Iowa Electronic Markets: Forecasting the 2024 US Presidential Election

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ABSTRACT We present Iowa Electronic Markets (IEM) forecasts for the popular vote shares in the 2024 US presidential election. We discuss the differences between IEM forecasts and polls, the influence of the first presidential debate, the changes resulting from Biden dropping out of the race, and the degree of uncertainty implied by IEM forecasts. On September 29, the IEM forecast a 9-percentage-point Democratic popular vote margin according to a thinly traded vote-share market and an 85.7% chance the Democrat will receive more votes than the Republican in a thickly traded winner-takes-all market. Using a distribution derived from both markets, the forecasts are for a 6- to 7-percentage-point Democratic margin and 87.0% chance of winning. However, significant uncertainty remains.

Since 1988, the Iowa Electronic Markets (IEM) have run real-money, internet-based futures markets where contract prices reveal information about future political outcomes. The IEM has a record of accurately predicting presidential, House, and Senate elections. Using the IEM, we forecast the 2024 US presidential popular vote.

Using a thinly traded market designed to predict the vote shares, the IEM currently forecasts a 9.0-percentage-point Democratic margin (54.5% to 45.5% on September 29, 2024). A more thickly traded market designed to predict the popular vote winner forecasts an 85.7% chance of a Democratic popular vote win. Combining the two markets to generate a forecast distribution forecasts a 6- to 7-percentage-point Democratic margin, with an 87.0% probability of a Democratic win.

For nearly a year, the IEM forecast probability that the Democrat would win the popular vote hovered between 70% and 80%. But, after the June 27 presidential debate, it fell to 59% and remained below 70% for nearly a month despite Biden dropping out of the race. National polls between Biden and Trump also shifted after the debate, giving Trump an edge in what was previously a close race. Figure 1 shows the *New York Times* national polling averages for presumptive nominees Biden and Trump before and after the debate. It shows a close race until the debate, with Trump rising afterwards.

Figure 2 shows how the switch to Harris as the "likely," then actual, nominee changed the national polling averages. Harris closed, then took the lead on August 6 in what remains a relatively close race.

We investigate two issues that may drive differences between our forecasts and polls. First, the IEM forecasts vote shares for actual nominees, not presumptive nominees. An IEM market that forecasts likelihoods of various candidates becoming the Democratic nominee shows much uncertainty postdebate, until Biden dropped out and Harris quickly received endorsements from a majority of delegates. Second, we use Berg, Geweke, and Rietz (2010) to forecast full vote-share distributions using both markets simultaneously. These distributions typically show a closer race than is indicated by either market alone, with many postdebate bimodal and/or asymmetric distributions. Furthermore, across the entire period, the forecast distributions show that the contest has never been a foregone conclusion.

THE IOWA ELECTRONIC MARKETS

The Iowa Electronic Markets (IEM) are relatively small scale, real-money futures markets that trade linear and binary options

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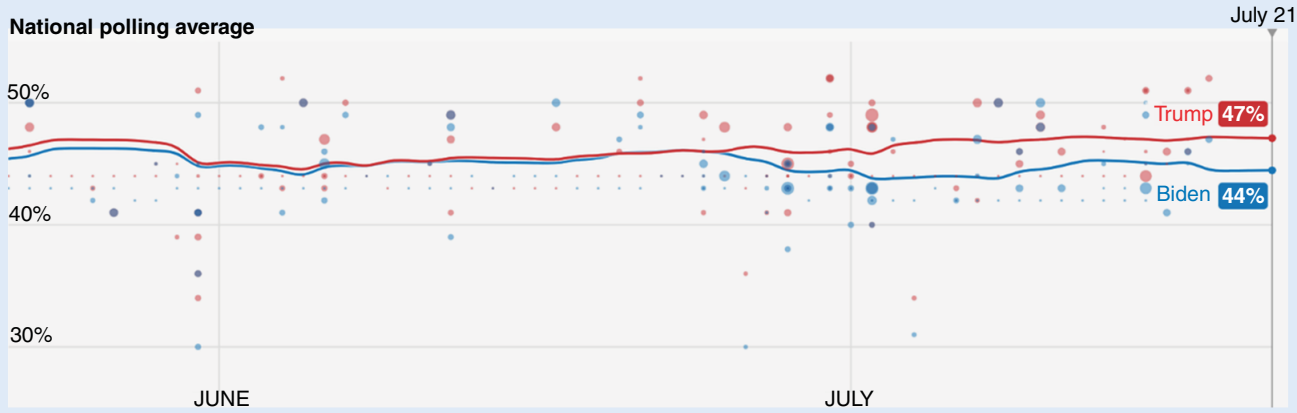
doi:10.1017/S1049096524000921

https://doi.org/10.1017/S1049096524000921 Published online by Cambridge University Press

