

# UBMK'18

## A Glimpse to Turkish Political Climate with Statistical Machine Learning

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# Introduction

- Asimov's (fictional) **Psyco-history** combines history, sociology, and mathematical statistics to make general predictions about the future behavior of very large groups of people.



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# Research Question

- Turkish political climate **description**:
  - In which political issues Turkish people agree on the most and in which political issues they are segregated the most.
  - Which parties are close and which parties are distant in multi-dimensional political space.
- **Vote prediction**:
  - Is it possible to measure the policy preferences of individual actors and harvest their policy orientation and predict their votes?



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# Methodology

- **Policial Data Science**

- We incorporate **data science** and **machine learning** tools to to analyze real-world political data about Turkish society.
- We make a glimpse to what social matters shape the Turkish political climate with the lenses of statistical models.



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# Data Collection

TABLE I  
NUMBER OF ELECTORATES FOR EACH PARTY IN OUR DATASET

<i>MHP</i>	<i>AKP</i>	<i>CHP</i>	<i>IYI</i>	<i>OTHS</i>	<i>HDP</i>	<i>Total</i>
27	126	255	264	193	20	885

<sup>a</sup> OTHS is abbreviated for remaining parties.

## Questions on political matters:

- Do you think Turkish economy is going well?
- Do you think Turkish education system needs reform?
- Are you against denationalization?
- Do you support death penalty?
- Do you think Turkish media is objective as it should be?
- Do you support alcohol ban after 22:00pm?
- Do you want to live in a more secular state?
- Do you support the abortion ban?
- Do you think that the emergency rule (Ohal) restricts freedoms?
- Would you like a new party to enter to the parliament?

And finally we asked them

- Which political party will you vote for?



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# Turkish political climate **description**

