EITM and Comparative Politics

Afternoon Session

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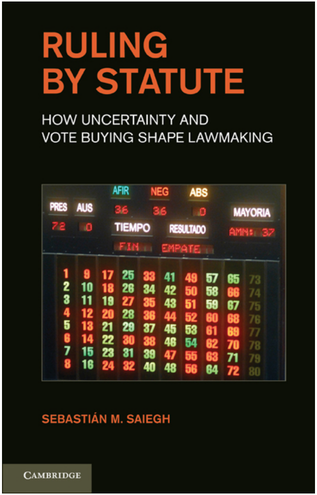
Comparative Politics: Theory and Inference

- Ruling by Statute (Saiegh 2011)
  - Agenda-Setting under Uncertainty
- Electoral Fraud (Cantú and Saiegh 2011)
  - Unobservability


RULING
BY STATUTE
HOW UNCERTAINTY AND
VOTE BUYING SHAPE LAWMAKING
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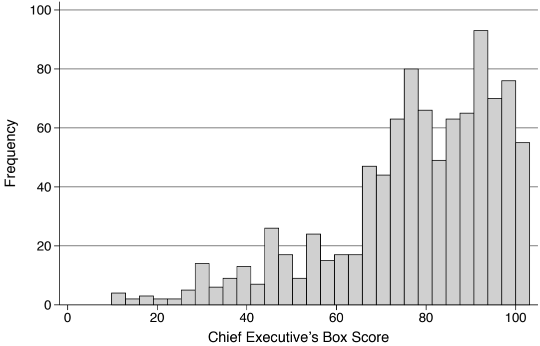
Ruling by Statute: Motivation

Given their proposal powers, chief executives should always win.



In practice, however, they experience numerous defeats.

Ruling by Statute: Main Argument

- Legislative defeats are associated with situations where chief executives cannot fully predict legislators' voting behavior.
- The source of the uncertainty is the existence of cross-pressured legislators.
- A government may try to handle the effects of cross-voting with "deep pockets" or "big sticks."
- But, if the total cost of securing these votes exceeds the value of policy change, it may be better off by conceding defeat.

Decisiveness, Bribes, and Voting Coalitions

Vote-buying opportunities depend on the properties of statutes, and the manner in which they are produced.

- Legislation possesses the characteristics of *public goods*.
- The gains (losses) are not confined to those who voted on the winning (losing) side.
- The exception are legislators who can unilaterally change the outcome.

A strategic chief executive should buy enough votes to ensure that no legislator is "decisive."

Model: Setup

Executive is a single actor.

- Its objective is to alter the status-quo (defeats are costly).
- Has a fixed budget to induce the legislature to adopt bill.

Legislature is composed by an odd number of legislators, $i = 1, 2, ..., n$ ($n \geq 3$).

- Each legislator may cast a vote $v_i \in \{yes, no\}$.
- Decisions are made using majority rule under *closed rule*.

Model: Setup (cont.)

Legislators belong to political parties. As such, they have an ideal policy that corresponds to their party's preferred alternative.

- But, legislators also care about their district's reaction to how they vote.
- They receive a sanction/reward depending on the districts' preferences.
- They can thus be ordered according to the intensity of their districts' preferences over the new policy.

For each legislator i, her *ex-post* utility from a particular vote is additively separable between: the chosen policy, bribes (if offered), and her district's reaction to how she votes.

Model: Setup (cont.)

The sequence of play is as follows:

1. *Bill Introduction*. The Executive sends a bill to the legislature without knowing the ideal policy of legislators' districts but has some prior on the distribution of districts' preferences over the new policy.
2. *Vote Buying*. Once the bill has been sent to the legislature, the legislators go to their districts and they come back with a particular mandate (d_i). With this knowledge, the Executive "counts noses" and may offer each legislator a schedule $\tau_i(v)$ of payments for voting for x^*.
3. *Legislative Voting*. Each legislator simultaneously casts a vote $v_i \in \{yes, no\}$. The Executive observes a voting profile v and delivers payments according to $\tau_i(v)$. The outcome x is determined by majority rule.

Equilibrium Outcomes without Bribes

Proposition 1. *A pure-strategy equilibrium outcome where the Executive offers no bribes and* x^* *wins exists. In every equilibrium, legislator* i *will never vote against her district unless her vote is pivotal*

> A government legislator will only take the "bitter pill" and vote contrary to her district's preferences when she is pivotal.

