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Surprise me if you can: Influence of Newspaper Endorsements in US Presidential Elections

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ABSTRACT

Using the daily trade of utures from the prediction markets site Intrade, we pin down the effect of printed newspapers endorsements (announcement of an explicit support for a political candidate) on the candidates' likelihood of winning. It is established that unexpected endorsements have a large impact on voters' behavior. However, we show that this effect is only true when the endorsement is a coherent one: if a newspaper that praises conservative (liberal) po icies endorses a candidate with liberal (conservative) ideas, the endorsement does not impact the candidate's probability of winning, as it is egarded as incoherent. Our measure for coherence comes from Gentzkow and Shapiro (2005), but we also use Ansolabehere and Snyder (2004)'s \propensity to endorse Democrats" to show that a surprise endorsement has a large and potentially tipping effect in a tied contest.

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1 Introduction

To what extent printed newspaper endorsements affect the electoral outcomes is still an issue of debate in American politics. Although in every electoral cycle most newspapers publicly endorse candidates, pinning down their effect is often problematic. The main reason is the difficulty in separating the unobserved factors that may be correlated with both the endorsement and the probability of winning from the causal effect of endorsements. The perceived quality of the candidates often changes between elections and even within a single election, which makes it crucial to address this concern (see Druckman and Parkin (2008)).

Using the daily trade of futures from the prediction markets site Intrade, we are able to focus on the effect of endorsements *within elections* and, therefore, we can identify their effect on the expected probability of winning. Specifically, newspapers' endorsements are exogenous to the trading prices: although newspapers' editorial boards might have incentives to endorse the winning candidate, they are unlikely to decide their endorsements based on the daily price of futures. Moreover, endorsements are decided several weeks before their announcement (Meltzer (2007)). If the probability of winning and endorsements were jointly determined by candidates' types, any public information on the candidates or the campaign that was used to decide the endorsement would be already reflected in the closing price of the previous day, assuming these markets are efficient (for which Leigh and Wolfers (2006) show some convincing evidence). Hence, endorsements are independent from the prediction market return of the day that the they are announced.

Our empirical strategy allows us to estimate the causal relationship between endorsements and the probability of winning of a candidate but, beyond treating it as vertical differentiation between candidates, it abstains from the mechanism behind that effect; that is, independently of whether these endorsements are informative signals of a candidate's type, or whether they are extra publicity for a candidate, etc.[1]

[1]There are two mechanisms highlighted which are mostly related to the information content of the

Traditionally, most newspapers make their endorsements explicitly once per electoral cycle in an *editorial page* where they state their reasons for supporting one candidate or the other. This page is clearly separated from the news content of the newspaper and it is usually not signed, as it is decided by the *editorial board*. The direction of this decision could be taken either to match the readers' preferences, or on the contrary, to influence them to support the newspapers' candidate. Thus, it is possible to split the literature into demand and supply-driven endorsements. In the latter, the publisher, the owner or the journalists (Baron (2006)) in the editorial board decide the endorsements according to their own preferences. In the former, endorsements "validate" the readers' expectations by choosing their preferred candidate; this branch in the literature is also referred as the "profit-maximizing" view of media outlets (Gentzkow and Shapiro (2005)). Most of the time, the editorial endorsement is presented along with some accomplishments of the candidate, and the reasons that make him/her the most suitable individual for office.[2] Although it is not mandatory to endorse a candidate, in the 2008 US elections 90 out the top 100 newspapers have endorsed a presidential candidate (76 in 2012)(see Table 1).

Although endorsements usually echo the political stance of the corresponding newspapers, and are therefore mostly expected, they may come as (i) a surprise, when a newspaper traditionally endorsing one Party goes for the other Party; likewise, they may appear to be (2) incoherent, when at odds with the discourse (political language) presented in the newspaper. Ansolabehere and Snyder (2004)'s measure of "propensity to endorse democrat candidates" will be used to define a surprise endorsement, while we will resort to Gentzkow and Shapiro (2005)'s "media slant" to classify an endorsement as incoherent. The two measures are correlated but not the same.

We show that Republican endorsements have the largest effect when they come from newspapers biased toward the Republican Party while, instead, Democrat endorsements have the largest effect when they come from relatively neutral newspapers. Non-credible

news: the one coming from the finance literature claims that the type and the tone of the news matter (Boudoukh et al. (2012)), while the political science argument claims that the endorsements might not only be dichotomic but also that could also be informative for some voters.

[2]For a detailed account of the wide range of mechanisms to endorse candidates, see Meltzer (2007).

or incoherent endorsements, those whose content identifies with one party but endorse another one, have no effect. On the contrary, we show that newspapers that deviate from their historical endorsements tradition (using Ansolabehere and Snyder (2004)'s measure of propensity to endorse democrat candidates) do have an effect on both parties' probabilities of winning. This differentiation between coherent and surprise endorsements contributes to further clarify the effect of the informational role of "unexpected" endorsements, abundant in the literature (Chan and Suen (2008); Chiang and Knight (2011)). For instance, we predict a very large effect from the Chicago Tribune endorsement in 2008: although historically inclined toward the Republican Party (that is, with a low propensity to endorse Democrats), the endorsement of Obama in 2008 and 2012 is coherent with respect to the content of the newspaper (its measure of media slant places it amongst the Democrat newspapers).

