters declined sharply. The evidence is in figure 5 and table 3, which use medians calculated by linear interpolation.[18]

As table 3 indicates, the income of the median non-citizen is falling sharply relative to that of the median voter. The ratio is unaffected by whether the year is a

presidential one. The median income of non-voters has also fallen, but not nearly as sharply. The coefficient estimate of -0.0016 is less than one fourth the magnitude of the -0.0068 for non-citizens. Much of the negative trend for non-voters results from the two high turnout presidential election years of 1992 and 2000, years that were likely to have left the non-voters poorer than usual. Moreover, if we drop the questionable 2002 data, the trend for non-voters is only borderline significant.

What happens systematically, in contrast, is that high turnout elections draw the richest non-voters into voting, tending to leave only the poorest as non-voters. As discussed earlier, we have a significant midterm cycle—the median non-voter is relatively poorer in a presidential year than in the preceding or succeeding midterm elections.

To show how the midterm effect operates, we compare the midterm election of 1998 to the high-turnout presidential year of 2000. If turnout in presidential years among off-year non-voters was not correlated with income, we would expect to see a larger fraction of non-voters with high nominal incomes in 2000 than in 1998. Inflation was low but positive and, moreover, there had been real economic growth between November 1998 and November 2000. Yet the percentage earning over $35,000 actually declined from 41.6% of the non-voters in 1998 to 39.0% in 2000. Therefore, the higher-income non-voters in off-years tend to vote in presidential years. A perhaps simpler way to see what underlies the midterm cycle is to note that while the nominal median income of voters increased in every two-year period through 2002, the nominal median income of non-voters actually fell in 1988, 1992, and 2000.

There is an implication for the study of national elections in these results. The trend to Republican success in the three decades that inequality has increased (Duca and Savings, 2002) can hardly be solely a matter of very poor social conservatives voting against their economic interests. A large segment of the truly poor does not have the right to vote. While in 2000 non-citizens were 7.7 percent of the general population, they were 11.3 percent of families with less than $10000 per year. (See figure 1.) In 1996, when the Clinton administration, it is claimed, accelerated naturalizations of non-citizens, non-citizens were 10.0 percent of families with less than $10000 but only 6.3% of the general population.

Our results comparing medians of non-voters to the medians for voters do contrast with the earlier results where we compared medians of non-voters to the 72^{nd} or 80^{th} percentiles of all families or families of citizens. There the result was a much more statistically significant decline for non-voters. The results can be reconciled by observing that income growth has been increasing most in the higher centiles of the income distribution. When compared to the median income of voters, the median income of non-voters has not deteriorated much. But since median income among non-voters is much less than that for voters, the position of non-voters has fallen more sharply in comparison to relatively high income families.

The main thrust of our analysis, moreover, rests on the increase in economic differences between citizens and non-citizens. Our results bear out research by economists and demographers. As, for example, Borjas (1999) explains, in 1972 these immigrants came predominantly from first world nations. Their median income was not far behind that of the voters and in fact higher than that of non-voters. Over time, the

immigrants became predominantly from the third world, in large part Mexico. By 1982, median non-citizen income had fallen permanently behind that of the median non-voter.

The changing pattern of income of non-citizens, as indicated by the November CPS, is echoed by the changing racial-ethnic composition of this group. We graph the ethnic-racial composition of non-citizens in figure 6.[19] We break out Hispanics from non-Hispanics. Within non-Hispanics, we distinguish between white, black, and other. In 1974,[20] non-citizens were slightly over 40 percent white. The white percentage fell to just over 20 percent by 2000. The decrease among whites was made up in the 1970s by an increase in the "Other" category and in the 1980s and, increasingly, in the 1990s by Hispanics. Our results are likely to underestimate the income of non-citizens if illegal immigrants are less likely to be sampled and more likely to be Hispanic. We will also underestimate the income of non-citizens if illegal immigrants with low incomes over-report citizenship.[21]

