
THE SOCIO- ECONOMIC DETERMINANTS OF VOTING BEHAVIOR IN VERACRUZ, MEXICO

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ABSTRACT

This paper proposes to look which are the conditions that influence the Mexican population from Veracruz State to define its tendency to vote; as well, we will find which of them are related with the participation, the change of vote, and with the cancellation of the vote between election and another (2006 and 2012).

RESUMEN

Esta tesis se propone encontrar cuales son las condiciones que influyen la población Mexicana del estado de Veracruz para definir su tendencia de voto. Así mismo, encontraremos cuales están relaciones con la participación, el cambio y la anulación del voto en las elecciones del 2006 y 2012.

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PROBLEM STATEMENT AND PURPOSE OF RESEARCH

INTRODUCTION

The increased electoral competition and the evolution of the party system in Mexico have been accompanied by crystallization from political-ideological tendencies of Mexicans. The paper review indicated that there is an ideological configuration linked to demographic and socioeconomic factors, therefore, voting reflects the way in which individuals establish partnerships between their positions on issues of conflict and political orientation. We focused on Veracruz state and in 2006 and 2012 presidential elections.

We applied a logistic regression model to determine exactly which factors were important to a particular party (or candidate) for to win the election, finding the variables given by socio-demographic characteristics of the voters of a municipality, followed by a linear regression model to find which determine the cancellation of the vote. The third model was the factor analysis, used to observe graphically the distribution of this variables.

For presidential elections we took as a geographical unit of observation the municipality, whose election results are generated by the Federal Electoral Institute (IFE, 2006-2012). Socioeconomic and demographic data belong to the results of the General Census of Population and Housing, 2010 Generated by National Institute of Statistics, Geography and Informatics (INEGI, 2010).

OBJECTIVES

The main objective of this thesis is to verify the effects that socioeconomic variables has on electoral results in the state of Veracruz in Mexico. There are mainly two ways for the analysis of this study, one will try to find the aspects that a party may search in a population so they vote for them in future elections and the second way, is to find the socioeconomic aspects of the populations and analyze them. The objectives are highlighted below:

- 1) Make a state-of-the art review of studies conducted in the field of socioeconomic variables and elections
- 2) To find correlations between socioeconomic variables and winning parties in electoral years

RESEARCH QUESTIONS

The research questions that seek to address the objectives outlined above are:

- 1) What kind of studies has been made to study the correlation between socioeconomic variables and elections? What kind of further studies can be done? What this thesis can give to this kind of studies?
- 2) Is there a relationship between how the vote will turn, due to the socio-economic conditions of the people?
- 3) What makes people change vote? What make them not to vote? What makes them cancel their vote?

THE SOCIO-ECONOMIC DETERMINANTS OF VOTING: LITERATURE REVIEW

STATE –OF- THE ART ANALYSIS

Throughout history, there have been several studies to understand the influence of the economy and society in politics. This goes back to the 18th and 19th centuries in the United Kingdom and the United States. Modern scientific analysis of voting behavior does not begin until the middle of this century with the works of Kramer (1971) and Goodhart and Bhansali (1970). These studies represent the first attempt to analyze the performances of the electorate, both individual and aggregate level, from behavioral model of Downs' Rational Voting Behavior's Theory (1957), currently, the dominant theory.

In this theory, one of the main challenges of political science has been to identify and quantify the factors that determine the choice of the electors to vote or not vote for a particular party or candidate. The basic postulate of rational theory states that the decision to vote is strongly determined by the economic conditions of the voter. That is, the voters vote for the candidate or party that represents their interests and improve their welfare condition. This implies that the economic rationality of voters is more important than political ideology.

A select review of the literature from transitional voting systems like Mexico's reveals numerous components that influence voter decisions in presidential elections.

The factors on the economics axis are more important to voters than those located in the liberal-conservative axis (Pacheco 2005). Therefore, the focus of this paper is to look mainly for socio-economic data.

Before choosing which candidate or party to vote, the voter has to decide whether vote or not vote. Miller and Shanks say, for example, "It is not difficult to understand why the majority of abstainers do not vote, they are not interested, informed or involved in politics. One can also understand why people who have never seen a football game does not play football, or why someone who has never heard an opera, not sing an aria opera. The real question is why many disinterested, uninformed and out of politics citizens bother to vote".

Another block that is also prevalent among abstainers, are the null votes, another segment that is interesting to analyze. In this paper we will focus on analyzing the socio-economic relationship with the segment of the population who chooses not to vote or cancels its vote.

