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**Election Forecast for 2023 Presidential Election in Turkey**

Literature Review

Andreas Graefe’s article “Accuracy of Vote Expectation Surveys in Forecasting Elections”  is a study comparing different forecast methods such as expert judgment, polls, prediction markets, and quantitative models. He concluded that Polls give the closest prediction and especially the polls which are made close to election day. The following study is on calculating the accuracy rate of poll companies in their election prediction by combining models, in other words, ensemble models to reduce the measurement error. Graefe used the 2010 British election and U.S. presidential elections between 1932 and 2012 and calculate the success rate of poll companies and whether they predict the incumbent’s success right. We used one of the methods used in Andreas Graefe’s which is distributing weighted averages to poll firms according to their error terms in terms of deviance from the actual election result. We used Turkey's 2018 and 2023 first-term elections forecasts of poll companies and calculated related errors and scaled them in the interval of [0,1] which represent the share of 100% of the vote share.

Method

In order to make a prediction on the 2023 second-term presidential election we used the previous presidential elections of 2018 and 2023 first term. For each election year, we collected all of the recent forecasts of the poll firms and then calculate their absolute differences from the actual election result. Then we have two different error terms for some companies, and for others, we have only one error term only for one year because we couldn’t find the forecast for the other year's election. We decided to take means for each company, if a company has one value for the error term, we accept this as the mean. To make a measurable prediction we filter the companies according to the 2023 second-term forecast data because the sum of the weights must equal 1. Then, we divided these error terms to 1, and to normalize in other words to squeeze between [0,1] we divide this fraction by the sum of all fractions of error terms. Finally, we obtain the related weighted averages for each company. In the last step, we multiply each candidate's forecast for each company with their weighted averages and sum them.

Data

| Pollster | N | year | Date | Erdogan | Ince | Aksener | Demirtas | Other |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Election Result | NA | 2018 | 2018-06-24 | 52.59 | 30.64 | 7.29 | 8.40 | 1.08 |
| GENAR | 5000 | 2018 | 2018-06-24 | 51.50 | 28.40 | 7.60 | 10.50 | 2.00 |
| SAROS | No | 2018 | 2018-06-23 | 51.90 | 26.30 | 10.60 | 10.70 | 0.50 |
| A&G | 5054 | 2018 | 2018-06-22 | 53.50 | 29.10 | 8.10 | 8.80 | 0.50 |
| AKAM | No | 2018 | 2018-06-22 | 44.50 | 28.30 | 13.50 | 11.50 | 2.20 |
| Piar | 2464 | 2018 | 2018-06-20 | 42.50 | 27.10 | 16.70 | 11.00 | 2.70 |
| ORC | 4250 | 2018 | 2018-06-18 | 52.70 | 29.20 | 8.60 | 8.50 | 1.50 |
| Optimar | 2476 | 2018 | 2018-06-17 | 51.60 | 28.00 | 8.50 | 10.30 | 1.60 |
| Gezici | 1812 | 2018 | 2018-06-17 | 48.20 | 29.10 | 11.40 | 10.00 | 1.30 |
| Argetus | 2360 | 2018 | 2018-06-16 | 51.30 | 28.40 | 8.10 | 9.90 | 2.30 |
| KONDA | No | 2018 | 2018-06-10 | 51.90 | 28.00 | 10.20 | 9.00 | 1.30 |
| TÜSIAR | 5561 | 2018 | 2018-06-12 | 50.70 | 24.90 | 11.70 | 9.70 | 3.00 |
| Metropoll | 2888 | 2018 | 2018-06-10 | 49.20 | 26.15 | 9.82 | 12.06 | 2.78 |
| REMRES | 5674 | 2018 | 2018-06-10 | 43.60 | 29.50 | 12.30 | 11.40 | 3.20 |
| Mediar | 2401 | 2018 | 2018-06-09 | 47.96 | 29.88 | 9.15 | 10.18 | 2.83 |
| Foresight | 500 | 2018 | 2018-06-09 | 50.80 | 30.10 | 8.00 | 10.50 | 0.60 |
| Vera | 2419 | 2018 | 2018-06-08 | 48.40 | 28.80 | 10.30 | 11.70 | 0.80 |
| MAK | 5400 | 2018 | 2018-06-04 | 51.50 | 24.40 | 12.50 | 8.80 | 2.80 |
| SONAR | 3000 | 2018 | 2018-05-31 | 48.30 | 31.40 | 9.50 | 8.20 | 2.60 |
| Konsensus | 1880 | 2018 | 2018-05-15 | 47.90 | 26.80 | 14.80 | 9.70 | 0.80 |