Figure 5: Income Ratios 1972-2002

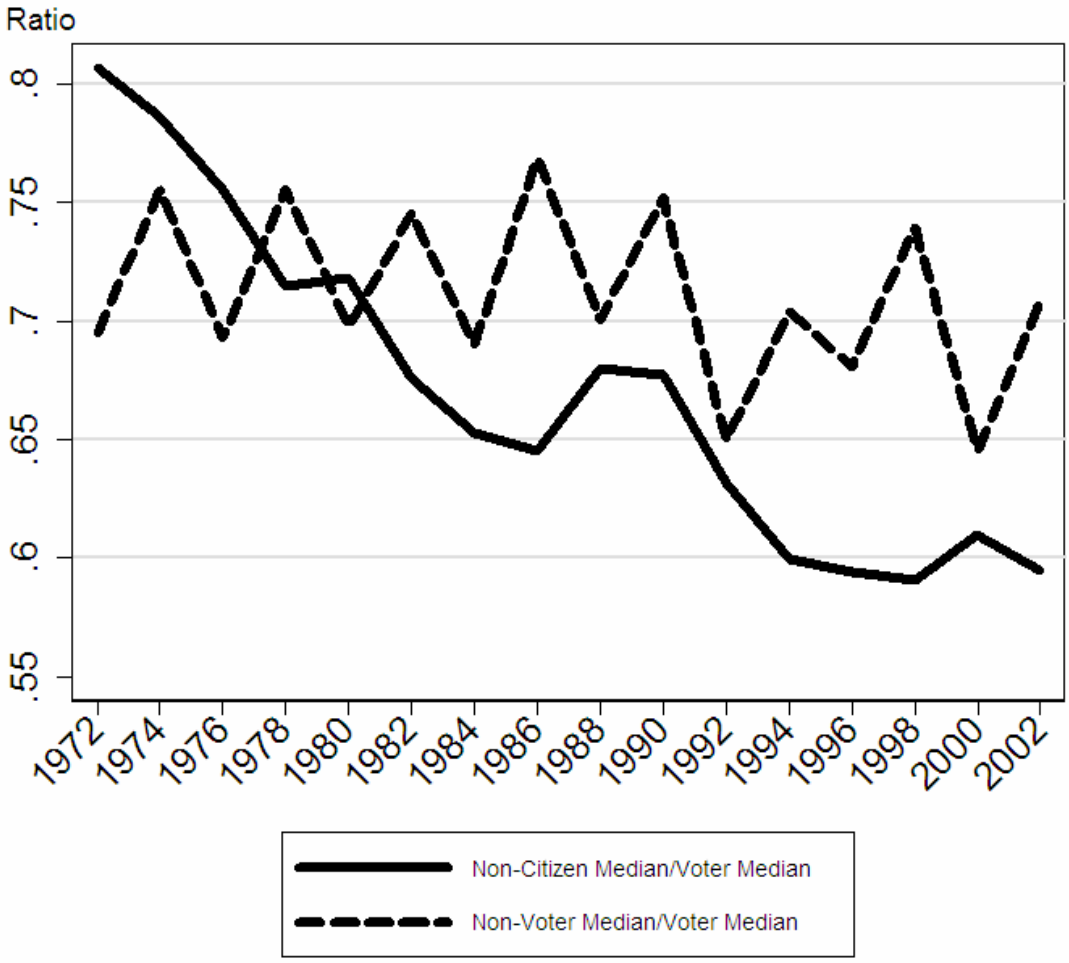
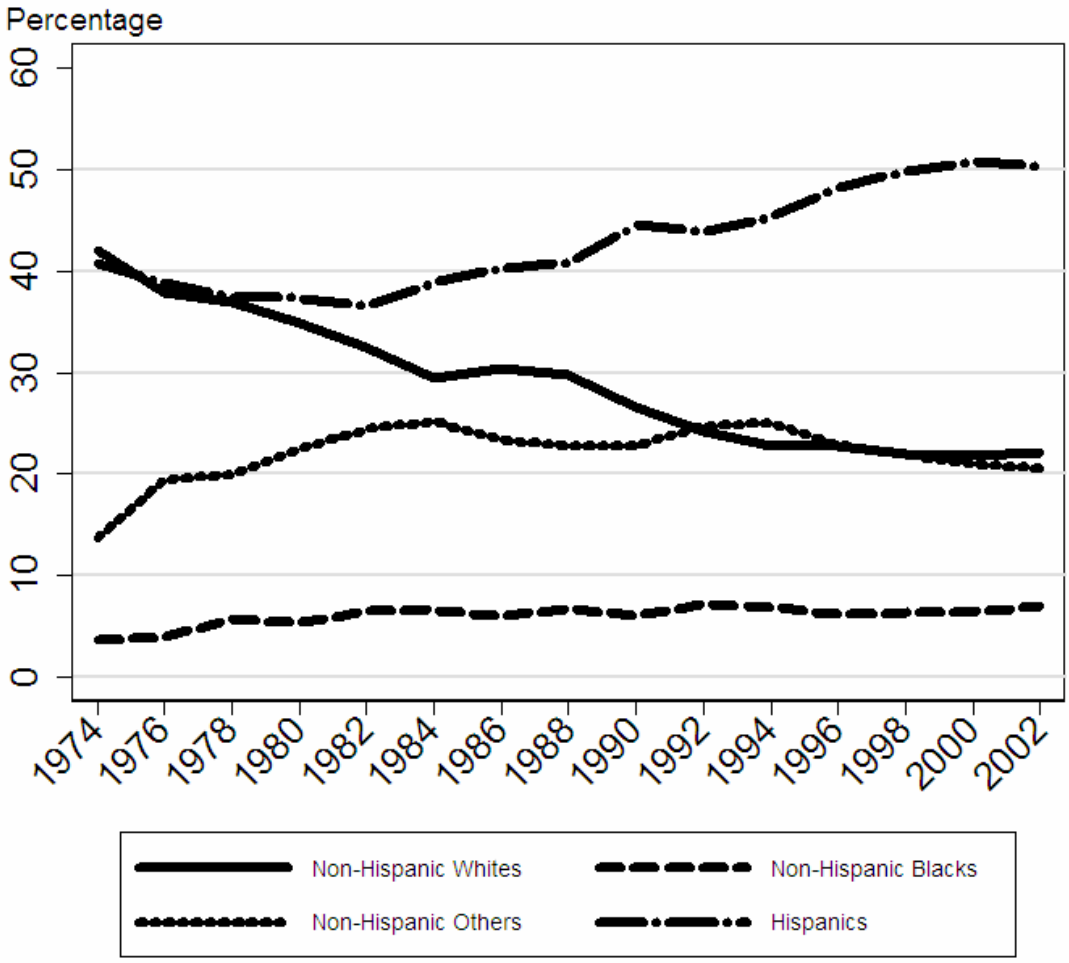