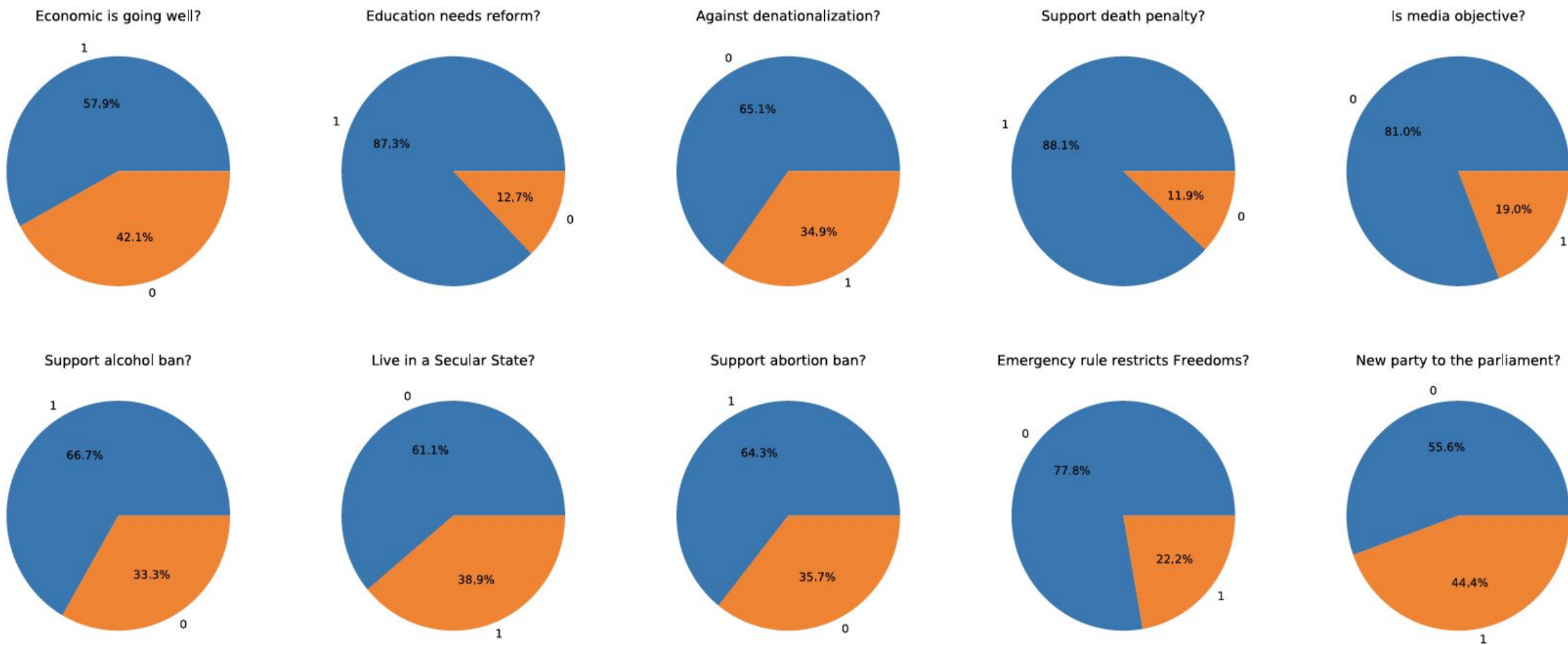


Fig. 1. Opinion of AKP (party in government). Here 0 means no and 1 means yes.

# Turkish political climate **description**

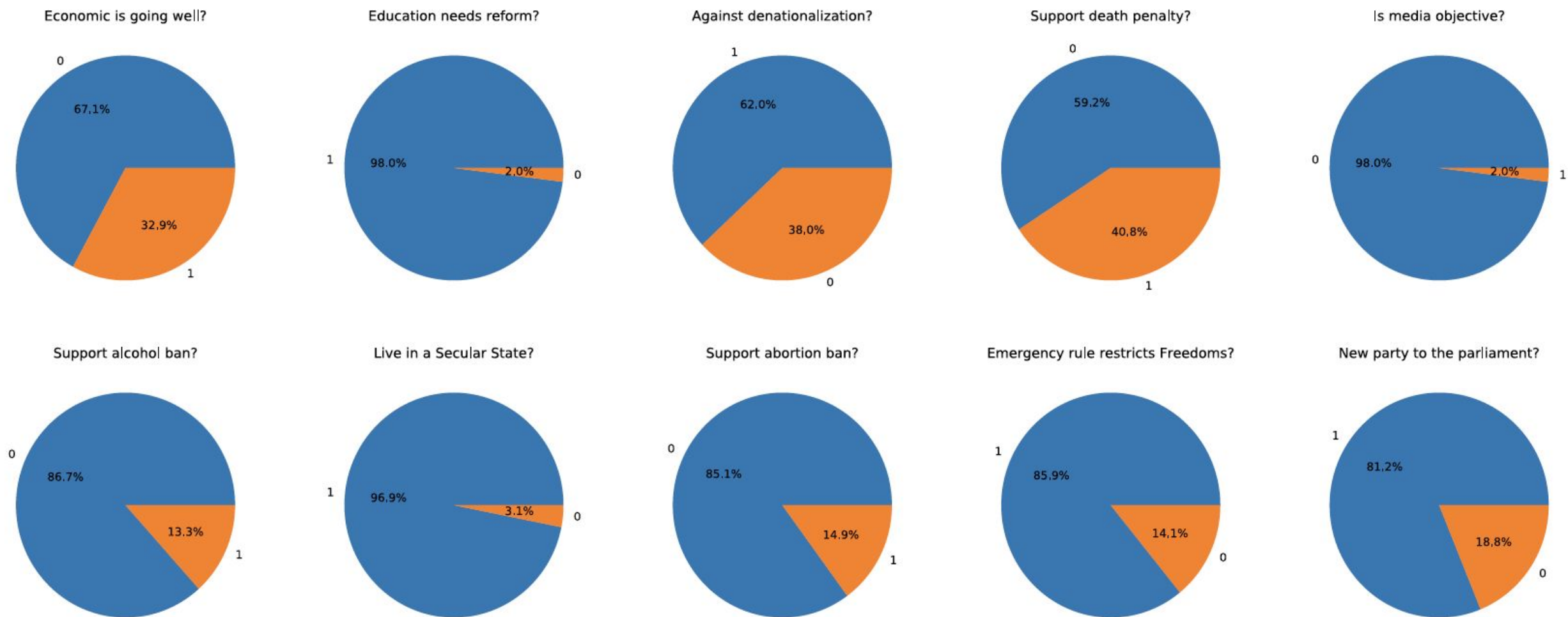


Fig. 2. Opinion of CHP (main party in opposition). Here 0 means no and 1 means yes.