Some recent papers have looked at this issue from the supply side. For instance, Garthwaite and Moore (2012) studies the impact of Oprah Winfrey's endorsements to Obama in 2008, while Chiang and Knight (2011) estimates a model in which voters derive information cues from endorsements, after self-sorting into media outlets and filtering out ideologically biased information. On the demand-side, de Leon (2010) looks at local elections, and shows that the media market structure greatly affects the likelihood of endorsing a candidate: in particular, she shows that when the risk of losing readers is larger, the newspapers avoid endorsements. Our results are consistent with these papers regarding the sign and the magnitude of the effect, however our findings show stronger effects for the coherent and surprise endorsements.

Before moving forward, notice that we use the terms Republican and *GOP* (a commonly used acronym for the party's nickname: "Grand Old Party") interchangeably. In the remaining of the paper we discuss our empirical strategy before displaying the main results. We then provide a few robustness checks, compare our results to the rest of the literature, and finally, conclude.

2 Estimation Strategy

In order to identify and understand the effect of endorsements on the probability of winning, we derive the baseline model for our estimation from a standard model of voting with vertical differentiation (see for instance Groseclose (2001)). From individual behavior, we derive the expected share of the Democratic Party for each of the 100 days (t) before the campaign, $S_{d,t}$, and the probability that the Democratic Party wins at time t, i.e. $\Pr_{d,t} \equiv \Pr_t(S_{dem,t} > S_{gop,t})$. Then, we estimate our model using Intrade data as the probability of winning.

2.1 The baseline model

There are two Parties, the Democratic and the Republican Party, indexed by $p \in \{dem, gop\}$. Let $x_p \in R$ be their political platform (observed by everybody), and $x_i \in R$ the voters' ideological position in the same policy space. The interim utility of the voter i who would vote for the Democratic Party ($p = dem$) at time t, can be written as

$$U_{i,dem,t} = -d_t(x_i, x_{dem}) + \tilde{q}_{dem,t}(\eta_p) + c_t, \tag{1}$$

and the utility of a voter who votes for the Republican Party $p = gop$ can be written as

$$U_{i,gop,t} = -d_t(x_i, x_{gop}) + \tilde{q}_{gop,t}(\eta_p) - c_t, \tag{2}$$

where $d_t(x_i, x_p)$ is a distance function between the voter's ideology x_i, unobserved by the econometrician, and the Party's platform x_p. Finally, $\tilde{q}_{p,t}$ is a component that captures the candidates' quality (or valence[3]). Hence, the voters' preferences over a candidate are determined by the candidate differentiation, both horizontal (captured by the distance function) and vertical. This term captures the beliefs of a voter i over the

[3]Valence is a term that comes from the political science literature (Stokes (1963)) and refers to carachteristics that are not only ortoghonal to ideology, but also equally valued by all voters. In economics, this would be similar to vertical differentiation.

quality of the candidate of Party p at time t. The voters' expectations over $\tilde{q}_{p,t}$ is given by

$$E(\tilde{q}_{p,t}(\eta_p) \mid I_{p,t}) = I_{p,t-1} + Endors_{p,t} + \eta_p,$$

where $Endors_{pt}$ is the number of endorsements of party p at time t, η_p is an idiosyncratic shock over the quality of the candidate that is not observed by the econometrician, and I_{t-1} is a measure of the information available at $t-1$, which we will approximate by Party p's probability of winning at $t-1$: $\Pr_{p,t-1}$.

In sum, in the equations 1 and 2 above, there are three terms, which although known by the voters, they are unobserved by the econometricians: the voters' ideology x_i, the way voters are influenced by candidates' characteristics η_p (which, for convenience, we assume it to be iid with a type 1 extreme value distribution), and the way voters process the daily information received in the news, c_t.

Let the voters' ideological payoff $-d_t(x_i, x_p)$, unknown to the econometrician, be modeled as a type 1 extreme value random variable: $x_{i,p,t}$, and let $\bar{U}_{p,t}$ be the average utility derived from voting for party p at time t:

$$\bar{U}_{p,t} = I_{p,t-1} + Endors_{p,t} + \eta_p + c_t.$$

Let a voter i vote for candidate p if $U_{i,p,t} > U_{i,p',t}$, then we can obtain a closed form solution for the expected share of the Democratic Party $S_{dem,t}$:

$$\Pr(U_{i,dem,t} > U_{i,gop,t}) \equiv S_{dem,t}.$$

Thus, the probability that the Democratic Party wins is the probability of its share being larger than the Republican share (see Banks and Duggan (2005)):

$$\Pr(D \text{ wins}, t) \equiv Pr_{d,t} \equiv \Pr(S_{dem,t} > S_{gop,t}) = \Pr(\bar{U}_{dem,t} > \bar{U}_{gop,t}),$$

which also has a closed form solution (due to the assumption on η_p to be also distributed

as a type 1 extreme values random variable).

Therefore,

$$Pr_{d,t} = \frac{e^{\bar{U}_{dem,t}}}{e^{U_{dem,t}} + e^{\bar{U}_{gop,t}}}$$

We arrive to the baseline model for our main estimations:

$$\ln\left(\frac{\Pr_{dem,t}}{\Pr_{gop,t}}\right) = \beta_{dem} Endors_{dem,t} - \beta_{gop} Endors_{gop,t} + \alpha(Pr_{dem,t-1} - Pr_{gop,t-1}) + 2c_t \quad (3)$$

The above specification is flexible to including not only the number of Democrat and Republican endorsements but also some relevant newspaper characteristics such as circulation and ideological bias. [4]

2.2 Data and discussion of the main variables

We retrieve information on the endorsements of the top-100-circulation newspapers for the US Presidential elections from "The American Presidency Project". The pricing of future contracts during the last 100 days before 2008 and 2012 election day comes from the prediction markets website "Intrade".