Table 3. Income Median Comparisons (t-statistics in parentheses)		
Variable	**Median Non-Citizen /Median Voter**	**Median Non-Voter /Median Voter**
Constant	0.7660 (52.97)	0.7670 (82.99)
Presidential Year	0.0068 (0.523)	-0.0629 (-7.60)
Year - 1972	-0.0068 (-9.58)	-0.0016 (-3.60)
R^2	0.88	0.83

Figure 6: Non-Citizens by Race and Ethnicity

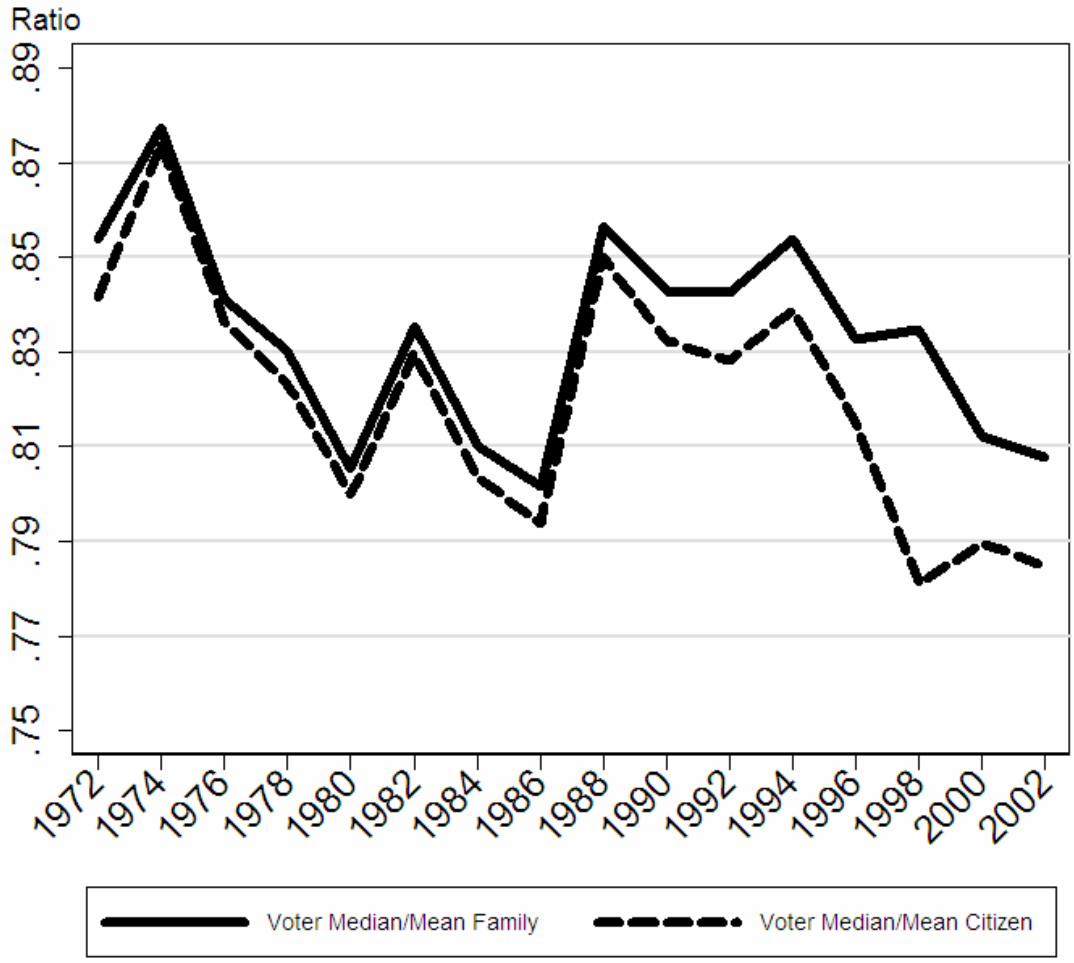


Until this point our analysis has focused on the disenfranchisement effect. We have shown a steep and increasing difference in the tax rates that the Bolton-Roland model would associate with the median voter being pivotal as against the median family. Taxes would be higher, however, were it not for the sharing effect. Our analysis of the sharing effect presumes that there would not have been major changes in relative income had there been closure of the immigration floodgates. This assumption is perhaps not outrageous. Cutting off immigration might have raised wages of citizens at the very low

end. It might also have, for example, eliminated the supply of nannies that permit two spouses to work and obtain very high incomes. Here the impact is likely to be greatest at very high incomes. The impact at the median would have been less. So the comparisons we make have some credibility, especially the 50-72 and 50-80.

