ATTENTION ECONOMY: AN AD-TEMPT TO QUANTIFY
THE PERSUASIVE POWER OF POLITICAL ADVERTISING

INVESTIGATING THE EFFECTS OF COMMERCIALS ON DEMOCRATIC TURNOUT
IN PENNSYLVANIA DURING PRESIDENTIAL ELECTIONS

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Abstract

Over the last few election cycles, political ad budgets have skyrocketed. With the political landscape continuing to embrace higher levels of political ad spend, one must wonder: is it worth it? This paper analyzes Democratic advertising spending on the United States presidential elections of 2012 and 2016 in the battleground state of Pennsylvania. By deploying a fixed-effect model that accounts for county turnout, media market spending, and election year, this paper finds that political ad spending is arguably ineffective and does not significantly influence Democratic voter turnout.

ON MY HONOR, I HAVE NEITHER GIVEN NOR RECEIVED
UNAUTHORIZED AID ON THIS THESIS

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Gray Sizer Cullen

ACKNOWLEDGEMENTS

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Introduction

The biggest winner of the 2020 presidential election? The political advertising industry, which commanded 8.5 billion dollars in total spending according to advertising news site Ad Age (Passwaiter, 2020). And, notably, the other big winner of the 2020 election, Joe Biden, beat his counterpart in this area, too. In the month of September 2020 alone, Biden outspent Trump 157 million to 57 million on campaign ads, at a rate of nearly 3 to 1 (NPR; Todd et al, 2020). This phenomenon is not a one-off, either. According to the media company Kantar, spending is expected to reach nearly 8 billion *again*, just 2 years later — except this time not for a presidential election, but for the upcoming 2022 midterms (Passwaiter, 2021). Suffice to say, as political campaigns dedicate a larger and larger degree of their budget to marketing and advertising, a simple question remains: do more ads translate to more votes? And perhaps even more worryingly: does spending more (translation: having more money) on ads lead to more votes?

This paper's central thesis statement is that increased ad spending will lead to more votes, given the hypothesis that a massive market share of voters remain neutral every election year (one-third of Americans did not vote in 2020), and therein lies a largely untapped market. That also does not account for the fact that advertising presumably holds to potential to convert voters from one party to another. (Granted, presumably advertising also has the capacity to alienate voters, making them decide to not vote at all — or worse, switch sides — though that assumes the ads are failing at their number 1 objective); it also ignores a key (Democrat) advertising strategy: encouraging people to vote, period — regardless of whether it's for their party.

By running a fixed effect model using data from election results and media market ad spending by Democrats in Pennsylvania during the elections of 2012 and 2016, this paper finds there is no clear relationship between campaign spending and votes gained. This finding is further complicated by the fact that some media markets were positively influenced by increases in spending, while others were dramatically negatively influenced.

The methodology for this study focused on the 11 media markets that contain at least one county in the political battleground state of Pennsylvania. By looking at disparities across ad spend on a media market by media market basis, this analysis was able to determine the effects of higher and lower spending, even across seemingly arbitrary geological borders. (For example, some counties, when compared, saw differences of over 1 million in ad spending, even when comparing neighboring counties.)

Though the findings are statistically significant at the .01 level, they are not without caveats. This study only focused on two elections — 2012 and 2016 — giving readers a limited view of historical trends in the field of political advertising. Additionally, these findings only pertain to Democratic spending behaviors and results, as this paper decided to only focus on a single party. This means it does not consider the strategy of the opposing side, or other political forces, like third parties. Lastly, this analysis did not incorporate other key factors, like increases in overall turnout, meaning that better results could also be attributed to other variables.

Before delving into results, it is critical to first understand prevailing literature within the political advertising field, and how that shaped this paper's methodology and approach.

Literature Review

American historians can attest to the power of political advertising, and they'd argue themselves that you do not have to look far back to see their effect in our elections. For example, one advertisement called "White Hands," is cited by many scholars as deciding the United States Senate election of 1990 in North Carolina between Jesse Helms and Harvey Gantt (Lee, 2008). In the ad, Helms inspires racial resentment among white voters and criticizes Harvey Gantt for supporting Ted Kennedy's racial quota law. The ad angrily reads: "You needed that job, and you were the best qualified. But they had to give it to a minority because of a racial quota. Is that really fair?" This ad is commonly cited as being the difference-maker in the 1990 Senate election, as prior to its airing Helms was behind in polling, but in the month afterward, he captured a very narrow lead and won (Jamieson, 1992).

