



# 1988 Chilean Elections

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## Voting Intentions in Chile

Team 6  
Jason Andrew  
Carrie Boyle  
Greg Fries  
Ramana Reddy



# Agenda

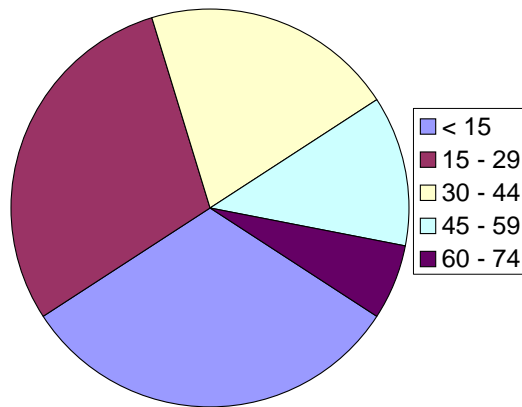
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- Background information-Carrie
- Data set-Jason
- Results of classification analysis-Ramana
- Implications of observations-Greg

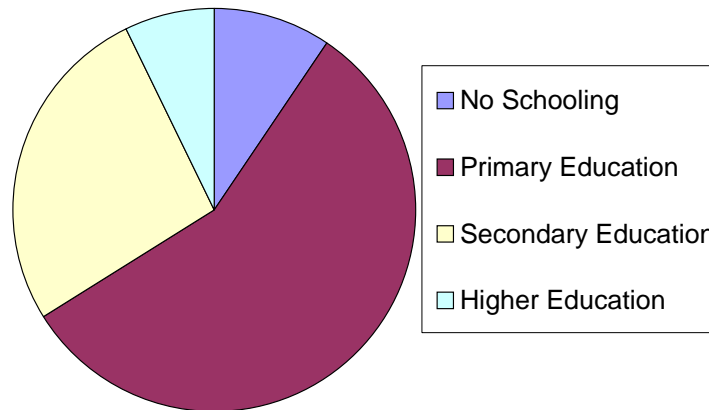
# Chile - at a glance

- 1988 Population (Approx 9M):
  - 80.8% Urban
  - 50.6% Female

Age Distribution



Education of citizens > 25 years





# Pinochet into power

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- 1970 Allende becomes world's first democratically elected Marxist Communist
- 1973 Allende assassinated in CIA backed coup (Operation Condor) => Pinochet into power as a dictator
- Pinochet moves to suppress all opposition
  - banning all other political parties
  - suspending labor unions
  - severe prosecution and abuse of dissident people / groups
- 1981 begins an 8 year term under new constitution : termed a "transition to democracy."



# Chile in 1998

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- Past economic prosperity due to effects of free market actions (Fastest growing economy in Latin America)
- Assassination attempt wounds Pinochet in 1986
  - Reacts through implementation of heightened repression
  - Active elimination of perceived enemies / threats
- 1988 recession and economic slowdown
- In 1988 there was a plebiscite to determine if Pinochet would be the only candidate on the ballot for the scheduled 1989 presidential elections.



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# Data Set

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- Independent Variables
  - Region-1 of 5 different regions in which voters reside
  - Sex – Either male or female
  - Age- Voter age range 18-70
  - Education-Primary, secondary or college
  - Income- Monthly income in pesos
  - Population- Size of voter's town
  - Scale for support of Status Quo – Distribution showing the interest in electing Pinochet to office
  - Response Variable- Voting Intentions
    - 1 = Vote for Pinochet
    - 0 = Not vote for Pinochet

# Data Set-2

Observation	Region	Population	Sex	Age	Education	Monthly Income in Pesos	Scale of Support For Status Quo	Voting Intentions
1	1	175000	1	65	1	35000	1.0082	1
2	1	175000	1	29	3	7500	-1.29617	0
3	1	175000	0	38	1	15000	1.23072	1
4	1	175000	0	49	1	35000	-1.03163	0
5	1	175000	0	23	2	35000	-1.10496	0