Since all the endorsements in our dataset occurred in the 100 days before the election day, we focus on that period of time, for both elections. Besides, the volume of trade of future contracts is almost zero until the end of August, when the Demoratic and Republican Conventions traditionally take place (see Figure 1). In our dataset, one observation is one day, and our main dependent variable is the log of the odds ratio $\Pr_{dem,t} / \Pr_{gop,t}$, which captures the perceived relative probability of Obama winning. A future contract has a price $P_t \in [0, 10]$ at time t and pays 10 if the event occurs. Thus, if the price is 5, Obama's probability of being (re-)elected can be seen as being 1/2, and

[4] Alternatively, we also estimate a linear version of the equation above that allows us to interpret our coefficients directly as growth in the probabilities of winning, but we do not report it here as the results are similar in both significance and magnitude. That model is the following:

$$\frac{\Pr_{dem,t} - \Pr_{dem,t-1}}{\Pr_{dem,t-1}} = \beta_{dem} Endors_{dem,t} - \beta_{gop} Endors_{gop,t} + \quad _t \quad (4)$$

the corresponding odds ratio as being 1.

Prediction Markets. We use data from a prediction market Intrade to measure each candidate's probability of winning over the 100 days preceding the election Day. Intrade does not directly provide us with the probability of winning of each candidate. Instead, it offers winner-take-all contracts linked with the victory of the two candidates. The price per share of these contracts lies between 0 and $10, and a transaction is made when bid and ask orders meet, at a price that reflects the average probability of each candidate's victory as estimated by market participants (e.g. a price of $5.25 means a 52.5% probability of winning for Obama). These binary options pay $10 if the chosen candidate wins, 0 else. Hence, an investor buying a "Obama to be (re-)elected" future at $7 will earn a net payoff of $3, when Obama is elected.

Using daily data allows us to treat each of the campaign days **as if** it was a different election, with different endorsements but keeping the candidates "constant". The use of prediction markets data as winning probabilities is not new in the political economics literature: Mattozzi (2008) exploits it to show the existence of stocks' portfolios that could be used as hedging in political markets, and Malhotra and Snowberg (2009) shows the effect of the US 2008 primary elections and caucuses on the probability of winning of candidates, measured with the price of the futures from Intrade. Moreover, prediction markets data has been theoretically motivated in (Mattozzi (2010) , Musto and Yilmaz (2003), and partly Manski (2006)) while its empirical validity was ascertained in Forsythe et al. (1992); Rothschild (2010); Wolfers and Zitzewitz (2004); Saxon (2010); Chen et al. (2008), as discussed in the following section.

Forsythe et al. (1992), in a paper that uses prediction markets data, assure the external validity of their results through a survey of the participants to the prediction market. Although they have found judgement biases in the trading behavior of the participants in the market, the authors show that this bias is driven by the average traders, while the "marginal traders" (those who determine the prices in their dataset) do not demonstrate

the same behavior. In our case, that would mean that even though there were traders buying/selling contracts because they think that endorsements affect the probability of winning, if this was not true, the marginal traders would find arbitrage possibilities and close the gap produced by those average traders.[5]

Figure 2 plots the price of those contracts linked to the victory of Obama over the 100 days preceding the 2008 and 2012 elections. Although Obama won the two elections, his victory seems to have been much more predictable in 2008 than in 2012. Both series start around 60, but 2008 prices are characterized by a regular increasing trend, while in 2012 they go up and down, and end at a value of 68.2 (against 91.3 in 2008) on the day before Election Day. Few events during the electoral campaign are supposed to impact the candidates' probability of winning like the official Presidential debates (for instance, see Holbrook (1996)). During both campaigns, the two candidates agreed to face each other three times, while their potential vice-presidents would debate once. Figure 2 shows that the price of the contract linked to Obama's victory varies consistently with the perceived performance of the two candidates during these debates: the largest variations in Obama's stock occured in the 2008 and 2012 campaigns on the day following a Presidential debate: +9.8 after the second debate in 2008, which Obama "won" according to 54% of those surveyed by a CNN poll (only 30% felt McCain had won); -9.6 points after the first presidential debate in 2012, which he "lost" unambiguously according to CNN polls (67% said Romney had won, against 25% for Obama, and this debate was also the most widely viewed Presidential debate in 32 years). As long as these debates are uncorrelated with the endorsements, these (possibly omitted) variables should not bias our estimators. That is, as the endorsements are likely to be decided at least days before they are published, the realization of an event at time t (say, a debate) should not have influenced the endorsement decision take at date $t - n$. Nonetheless, in order to show that our results are robust, we include dummies for each Presidential and Vice-presidential debate, and although some come significant, they do not alter our predictions substantially.

[5]This paper also shows there is no serial correlation in the data, as we do in Figure 4

In sum, Intrade stock prices, linked to the victory of each candidate, are an accurate reflection of their underlying probability of victory.

"Unexpected" endorsements. As previously mentioned, a newspaper can endorse a candidate it was not expected to. We create two variables to deal with these unexpected endorsements: one that will be used to capture incoherent endorsements (i.e. "unexpected" ideologically), and another one for surprise endorsements ("unexpected" according to the newspaper's history of endorsements). An endorsement is defined as *incoherent* when the ideology of the journal, as measured by Gentzkow and Shapiro (2005)'s media slant, and that of the candidate, differ. This media slant measure results from comparing the language used by the newspapers to the one used by congressmen from each party (looking through the congressional records). A higher value is associated with a more Republican content, in terms of the language that is used.[6] We then use this information, combined with our endorsement data, to classify an endorsement as (in)coherent.