We begin the comparisons, however, with the median/mean ratios first seen in figure 2. In figure 7, we compare the previously plotted ratio of median voter income to mean *family* income and the ratio of median voter income to mean income for all *citizen* families. As can be seen, there is little difference between the two series until 1990 when a larger gap widens up. The gap widens to a point where, in terms of the Bolton-Roland (1997) model, the median voter will want substantially higher taxes were the income distribution that of citizens rather than all families. In terms of the benchmark Bolton-Roland scenario with $\alpha=1/2$, the tax rate for a ratio of 0.79 would be 21% but would fall to 17% if the ratio increases to 0.83, the type of difference between citizens and families seen in figure 7. Note that in this range, we have not chosen an unreasonable value for government inefficiency. The cost, $\frac{1}{2}t^2$ would only be about two cents on the dollar. The magnitude of the trend for citizens over time, 0.00163, is over twice the 0.00078 ratio estimated for families. The decline is statistically significant ($t=-2.76$, $R^2=0.353$). (Again the contrast between the two series is somewhat greater if the 2002 data are excluded.)

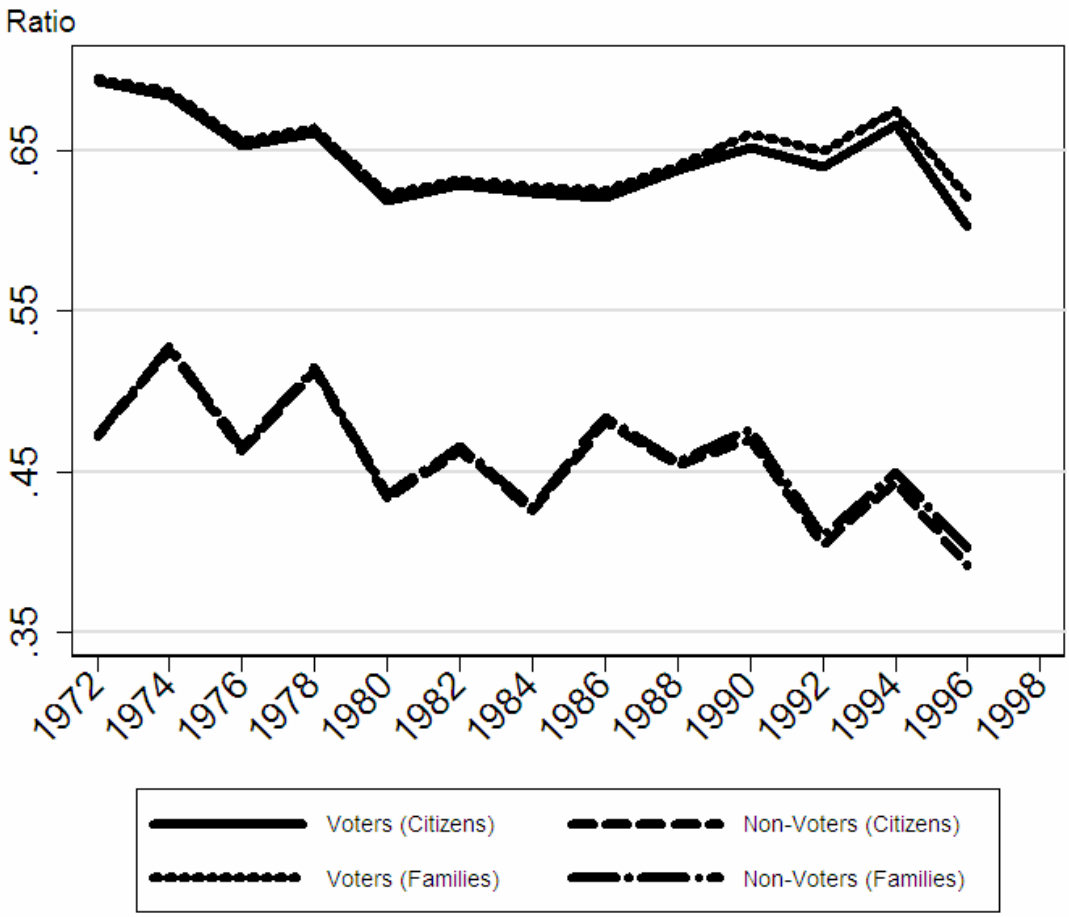
Figure 7: Median Voter Mean Ratios



The results for the median/mean ratios are confirmed by analysis of 50-80 and 50-72 ratios. In figure 8, we produce the 50-80 comparisons of medians of voters and non-voters to the 80th percentiles of all citizen families. In the same figure, we include the previous comparisons to the 80th percentiles of all families. The curve for citizens lies below that for all families. In the 1970s, however, the curves are indistinguishable, reflecting the facts that non-citizens were few and of income relatively similar to that of

citizens. As non-citizens become both more numerous and relatively poorer, a gap opens up, small but increasing.