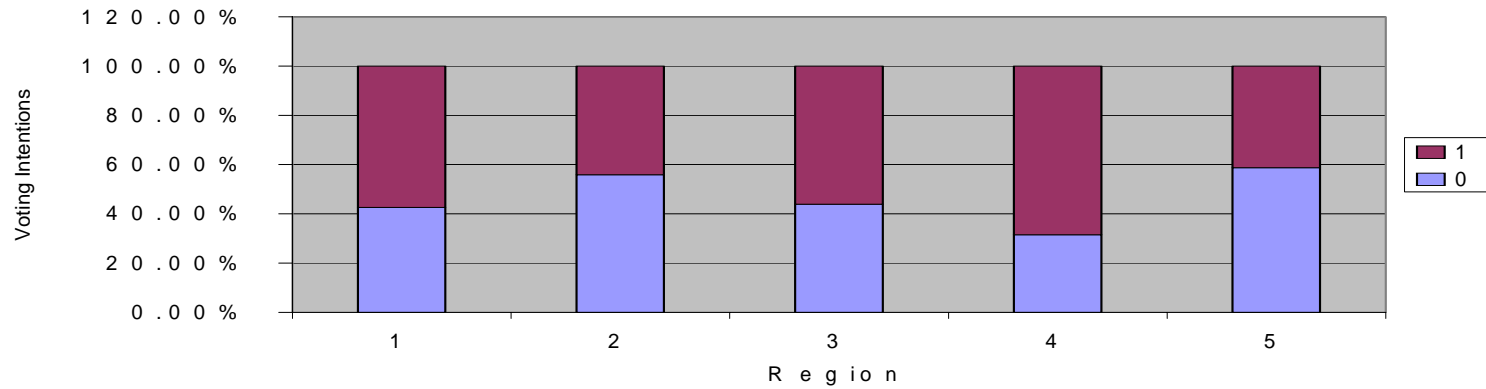
## Summary measures for selected variables

Count of Voting Intentions	Voting Intentions		
	0	1	Grand Total
Total	50.91%	49.09%	100.00%

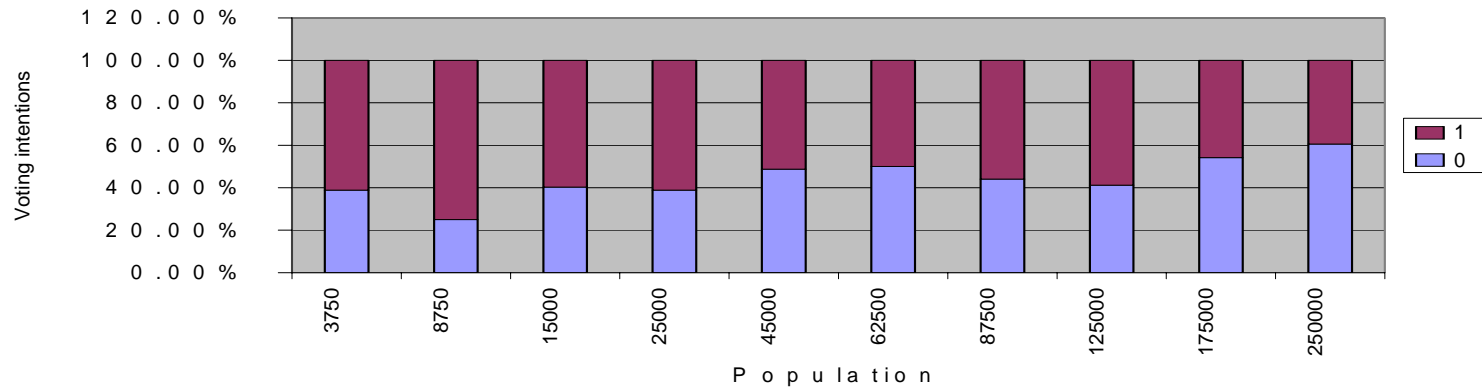
	Population	Age	ly Income in Pesos
Count	1703	1703	1703
Mean	150716.383	38.063	36837.933
Median	175000.000	36.000	15000.000
Standard de	101362.843	14.882	42849.858
Variance	10274425903.595	221.485	1836110322.870