Another more recent (and arguably trivial) example of media content influencing election results is the 2004 Howard Dean scream, which some commentators even claim cost him his campaign and political future (Storkel, 2016). After losing the Iowa Caucus to his opponent John Kerry, Howard Dean tried to comfort supporters by riling them up with a scream. His microphone, unfortunately, distorted the background noise of the room he was in and made his scream sound like it was in an empty room. The scream itself also sounded out of place and bizarre, according to some. As a result, his opponents played the scream hundreds of thousands of times in the following 4 days, a media ploy that some analysts say proved costly for Dean's Democratic nominee hopes (Storkel, 2016).

Where historians see the power of political ads, statisticians and economists are less certain. A substantial amount of economic research studies the impact of political advertising on election outcomes. Yet, in a broad field like advertising, where researchers are also measuring broad outcomes, such as political outcomes, questions and debates run rampant, such as: What is the best way to measure advertising success in elections? Surveys? Voter share? Donations? What are the various modes of advertising, and which is best to assess, and how? TV? Digital? Print? While a lot of research and methods have been explored to varying degrees, the historical consensus is quite mixed, as explained below (Ashworth & Clinton, 2000):

> "Despite the resources candidates spend on advertising, a
> consensus has yet to emerge regarding its impact; some argue that
> advertising mobilizes voters (e.g. Freedman, Franz, and Goldstein
> 2004, Goldstein and Freedman 2002) while others argue that the
> impact is ambiguous or even negative (e.g., Ansolabehere, Iyengar,
> and Simon 1999, Lau et al. 1999)."

Since 2000, the view that that advertising is ineffective has only become more pervasive amongst researchers, as articulated by Jörg L Spenkuch and David Toniatti (Spenkuch & Toniatti, 2018):

> "Commercials appear to be ineffective at engaging the electorate
> (Ashworth and Clinton 2007; Krasno and Green 2008), and their
> impact on individuals' opinions is extremely short-lived (Gerber et al.
> 2011). Taken at face value, these findings contradict campaigns'

choices. Why allocate close to half of all available funds to a mode of

campaigning that promises only minimal results?"

Although these findings agree that advertising is likely less effective than

commonly thought, all the above studies used remarkably different approaches to reach

these conclusions, and fail to answer that final question: if ads are truly ineffective, why

are political ad budgets higher than ever? To understand why this might be the case, one

must get into the weeds of the various methodologies that have been utilized, and why.

Wilson Law (Law, 2021) argues that there are two axes to evaluate the success of

political marketing: persuasion — did advertising spark a switch in party loyalty — or

mobilization — did advertising ignite a disinterested voter to engage in the political

process, suggesting that political advertising should be measured via surveys. Using

monthly surveys leading up to the 2008 election, Wilson finds that advertising is most

effective on those who did not originally plan to vote for a majority candidate, but

overall, offered marginal effect.

Another well-respected study (Spenkuck & Toniatti, 2018) focuses on media

markets (Broadcast TV) rather than surveys. They found that mobilization (as described

above) was not affected, but persuasion, partially. For their methodology, they focused on

'counties pairs' (neighboring counties that were each assigned to different media markets,

that each commanded vastly different levels of ad spend). By studying these media

markets during the elections of 2004, 2008, and 2012, they found that voters were

marginally persuaded by ads, but so minimally that millions in spending may not be

warranted.

In this paper, I opted for a similar approach as Spenkuck & Toniatti, choosing to study voter totals by media market, allowing me to assess the performance of broadcast television ads (which make up most of the political advertising spend). I also chose to study voter totals by media market rather than other potential measurements of campaign success, like donations received, website traffic (a popular proxy for ad success), and surveys, since I felt that votes gained or lost is the bluntest way of measuring a campaign's success. Yet, I differed from Spenkuck & Toniatti in some key areas, such as studying the 2012 and 2016 elections, rather than the elections between 2004 and 2012. I also chose to study the battleground state of Pennsylvania in particular, including all 67 counties within it, rather than simply bordering county pairs that were assigned to different media markets, allowing me to get a picture of how ad spending performs on a statewide level, in addition to on a media market and county level.

Theory

The most major consideration when evaluating the effect of political ads is how to address the problem of differing demographics and differing levels of competitiveness in each state. Since some states are inherently more valuable to campaigning candidates given their ability to flip to either major party, many places in America command disproportionate levels of advertising spending, sometimes to the extent that even neighboring counties see a significantly different volume of ads. This is especially the case for places like Florida and Pennsylvania which have been known to decide presidential elections on a national scale.