Figure 1

New York Times National Polling Average Graphic: Biden vs. Trump



Source: https://www.nytimes.com/interactive/2024/us/elections/polls-president.html. Downloaded August 7, 2024.

contracts designed to forecast future events. The University of Iowa, Tippie College of Business operates the markets for teaching and research purposes. Traders invest their own money to trade, bearing real-money risks and reaping the real-money rewards.[1] The IEM markets closely parallel naturally occurring financial market structures. It is an order-driven market that traders access through the internet. Traders can place both limit and market orders. Price and time ordered queues hold outstanding bids and asks. The current best (highest) bid and best (lowest) ask are always publicly known.

The Iowa Electronic Markets (IEM) are relatively small scale, real-money futures markets that trade linear and binary options contracts designed to forecast future events.

The IEM runs two general types of prediction markets: Vote-Share (VS) markets and Winner-Takes-All (WTA) markets. Vote-share markets forecast the vote shares taken by listed candidates in the election. Winner-takes-all markets forecast the probability that each candidate will receive the most popular votes.

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In each VS market, a complete contract "bundle" consists of one contract associated with each candidate where the payoff will equal the share of the votes received by that candidate relative to all listed candidates. The bundle is risk free because the payoffs will always sum to \$1. Bundles can be purchased from or sold to the exchange at any time for \$1 and earn a zero return. Cash holdings are also risk-free and earn a zero return. There are no transaction fees. There is no aggregate uncertainty. As a result, all assets should yield the risk-free return of zero and be priced at their expected values.[2] Thus, $p_t^j = E\left(\frac{V_T^j}{\sum_i V_T^i}|\Phi_t\right)$, where p_t^j is the price of contract j at date t, V_T^j is the number of votes received by candidate j on election date T, the summation is over candidates indexed by i, E is the expectations operator, and Φ_t is the information available at date t. Thus, the price should be the market forecast of the vote share received by the candidate relative to all the candidates in the market. Because of asynchronous trading, the most recent prices may not add up to exactly 1. Therefore, following Berg, Nelson, and Rietz (2008), we "normalize" the most recent prices by their sum when computing forecasts. Thus, normalized prices and forecast are $\widehat{p}_t^j = \frac{p_t^j}{\sum_i p_t^i}$, where p_t^j is the closing price for contract j on date t and i indexes the contracts, making the forecast vote shares sum to one.

In each WTA market, a bundle consists of one contract associated with each candidate, with a payoff equal to 1 if that candidate wins the most popular votes among the candidates listed. The bundle is risk free and can be purchased from or sold to the exchange at any time for \$1. Expected value pricing gives $p_t^j = \left(q_t^j|\Phi_t\right)\cdot \$1 + \left[1-\left(q_t^j|\Phi_t\right)\right]\cdot \$0 = \$q_t^j|\Phi_t$, where p_t^j is the price of contract j at date t and $\$q_t^j|\Phi_t$ is the probability that the candidate will receive the most votes among listed candidates given information available at date t (Φ_t). Thus, the price should be the market forecast of the candidate winning the