DESCRIPTION OF PARTIES

PAN. National Action Party

National Action Party (PAN): PAN is founded on the basis of a principle: "first to educate, to win power afterwards". It defines itself as "Humanist and Reformer center", belongs to the Democratic International Center. It is a party of small numbers rather than a party of masses. Founded in 1939, conservative and Christian Democrat, after 61 years of existence, it stepped over the loyal opposition to get the power, achieving the first president from within its ranks, in 2000, Vicente Fox. On December 2006, again, from the PAN, Felipe Calderon took power and began the second presidential term of the party. Calderón proposed to deal with a war against organized crime. In 2012, the PAN lost the presidency, the PRI retrieved it again.

APM. Coalition Alliance for Mexico (PRI, PVEM)

Institutional Revolutionary Party (PRI): This party currently has the Presidency of the Republic (2012-2018), with Enrique Peña Nieto as the president. The party proclaimed itself to continue the principles of the Revolution of 1910. This party ruled Mexico for 71 uninterrupted years in the Presidency of the Republic. It was founded as PNR (National Revolutionary Party) in 1928, and later renamed as PRM (Mexican Revolution Party), to finally, in 1945, get the name it has today. The party was restructured with the sectors that integrated the society as a whole: the farmers, the workers, and later, the military. The strength of the party was that it did not exclude the masses emerging from the quick processes due to the population growth: mass migration from the countryside to the city, and the redefinition of the economy. Since the eighties, it has tended more toward neoliberalism. It defines itself as a party of social democracy.

Green Party of Mexico (PVEM or Green): It was founded in 1986 with the name Mexican Green Party (MVP) by Jorge Gonzalez Torres. It is a party that proclaims the environmentalism as political ideology. It has participated in all presidential elections since 1994 in coalition with the PAN (2000) and PRI (2006, 2012). It is the fourth force in congress.

PBT Coalition for the Good of All. (PRD, Labor Party, Citizen Movement)

Party of the Democratic Revolution (PRD): In 1987, a detachment of a sector of the PRI took place, which proposed to form an opposition with ideas from the "left". This detachment was headed by the former governor of Michoacán, Cuauhtémoc Cárdenas, and by a former president of the PRI, Porfirio Muñoz Ledo, who managed to build a very heterogeneous coalition: the displaced people from the government party and the members from the old left, under the name of the National Democratic Front, which had Cardenas as its presidential candidate. In 2006 and 2012 elections, the PRD, led by Andres Manuel Lopez Obrador, lost the presidential elections by a narrow margin from the respective winners.

Labor Party (PT): It was founded in 1990, and first participated in the 1994 presidential elections. Socialistic-leftist, defines itself as a party of centralized democracy. It usually participates in the elections in alliance with the PRD (since 1997).

Citizen Movement: is based on the values and principles of social democracy. It is involved in the search and the consolidation of the new democratic State. Founded in 1999, with the name of Convergence by Democracy. In 2002, it was renamed to "Convergence" and in July 2011 became the Citizen Movement. A group from the PRD formed it. Nevertheless, it frequently forms coalitions with this party. In the elections of 2006 and 2012, it formed an alliance with the PRD and the Labor Party. When it was transformed into Citizen Movement, it agreed to provide 50% of their nominations to independent citizens to fight for causes that were in line with the ideals of the party.

PANAL. New Alliance

New Alliance (PANAL): was registered in 2005 and participated in the elections of 2006 and 2012. It retained its registration by getting more than 2% of the overall vote in those elections. On the 26th of February 2013 the PANAL suffered a big fall, by the arrest of its leader and founder Elba Esther Gordillo by diverting funds from the SNT (National Union of Workers).

DATA

DEMOGRAPHIC VARIABLES

The demographic data that was used was provided by the National Institute of Statistics and Geography (INEGI) federal census 2010 of Veracruz state.

The data was filtered by some indicators of poverty and development considered by the National Bank of Foreign Trade (BANCOMEXT). This way, we could find a way to quantitatively measure the "quality" of life in both years. Then, we can compare the demographic conditions with the voting trends of each municipality of Veracruz.

The indicators are the next:

- The current income (monetary and non-monetary)
- The rights of access to free of charge (or subsidized) governmental services or goods
- The property or rights of use of assets that provide basic services of consumption (basic heritage)
- The educational levels, abilities and skills.
- The time available for education, recreation, rest and housework.
- The property of non-core assets and borrowing capacity of the house.

We used the following variables to perform the study:

1. Total fertility rate
This rate answers to the question of how many children are women having on average during their reproductive years. It is a reflection of the public policies of fertility and health campaigns.
2. Incomplete Education in people 15 years old or more
It is estimated that the transcendent level of education as a means to overcome poverty, and it is known that there is an association between low levels of educational attainment and low living standards.
3. Illiterate Population in people 15 years old or more
Illiteracy usually represents a low level of access to information and a lower quality of life, limits the development of basic skills and consequently generates poverty.
4. Literate Population
Counting with basic skills to read, writing and counting allows people to have access to better paying jobs and indicates the public policies to promote the intellectual growth of the people. In this way, it is an important measure to watch the development of people.
5. Urban Population
The industrialization of Mexico produced a growth in the urban population; that is to say, the presence of people who are socially conformed in urban groups is representative of the economic development of a municipality. The urban population is dedicated to tertiary activities, which are better paid. On the other hand, according to the BANCOMEXT,, in the urban areas is where poverty grows mostly due to the fluctuations of the crisis, which places them at greater risk of falls in poverty measured by income. Consequently, it is a good indicator and reflects the economic policy of a locality.