A surprise endorsement, on the other hand, occurs when issued by a journal whose tradition was to endorse the other Party. By replicating Ansolabehere and Snyder (2004), we obtain a measure of the historical propensity to endorse the Democrat candidate, based on data on newspapers endorsements back to 1940.[7] An endorsement from a newspaper deviating from his historical trend is then considered as a surprise.

For both our media slant and propensity-to-endorse-Democrats variables, we normalize the corresponding measure, so that they now lie between 0 and 1. We then divide the newspapers into four quartiles of slant and propensity. Table 3 shows the endorsement behavior of all newspapers, depending on the slant and propensity quartiles they belong to. The higher their slant, the more likely they are to endorse the Republican candi-

[6]This index of media slant follows on the tradition of "content analysis" and has been widely used in the literature, for instance in Gentzkow and Shapiro (2010) from the same authors.

[7]In short, the measure is the newspaper's fixed effect from a regression of endorsements (Democrat, Republican, or no endorsement) on the electoral race, period, incumbency and other variables. We replicate their analysis in order to obtain the coefficients corresponding to our set of newspapers (they only display the FE corresponding to a dozen of newspapers

date. More precisely, the first three quartiles are the most aligned with the Democrat Party, while the fourth one is Republican. Hence any Republican endorsement coming from a newspaper belonging to the first three quartiles will be classified as incoherent. The same goes for a Democrat endorsement issued by a newspaper in the 4th quartile of slant. Regarding our propensity measure, the endorsement pattern is straightforward: across quartiles, the higher the propensity to endorse Democrats, the more Democrat endorsements we observe (see also Figure 5).

Last, if our measures were used to predict a newspaper endorsement, both of them would yield similar forecasts. However, although deviations from these "predictions" result in "unexpected" endorsements, we have to discriminate between cases (ideological vs historical). Our main point is that unexpected endorsements do not necessarily have a positive impact on the endorsed candidate: a Republican newspaper in content (according to its media slant) that endorses a Democrat candidate may be interpreted as a contradictory endorsement. Yet, it may still be the case that "unexpected" endorsements that break from a newspaper historical trend result in a positive surprise to voters, as stated in the literature.

3 Results

In this section we present and discuss the estimation of our baseline specification (equation (3)) to quantify the effect of the endorsements. In particular, we do not only explore whether the endorsements matter but also which endorsements matter the most. In all our specifications, if the coefficient on the Democrat endorsement is positive, it means that a day with at least one Democrat endorsement increases the probability of Obama winning the election. The impact of endorsements on the Democrat's probability of winning is given by the following equation

$$P_{dem} = \frac{e^{\beta} OR}{e^{\beta} OR + 1},$$

where β is the coefficient of interest and OR is the "odds ratio" (P_{dem}/P_{gop}). Similarly, a negative coefficient accompanying the Republican (or GOP) endorsements implies a positive effect on the Republican candidates' probability of winning (McCain in 2008 and Romney in 2012).

Do endorsements matter? A first look at Figure 3, which plots the endorsements and the odds ratio of Obama winning, does not shed much light on the relationship between those two. Hence, beyond the simple bivariate correlations, we proceed to estimating our baseline model in equation 3.

As shown in Table 5, the impact of the endorsements dummy (i.e. takes value 1 for days where there was at least one endorsement) is as expected. In the first two columns of the table we show that, on average, endorsements to a Republican candidate have a moderate effect on the candidates' probability of winning: in a tied election a GOP endorsement would reduce Obama's probability from 50% to 47%. More interesting, in columns (5) to (7), the Democrat endorsements only have an effect when they come from high circulation newspapers. Moreover, this effect is largest when the newspapers' circulation is above 400 thousand newspapers: a day with a democrat endorsement from a large newspaper increases Obama's probability from 50% to 58%. In a less contested election (suppose he had a 60% of winning) the effect would be smaller (from 60% to 63%). Also notice that since the Republican endorsements come from lower circulation newspapers[8], we observe that GOP endorsements only have an effect when they come from those "smaller" newspapers.

If both things were to happen (a GOP endorsement and a high circulation DEM endorsement), in a tied election the balance would tip to the Democrat side, increasing the probability of winning to 53% approximately.

[8] Table 4 shows that approximately 75% of GOP endorsements come from newspapers with circulation below 200 thousands.

Which endorsements matter the most? As argued above, we measure the newspapers endorsements' coherence with Gentzkow and Shapiro (2005)'s praised media slant. We normalized their media slant between 0 and 1, and we split the sample in four quartiles. The first quartile contains the set of newspapers which are the most aligned ones with the Democrat party, but as shown in Figure 5 and Table 3, the first three quartiles are largely dominated by democrat-leaning newspapers. That is, this measure is consistent with the documented media bias toward the Democrat party (de Leon (2010) and Ansolabehere and Snyder (2004)).

The main result coming from Tables 6 to 8 is that incoherent endorsements have no effect while the coherent endorsements and surprise endorsements have a large, positive, significant and robust effect. Besides, except for the mentioned asymmetric effect of circulation, the magnitude of the Democrat and Republican endorsements on the probability of winning is very similar.

In Tables 6 we use a coarse classification of the newspapers according to their endorsements' coherence: a coherent Democrat endorsement comes from the first three quartiles of the media slant, while a Republican coherent endorsement comes from newspapers in the fourth quartile. In order to show that our conclusions do not depend on the splitting of the sample, we also show the results by quartile in Table 7. Noticeably, only the coherent endorsements increase the probability of winning of the endorsed candidate, and this is more particularly the case for Republican endorsements (large and significant impact): the presence of one such coherent Republican endorsement decreases Obama's probability of winning from 50% to 41% approximately. In a less tied election scenario, the same effect could reduce the Democrat's probability from 60% to 47%. Moreover, the incoherent endorsements are never significant, neither using a dummy nor the number of endorsements in a day (what we refer to as the *Count* variable).