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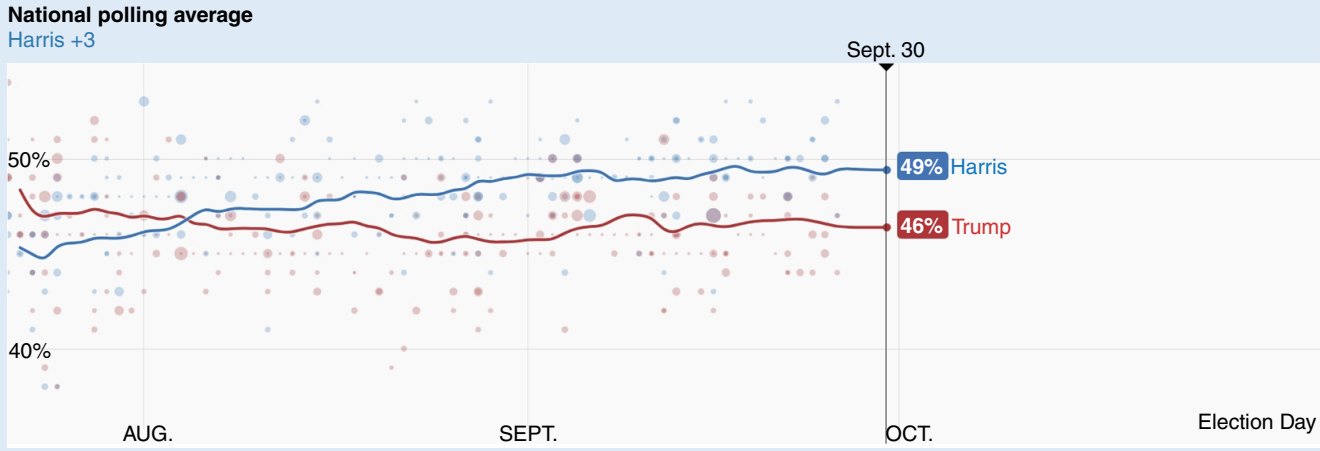
Figure 2

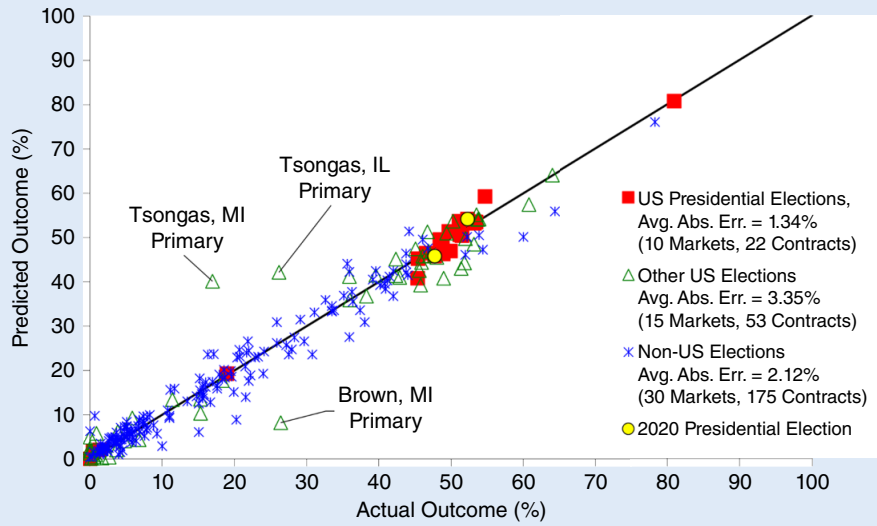
New York Times National Polling Average Graphic: Harris vs. Trump



Source: https://www.nytimes.com/interactive/2024/us/elections/polls-president.html. Downloaded September 30, 2024.

Figure 3

Accuracy of IEM Markets for US Presidential Elections, Other US Elections, and Non-US Elections



Source: Reproduced from Berg, Gruca, and Rietz (2022).

most votes. Again, we normalize, ensuring that the forecast probabilities sum to one.

One way to measure IEM accuracy is to compare forecast versus actual vote shares received by candidates. Reproduced from Berg, Gruca, and Rietz (2022), figure 3 compares election eve forecasts to actual vote shares received in IEM VS and similar markets. In presidential elections (including 2020), the absolute prediction error averages 1.34 percentage points. Berg, Nelson, and Rietz (2008) show that VS market forecasts are closer to eventual outcomes than polls 74% of the time overall and increase in relative accuracy farther in advance of the election. Using WTA markets, Berg and Rietz (2019) find that prices are relatively efficient in forecasting probabilities, except possibly for transitory mispricing for tail probabilities.