Table1: 2018 Election Forecasts and Election Result

| date | Year | Pollster | N | Erdoğan | İnce | Kılıçdaroğlu | Oğan |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 45060 | 2023-05-14 | Election Result | 54796049 | 49.52 | 0.43 | 44.88 | 5.17 |
| 12-13 May | 2023-05-14 | Özdemir | 3016 | 48.40 | 0.00 | 45.20 | 6.40 |
| 11-13 May | 2023-05-14 | Remres | 4764 | 44.40 | 0.10 | 53.60 | 1.90 |
| 45058 | 2023-05-14 | İEA | 1500 | 45.60 | 0.00 | 50.50 | 3.90 |
| 11-12 May | 2023-05-14 | BETİMAR | 5751 | 49.10 | 0.30 | 45.00 | 5.60 |
| 11-12 May | 2023-05-14 | Areda Survey | 25000 | 51.30 | 0.60 | 44.20 | 3.90 |
| 10-12 May | 2023-05-14 | ASAL | 2017 | 50.60 | 0.00 | 46.30 | 3.10 |
| 9-12 May | 2023-05-14 | Aksoy | 4000 | 45.60 | 0.80 | 47.90 | 5.70 |
| 10-11 May | 2023-05-14 | GENAR | 2000 | 51.40 | 0.00 | 44.30 | 4.30 |
| 10-11 May | 2023-05-14 | ORC | 3920 | 44.20 | 1.30 | 51.70 | 2.80 |
| 9-11 May | 2023-05-14 | Optimar | 5950 | 50.40 | 1.50 | 44.70 | 3.40 |
| 8-11 May | 2023-05-14 | Avrasya | 2476 | 44.20 | 1.40 | 51.30 | 3.10 |
| 9-10 May | 2023-05-14 | Yöneylem | 2476 | 44.40 | 1.40 | 49.50 | 4.70 |
| 9-10 May | 2023-05-14 | MetroPOLL | 2038 | 46.90 | 1.30 | 49.10 | 2.70 |
| 7-10 May | 2023-05-14 | Argetus | 2568 | 50.60 | 1.20 | 46.10 | 2.10 |
| 2-9 May | 2023-05-14 | Artıbir | 1500 | 44.60 | 3.00 | 50.10 | 2.30 |
| 20 Nis-9 May | 2023-05-14 | ADA | 65000 | 50.60 | 1.70 | 44.80 | 2.90 |
| 8-9 May | 2023-05-14 | Area | 3000 | 46.10 | 1.30 | 49.10 | 3.50 |
| 6-9 May | 2023-05-14 | Piar | – | 45.30 | 0.80 | 51.30 | 2.60 |
| 5-9 May | 2023-05-14 | ALF | 6000 | 44.70 | 1.60 | 51.20 | 2.50 |
| 4-8 May | 2023-05-14 | İvem | 4020 | 48.60 | 2.10 | 46.90 | 2.40 |
| 2-8 May | 2023-05-14 | Bulgu | 2400 | 43.20 | 2.50 | 50.50 | 3.80 |
| 6-7 May | 2023-05-14 | Gezici | 3577 | 45.90 | 3.20 | 46.90 | 4.00 |
| 6-7 May | 2023-05-14 | KONDA | 3480 | 43.70 | 2.20 | 49.30 | 4.80 |
| 3-7 May | 2023-05-14 | SAROS | 8164 | 44.50 | 3.20 | 50.00 | 2.30 |
| 26 Nis-4 May | 2023-05-14 | MAK | 5750 | 45.40 | 1.70 | 50.90 | 2.00 |
| 25 Nis-2 May | 2023-05-14 | HBS | 5100 | 47.50 | 3.30 | 47.00 | 2.20 |
| 27 Nis-2 May | 2023-05-14 | SONAR | 4197 | 48.80 | 3.60 | 44.10 | 3.50 |

Table2: 2023 First Round Forecasts and Election Result

| Pollster | mean\_error\_2018 | mean\_error\_2023 | mean\_error |
| --- | --- | --- | --- |
| GENAR | 1.4350 | 0.940 | 1.1875 |
| SAROS | 2.6600 | 3.945 | 3.3025 |
| A&G | 0.9150 | 0.000 | 0.9150 |
| AKAM | 4.9350 | 0.000 | 4.9350 |
| Piar | 6.4100 | 3.395 | 4.9025 |
| ORC | 0.7400 | 3.845 | 2.2925 |
| Optimar | 1.6850 | 0.975 | 1.3300 |
| Gezici | 2.9100 | 2.395 | 2.6525 |
| Argetus | 1.4600 | 1.535 | 1.4975 |
| KONDA | 1.7100 | 3.095 | 2.4025 |
| TÜSIAR | 3.3350 | 0.000 | 3.3350 |
| Metropoll | 3.5175 | 0.000 | 3.5175 |
| REMRES | 4.5350 | 0.000 | 4.5350 |
| Mediar | 2.2575 | 0.000 | 2.2575 |
| Foresight | 1.2850 | 0.000 | 1.2850 |
| Vera | 3.0850 | 0.000 | 3.0850 |
| MAK | 3.2350 | 3.645 | 3.4400 |
| SONAR | 1.8650 | 1.585 | 1.7250 |
| Konsensus | 4.3350 | 0.000 | 4.3350 |
| Özdemir | 0.0000 | 0.775 | 0.7750 |
| Remres | 0.0000 | 4.360 | 4.3600 |
| İEA | 0.0000 | 2.810 | 2.8100 |
| BETİMAR | 0.0000 | 0.275 | 0.2750 |
| Areda Survey | 0.0000 | 0.975 | 0.9750 |
| ASAL | 0.0000 | 1.250 | 1.2500 |
| Aksoy | 0.0000 | 1.960 | 1.9600 |
| Avrasya | 0.0000 | 3.695 | 3.6950 |
| Yöneylem | 0.0000 | 2.795 | 2.7950 |
| MetroPOLL | 0.0000 | 2.545 | 2.5450 |
| Artıbir | 0.0000 | 3.895 | 3.8950 |
| ADA | 0.0000 | 1.175 | 1.1750 |
| Area | 0.0000 | 2.545 | 2.5450 |
| ALF | 0.0000 | 3.745 | 3.7450 |
| İvem | 0.0000 | 1.845 | 1.8450 |
| Bulgu | 0.0000 | 3.845 | 3.8450 |
| HBS | 0.0000 | 2.495 | 2.4950 |