# Histogram-Region, Population

Histogram - Region and Voting intentions

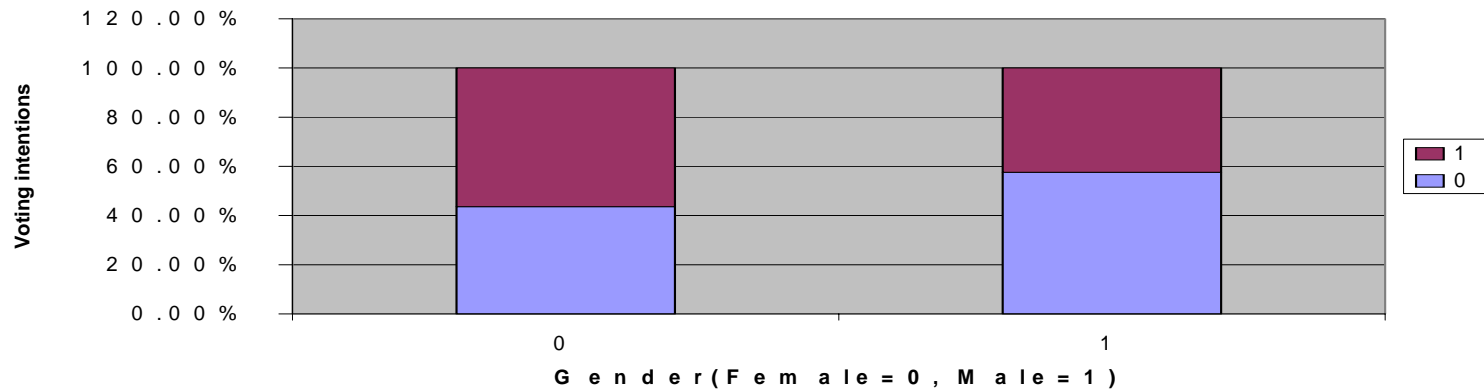


Histogram - Size of town and Voting intentions