Figure 8: Ratio of Median Income to 80th Centile Income, Citizens and Families Compared



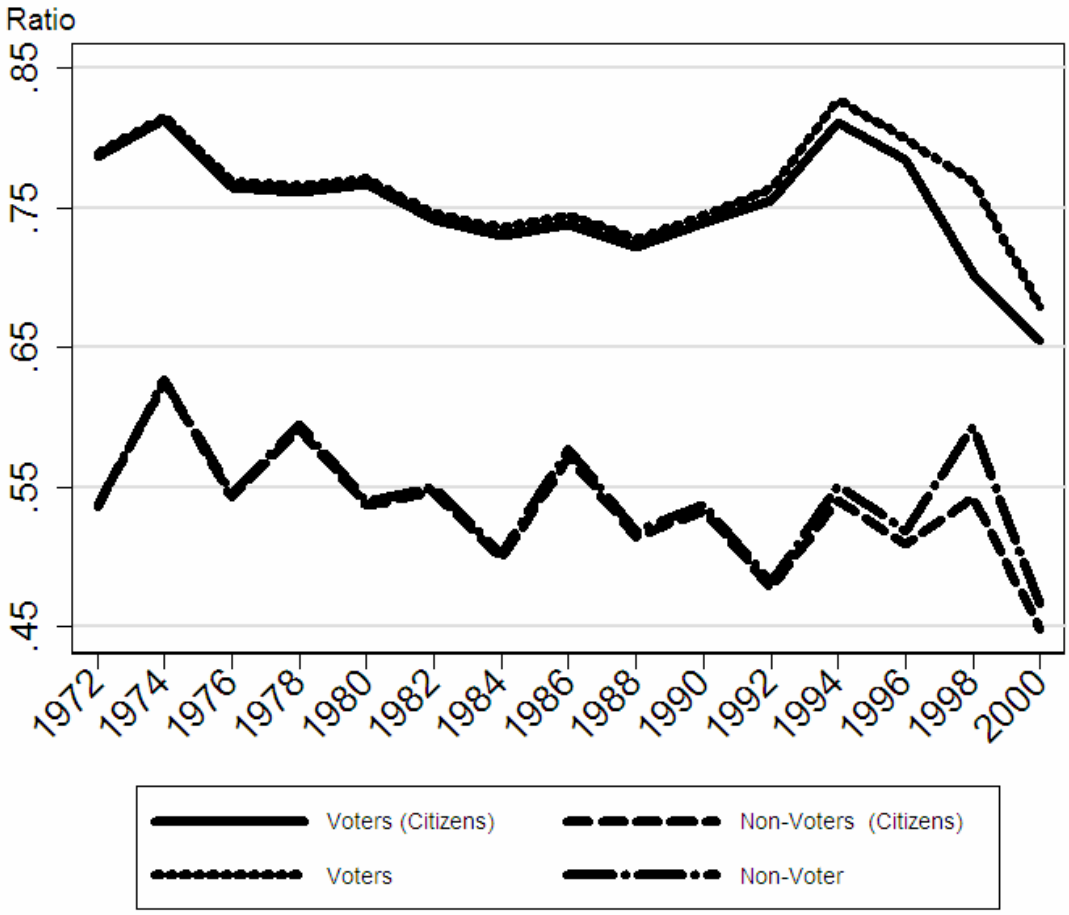
In table 4, we report regressions similar to those in table 1, replacing families with citizens. The pattern for non-voters changes little from table 1. Voters do show a statistically significant negative trend (at the 0.05 level, one-tail) when compared to citizens in contrast to the comparison to families. That is, non-citizens are bumping

voters up a bit in the income distribution, compensating, in part for the rise in income inequality.

Table 4. 50-80 Comparisons, Citizens (t-statistics in parentheses)		
Variable	**Median Non-Voter /80th Family, Citizens**	**Median Voter /80th Family, Citizens**
Constant	0.5225 (55.32)	0.6747 (48.05)
Presidential Year	-0.0481 (-5.689)	-0.0138 (-0.969)
Year - 1972	-0.0033 (-5.531)	-0.0019 (-2.174)
R^2	0.863	0.369

In figure 9, we show a similar comparison for 50-72 ratios. This figure shows a larger gap between the citizen and the family comparison than does figure 8. Regression results again (not reported) show a significant decline of median voters within the citizen population.