Winning Coalitions without Bribes

Comment 1. *In the absence of bribes, minimum-winning voting coalitions where the chief executive wins for sure only occur if* :

1. neither unconditional supporters nor unconditional opponents constitute a majority;
2. there are some potentially pivotal government legislators;
3. exactly one additional vote is needed to change the outcome;
4. there are no potentially pivotal nor unconditional supporters in the opposition.

Equilibrium Outcomes with Bribes

Proposition 2. *The Least Expensive Bribed Majority strategy that guarantees a victory to the Executive entails buying k or less votes.*

- Unlike Groseclose and Snyder (1996), vote-buying behavior does not result in supermajority coalitions.
- This result reflects the importance of legislators' voting motivations.

Equilibrium Outcomes with Bribes (cont.)

Comment 2. *in the presence of vote-buying, winning coalitions are either strictly minimal or they include* $(\frac{n+3}{2})$ *legislators.*

> Voting coalitions in support of x^* can be conformed by buying different types of legislators. And these costs depend on the realization of the the d_is.

Proposal Stage

Proposition 3. *The game has an equilibrium in pure strategies where the Executive sends a bill to the legislature and is defeated*

- The Executive will make less mistakes and be more successful when legislators' partisan identification is correlated with constituency interests.

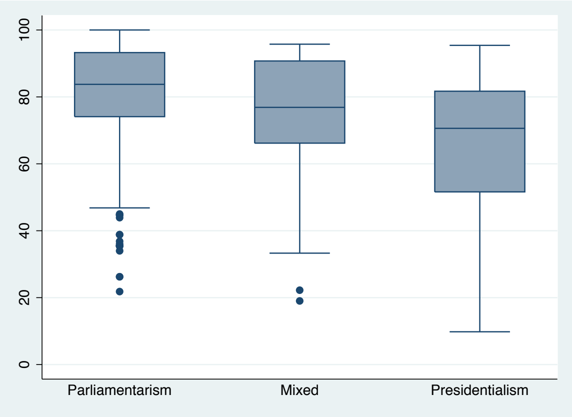
Measuring Chief Executives' Statutory Performance

How can one gauge a chief executive's effectiveness?

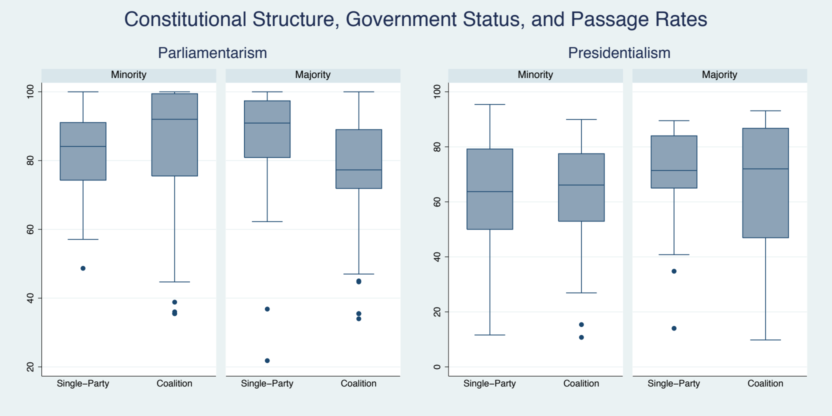
- *Box Score*: the percentage of executive initiatives approved by the legislature.
- Analogous to a batting average (i.e. number of hits as a proportion of times at bat).

As such, it summarizes a chief executive's record of wins and losses.

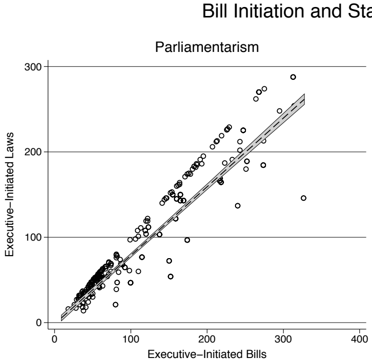
Empirical Patterns



Empirical Patterns (cont.)



Empirical Patterns (cont.)



Legislative Performance: A Sabermetric Approach

The comparative ability of chief executives to rule by statute depends to a great extent on circumstances that are not fully under their control.