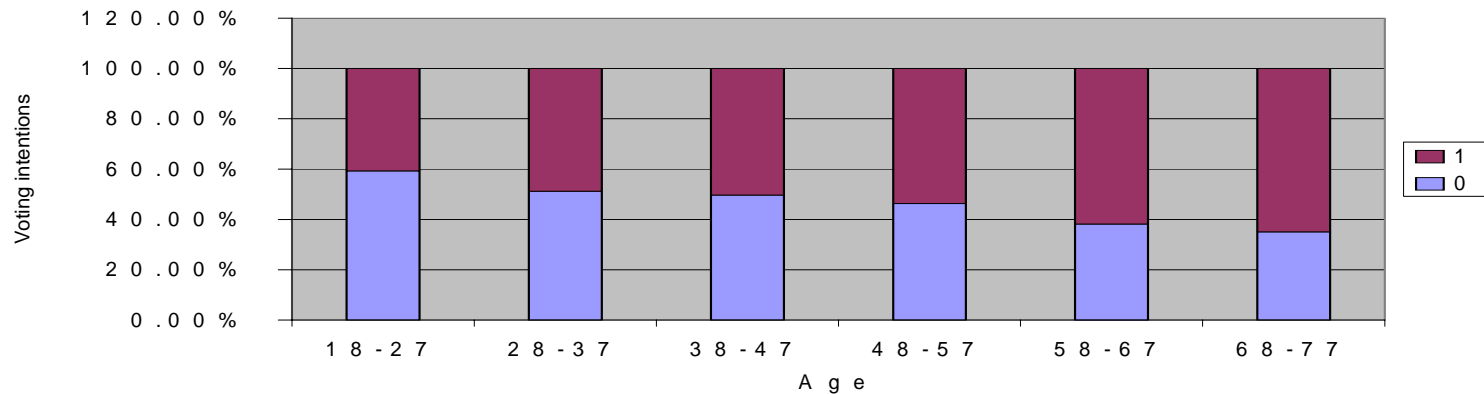


# Histogram-Gender, Age

Histogram - Gender and Voting intentions

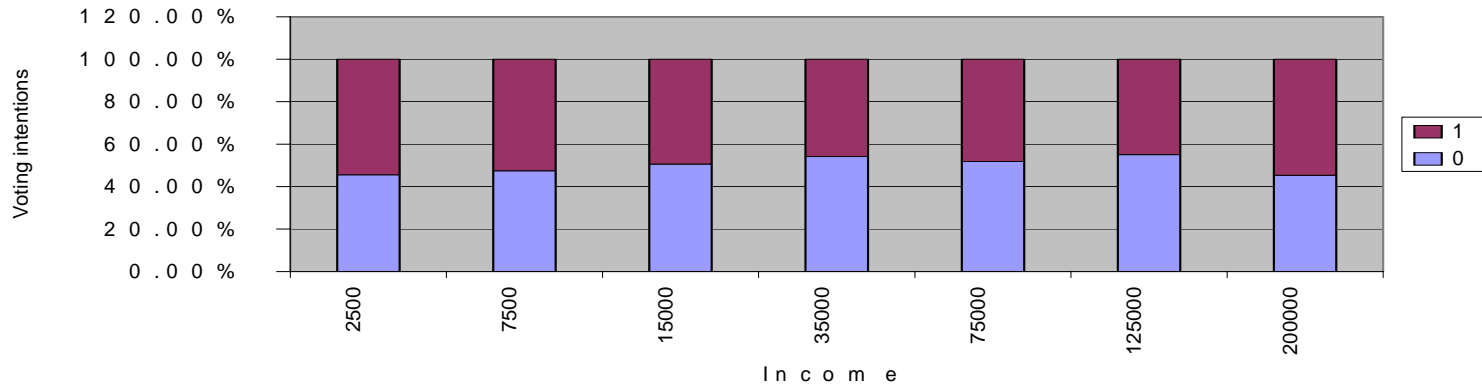


Histogram - Age and Voting intentions