2024 US PRESIDENTIAL MARKETS

The 2024 US Presidential Vote-Share Market forecasts the two-party vote percentages taken by each party. The contracts are DEM24_VS, associated with the Democratic nominee's vote share, and REP24_VS, associated with the Republican nominee's. Appendix I contains the market prospectus. The 2024 US Presidential Winner-Takes-All Market forecasts the probabilities of each major party receiving the majority of the two-party popular vote. The contracts are DEM24_WTA, associated with the Democratic vote share, and REP24_WTA, associated with the Republican's. Appendix II contains the market prospectus. Table 1 summarizes the markets to date, their current forecasts based on prices, and forecasts based on distributions derived from the two markets together.

https://doi.org/10.1017/S1049096524000921 Published online by Cambridge University Press

Table 1

Summary Statistics and Prices for the IEM 2024 US Presidential Election Markets

Panel A: Presidential Market Statistics

Market	Vote Share	Winner-Takes-All
Opening Date	May 19, 2023	May 20, 2023
Most Recent Date	September 29, 2024	September 29, 2024
Days Open	499	498
Contract Volume to Date	3,772	41,971
Dollar Volume to Date	$1,948.75	$21,111.42

Panel B: Presidential Markets Most Recent Normalized Prices (September 29, 2024)

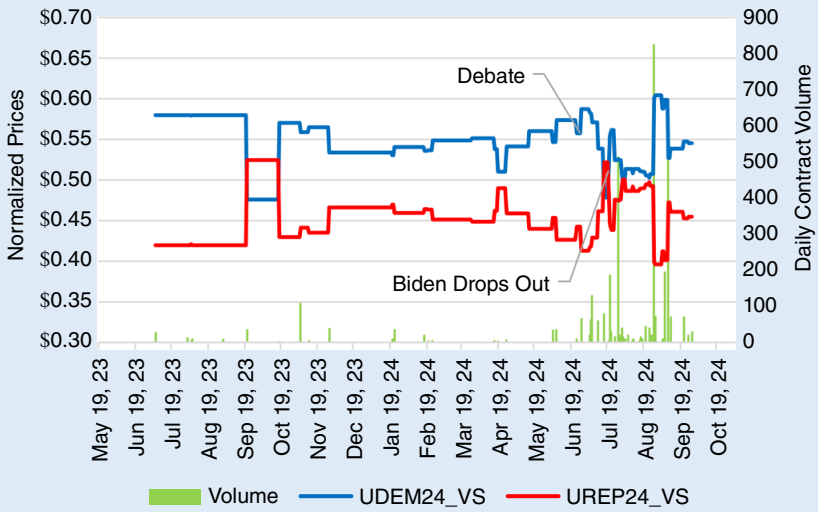
Market	Vote Share		Winner-Takes-All	
Contracts	UDEM24_VS	$0.545	DEM24_WTA	$0.857
and Prices	UREP24_VS	$0.455	REP24_WTA	$0.143

Panel C: Combined Distribution Forecasts (September 29, 2024)

	Democrat	Republican
Probability of Winning:	87.0%	13.0%
Mean Vote-Share Forecast:	53.5%	46.5%
Median Vote-Share Forecast:	53.0%	47.0%

Figure 4

2024 US Presidential Vote-Share Market Normalized Daily Prices and Contract Volumes



Panel A shows market statistics. Panel B shows current prices from each market. Panel C summarizes current forecast distributions derived via the Berg, Geweke, and Rietz (2010) method.

The VS market opened on May 20, 2023, and is thinly traded. To date, 3,772 individual contracts have traded. Figure 4 shows the market's daily closing normalized prices and contract volumes. In contrast to polls, the IEM consistently forecast a 5–10-point Democratic popular vote margin until a significant increase in postdebate volume and volatility. The most recent forecast is 9.0 percentage points. To place this in context, the two-party popular vote margin has averaged 10.2 percentage points for winners since 1856 overall, 3.3 for incumbent parties, and 6.9 for incumbent presidents running for reelection (compiled from Leip 2019).

A large spread in late August and early September points out a weakness of a thinly traded market: "stale" prices. On August 28, a single trader put in bids for large quantities of DEM24_WTA at up to 10 cents above then current market prices, blowing through the ask queue and creating an arbitrage opportunity. This was quickly

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exploited until the REP24_WTA bid queue was exhausted. Although the bids and asks recovered, the "stale" last trade prices remained for some time. Using bids and asks, the Berg, Geweke, and Rietz (2010) method forecast a more reasonable spread during this period: 4 to 5 percentage points.