To circumvent some of these issues, one must study ad spending by media markets rather than by the state. By doing so, one not only gets a clearer portrait of where ads are being purchased but also allows the researcher to compare neighboring geographical media markets within the same state. This then allows researchers to reveal true advertising disparities among very similar geographic groups, using a fixed-effect method.

A good example of a similar methodology tactic was used in the famous study titled "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania" (Card & Krueger, 1992). To examine the effects of a minimum wage increase, Card and Kreuger selected two counties that resembled each other in size, number of fast-food workers, and economic situation. By comparing a New Jersey County that was subjected to a minimum wage increase to a Pennsylvania county that was not, they were able to truly determine the effects of the policy.

Media markets are like states in that they each have a firm geographic border. The term refers to a region in which media consumers are grouped, and then are exposed to the same television and radio programming. Notably, media markets differ from other regional borders since they often encompass multiple states at once. For an idea of what media markets look like on a national scale, visit Figure 1 below.

This study will select media markets, and then isolate the counties within those media markets to determine how the ad spend performed on a county by county. By tallying the Democratic turnout for each county within a specific media market, we will be able to determine the performance of the Democratic party by media market. The independent variable will be advertising spending, with our dependent variable being voter share. Each observation will be on a county-by-county basis.

$$Y_{c,t} = M_{c,t} + E_c + Ads_{c,t} + \varepsilon \qquad \qquad \text{Equation 1}$$

Ads stands for the number of advertising dollars spent, with c referring to the county, and t referring to the election year. M is a media market fixed effect, E is an election year fixed effect, and ε is the error term.

Data and Descriptive Statistics

Data was collected from 3 primary sources. The first was from Echelon Insights, a research institute based in Virginia. They provided a dataset that showed Democrat votes by media market, for election years 2012 and 2016. This dataset was paired with two large datasets from Wesleyan Media Group, each with around one million observations

from the same two election years. Each observation was a single ad purchased for a presidential candidate, each with an assigned price tag, and each attributed to a specific media market. By adding the price tags of all ads purchased in a single media market (and removing all presidential ads purchased by Republicans, or other third parties), I was able to determine the total spending by Democrats within each media market, for each election year.

In the interest of mere practicality, however, I determined to only do this for media markets and counties within one state: Pennsylvania. I chose Pennsylvania for a few reasons; one is because PA has 11 media markets (depicted in Figure 2 below), and many counties that are present in Pennsylvania are actually assigned to media markets of other states, such as New York, Washington DC, and Ohio. Since NY and DC are not known for being political battleground states, this gave me a high level of spending variation, among bordering counties.

Variable	Obs	Mean	Std. dev.	Min	Max
Votes_DMA	134	683,432	928,449	33,275	5183406
Votes_County	134	44,154.6	90,143.4	531	588,806
Ad_Spend	134	4088843	5282628	0	3.25e+07

Variables not included above: Election Year, County Name, DMA Location, DMA Number