- Examine the individual performance of chief executives once several contextual factors are taken into account.
- Introduce a standard to evaluate chief executives' lawmaking abilities when legislators' voting behavior is unpredictable (outcomes are decided by chance).

Identify "Overachievers" as well as "Underachievers".

Uncertainty as Flipping Coins

In a 1984 paper, Hammond and Fraser propose the following:

- Suppose that legislators decide their votes by flipping unbiased coins.

Additional assumption: A majority of the chief executive's copartisans always have preferences identical to his/hers, and this party's majority will always vote in accordance with these preferences.

Flipping Coins: Example

The probability that a chief executive will be on the winning side can be illustrated with this example:

> A three-member legislature (composed of A, B, C) operates under majority rule. Legislator A is a copartisan of the chief executive. The probability that each legislator will vote yes is $\frac{1}{2}$. There are eight possible voting combinations. In six of them, the position of A prevails.

Therefore, the probability that the chief executive will "win" is $6 \times \frac{1}{8} = \frac{3}{4}$, or 75%.

Flipping Coins: Simulations

I explore the relationship between party size and a chief executive's expected win rate in the following way:

- In any given roll call, each individual legislator can either vote "yes" or "no".
- The number of "yes" votes from a party in a series of coin flip roll calls will be binomially distributed.
- Therefore, we can simulate the results of a roll call by generating a series of binomially distributed random numbers.

Given a party size, these random numbers will produce a distribution of yes votes from the party which approximates the binomial distribution.

Flipping Coins: Simulations (cont.)

I simulated 5,000 roll calls for a 100-member legislature, using different sizes for the chief executive's party as inputs.

For example, in a legislature where the party of the chief executive holds 45 seats and the opposition controls the remaining 55 seats, the chief executive won 3705 of the votes (74%).

When the party of the chief executive holds 55 seats and the opposition controls the remaining 45 seats, the chief executive's passage rate was 76%.

Armed with these numbers we can evaluate the actual performance of chief executives.

Expected and Actual Performance: Results (cont.)

Table 6.2. *Simulated and actual passage rates*

Seats	Simulated Values	Actual Values		
	Mean	Mean	Std. Dev.	Obs.
5	57.56	56.40	22.65	25
10	61.06	66.31	22.58	62
15	63.44	72.63	18.85	57
20	66.48	75.15	17.51	56
25	66.90	74.54	21.27	101
30	69.12	70.69	24.08	129
35	70.2	69.32	22.55	103
40	71.26	72.92	17.38	113
45	74.1	74.80	16.25	255
50	75.62	77.93	16.54	362
55	76.26	82.33	15.88	246
60	79.74	86.79	11.71	69
65	80.54	87.91	11.80	22
70	81.80	88.61	14.92	41
75	82.42	89.85	15.35	30
80	85.80	95.06	3.70	7
85	87.6	n/d	n/d	n/d
90	90.22	n/d	n/d	n/d
95	92.28	n/d	n/d	n/d
100	100	n/d	n/d	n/d

Beyond Randomness

Having identified what can be inferred simple on the basis of ignorance, we can now specify the extent of new information.

> In particular, once we take into account some broader institutional factors affecting the statutory process, we can make more precise predictions and a correct interpretation of luck and of political prowess.

The goal is to identify "league" and "team" effects to isolate the performance of individual chief executives.

Predicted Box Scores: Statistical Model

Logit transformation of the box score ($LNBOX = ln\ (\frac{BOX_ijt}{1-BOX_ijt})$) and then use OLS.

- $DIFSIZE_{ijt} = AVSIZE_i - SIZE_{ijt}$, where $AVSIZE_i$ measures the average number of seats held by the party of the chief executive in country i for all the chief executives in all the periods in the sample, and $SIZE_{ijt}$ is the actual share of seats controlled by the party of chief executive j in country i at time t.

The model specification is thus:

$$LNBOX_{ijt} = \sum_{i=1}^{I} \alpha_i\ COUNTRY_i + \beta' DIFSIZE_{ijt}$$

where I is an index identifying each country and the $\alpha_i s$ are the country specific constants.