# Turkish political climate description

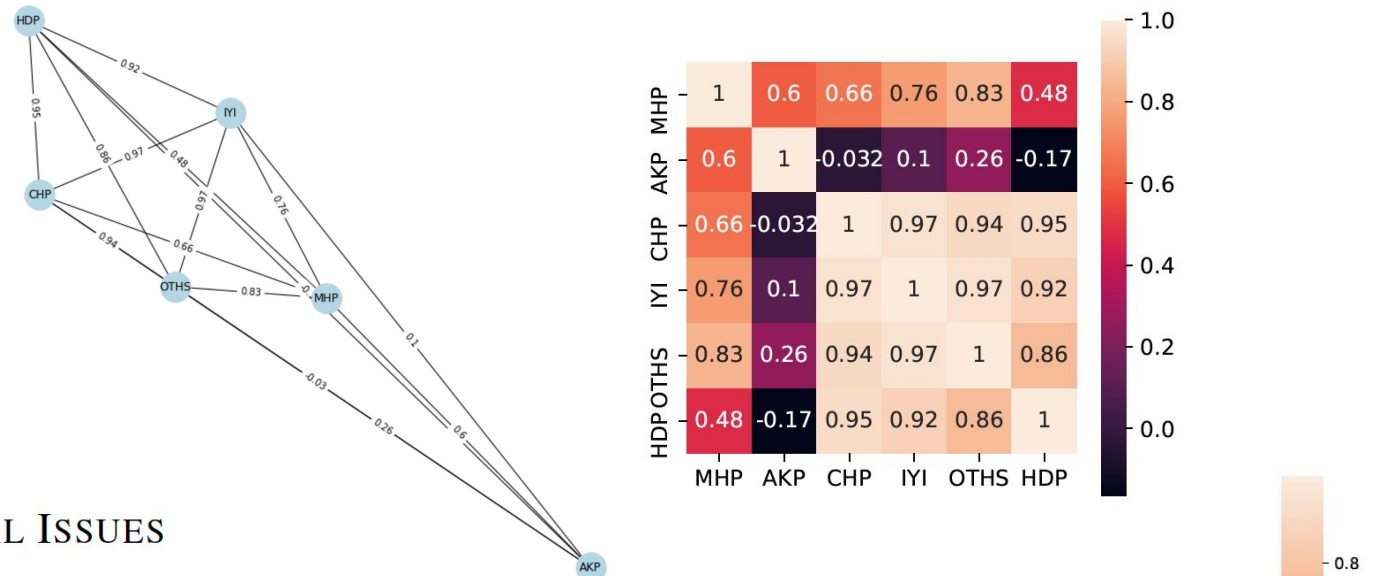
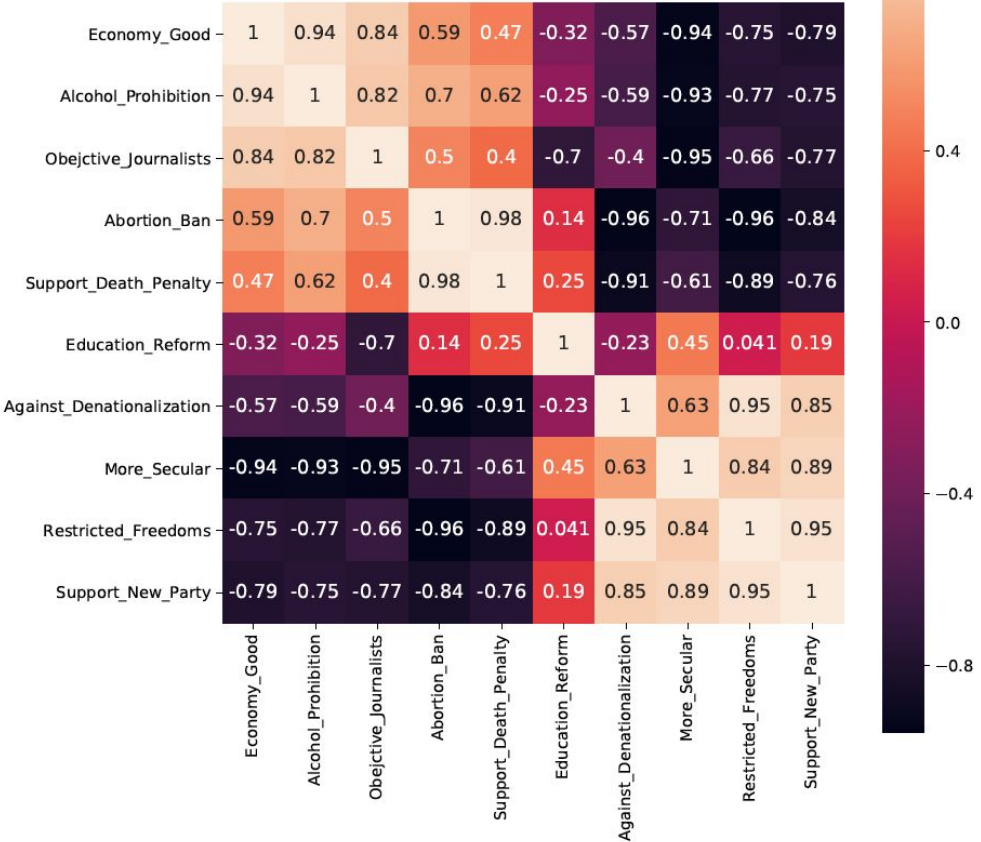