The specification of Table 7 shows that the Democrat endorsements from relatively neutral newspapers (in the third quartile of media slant, i.e. the most conservatives of the Democrat newspapers) have a positive impact on Obama's winning odds. On

the contrary, coherent Republican endorsements diminish them. In sum, in a day with a coherent Republican endorsement and a neutral Democrat endorsement, the overall effect is null due to similar magnitude of the coefficients (their sum is not significantly different to zero).

The evidence shown above complements the documented effect of surprise endorsements. Remember that due to the construction of Gentzkow and Shapiro (2005)'s media slant , an incoherent endorsement comes from a newspaper that esteems one type of policy, but does not support the candidate that proposes those policies. Indeed, such an endorsement is an unexpected one, but nonetheless it may be more confusing than informative for their readers. Applying this reasoning, while the Republicans only value the coherent endorsements, the Democrats see a larger effect when they come from relatively more neutral newspapers (not necessarily expected, but relatively consistent).

Moreover, although the media slant is correlated with Ansolabehere and Snyder (2004)'s propensity to endorse the Democrat candidate, the results from the previous tables are reversed when we show the effect of surprise endorsements, as expected. This is shown in Table 8, where the newspapers with a high propensity to endorse democrats (quartiles 3 and 4) have a large effect when they endorse the republican candidate (that is, when they are surprising), and the other way around.[9]

4 Conclusion

We add to the increasing literature on media and politics by pinning down the effect of printed newspapers endorsements on the candidates' likelihood of winning. Using survey data, Chiang and Knight (2011) show that endorsements make readers more likely to vote for the endorsed candidate, and that this effect is even larger when endorsements are unexpected. Our results are consistent with the latter findings, but we go further by establishing that all unexpected endorsements do not have the same effect. In particular,

[9]Notice that we cannot interact both measures of newspapers' bias due to lack of data: only for 53 newspapers we have both measures.

using Gentzkow and Shapiro (2005) and Ansolabehere and Snyder (2004)'s measures of the ideological leaning of newspapers, we show that although they are unexpected, incoherent endorsements have no effect. On the contrary, endorsements that are coherent with respect to the discourse used in the newspaper, and endorsements coming as a surprise with comparison to the newspaper's endorsement tradition, have a large and potentially tipping effect in a tied contest.

If, as argued elsewhere, endorsements are informative about the candidates' attributes, their presence might be welfare improving as they make the "better" candidate more likely to win. Nonetheless, knowing their effect on the probability of winning, a campaign manager may try to persuade newspapers to endorse his candidate. Would that strategy defeat the potential welfare-improving presence of endorsements? According to our results, in aggregate, the society is not influenced by incoherent endorsements. Hence, such a luring attempt would have an impact only if the endorsement is coherent, for which the campaign manager should not put any effort.

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5 Appendix

5.1 The underlying voting model

In summary, the uncertainty has a horizontal component, and a vertical component. If we assume that d is separable, we can write U_{ipt} as

$$\begin{aligned} U_{i,p,t} &= -d(\tilde{x}_i, x_p) + q_{p,t}(\tilde{\eta}_p) \pm \tilde{\varepsilon}_t \\ &= h(x_p) + \beta_p Endors_{pt} + f(Info_{p,t-1}) + \tilde{\eta}_p + \tilde{x}_i \pm \tilde{\varepsilon}_t \\ &\equiv u_{p,t}(\tilde{\eta}_p, \tilde{\varepsilon}_t) + \tilde{x}_i \\ &\equiv V_{p,t}(\tilde{\varepsilon}_t) + \tilde{\eta}_{p,t} \pm c_{it} \end{aligned}$$

Hence, a voter i votes for candidate p if $U_{ipt} > U_{ip't}$. And so $\Pr(U_{i,dem,t} > U_{i,gop,t}) \equiv S_{dem,t}$ is the expected share for the democratic party $S_{dem,t}$, which can be written as (Nevo (2000)):

$$S_{dem,t} = \frac{e^{u_{dem,t}}}{e^{u_{dem,t}} + e^{u_{gop,t}}}$$

Thus, the probability that the democratic party wins is the probability that the democratic share is larger than the republican share (see Banks and Duggan (2005)):

$$\Pr(D\ wins, t) \equiv \Pr(S_{dem,t} > S_{gop,t}) = \Pr(u_{dem,t} > u_{gop,t})$$

Which is the same as

$$\Pr(ln(S_{dem,t}) > ln(S_{gop,t}))$$

So

$$\Pr(D\ wins, t) = \frac{e^{V_{dem,t}}}{e^{V_{dem,t}} + e^{V_{gop,t}}}$$

Thus,

$$\ln\left(\frac{\Pr_{dem,t}}{\Pr_{gop,t}}\right) = \beta_{dem}Endors_{dem,t} - \beta_{gop}Endors_{gop,t} + f(Info_{dem,t-1}) - f(Info_{gop,t-1}) + 2c_t$$