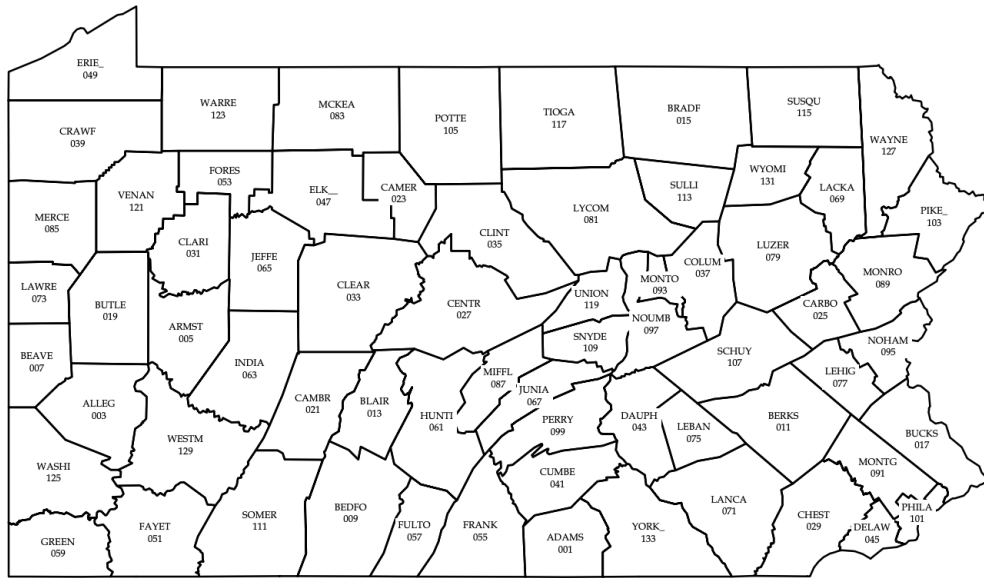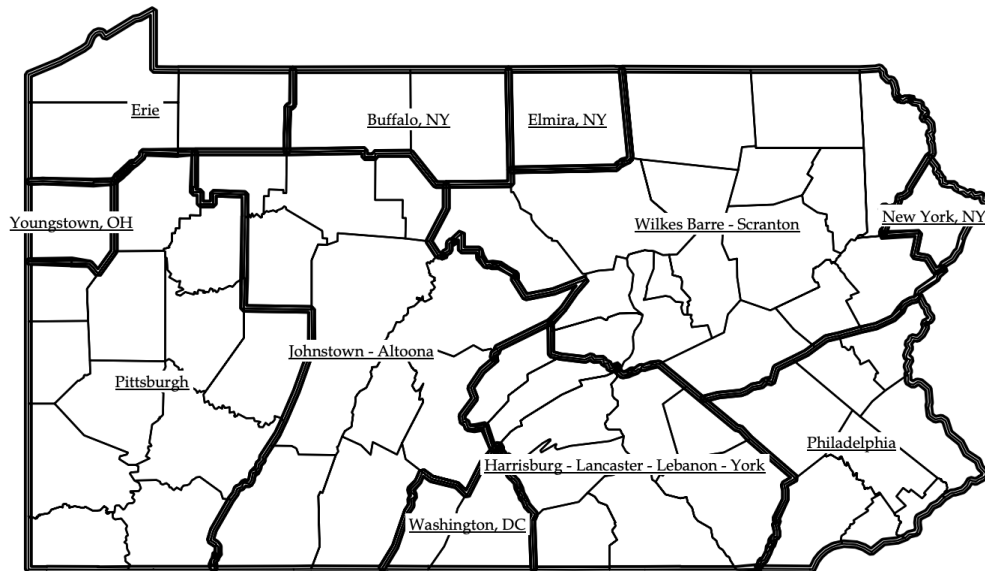Figure 1: All Counties in the State of Pennsylvania

Figure 2: All Media Markets in the State of Pennsylvania

Source (Figures 1 & 2): Polidata Regional Maps, 2002

It is important to admit that all advertising spend estimates are indeed estimates, determined by Wesleyan Media Group. For some of the data to make sense, it is also important to acknowledge the huge disparity in ad spending between Pennsylvania and other states, given that PA is a battleground state, and thus, commands a greater share of political attention and advertising spend.

Notably, there is a minimal disparity in overall spending between 2012 and 2016, with 2016 media markets commanding around $200,000 more per media market in advertising spend. Yet, despite the lack of disparity on a macro level, there is notably disparity on a media market by media market basis. For instance, as you can see in the figure below, Democrats spend only $24,810 on advertising in the NYC media market in 2012, compared to $11,200,000 in 2016.[1] While we cannot know why this is the case specifically, it likely reflects a change in political strategy.

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[1] Note, all monetary values were deflated to a fixed year and election month November 2012, using the Inflation Calculator on the U.S. Bureau of Labor Statistics: https://www.bls.gov/data/inflation_calculator.htm

Table 1: Media Market Spending by Year and DMA

Election Year	2012	2016
New York, NY	24,810	11,200,000
Philadelphia, PA	2,613,700	16,500,000
Pittsburgh, PA	3,341,340	8,407,410
Erie, PA	539,760	710,740
Harrisburg, PA	2,028,790	4,501,170
Johnstown-Altoona, PA	533,670	1,807,980
Wilkes Barre, PA	1,620,390	3,139,270
Buffalo, NY	0	0
Elmira, NY	0	0
Washington, DC	32,500,000	882,340
Youngstown, OH	4,165,910	2,661,400
Average	4,306,215	4,528,210

Source: Wesleyan Media Group, 2022

While there was only a marginal $200,000 shift in overall spending between 2012 and 2016, Democrats dramatically shifted their spending habits in specific, highly populated media markets. By contrast, in areas of less population density and presumed Democratic political status — such as Buffalo and Elmira NY — Democrats choose to spend $0 on those media markets in both the 2012 and 2016 elections. Notably, NYC and Washington both experienced huge spending pivots, with DC having 31 million fewer dollars spent in the DC media market in 2016 than in 2012, and with NYC experiencing an ad budget increase of 11 million in 2016 compared to 2012.