Figure 9: Ratio of Median Income to 72nd Centile, Citizens and Families Compared



Conclusion

This paper argues that the median income *voter's* incentive to redistribute has not increased as overall economic inequality has risen in the United States. The reason is partly that the rise in inequality has been offset by immigration that has changed the location of citizens in the income distribution. Those ineligible to vote are substantially

poorer than the eligible. Moreover, poorer citizens have not become increasingly apathetic, measured by failure to vote. Most citizens, and voters in particular, have been "bumped up" by the disenfranchisement of poorer non-citizens. At the same time, a voter of a given income is less eager to redistribute given that redistribution has to be shared with the non-citizen poor.

Immigration, in any event, cannot have been a driving force in the onset of the increase in income inequality and political polarization. In the early 1970s, non-citizens were quite a small share of the population of the United States, and their income profiles were close to those of citizens. Increasingly, however, non-citizens became a larger, poorer share of the population. From 1990 on, this change placed a number of ineligibles at the bottom of the income distribution, sufficient to make a substantial impact on the redistributive preferences of the median income voter. Even if immigration occurred too late to have produced the increases in inequality and polarization, it may well be contributing to blocking efforts to redress these trends.

Our results argue against the claim of Lijphart (1997) in his American Political Science Association presidential address that low voter participation is responsible for the much greater inequality in the United States than in Europe. Lijphart's claim may make sense in terms of contemporary cross-national comparisons, but it does not hold up in the time series. Piketty and Saez (2003) present evidence that inequality fell in the United States just as much as in France and Britain from the First World War until 1970. During this period, there was considerably lower turnout in the United States than in France. Since 1970, the three nations have diverged in inequality, but turnout of eligible citizens in the United States has not fallen. Turnout in France fell but inequality has remained in

check. It is true that turnout of *residents* of the United States over 18 has fallen, but few would be prepared to extend the right to vote to non-citizens. Compulsory voting for citizens, proposed by Lijphart, might indeed lead to more redistribution, but the absence of compulsory voting cannot by itself explain the rise in inequality in the United States in the past thirty years. The explanation is likely to be more closely related to the rise in non-citizenship. The increase reflects two political outcomes. First, immigration reforms in the 1960s and 1990s permitted a large increase in legal immigration. Second, the United States did little to contain illegal immigration. The two outcomes have changed the relationship of income to voting.

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Appendix 1. Overreporting of Voting

Since the CPS-VS is based on self-reports, voter turnout rates in the CPS may be biased upwards if people overstate their voting behavior. Figures A1 and A2 show voter turnout rates from the CPS-VS over the period from 1972-1996. For comparison, we also show voter turnout rates as reported by the Federal Elections Commission (FEC). While the FEC does not currently report statistics based on the voting eligible population, we compare the FEC statistics to CPS-VS turnout rates using both the full sample and citizens only. These graphs indicate that reported voter turnout in the CPS-VS is much higher than official turnout rates calculated by the FEC.

Figure A1

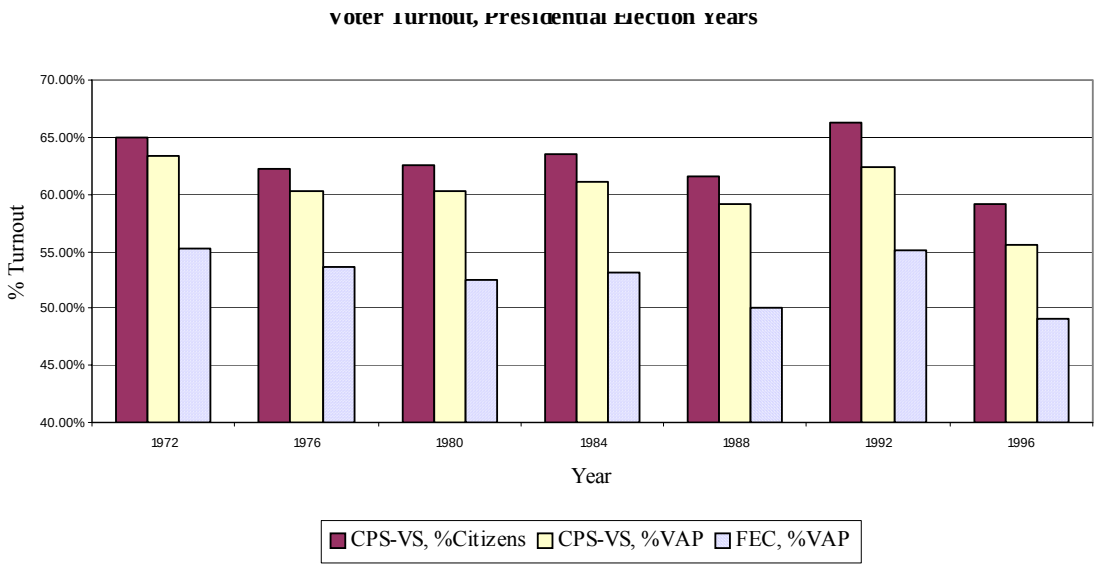
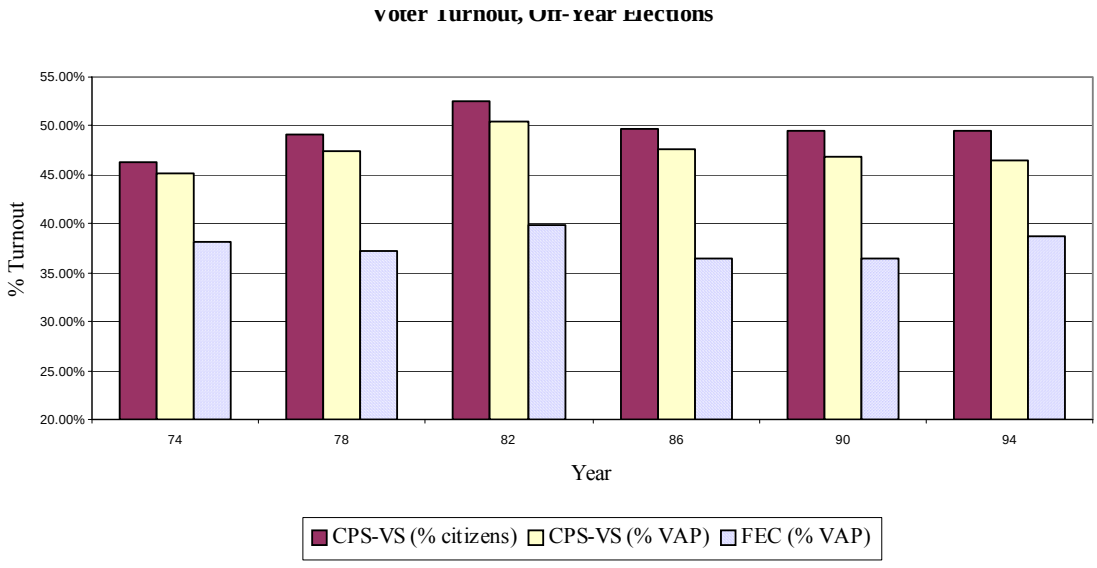