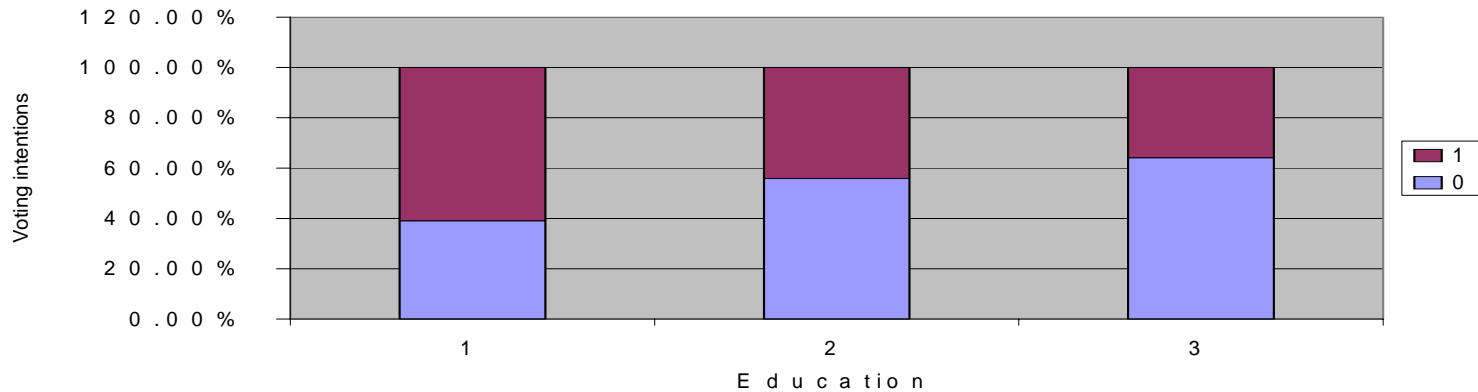


# Histogram- Education, Income

Histogram - Income and Voting intentions



Histogram - Education and Voting intentions