Yet, how did the Democrats perform overall in 2012 and 2016? Despite slightly higher spending in 2016, counties averaged 953 votes fewer than in 2012. This makes sense when considering that the Democrats (Obama) won Pennsylvania in 2012 but lost it in 2016 to Trump. In total, Democrats amassed 2,990,274 votes in the state of Pennsylvania in 2012, compared to 2,926,441 in 2016 — 63,833 fewer votes. On a state level, Democrats spent 51.6 million in 2012, and 54.3 million in 2016. They achieved fewer votes despite almost 3 million more in spending.

Results

After running the final regression, we find that if all variables were 0 — including ad spend — the expected Democratic voter turnout in a county would be 14,772.66 (or 14,773, to round up, since the constant was equal to 14772.66). When considering both elections, we also find that for every $10,000 increase in ad spending, Democrats should expect only a measly gain of only 1.8 votes on average across Pennsylvania counties. Both statements are true at the 99% significance level, with p-values of 0.000. Additionally, advertising in 2016 initially seems to have been less effective (and arguably even detrimental!) than it was in 2012, since, for every additional $1 of advertising investment in 2016, nearly 1,458 votes were lost (a coefficient of -1458.58). This factoid is also statistically significant, though slightly less so, with a p-value of 0.031. However, given that the Democrats got fewer overall votes in 2016 in Pennsylvania than they did in 2012, this makes sense, and cannot necessarily be simply attributed to failures of advertising.

When weeding through the details and observing results on a media market by media market basis, however, an even more complicated narrative unfolds. At first, it appears the counties that performed the best in increased Democratic voter turnout were the counties that experienced the largest increases in ad spending between the 2012 and 2016 elections. For example, Chester County reported a 14% increase in Democratic votes between the 2012 and 2016 elections, and during that time, saw a 6x increase in ad spending in its associated media market (Philadelphia). In fact, 6 of the 8 counties within the Philadelphia media market experienced increases in Democrat votes between 2012 and 2016. However, this pleasant narrative is almost completely undermined by the

Johnstown-Altoona media market, in which Democrats increased ad spending by 3x between 2012 and 2016. Except, unlike the Philadelphia media market, it was the counties within the Johnstown-Altoona that experienced the sharpest declines in Democratic votes between 2012 and 2016; with 10 of the 11 counties reporting steep drop-offs in votes, and the average Johnstown-Altoona county experiencing Democratic vote declines of 21%.

Conclusion

Ultimately, this paper finds that political advertising may not be worth the billions it commands, given its inability to demonstrate a clear return-on-investment in the 2012 and 2016 elections. With that said, given both the scale of national elections and the limited capabilities of an undergraduate thesis, here are some suggestions to consider these findings with a grain of salt.

One, this analysis only looked at two elections given the limited data out there on ad spending. I had originally hoped to incorporate the data on the 2020 presidential election as well, but due to some legal regulations according to Wesleyan University, that dataset is not allowed to be fully published until after the 2022 midterm results are finalized. With incomplete data available, I decided not to incorporate it into my final dataset.

Secondly, this paper only examined one state, out of a possible 50 states total. As the Washington DC Media Market slightly hinted, perhaps there are certain geological sections in the country where citizens are slightly more responsive to political ads, whereas Pennsylvanians are not. Crucially, too, is to consider that this paper only examined Democrat spending in Pennsylvania and results, without also considering their primary competitors: Republicans. Unfortunately, presidential elections can be viewed as a zero-sum game, as each candidate can only vote once. Perhaps the Democratic ads are more effective than we analyzed, but so is Republican advertising, negating its effect. Without also incorporating some of the Republican data, we can only theorize this may be this case.

One final consideration, too, is that not all ads are created equal. As mentioned earlier, throughout American history, there have been specific ads that arguably have shaped elections (such as the White Hands ad mentioned earlier). Perhaps this is a matter of quantity of ads not impacting the electorate more than quality of ads. Without also analyzing specific ad campaigns within the overall presidential campaign, it's impossible to truly deduce whether some messages were more effective than others.

While the words and images of the 2012 and 2016 presidential ad campaigns may not have provided positive outcomes, hopefully, the words and images of this thesis proved more convincing.

Table 2: Fixed Effect Democratic Voter Outcomes by County & Media Market

Parameter	Model 1
Ad Spend	.0001873
	(0.00)
Y2016	-1458.585
	(660)
Constant	14772.66
	(2559)
Observations	134
R-Squared	.9992

Note: Standard errors are in parentheses. Overall p-value was 0.00, but Ad Spend p-value was 0.030; Y2016 p-value was 0.031. *p<0.01.

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