TABLE II  
OPINION OF PARTY ELECTORATE OVER 10 KEY POLITICAL ISSUES

Policy Matters	Electorate Opinion					
	MHP	AKP	CHP	IYI	Others	HDP
Economy Good	0.33	0.57	0.32	0.28	0.38	0.40
Education Reform	0.92	0.87	0.98	0.96	0.95	0.65
Against Denationalization	0.37	0.34	0.62	0.62	0.49	0.65
Support death penalty	0.81	0.88	0.40	0.61	0.55	0.40
Objective journalists	0.07	0.19	0.02	0.03	0.03	0.15
Alcohol prohibition	0.22	0.66	0.13	0.24	0.30	0.30
More secular	0.77	0.38	0.96	0.94	0.86	0.70
Abortion ban	0.55	0.64	0.15	0.30	0.35	0.20
Restricted freedoms	0.40	0.22	0.85	0.83	0.64	0.75
Support new party	0.59	0.44	0.81	0.89	0.80	0.75

<sup>a</sup>Values are rounded to 2 decimals





# Vote prediction - Importance of Features

to distinguish AKP and CHP

Most discriminant features

- Thoughts on secularism
- Restriction on freedom
- Alcohol prohibition and so on

Less discriminant features

- Education needs reform
- Being against denationalization
- Economy is not going well and so on

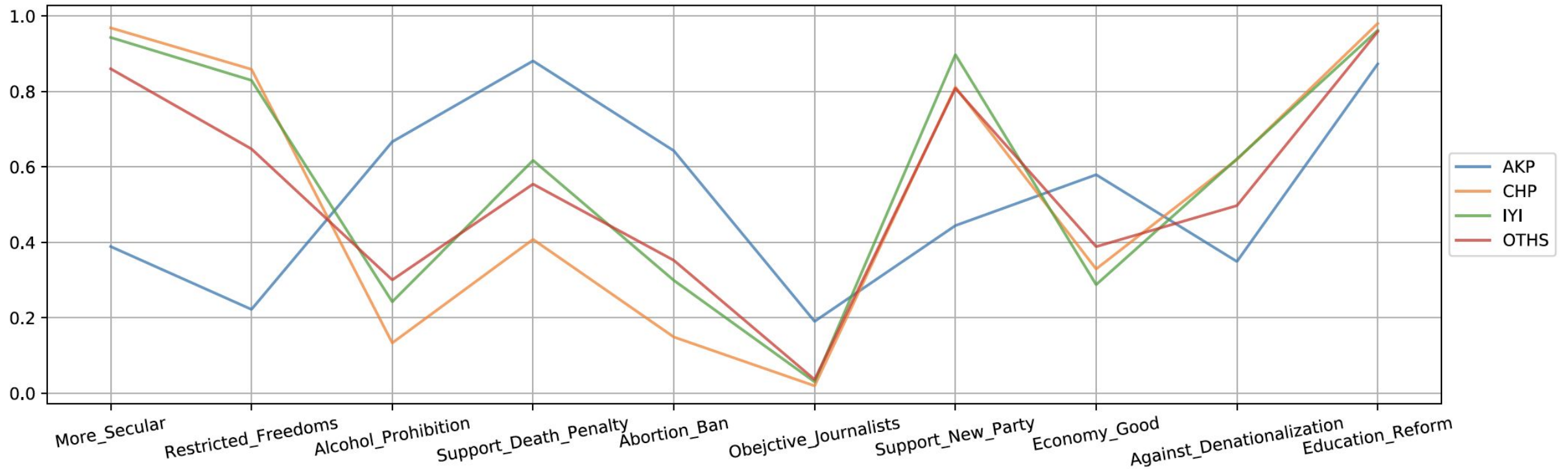


Fig. 6. Turkish political space over sorted features.