The Winner-Takes-All market opened on May 20, 2023, and is much more heavily traded. Nearly than 42,000 contracts have traded to date. Figure 4 shows the normalized prices and, thus, forecast probabilities of winning the popular vote to date, and figure 5 shows the 2024 US Presidential Winner-Takes-All market prices. The probability of a Democratic win had been hovering in the 70% to 80% range for nearly a year. On the day of the presidential debate, it decreased to 59%. More than a month of active trading later, it surpassed the pre-debate forecast on July 31. On September 29, 2024, it stood at 85.7% according to WTA market prices and 87.0% according to the Berg, Gweke, and Rietz (2010) method.

To put this in context, incumbent Presidents running for reelection have won the popular vote in 77% of instances since 1856 and incumbent parties have won the popular vote 62% of the time overall (compiled from Leip 2019). On September 29, 2016, the IEM forecast a 72.7% chance that Clinton would win the popular vote (which she did, though Trump won the electoral college). On September 29, 2020, the IEM forecast a 71.8% chance that Biden would win the popular vote (which he did). Thus, relative to the same date on his prior two runs, the IEM forecasts a somewhat higher probability that Trump will lose the popular vote. But, of course, that does not necessarily imply a Democratic win in the electoral college.

CANDIDATE UNCERTAINTY

An important difference between the IEM and head-to-head polls is that the IEM is based on the party nominees, not specific candidates. This can drive a wedge between the IEM and polls between the presumptive or likely nominees. The IEM's 2024 Democratic Convention Nomination Market is a WTA market that forecasts the probabilities of various candidates becoming the Democratic nominee. Appendix III contains the market prospectus. Figure 6 shows normalized prices, and thus probabilities, for listed candidates becoming the nominee: Joe Biden (JBID_N24), Kamala Harris (KHAR_N24), Robert Kennedy Jr. (RKEN_N24), and any other candidate (DROF_N24). From the first trades until the debate, Biden led. Postdebate, his chances of becoming the nominee fell dramatically. There was considerable volatility until he dropped out of the race on July 21 and Harris quickly received endorsements from the majority of convention delegates.

IMPLIED UNCERTAINTY

On May 5, 2024, NBC News reported that the 2024 Presidential election "is roiling with uncertainty" (Bowman, et al. 2024). Issues cited include (1) potential third-party candidates; (2) voter apathy, concerns over major issues, and tendency to change minds; (3) differences in fund-raising, and (4) legal issues. Postdebate, we can add a period of uncertainty over whether Biden would be the Democratic nominee. Potential voter reactions to two assassination attempts against Donald Trump added to the uncertainty as did the shift to Harris as the likely Democratic nominee. The IEM forecasts also indicate that significant uncertainty surrounds the election outcome. An ≈85% chance of a Democratic popular vote win means that there is an ≈15% chance of a Republican win.

To better understand the full distributions underlying IEM forecasts, we use the Berg, Geweke, and Rietz (2010) method to generate daily forecast distributions. Each distribution has (1) a mean that lies between the best bids and asks in the vote-share market and (2) a probability of winning that lies between the best bids and asks in the winner-takes-all market. Given these constraints, the estimated distributions are as smooth and compact as possible. Intuitively, if this distribution were held by traders, they would not trade at existing bids and asks, leaving them standing at the end of the day.