Predicted Box Scores: Ranking of Polities

Values above (below) unity indicate that the predicted box scores in the country are higher (lower) than the average:

United Kingdom: 3.551^{**} (0.141)

Israel: 2.084^{**} (0.331)

France: 1.551^{**} (0.137)

Italy: 1.454^{**} (0.124)

Belgium: 1.048^{**} (0.159)

Venezuela: 0.881^{**} (0.148)

Chile: 0.698^{**} (0.256)

Argentina: 0.568^{**} (0.197)

Turkey: 0.394^{*} (0.197)

Ecuador: -0.397^{*} (0.191)

Ranking of Chief Executives (cont.)

The estimation results also allow us to evaluate the individual performance of particular chief executives.

- To rank the performance the individual chief executives I use the residuals generated by the model and calculate the difference between a chief executive's actual box score in a given year and his/her predicted performance.
- Namely, their performance once the average effect of the size of their legislative party and country characteristics are taken into account.

Therefore, the most "successful" chief executive in a given country is the one who exhibits the greater "unexpected" performance.

Ranking of Chief Executives (cont.)

Table 1: Ranking of Chief Executives

Country	Year	Chief Executive	Pred. Box Scr.	Act. Box Scr.	Cty. Avge.	Seats	Regime
Argentina	1984	Raúl Alfonsín	64.00	78.20	63.19	50.98	Presid.
Brazil	1995-97	Fernando Henrique Cardoso	43.27	70.70	54.18	12.08	Presid.
Chile	1990	Patricio Aylwin	66.92	86.30	65.90	31.67	Presid.
Colombia	1983	Belisario Betancur	48.08	72.00	50.80	41.21	Presid.
Ecuador	1985	León Febres Cordero	37.06	64.70	41.90	12.86	Presid.
Israel	1978-80	Menachem Begin	88.50	90.60	88.23	35.83	Parliam.
Belgium	1984	Wilfried Martens	73.83	88.10	73.02	20.28	Parliam.
France	1959	Michel Debré	84.80	98.00	79.02	42.58	Mixed
Germany	1973	Willy Brandt	76.92	82.80	76.62	46.37	Parliam.
Italy	1985	Bettino Craxi	73.21	92.00	75.90	11.59	Parliam.
Poland	1994	Waldemar Pawlak	57.60	66.18	60.35	10.50	Mixed
Spain	1997-99	José María Aznar	83.13	89.50	83.61	44.57	Parliam.
Turkey	1984-86	Turgut Özal	63.17	80.90	58.45	52.89	Parliam.
United Kingdom	1965	Harold Wilson	96.94	98.50	96.45	50.31	Parliam.

Buying Legislators

Records of monetary payments made to members of the legislature in exchange for their support seldom exist.

- I examine two historical cases where they do exist : England under George III and Perú under Alberto Fujimori.
- The empirical evidence reveals that the amount paid in bribes by these governments were not excessively large.

The pattern of bribes in these two countries also validate the idea that when governments engage in vote buying, winning coalitions will not be oversized.

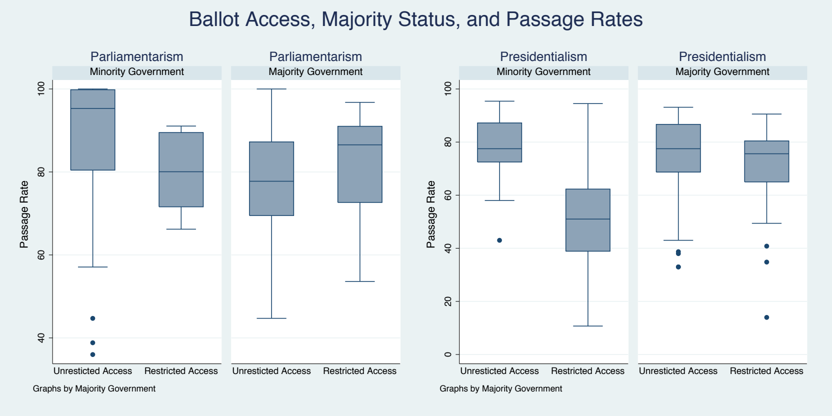
Ballot Access and Lawmaking

Governments with institutionalized party systems can employ a variety of institutional tools to obtain party loyalty:

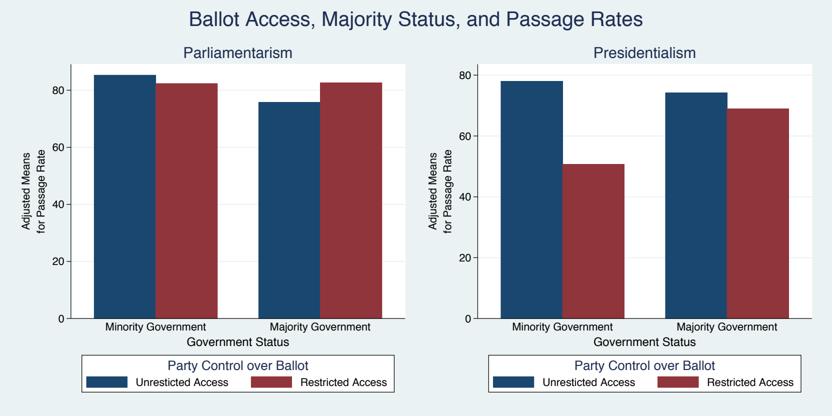
- Party leaders can exert influence on legislators' behaviors by two avenues:
  (1) the prospect of nomination;
  (2) ideological screening.

Low party unity can deprive the chief executive of support from members of her own party; but may allow the formation of policy coalitions with dissenting opposition legislators.

Ballot Access and Lawmaking (cont.)



Ballot Access and Lawmaking (cont.)



Cantú & Saiegh

- How can we distinguish an electoral landslide from a stolen election?
- The operational problem is the lack of reliable information (governments seldom advertise that they've cheated).
- An appealing option is to examine the distribution of the digits in reported vote counts to detect fraudulent practices.
- However, such approach has some important drawbacks.

Research Strategy

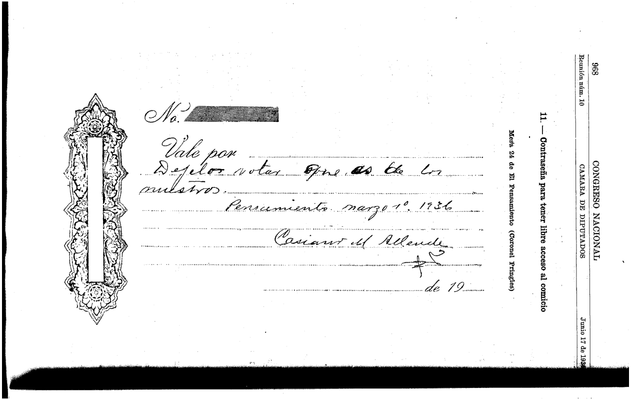
- Generate synthetic data to train a fraud detection prototype.
- Use a naive Bayes classifier as our learning algorithm and rely on digital analysis to identify the features that are most informative about class distinctions.
- Evaluate the detection capability of the classifier with district-level vote counts in the province of Buenos Aires (Argentina) between 1931 and 1941.

Authentic Data

District-level vote counts in the province of Buenos Aires between 1931 and 1941.

- The became known in Argentine politics as the "infamous decade.":
  - Two-party competition: Conservatives and Radicals.
  - Fraudulent practices were committed throughout the province
  - Conservatives used violence and intimidation to disenfranchise Radicals.

Authentic Data (cont.)



968 CONGRESO NACIONAL
Reunión núm. 10 CAMARA DE DIPUTADOS Junio 17 de 1936

11. — Contraseña para tener libre acceso al comicio

Mesa 24 de El Pensamiento (Coronel Pringles)

No. [redacted]

Vale por
Dejelos votar que es de los
nuestros.
Pensamiento marzo 1°. 1936
Casiano del Allende
de 19

Written authorization to access a polling station.

Authentic Data (cont.)

Table 1
Elections in the Province of Buenos Aires (1931-1941)

	Obs.	Mean	Std. Dev.	Min	Max
1931					
UCR	100	1672.81	1007.76	262	4636
Conservatives	100	1384.30	778.01	339	4081
1935					
UCR	100	1057.08	957.458	40	4641
Conservatives	100	2099.71	1332.41	554	6772
1936					
UCR	100	1212.42	965.89	81	5060
Conservatives	100	1689.55	1094.59	395	5576
1940					
UCR	100	1874.02	1246.69	264	6103
Conservatives	100	1470.81	896.30	411	3998
1941					
UCR	100	1292.91	911.17	224	4979
Conservatives	100	2079.20	1372.76	450	6393

It is tempting to claim that Conservatives won through fraud.