5.2 Figures

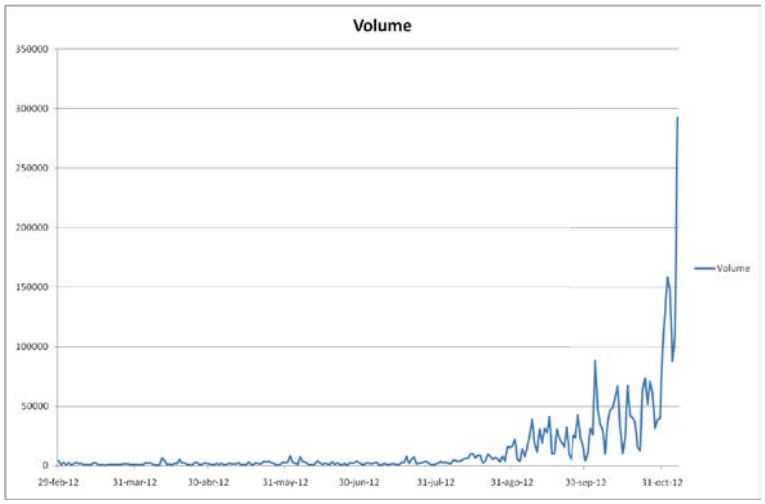

Figure 1: Volume of trade (weights) over the months prior to Election Day in 2012

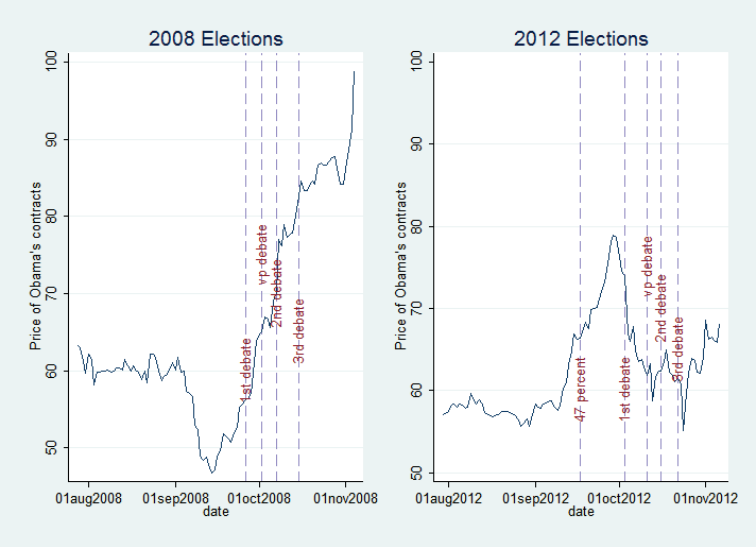

Figure 2: Daily Obama's stock prices at 2008 and 2012 Presidential elections.

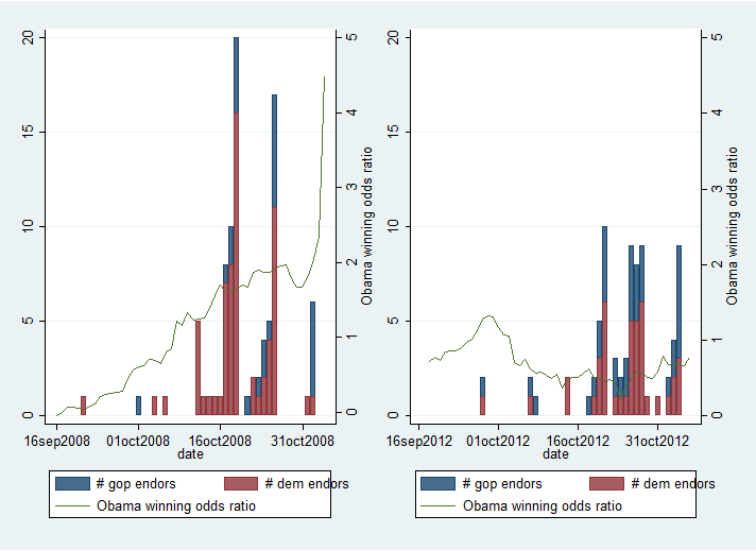

Figure 3: Number of endorsements and Obama's winning odds ratio at 2008 and 2012 Presidential elections.

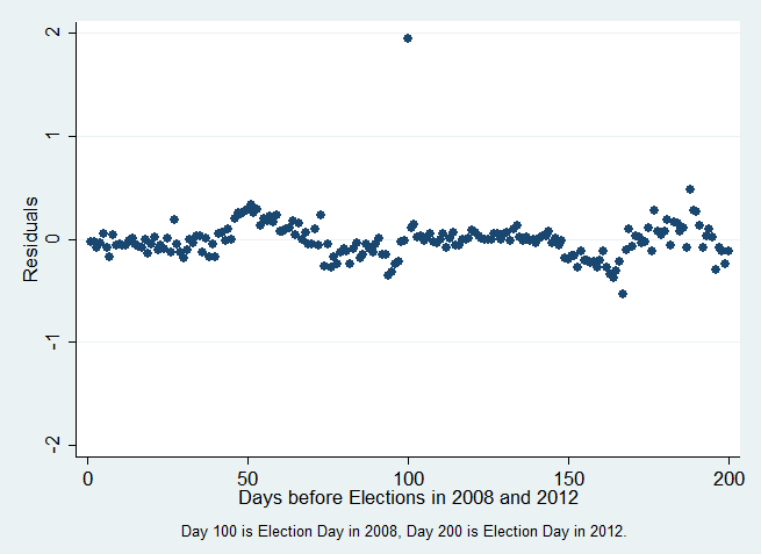

Figure 4: Residuals of the WLS regression plotted against time: regression of Obama's winning odds-ratio on dummies for DEM and GOP endorsements, with month and week-end FE, and weighted by volume (corresponding to Table 5, Column (2).