Figure 5

2024 U.S. Presidential Winner-Takes-All Market Prices

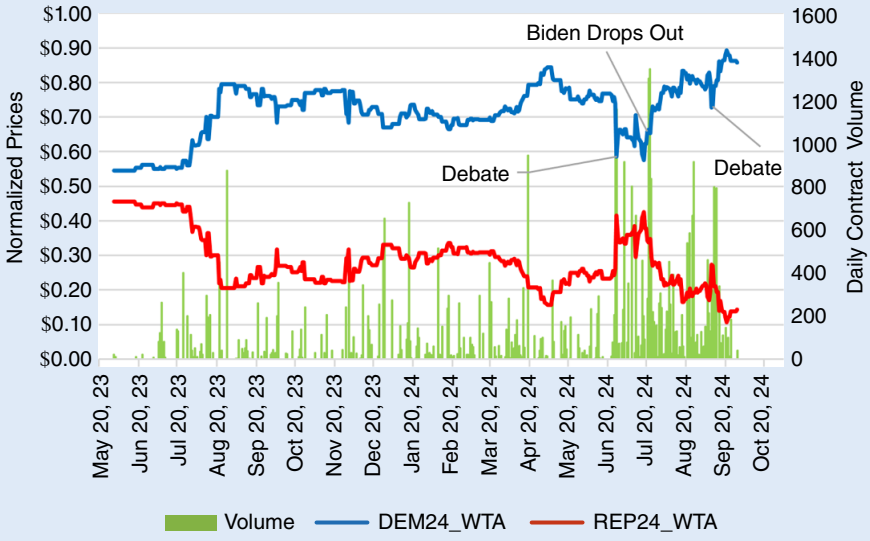

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Figure 6

2024 Democratic Convention Nomination Market Normalized Daily Closing Prices and Contract Volumes

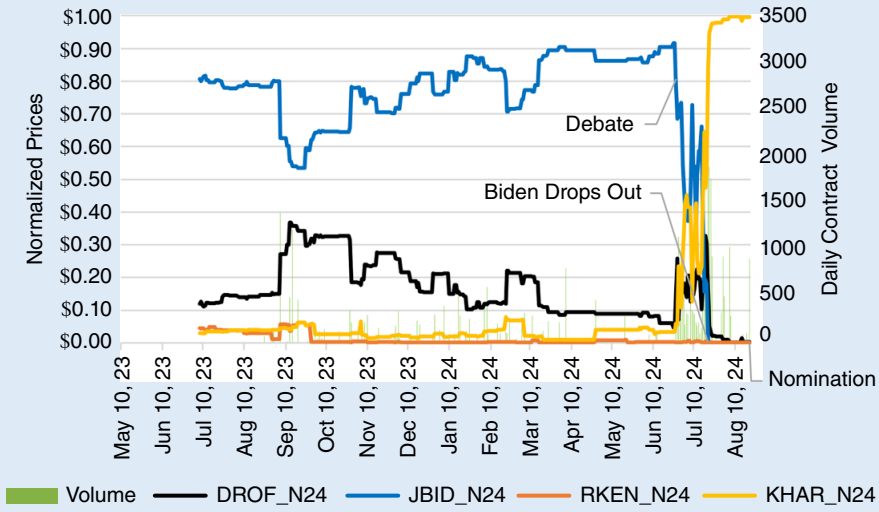
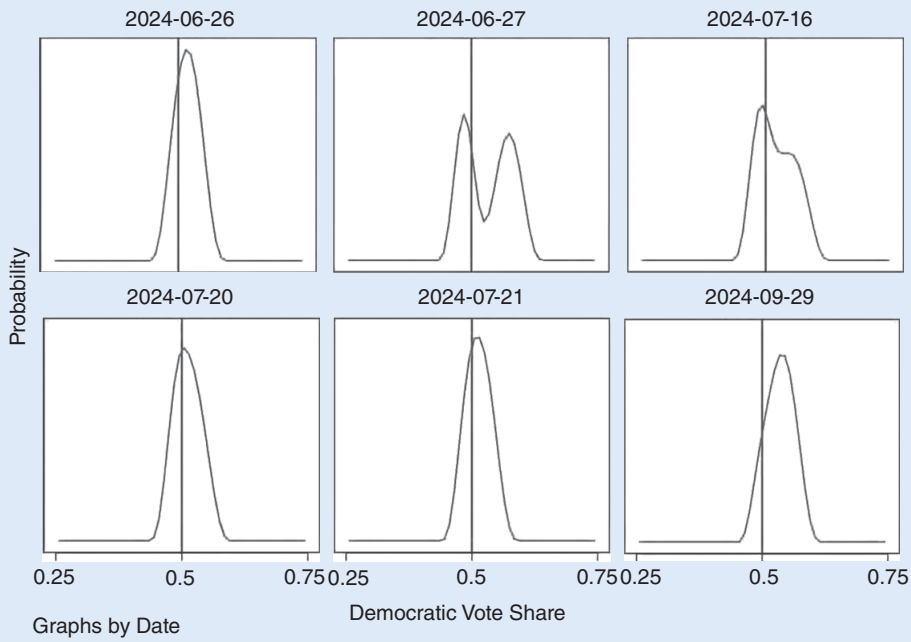


Figure 7

Forecast Vote-Share Distributions Using the Berg, Geweke, and Rietz (2010) method



Each panel shows a different day.