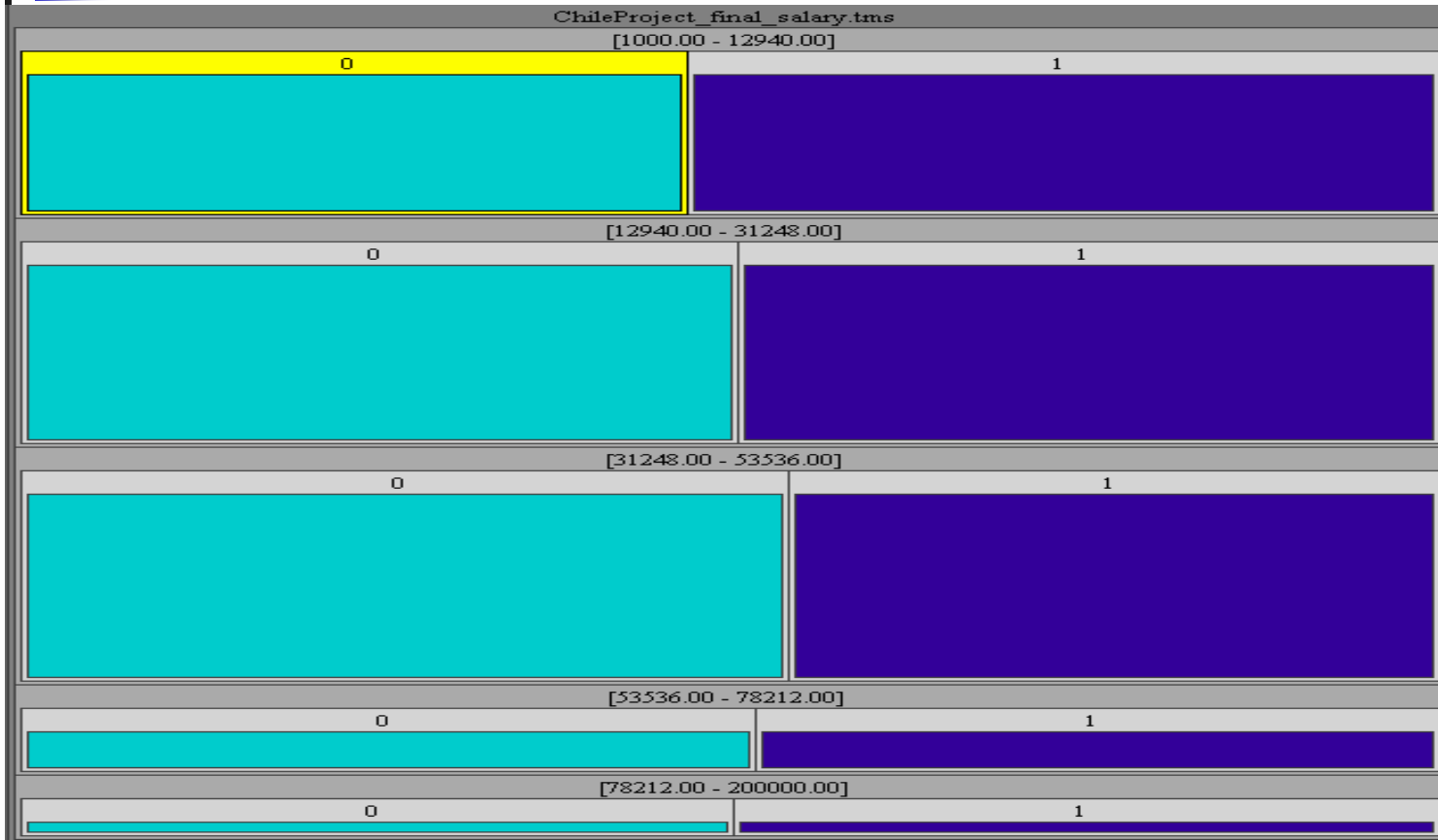


# Agenda

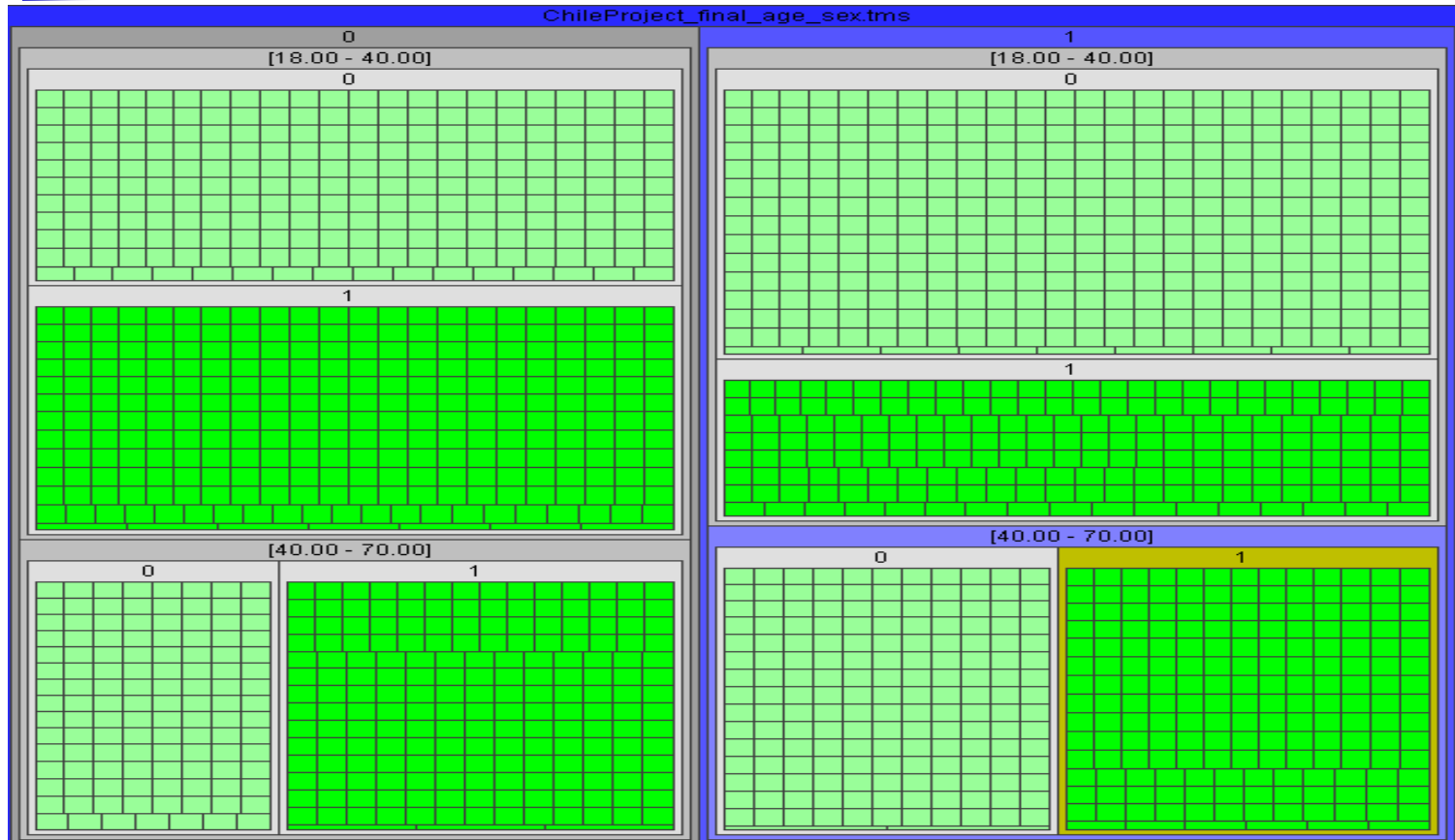
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# Treemaps- Income in pesos