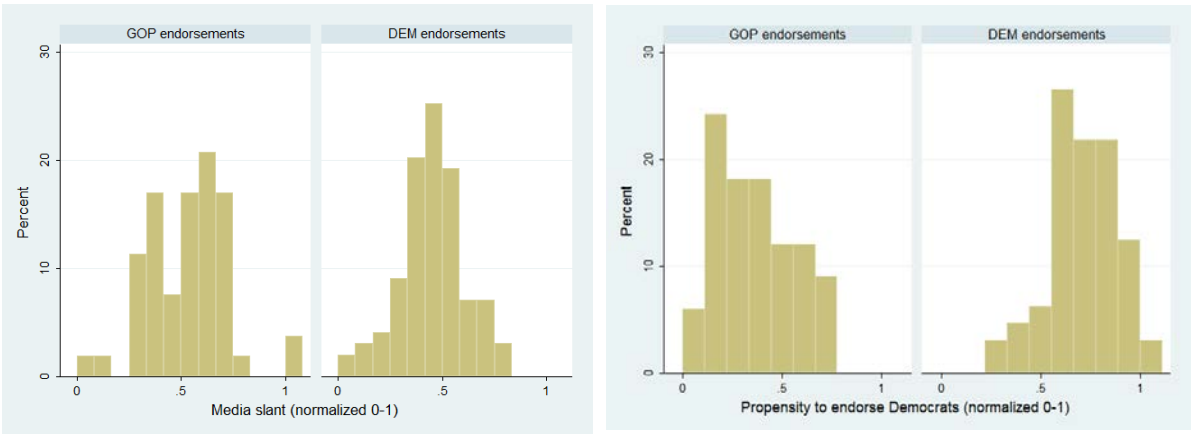

Figure 5: This graph shows the Republican and Democrat endorsements according to our normalized measures of media slant (left panel, with 1 being the most Republican) and propensity to endorse Democrats (right panel, with 1 being the most Democrat).

6 Tables

Table 1: Top 100 newspaper endorsement statistics, by Presidential candidate during the US 2008 and 2012 election cycles

	2008		2012	
	Obama	McCain	Obama	Romney
Circulation endorsement (millions)	16.099	5.194	10.015	6.476
Days with an endorsement	18	11	17	16
Total endorsements	25	65	41	35

Table 2: Number of endorsements and days of endorsements, per circulation, for each party

	dem endorsements		**gop endorsements**		**Total**	
Circulation (in thousands)	#newspapers	#days	#newspapers	#days	#newspapers	#days
>-100	97	33	51	27	148	40
>-200	50	22	16	13	66	25
>-400	12	8	5	5	17	12
>-600	6	6	1	1	7	7
>-800	2	2	0	0	2	2
Total	106	35	60	27	166	40

Table 3: Number of endorsements and days of endorsements, per slant and propensity quartiles, for each party

	dem endorsements		gop endorsements		Total	
slant quartiles	#newspapers	#days	#newspapers	#days	#newspapers	#days
Q1	29	16	10	9	39	21
Q2	28	17	10	9	38	23
Q3	29	15	9	9	38	16
Q4	13	11	24	14	37	19
Total	99	35	53	27	152	40
propensity quartiles	#newspapers	#days	#newspapers	#days	#newspapers	#days
Q1	5	5	20	14	25	17
Q2	14	11	10	5	24	13
Q3	22	16	3	3	25	17
Q4	23	15	0	0	23	15
Total	64	35	33	27	97	40

Table 4: Summary statistics of newspapers' circulation (in millions)

Newspapers	Mean	Std. Dev.	Min.	Max.	N
DEM endorsements	0.246	0.208	0.078	1.587	106
GOP endorsements	0.194	0.129	0.083	0.702	60
1st quartile slant	0.242	0.141	0.094	0.703	39
2nd quartile slant	0.325	0.31	0.083	1.587	38
3rd quartile slant	0.187	0.076	0.088	0.401	38
4th quartile slant	0.173	0.097	0.078	0.494	37
All	0.228	0.185	0.078	1.587	166

Table 5: Endorsements baseline effects (dummy).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dummy DEM	0.010	0.024	-0.061	-0.054	-0.003	0.010	0.011
	(0.07)	(0.07)	(0.10)	(0.10)	(0.08)	(0.08)	(0.08)
Dummy GOP	-0.118*	-0.109	-0.095	-0.096	-0.191**	-0.184**	-0.186*
	(0.07)	(0.07)	(0.09)	(0.09)	(0.09)	(0.09)	(0.10)
Circulation > 200 thousand DEM			0.200**	0.218**			
			(0.10)	(0.10)			
Circulation > 200 thousand GOP			-0.098	-0.064			
			(0.14)	(0.13)			
Circulation > 400 thousand DEM					0.342**	0.339***	0.337**
					(0.13)	(0.13)	(0.13)
Circulation > 400 thousand GOP					0.043	0.046	0.048
					(0.11)	(0.10)	(0.10)
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weekend FE	No	Yes	No	Yes	No	Yes	Yes
Debate FE	No	No	No	No	No	No	Yes
r2	0.76	0.76	0.77	0.77	0.77	0.78	0.78
N	200	200	200	200	200	200	200

Standard errors in parentheses
All specifications are weighted regressions
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Coherence (slant). Dummies and Count.