Figure 7 shows several distributions, whereas figure 8 shows every distribution between June 27 and August 6. The June 26 distribution in figure 7 shows a typical predebate distribution: unimodal, favoring the Democrat, but leaving a fair probability for a Republican win. The September 29 distribution shows a typical distribution that has held since Harris became the likely Democratic nominee: again unimodal, favoring the Democrat.[3]

The June 27 distribution—immediately after the presidential debate—is bimodal, reflecting two possible outcomes: the Democrat winning by a relatively large margin or the Republican winning by a relatively small margin. Figure 8 shows that the bimodal distribution lasted for nine days while Biden made repeated firm assertions that he would not withdraw. Overall, between June 27 and August 6, 19 (46%) of the distributions were bimodal.

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Figure 8

Berg, Geweke, and Rietz (2010) Forecast Distributions for the Democratic Vote share from June 27 through August 6, 2024

On July 12, the distributions became unimodal with a notably asymmetry. July 16 in figure 7 is a typical example. This pattern held until July 17, when support seemed to coalesce around Harris. Although there may be many explanations, both the bimodal and asymmetric distributions can arise from a mixture of two unimodal distributions, again with a relatively narrow Republican win and a wider Democratic win.

July 20 and 21 in figure 7 show the result of Biden dropping out. In contrast to the debate, there was no major change in the distributions, just a small shift to the left.

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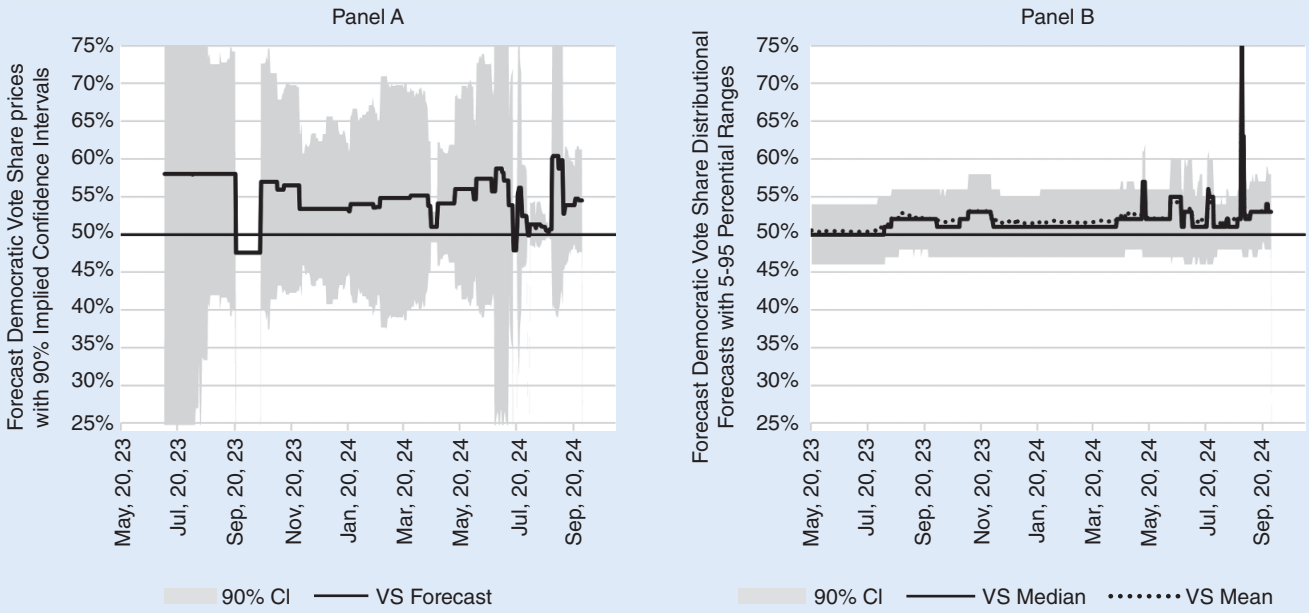
Figure 9

Forecast Democratic Vote Shares and 90% Confidence Intervals (CIs)



Panel A uses the vote-share market prices and confidence intervals using the Gruca and Rietz (2021) implied volatility method. Panel B shows the mean and median of the Berg, Geweke, and Rietz (2010) forecast distributions along with the 5th to 95th percentile range.