6. Rural population
The rural population is dedicated to primary activities that are usually not well paid. It is known that in the rural areas is where poverty, measured by income, is mostly found. The problem is structural in nature, i.e. it is not enough that the economy grows for the poverty to get reduced. Thus, it is a good measure of the life quality of a municipality.
7. Semi-rural population
The semi-rural population is the one that is in a period of transition between rural and urban. It represents a mixture of two types of completely different life. It is, as well, an indicator that represents the development of towns.
8. Gross domestic product (GDP) per capita
In the classical economy, where economic growth has been central, GDP has been traditionally used to measure and has been used to measure the level of economic development of people. This same approach will be used in this work.
9. People without access to drinking water
Providing drinking water to a municipality translates into health benefits to its inhabitants, decreasing the incidence of disease and increasing productivity, among many other benefits to human health. Used as an indicator, the number of people who do not have access to drinking water denotes a large amount of things that are not useful in our study.
10. People without access to health service
Access to health has been seen as an aggressive form of combating inequality and poverty, since the quality of life is associated with the medical condition of the people and the great need to take a health legislation that promotes these aspects in the individuals of communities. The main services that promote the health services: the prevention of diseases, curing the patient and rehabilitation. In this way, the amount of people that do not have access to this human right tells us the economic, political and social development of a community.
11. Income measured in minimum wages
There are three variables related:
 - People who receive less than a minimum wage
 - People who receive from one to two minimum wages
 - People who receive two minimum wages or moreThe minimum wage represents the basic unit in the measurement of income. There is a direct relationship between the amount of wages and the progress or regress in poverty. In addition, the growth of wages contributes to reduce inequality and is related to the life quality that allows access to health, culture, and several opportunities. It is also known for the inverse relationship between productivity and minimum wage. The population distribution does not tell us about the socio-economic development of a municipality.
12. Population in marriage or union and resident couple
According to the National Social Policy Evaluation Board: "The physical environment in which people live has an influence on the quality of life, especially the space where the daily life and social environment is developed i.e. housing. Both the physical components of the house -its size, equipment, infrastructure and materials-such as family -relational, cultural and environmental- are critical factors in the process of personal training and adaptation to cultural and economic environment ". If a person is in bed (in case of an adult), or if a child lives in a house where their parents live together, their personal development will be different and will influence the individual's economic status and the opportunities in the present and in the future,

13. Overcrowding

The relationship between the number of inhabitants and the space available is best known as overcrowding. Two factors associated with the physical layout of the housing affected by the condition of overcrowding are the privacy and freedom of movement; both contribute emotionally to a healthy mental life. The lack of privacy and free movement has as a result causing alterations in the physical and mental health, improving the spread of infectious diseases, and increasing the occurrence of accidents. There is a close correlation between poverty and overcrowding, like overcrowding and social violence, and it is a good gauge of the status of a municipality in terms of health, public safety and economic development.

14. Housing situation in the municipality.

We use this to measure different variables:

- a. Own houses
- b. Rented accommodation
- c. Relationship of own dwellings by number of persons
- d. Own houses bought
- e. Own houses built by others
- f. Own houses self-built

When we use the word "own" we mean that the inhabitants of the space of the housing are the owners of it. Also, we are interested in how they got it. Either because they bought it, they were built by others or were built by themselves (self-built). On the other hand we counted how many people own their homes and how many housing units are rented. We establish a relationship between the houses that are owned by the number of people in the municipality.

The housing sector is an important sector in any economy. The reasons behind this are several; one of them is that housing is an essential "consumers good" that represents a significant proportion of the budget of the domestic economy. At the same time, housing is the most important asset for most families. The housing situation is a reflection of the policies aimed at the management of social inequalities to meet a basic human need, which is the shelter.

15. Water Distribution

To measure this we use the following variables:

- o Relationship of homes with piped water by number of people
- o Homes with daily water staffing
- o Homes with water staffing every third day
- o Homes with water staffing one or two times per week
- o Homes with sporadic water staffing

It is known that in poor countries, those who have greater access to water will have a stronger economic development. The consequences of the water supply are also reflected in individual and public health as well as in agriculture and industrial sectors. Not only this, a more equitable distribution of the water is an effective tool to eradicate poverty and has long-term effects, such as an improvement to indirect education, enabling people to have more time for cultural activities and intellectual development by significantly reducing their time in search of water, such as going to the wells, which can be one or two hours from where the people reside. For these reasons, it is a good indicator of socio-economic levels in an area.