Synthetic Data

- We generate vote counts for 100 simulated districts, each containing two competing parties, $i \in \{A, B\}$.
- The total number of votes for party i in each district is determined by:

$$V_{ij} = \alpha_i X_{ij},$$

  where α_i represents the baseline support for party i across all districts, and X_{ij} is a random variable having Benford's distribution: $X \leftarrow \lfloor 10^U \rfloor$, where $U \sim U(0, 1)$.
- Benford's law specifies that in a collection of numbers, the first possible digits should not occur with equal frequency.

Synthetic Data (cont.)

- Fraud is simulated in the following way:
  - In each district, we take away a fixed proportion γ of party A's votes and give $\delta(\gamma V_{Aj})$ votes to party B (with $\gamma > 0$, $\delta > 0$).
- We set $\gamma = \delta = 0$ to simulate a clean election.
- For example, consider $\alpha_A = 400$, $\alpha_B = 320$, $X_A = X_B \approx 2$, $\gamma = 0.3$, and $\delta = 1.2$:
  - Without fraud, party A would win in that district (with 800 over 640 votes).
  - However, if fraud exists, $V_A = (800) * (.7) = 560$ and $V_B = (640) + [(1.2) * (.3) * (800)] = 928$.

Synthetic Data (cont.)

- We generate 10,000 electoral contests. Each one is treated as a Bernoulli trial with probability of success/failure, $p = .5$.
- For each contest, we record the values of two variables:
  1. The mean of the first digit of party i's votes in every district.
  2. The frequency of the number 1 as the first significant digit of party i's votes in every district.
- To distinguish between legitimate and fraudulent elections, we also record the outcome of each Bernoulli trial.

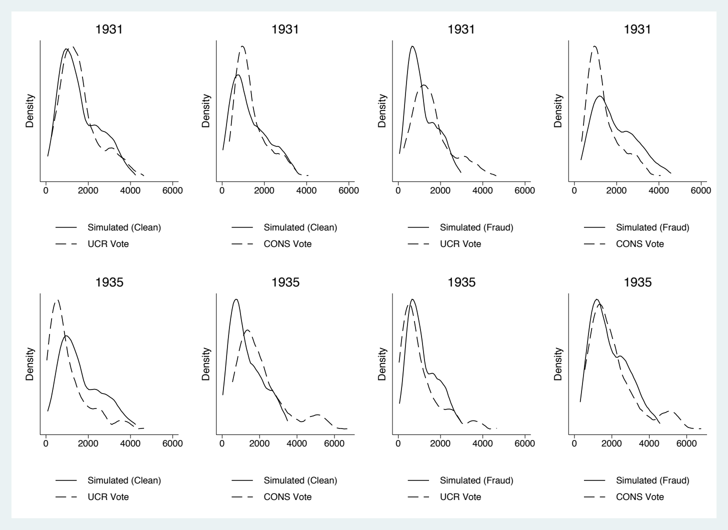
Calibration

To ensure that the synthetic data are representative, we calibrate our simulations using the 1931 and 1935 elections:

- Find values of α_A, α_B and the *fraud* parameters, γ and δ.
- We compare the electoral returns of party A and the Radicals (the victims of fraud), and party B with the Conservatives using a two-sample Kolmorov-Smirnov (K-S) test.

The results suggest that $\alpha_A = 400$, $\alpha_B = 320$, $\gamma = 0.3$, and $\delta = 1.2$ provide the best fit between the simulated and real data.

Calibration (cont.)



Classification using Naive Bayes

- The classification problem consists of finding the class with maximum probability given a set of observed attribute values.
- Following Bayes' theorem, the posterior probability of class y can be written as:

$$p(y|\mathbf{x}) = \frac{p(y)}{p(\mathbf{x})} \prod_{i=1}^{m} p(x_i|y),$$

- Independence rarely holds in real-world applications; yet NB is accurate and efficient even if this assumption is violated.