The most recent distribution (September 29) is similar to most since Harris became the "likely" nominee: unimodal, with a Democratic lead.

Given the asymmetric distributions, using the means (as given by vote-share prices) to summarize the central tendencies may be misleading, as would computing confidence intervals using implied volatility. In figure 9, Panel A, we show the forecast vote share and 90% confidence intervals using prices and implied volatilities (Gruca and Rietz 2021). It shows a relatively large Democratic lead at times but wide and quite variable confidence intervals, at least until very recently. In Panel B, we show both means and medians of the forecast distributions Berg, Geweke, and Rietz (2010) along with 90% confidence intervals defined by the 5th and 95th percentiles of the distributions. This typically shows a closer race (current median: 53.0% Democrat vs. 47.0% Republican). The confidence intervals are more stable and smaller. Although the forecasts spiked up due to the larger bids on August 28, the forecasts recovered relatively quickly to reasonable levels. The forecasts using the Gruca and Rietz method took longer to recover because they rely on stale prices. Although both sets of estimates suggest a Democratic win, neither set of confidence intervals rules out a Republican win at conventional levels of confidence.[4]

SUMMARY

The consistent forecast from IEM prices had been for a Democratic popular vote win by a fair margin, but it became much closer postdebate, then slowly recovered. However, there was always significant uncertainty in the forecasts, with a Republican win a distinct possibility. Furthermore, forecasts of vote-share distributions based on both VS and WTA markets simultaneously indicate a closer race than either individual market. A recent set of unusual bids shows a potential weakness of a traded market: stale market prices. Although it is more complicated to forecast the vote-share distribution from bids and asks in both the VS and WTA markets, the resulting forecast seems more reasonable and robust to the stale-pricing problem.

Although it is more complicated to forecast the vote-share distribution from bids and asks in both the VS and WTA markets, the resulting forecast seems more reasonable and robust to the stale-pricing problem

According to market forecasts, the June 27 presidential debate had a significant influence. Postdebate, (1) Biden's likelihood of becoming the Democratic nominee fell dramatically while Harris's increased, (2) the chances of the Republican nominee winning the two-party vote increased significantly, and (3) the forecast distributions became volatile and, often, asymmetric and/or bimodal. This lasted until Harris received enough endorsements from delegates to become the likely nominee. Distributions have since returned to a relatively symmetric, unimodal distribution, with a Democratic lead and a roughly 80% to 90% chance of winning the popular vote.

https://doi.org/10.1017/S1049096524000921 Published online by Cambridge University Press

SUPPLEMENTARY MATERIAL

To view supplementary material for this article, please visit http://doi.org/10.1017/S1049096524000921.

ACKNOWLEDGMENTS

We thank the Tippie College of Business for supporting Iowa Electronic Markets research and Brian Heil for programming and data support

DATA AVAILABILITY STATEMENT

Research documentation and data that support the findings of this study are openly available at the Harvard Dataverse at https://doi.org/10.7910/DVN/C09NG6.

CONFLICTS OF INTEREST

The author declares that there are no ethical issues or conflicts of interest in this research. ■

NOTES

1 Because IEM contracts are real futures contracts, the IEM is under the regulatory purview of the Commodity Futures Trading Commission (CFTC). The CFTC issued "no-action" letters to the IEM stating that as long as the IEM conforms to certain restrictions (related to limiting risk and conflict of interest), the CFTC will take no action against it. Under this no-action letter, IEM does not file reports that are required by regulators and therefore it is not formally regulated by, nor are its operators registered with, the CFTC.

2 See Malinvaud (1974) for a general equilibrium proof of this proposition and Berg and Rietz (2019) for a more complete exposition in context.

3 The only exceptions to this were driven by the single set of high bids in the VS market we discussed earlier.

4 Vote-share forecasts, means, medians and confidence interval limits for the Republican candidate are 1 minus those for the Democratic candidate.

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