Figure A2



Appendix 2. Alternative Estimates of Median income (Nominal $)

Non-citizens

	Log-normal estimates		Linear interpolation	Logarithmic interpolation
Year	mean	median	median	median
1972	9933	7785	8082	8020
1974	11499	9000	9461	9398
1976	12448	9633	10204	10187
1978	14415	10905	11322	11281
1980	17711	12582	13074	12998
1982	19921	13822	14011	13956
1984	21787	14662	14833	14818
1986	24290	16318	16815	16776
1988	22512	16399	16819	16780
1990	24100	17765	17780	17764
1992	24078	17624	17484	17483
1994	26544	18996	18666	18625
1996	27212	20090	19150	19112
1998	31027	22494	21388	21278
2000	34829	25311	24104	24020

Non-voters

	Log-normal estimates		Linear interpolation	Logarithmic interpolation
Year	mean	median	median	median
1972	9050	6708	7052	7017
1974	11470	8639	9371	9302
1976	12055	8831	9518	9461
1978	16209	11533	12354	12320
1980	17451	12222	12913	12843
1982	21233	15245	15838	15796
1984	22141	15506	16171	16123
1986	28356	19438	20658	20596
1988	22506	16899	17477	17475
1990	27087	19732	19459	19430
1992	24723	18124	18234	18199
1994	31381	22292	22182	22045
1996	31851	23017	22994	22859
1998	39747	28141	29138	29072
2000	38068	26796	27162	27051

Voters

Year	Log-normal estimates mean	Log-normal estimates median	Linear interpolation median	Logarithmic interpolation median
1972	12554	9653	10370	10305
1974	14690	11441	12112	12100
1976	16823	12746	13423	13340
1978	20574	15260	15983	15873
1980	23915	17518	18508	18354
1982	27284	20455	21544	21427
1984	30604	22471	23723	23615
1986	34683	25286	26689	26588
1988	31468	24125	24571	24526
1990	35457	26239	27051	26942
1992	37256	27889	28891	28811
1994	43127	31666	33189	33100
1996	47036	33827	35247	35232
1998	53274	38063	37725	37642
2000	59692	41523	39604	39580

Full Sample

Year	Log-normal estimates mean	Log-normal estimates median	Linear interpolation median	Logarithmic interpolation median
1972	11305	8502	9143	9061
1974	13040	9887	10662	10622
1976	15150	11159	11912	11904
1978	18377	13227	13941	13864
1980	21748	15398	16181	16055
1982	24485	17765	18602	18561
1984	27740	19673	20747	20678
1986	31540	22071	23320	23194
1988	28164	21099	20572	20517
1990	31132	22607	22668	22529
1992	33104	24077	24313	24245
1994	37078	26318	27009	26900
1996	40617	28710	29684	29656
1998	45592	31984	33345	33259
2000	51133	34961	35700	35661

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Endnotes

[1] Our computations are from the November Current Population Survey. The November CPS family income series includes single adult households but does not combine the incomes of unmarried individuals with the same residence.