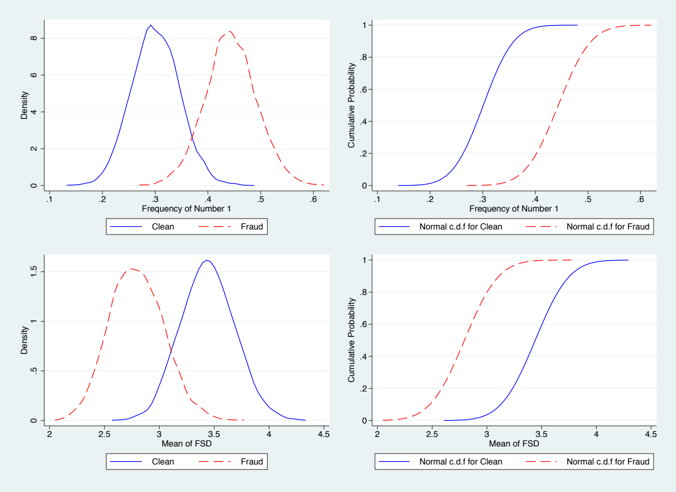
Estimation and Performance

- From an estimation viewpoint, the goal is to estimate a function of the form $p(class|\mathbf{x}) = f(\mathbf{x})$.
- For our two-class-problem, we can simply use logistic regression.
- The overall correct classification rate is 94.28% (and, the probability of a false negative is just 5.87%).

Classification of Real Elections

- We turn now our attention to the elections in Buenos Aires:
- Use the class-conditional densities from our training set and combine them with the real data.
- Suppose that the random variable x_i is the mean of the FSD. We can calculate $F(3) = p(x_i \leq 3)$ for both the fraudulent and non-fraudulent groups.

Classification of Real Elections (cont.)



Classification of Real Elections (cont.)

- The historical evidence suggests that the Conservative party was the beneficiary of fraudulent practices.
- Hence, for each election, we calculate our two feature variables based on the first significant digits (FSD) distribution of the votes of the Conservative party.
- For instance, in the 1931 elections, the frequency of the number 1 is 0.4, and the mean of the FSD is 3.77.

Classification of Real Elections (cont.)

- The probability that the 1931 election was clean is thus:

$$\frac{p(c)p(x_1 \leq 0.4|c)p(x_2 \leq 3.77|c)}{p(c)p(x_1 \leq 0.4|c)p(x_2 \leq 3.77|c) + p(c')p(x_1 \leq 0.4|c')p(x_2 \leq 3.77|c')},$$

  where x_1 denotes the frequency of the number 1, and x_2 denotes the mean of the FSD.
- Given a prior assignment of probabilities $p(c) = p(c') = \frac{1}{2}$, the probability is equal to:

$$p(c|\mathbf{x}) = \frac{(.5)(1)(.9108)}{(.5)(1)(.9108) + (.5)(.1954)(1)} \approx 0.823$$

Classification of Real Elections (cont.)

Table 4
Classification of Buenos Aires' Elections (1931-1941)

Election	$p(clean) = p(fraud)$	$p(clean\|\mathbf{x})$	$p(fraud\|\mathbf{x})$	$log\frac{p(y=1\|\mathbf{x})}{p(y=0\|\mathbf{x})}$	Classification
		Validation Set (Seed Data)			
1931	0.5	0.823	0.176	-1.539	Clean
1935	0.5	0.054	0.945	2.845	Fraudulent
		Test Set			
1940	0.5	0.756	0.243	-1.135	Clean
1941	0.5	0.080	0.919	2.441	Fraudulent

Notes: This table reports the classification of the elections in our validation set (top panel) and in our test set (bottom panel) obtained using the NB learning algorithm.

Evaluation of Classifier's Performance

- All competing parties in the 1931 election agreed that it was a free, open, and honest contest (Walter 1985).
- The 1935 election was universally condemned as one of the most fraudulent in Argentine history (Bejar 2005).
- The elections of 1940 were the "... freest and most democratic since April 1931 ..." (Walter 1985).
- According to the *Review of the River Plate*, the 1941 election was full of irregularities.

Evaluation of Classifier's Performance (cont.)

Table 5 Error rates of fraud detection algorithms in previous research

Procedure	*Correctly classified* (%)	*False positives* (%)	*False negatives* (%)
1BL test	66.6	25.0	0.0
2BL test (Mebane 2008b)	50.0	0.0	50.0
Last-digit test (Beber and Scacco 2008)	50.0	0.0	50.0
Mean of SSD (Mebane 2008b)	25.0	25.0	50.0
Turnout and SSD (Mebane 2008b)	50.0	0.0	50.0
Turnout anomalies (Levin et al. 2009)	50.0	0.0	50.0

Our approach provides a more powerful classification algorithm.