# Results and Discussion

TABLE III  
FORECAST USING INSTANCES OF AKP AND CHP

Model	Score on test set	Score on train set
Gradient Boosting Classifier	92.71	95.79
KNeighbors	91.67	89.47
Naive Bayes	89.58	88.77
SVC	88.54	91.58
Decision Tree	86.46	93.68
Random Forest	84.38	90.18
Logistic Regression	84.38	91.93

<sup>a</sup>Train/Test split is 75/25.

If we include other parties our accuracy score drops to %60.



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# Conclusions and Future Research

- Our aim is to forecast political vote of a person based on the questions we ask. To do that, we collected a political dataset on our own.
  - It reveals the point of view of Turkish people towards political matters.
  - Accurately measuring the policy preferences of individual voters is the key to capture the dynamics of politics.
- We can reliably predict on **the subset of our data** which is only composed of AKP and CHP electorates.
  - Better features (better questions) are needed for a general vote prediction.



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# References

- 1- Isaac Asimov (2016) The Complete Isaac Asimov's Foundation Series Books 1-7, Bantam Spectra
- 2- Enes Taylan (2017), Numbers in politics : comparative quantitative analysis & modeling in foreign policy orientation and election forecasting, <http://hdl.handle.net/11693/32994>
- 3- MIT Course on Machine Learning and Data Science in Politics  
<http://web.mit.edu/insong/www/pdf/syl-poldata.pdf>
- 4- Jakulin, A., Buntine, W., Pira, T., & Brasher, H. (2009). Analyzing the U.S. Senate in 2003: Similarities, Clusters, and Blocs. Political Analysis, 17(3), 291-310. doi:10.1093/pan/mpp006



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# Appendices

## SIYASİ ANALİZCİ

Siyasi Görüşünüz: Tarafsız

Tahmin sonucu doğru muydu ?

EVET HAYIR

Peki doğru cevap hangisiydi?

AKP

CHP

MHP

HDP

İYİ

Tarafsız

## SIYASİ ANALİZCİ

Siyasi Görüşünüz: Tarafsız

Tahmin sonucu doğru muydu ?

EVET HAYIR

Peki doğru cevap hangisiydi?

AKP

KATKIDA BULUN

Paylaş 153

Merhabalar ben Siyasi Analizci!! Yunus Emre Gündoğmuş ve Uzun Çetin tarafından oluşturuldum, şu anda da karşınıza Enes Tuzlu'nun kodları ile geldim. Amacım aşağıdaki politik sorulara vereceğiniz cevaplara göre siyasal yöneliminizi tahmin ederek size en yakın partiyi önermek. Siyasal Bilimin Veri Bilimi ile buluştuğu bir yerdeyim ve sizlerden öğrendiklerimle kendimi geliştirmeye devam ediyorum. Umarım, kararsız seçmenlere yardımcı olabilirim ve Türkiye'nin politik iklimine farklı bir bakış getirebilirim. Kaynak kodlarıma ve araştırma projeme tıklayarak ulaşabilirsiniz

## SIYASİ ANALİZCİ



Tahmin sonucu doğru muydu ?

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## SIYASİ ANALİZCİ

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Paylaş 153

## SIYASİ ANALİZCİ



Tahmin sonucu doğru muydu ?

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## SIYASİ ANALİZCİ



Tahmin sonucu doğru muydu ?

EVET HAYIR

## SIYASİ ANALİZCİ



Tahmin sonucu doğru muydu ?

EVET HAYIR

Cinsiyetiniz



Yaşınız



Yaşadığınız Bölge



Eğitim Seviyeniz



Ekonomik Durumumuz Sizce İyi Mi?



Eğitimde Reform Gerekliyor Mu?



Özelleştirmeye Karşı Çıkar Mısınız?



İdam Cezası Gelmeli Mi?



Gazetecilerimizi Tarafsız Buluyor Musunuz?



22'den Sonra İçki Yasağını Destekliyor Musunuz?



Daha Laik Bir Devlette Yaşamak İster Misiniz?



Kürtaj Yasağını Destekliyor Musunuz?