[2] Welch (1999) finds that inequality has increased much less when one looks within the population that remains within the labor force in two periods or within age cohorts. This also reinforces the main claim of this paper—that the median voter's incentive to redistribute has not increased. Voters may take into account where they stand in the life cycle when making voting decisions.

[3] See, for example, Piketty and Saez (2003) and Rosenthal (2004).

[4] See Rosenthal (2004) for a survey of changes in these public policies.

[5] See http://www.insee.fr/fr/ffc/chifcle_fiche.asp?ref_id=NATTEF02131&tab_id=339, viewed on 12/07/04. We equate "*étrangers*" to non-citizens. Immigrants, comprising both non-citizens and naturalized ("*acquisition*") rose slightly from 9.1% to 9.6%. We should point out that France counts citizens of other EU nations as non-citizens even though there is free mobility of labor within the EU. The EU "non-citizens" would be, until the recent admission of former Soviet bloc nations, a very different skill mix than the largely unskilled Latin American, Caribbean, and Asian immigrants that have come to the United States.

[6] We thank Patrick Bolton for suggesting this decomposition.

[7] Brady 2004, p. 692) presents evidence, like ours drawn from the CPS, that there has been little change in voter turnout by income quintile over the past 30 years. Summarizing the data in terms of the ratio of turnout in the top quintile to the bottom quintile, he finds no trend in midterm elections and an increasing trend in presidential elections. Some of the trend may reflect inaccuracies engendered by how Brady formed quintiles from the categorical data. Brady does not indicate whether he excluded non-citizens in forming the quintiles.

[8] From 1972 to 1976 the CPS did not ask directly about citizenship status. However, these surveys ask individuals who are not registered "why not?", and one of the possible responses is "not a citizen." We make the assumption that all non-citizens are captured by this registration question in 72-76. It looks like this assumption might be reasonably solid, since the percentage of non-citizens grows slowly but steadily from 1972 on.

[9] In some National Election Studies, reported turnout was validated by checking if the respondent had actually validated. Palfrey and Poole (1987) compared results using reported and validated turnout in models of the effect of information on vote choice. Their results were not highly sensitive to the reported-validated distinction.

[10] CPS respondents are interviewed once a month for four months, dropped for 8 months, and then re-interviewed once a month for an additional four months. In general it is possible to link information on individuals across months. However, since March and November do not overlap in within a four month period, we cannot supplement our data with information from the March survey.

[11] We used both linear and logarithmic interpolation. The results are highly similar.

[12] In particular, the lognormal estimates of the median fall outside the boundary of the category that must (except for sampling error) contain the median as follow: non-citizens: 1976, 1992, 1996, and 2000; non-voters: 1978, 1986, and 1990; voters: 1972, 1974, 1006, and 2000; all families, 1972,1974, 1992, and 2000.

[13] Results using linear interpolation are highly similar.

[14] We believe that the linear interpolation leads to an exaggeration of the all family 80th centile for 1996, lowering all the ratios. The reason is that the 80th centile for 1996 falls in a very broad income category, $50,000 to $74,999 that is in the right-tail of the distribution. Linear interpolation probably imputes too large a value to the income at the 80th centile, leading to an overly large denominator in the ratios.

[15] Again the problem is the centile falling in the $50,000-$74,999 income category. It is also possible that the stock market bubble of the late 90s sharply increased the income of high income families.

[16] There are only two years, 1996 and 2002, where the percentage of non-citizens decreases from what it was two years earlier. The year 1996, however, was one of record naturalizations, presumably undertaken

to benefit the Clinton administration in the 1996 elections. See Department of Homeland Security (2004, 137). The 2002 exception was discussed previously in the main text.

[17] Freeman (2004, p. 709) reports a regression similar ((but with the dependent variable in log form) to ours obtaining a positive but insignificant trend and a highly significant presidential year effect. He then claims that turnout has declined by running a regression where the dependent variable is the natural logarithm of voters as a proportion of the voting age population and the independent variables are trend, presidential year, and the log of the eligible as a proportion of the voting age population. He views this as a way of dealing with measurement error in the number of eligibles. But the log of the eligible has a t-statistics less than 1.0 in magnitude. This means that adjusted R^2 does not increase from a regression without this variable. It is thus difficult to use this specification to arrive at a firm conclusion of how voters as a proportion of the eligible is changing.

[18] Replicating the analysis in figure 2 and table 2 using the lognormal estimates of the median give results that are somewhat more favorable to our argument.

[19] The self-reports of non-citizenship and ethnicity/race match up quite well with the official yearly statistics on immigrants admitted and naturalizations. See Department of Homeland Security (2004).

[20] We begin this analysis in 1974 rather than 1972 because the November CPS did not ask about Hispanic ethnicity in 1972.

[21] A private exchange with an academic demographer suggests that over-reporting is largely a matter of citizenship claims by unauthorized Mexicans resident in the United States for less than 10 years. The over-report rate is "guesstimated" to be about 20 percent.