Table3: Mean Error for Each Company

| year | Tarih | Pollster | Örneklem | Erdoğan | Kılıçdaroğlu |
| --- | --- | --- | --- | --- | --- |
| 2023-05-28 | 25-26 May | İEA | – | 51.9 | 48.1 |
| 2023-05-28 | 25-26 May | ALF | 2500 | 49.7 | 50.3 |
| 2023-05-28 | 25-26 May | BETİMAR | 6601 | 52.2 | 47.8 |
| 2023-05-28 | 25-26 May | Özdemir | 3250 | 53.9 | 46.1 |
| 2023-05-28 | 24-26 May | İvem | 4492 | 53.8 | 46.2 |
| 2023-05-28 | 24-25 May | ORC | 3950 | 49.2 | 50.8 |
| 2023-05-28 | 24-25 May | Area | 2026 | 49.4 | 50.6 |
| 2023-05-28 | 23-25 May | Piar | 2560 | 52.5 | 47.5 |
| 2023-05-28 | 19-25 May | HBS | 6100 | 52.3 | 47.7 |
| 2023-05-28 | 22-24 May | TÜSİAR | 5697 | 51.4 | 48.6 |
| 2023-05-28 | 19-24 May | ASAL | 2184 | 53.4 | 46.6 |
| 2023-05-28 | 20-21 May | KONDA | 3607 | 52.7 | 47.3 |
| 2023-05-28 | 20-21 May | Areda Survey | 10491 | 52.4 | 47.6 |
| 2023-05-28 | 16-21 May | SAROS | 1868 | 53.1 | 46.9 |
| 2023-05-28 | 24-26 May | Aksoy | 3000 | 53.0 | 47.0 |

Table4: Forecasts for 2023 Elections Second Round

Results

We obtained ensemble results of forecasting companies which is more accurate than any other prediction because the performance of this method is extremely strong in the 2023 first-round election, the error term of our prediction is 1.01 point which is not quite a small number but acceptable.

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Table5: Weighted Averages of Each Company

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Table6: Comparison of the Prediction on 2023 Elections for the Firstroundand The Actual Election Results

Note that the error term in other words the deviance from the actual results is relatively low. A picture containing text, font, screenshot

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Table7: Error term of the 2023 First Round Election Prediction

| candidate | vote\_share |
| --- | --- |
| Erdoğan | 52.39213 |
| Kılıçdaroğlu | 47.60787 |

Table8: Prediction for the 2023 Second Round Election

Comments on Results:

| Pollster | mean\_error\_2018 | mean\_error\_2023 | mean\_error | weights |
| --- | --- | --- | --- | --- |
| SAROS | 2.66 | 3.945 | 3.3025 | 0.0286191 |
| Piar | 6.41 | 3.395 | 4.9025 | 0.0192789 |
| ORC | 0.74 | 3.845 | 2.2925 | 0.0412277 |
| KONDA | 1.71 | 3.095 | 2.4025 | 0.0393401 |
| Özdemir | 0.00 | 0.775 | 0.7750 | 0.1219543 |
| İEA | 0.00 | 2.810 | 2.8100 | 0.0336351 |
| BETİMAR | 0.00 | 0.275 | 0.2750 | 0.3436894 |
| Areda Survey | 0.00 | 0.975 | 0.9750 | 0.0969380 |
| ASAL | 0.00 | 1.250 | 1.2500 | 0.0756117 |
| Aksoy | 0.00 | 1.960 | 1.9600 | 0.0482217 |
| Area | 0.00 | 2.545 | 2.5450 | 0.0371374 |
| ALF | 0.00 | 3.745 | 3.7450 | 0.0252375 |
| İvem | 0.00 | 1.845 | 1.8450 | 0.0512274 |
| HBS | 0.00 | 2.495 | 2.4950 | 0.0378816 |

Table9: Mean errors and Weights for companies Used in 2023 Second Round Prediction

Our model works well for the 2023 election for the first round with a 1.01-point error term. There are three companies Özdemir, BETİMAR, and Areda Surveys which have lower error terms for the 2023 presidential elections for the first term. We predict that Erdoğan wins and the results show that he wins. We predict that Erdoğan wins with a vote share of 52.4% and according to unconfirmed results 52.16%. Our prediction is one of the closest predictions.