Ohal Özgürlükleri Kısıtlıyor Mu?



Meclese Yeni Bir Partinin Girmesini İster Misiniz?



# Appendices

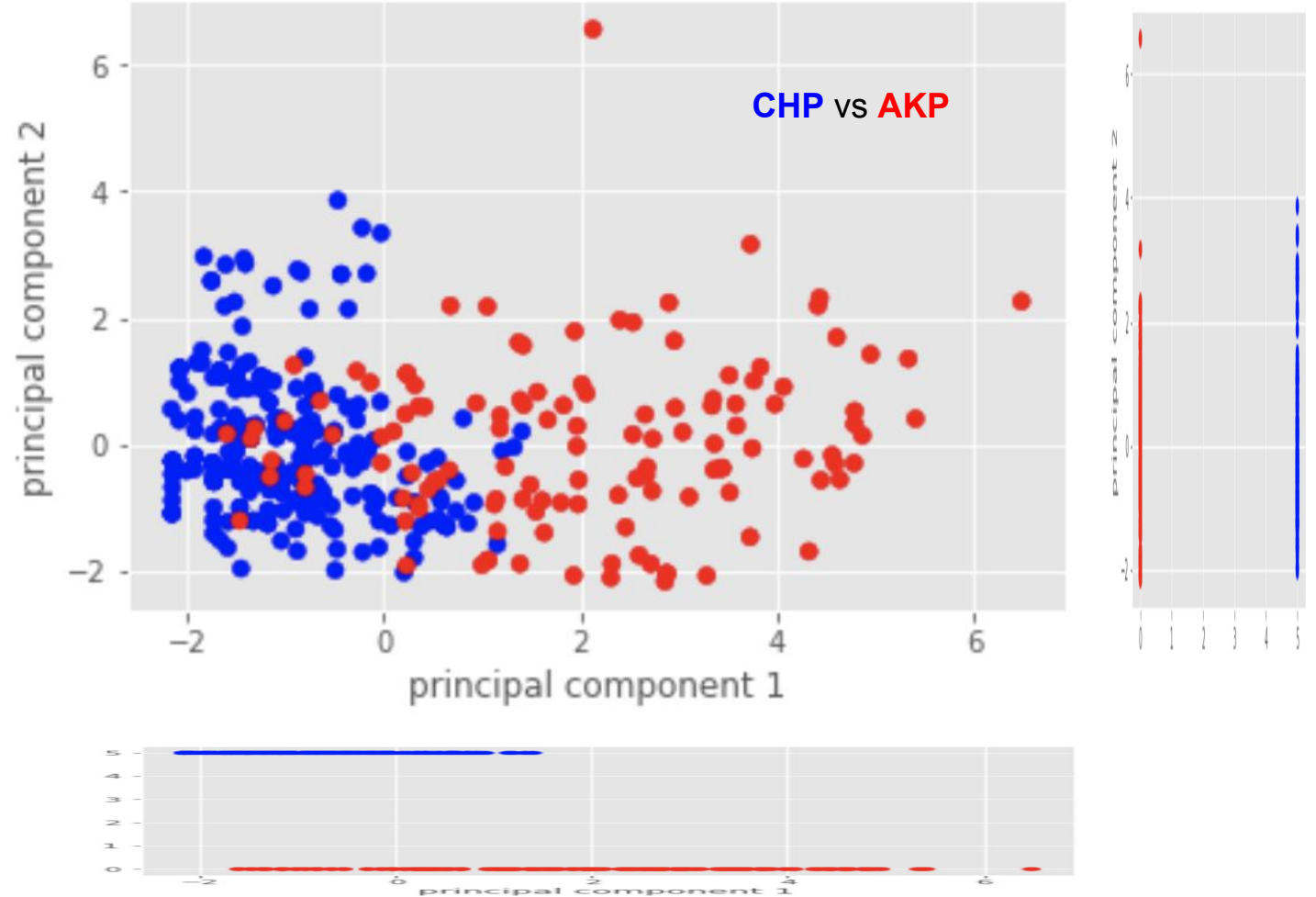
## Positively Correlated features with the principal component:

- 'Support\_Death\_Penalty',
- 'Alcohol\_Prohibition',
- 'Abortion\_Ban'

## Negatively Correlated Features

- 'More\_Secular',
- 'Restricted\_Freedoms',
- 'Support\_New\_Party']

PCA analysis show that we asked only one question.



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