	(1)	(2)	(3)	(4)	(5)	(6)
Dummy						
Coherent DEM endorsement (Q1-Q3)	0.065	0.070	0.085			
	(0.06)	(0.07)	(0.07)			
Incoherent DEM endorsement (Q4)	-0.051	-0.052	-0.066			
	(0.08)	(0.09)	(0.09)			
Coherent GOP endorsement (Q4)	-0.336**	-0.344*	-0.354**			
	(0.17)	(0.18)	(0.17)			
Incoherent GOP endorsement (Q1-Q3)	0.091	0.091	0.101			
	(0.08)	(0.09)	(0.09)			
Count						
Coherent DEM endorsement (Q1-Q3)				0.024	0.025	0.017
				(0.02)	(0.02)	(0.02)
Incoherent DEM endorsement (Q4)				-0.010	-0.014	-0.035
				(0.09)	(0.09)	(0.08)
Coherent GOP endorsement (Q4)				-0.174*	-0.167*	-0.169*
				(0.09)	(0.10)	(0.09)
Incoherent GOP endorsement (Q1-Q3)				0.065	0.068	0.089
				(0.05)	(0.05)	(0.06)
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Weekend FE	No	Yes	Yes	No	Yes	Yes
Debate FE	No	Yes	Yes	No	Yes	Yes
Year FE	No	No	Yes	No	No	Yes
r2	0.78	0.78	0.80	0.77	0.78	0.80
N	200	200	200	200	200	200

Standard errors in parentheses
All specifications are weighted regressions
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Quartiles of coherence (slant). Dummy and count variables.

	(1)	(2)	(3)	(4)	(5)	(6)
Dummy						
High coherence DEM (Q1)	-0.097	-0.099	-0.095			
	(0.10)	(0.10)	(0.11)			
Medium coherence DEM (Q2)	0.042	0.041	-0.055			
	(0.10)	(0.10)	(0.13)			
Low coherence DEM (Q3)	0.188***	0.206**	0.211**			
	(0.07)	(0.08)	(0.08)			
Incoherent DEM (Q4)	-0.101	-0.103	-0.144			
	(0.09)	(0.09)	(0.10)			
High incoherence GOP (Q1)	0.129	0.127	0.229*			
	(0.09)	(0.10)	(0.13)			
Medium incoherence GOP (Q2)	0.102	0.108	0.094			
	(0.08)	(0.09)	(0.09)			
Low incoherence GOP (Q3)	0.019	0.014	0.070			
	(0.13)	(0.13)	(0.15)			
Coherent GOP (Q4)	-0.296**	-0.296*	-0.289*			
	(0.14)	(0.16)	(0.15)			
Count						
High coherence DEM (Q1)				-0.073	-0.074	-0.082
				(0.07)	(0.07)	(0.07)
Medium coherence DEM (Q2)				0.165***	0.163**	0.112*
				(0.06)	(0.07)	(0.06)
Low coherence DEM (Q3)				0.078*	0.081*	0.074
				(0.04)	(0.05)	(0.05)
Incoherent DEM (Q4)				0.047	0.042	-0.008
				(0.06)	(0.07)	(0.07)
High incoherence GOP (Q1)				0.053	0.052	0.126
				(0.07)	(0.07)	(0.08)
Medium incoherence GOP (Q2)				0.071	0.077	0.057
				(0.07)	(0.08)	(0.08)
Low incoherence GOP(Q3)				-0.122	-0.117	-0.033
				(0.10)	(0.10)	(0.13)
Coherent GOP (Q4)				-0.218**	-0.214**	-0.194**
				(0.10)	(0.11)	(0.09)
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Weekend FE	No	Yes	Yes	No	Yes	Yes
Debate FE	No	Yes	Yes	No	Yes	Yes
Year FE	No	No	Yes	No	No	Yes
r2	0.79	0.79	0.81	0.78	0.79	0.81
N	200	200	200	200	200	200

Standard errors in parentheses

All specifications are weighted regressions

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Surprise (propensity). Dummy variables.

	(1)	(2)	(3)	(4)	(5)	(6)
Very surprising DEM (Q1)	0.207	0.167	0.153			
	(0.13)	(0.14)	(0.16)			
Surprising DEM (Q2)	0.191	0.212	0.238			
	(0.14)	(0.15)	(0.16)			
Anticipated DEM (Q3)	-0.182	-0.174	-0.160			
	(0.15)	(0.16)	(0.15)			
Very Anticipated DEM (Q4)	-0.035	-0.009	-0.037			
	(0.08)	(0.08)	(0.10)			
Very Anticipated GOP (Q4)	0.110	0.110	0.109			
	(0.09)	(0.10)	(0.10)			
Anticipated GOP (Q3)	-0.175	-0.135	-0.184			
	(0.15)	(0.16)	(0.18)			
Surprising GOP (Q2)	-0.223**	-0.217*	-0.212*			
	(0.11)	(0.12)	(0.13)			
Anticipated DEM (Q3-Q4)				-0.184	-0.172	-0.175
				(0.14)	(0.14)	(0.13)
Surprise DEM (Q1-Q2)				0.233*	0.257*	0.259*
				(0.14)	(0.15)	(0.15)
Anticipated GOP (Q1-Q2)				0.041	0.062	0.051
				(0.09)	(0.09)	(0.09)
Surprise GOP (Q3-Q4)				-0.213	-0.211	-0.193
				(0.14)	(0.16)	(0.16)
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Weekend FE	No	Yes	Yes	No	Yes	Yes
Debate FE	No	Yes	Yes	No	Yes	Yes
Year FE	No	No	Yes	No	No	Yes
r2	0.77	0.77	0.80	0.77	0.77	0.79
N	200	200	200	200	200	200

Standard errors in parentheses

All specifications are weighted regressions

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$