# Tree maps-Age and Gender



# Logistic Regression-1

## The Regression Model

Input variables	Coefficient	Std. Error	p-value	Odds
Constant term	1.20883727	0.6810559	0.07590684	*
Population	0.00000025	0.00000176	0.88888592	1.00000024
Sex	-0.84168178	0.26564637	0.00153265	0.43098509
Age	0.00971053	0.00952775	0.30811548	1.00975788
Education	-0.47152871	0.20924494	0.02422907	0.62404758
Monthly Income in Pesos	-0.00000131	0.00000374	0.7259686	0.99999869
Scale of Support For Status Quo	3.24181342	0.19877215	0	25.58006859
Region_2	0.14804177	0.47848025	0.75701731	1.15956128
Region_3	-0.07577381	0.44338658	0.86430407	0.92702585
Region_4	0.98764652	0.76263785	0.19530642	2.68490815
Region_5	-0.26828936	0.49202079	0.58556062	0.76468647

Residual df	1011
Residual Dev.	418.1387634
% Success in training data	48.8258317
# Iterations used	9
Multiple R-squared	0.70475203

## Training Data scoring - Summary Report

Cut off Prob.Val. for Success (Updatable)	<b>0.5</b>
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Classification Confusion Matrix		
	Predicted Class	
Actual Class	1	0
1	461	38
0	38	485

Error Report			
Class	# Cases	# Errors	% Error
1	499	38	7.62
0	523	38	7.27
<b>Overall</b>	<b>1022</b>	<b>76</b>	<b>7.44</b>

# Logistic Regression-2

## The Regression Model

Input variables	Coefficient	Std. Error	p-value	Odds
Constant term	1.68979692	0.35876304	0.00000248	*
Sex	-0.84613621	0.26405361	0.00135339	0.42906958
Education	-0.57141918	0.176743	0.00122476	0.56472343
Scale of Support For Status Quo	3.20752907	0.19033186	0	24.71793175

Residual df	1018
Residual Dev.	422.4872437
% Success in training data	48.8258317
# Iterations used	9
Multiple R-squared	0.70168161

## Training Data scoring - Summary Report

Cut off Prob.Val. for Success (Updatable)	0.5
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Classification Confusion Matrix		
	Predicted Class	
Actual Class	1	0
1	462	37
0	35	488

Error Report			
Class	# Cases	# Errors	% Error
1	499	37	7.41
0	523	35	6.69
Overall	1022	72	7.05



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# Summary of the results

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- Correlation tables showed:
  - Strong relationship between:
    - Education and Income
    - Population and Income
  - Weak relationship between:
    - Age and Income
    - Income and Gender
- Logistic Regression
  - Education and gender most useful predictors of voting intentions
  - The odds of a female voting for Pinochet is 2.33 times the odds of a male voting for Pinochet of the same age and education.
  - If an individual's education increases by 1 (primary to secondary, secondary to post-secondary) the odds that they will vote against Pinochet will increase by 1.77 times holding everything else constant.



# Interpretations of Results

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- Higher income educated individuals tended to live on more populated cities.
- Suggestions of middle class factor:
  - Relationship between Income, Education, and Vote
  - Lack of utility in using Income in regression model.
- Educated Females seemed to be the swing factor
- No one clear model can completely explain voter intentions.



# Historical results

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- 54.7% to 43% voters reject extension
- 1989 election results:
  - 7.1 M votes
  - Patricio Aylwin 55.3%
  - Hernan Buchi 29.4%
  - Francisco Errazuriz 15.4%
- Pinochet retains control over Army
- 1998 Pinochet arrested in UK on crimes against humanity.



# Historical Interpretations

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- The effect on women during early Pinochet regime:
  - “Mothers of the disappeared” – children taken from prisoners
- Pinochet and Chicago Boys “shock treatment” began in 1975. Chile experienced a short lasting economic turnaround until mid 1980s.
- During recession Pinochet reinstated repressive measures
- Many historians cite:
  - Economic recovery in late 80s as reason vote allowed
  - Recent government repressive actions caused a middle class backlash



# Logistic Regression-2

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## Validation Data scoring - Summary Report

Cut off Prob.Val. for Success (Updatable)	0.5
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Classification Confusion Matrix		
	Predicted Class	
Actual Class	1	0
1	307	30
0	25	319

Error Report			
Class	# Cases	# Errors	% Error
1	337	30	8.90
0	344	25	7.27
Overall	681	55	8.08