16. Gender distribution

The structure of the population according to the gender distribution is of utmost importance since it interacts with other demographic variables such as fertility, mortality, and migration. In turn, it tells us of a traditionally sexist division of tasks. It speaks of the social organization of a community and its possibilities and limitations, social status of a region, and all the implications that this brings.

18. Age distribution

We know that the municipalities do not have a homogeneous population, and complementary to the gender distribution, it is to know the age distribution. The age, like the gender, is decisive for the mortality and fertility levels, as well as the migration, which is more common in the young male population. Both determine the individual roles in the society. The age distribution allows the preparation of various public policies and with both variables as we can imagine how that society will be composed in the future.

To do this we use people between:

- 0 and 4 years
- 5 and 9 years
- 10 and 14 years
- 20 and 24 years
- 25 and 29 years
- 30 and 34 years
- 35 and 39 years
- 40 and 44 years
- 45 and 49 years
- 50 and 54 years
- 55 and 59 years
- 60 and 64 years
- 64 years or more

ELECTORAL VARIABLES

Each of the next variables represents how the votes were distributed in 2006 and in 2012. They are also an image of the participation in both years as the proportion of people who did not vote or cancelled their vote. These measurements will allow us to assess how the political thinking of the people has been in general and will help us to investigate more deeply how they are related to the social variables for a change in the political preferences of a municipality.

- What percentage of votes for PAN in 2006
 - What percentage of votes for APM in the 2006
 - What percentage of votes for PBT in the 2006
 - What percentage of votes for New Alliance in the 2006
 - What percentage of votes for ASDC in 2006
 - Percentage of the population who cancelled their votes in the 2006
 - Percentage of participation with respect to the nominal list in the 2006
-
- What percentage of votes for PAN in the 2012
 - What percentage of votes for APM in 2012
 - What percentage of votes for PBT in the 2012
 - What percentage of votes for New Alliance in the 2012
 - Percentage of the population who cancelled their votes in the 2012
 - Percentage of participation with respect to the nominal list in in the 2012

METHODOLOGY

CORRELATIONS AND DESCRIPTIVES

In a preliminary work, we got the correlations among the following variables. This measure will give us a basic idea of how they are correlated so we will get a simple description of the way in which they behave. With this introductory information, we can then perform a deeper analysis, but with a clearer path and knowing what to expect.

The software that we used to perform the statistical analysis (SPSS) gives us the Pearson coefficient of correlation and significance. The test had as null hypothesis that this coefficient is zero, against that it is not. The results are presented in table A1.¹ The descriptive statistics are shown in table A2.

LOGISTIC REGRESSION ANALYSIS

The logistic regression is intended for the modeling of dichotomous categorical outcomes (e.g., voted for PAN, not voted for PAN). Logistic regression focuses upon the relative probability (odds) of obtaining a given result category. For our data analysis below, we are going to use logistic regression for each of the political parties. The binary variables will be 0 if the party didn't get the highest percentage in one municipality or 1 if it got it.

There are two main uses of logistic regression:

1. The first one is the prediction of group membership. Since logistic regression calculates the probability of success over the probability of failure, the results of the analysis are in the form of an odds ratio.
2. Logistic regression also provides knowledge of the relationships and strengths among the variables.

Answering the second research question, in this section we analyze the results of the logistic regression for each of the parties. We compute an indicator variable for which will take the value "1" if the party won in the municipality and "0" if it did not. This way there will be an array of ones and zeros, which we can use to use logistic regression and determine the socioeconomic aspects that made a party win or lose.

LINEAR REGRESSION ANALYSIS

We want to explore the relationships among the variables. The most valuable use of regression is in making predictions. This technique is useful because we can predict with reliability. The assumptions are proved in Figure A3. We will work with SPSS, statistical software.

Cancelled vote in an election could not be computed with a logistic regression due to that. If we took it as a binary variable as if it were a party it would always be zero because it would always lose. Thus, we use a linear regression and use the percentage of cancelled votes and try to calculate it using the socioeconomic variables. This will provide help for answering the third question of our research.

¹ Only a part of the table is displayed. The rest will be scrapped.

FACTOR ANALYSIS

Factor analysis is a statistical procedure used to identify a small number of factors that represent relationships among sets of interrelated variables. Factor analysis is a technique that requires a large sample size. It is based on the correlation matrix of the variables involved, and correlations usually need a large sample size before they stabilize. As a rule of thumb, a bare minimum of 10 observations per variable is necessary to avoid computational difficulties.

In order to be able to group our data and find that something changes, we use an analysis of factors to find the main components and make our purpose easier. (FIGURE D. Factor Analysis)

There are 31 variables. When standardized (this is done by the package internally), the total variance to be explained is 31 since each variable contributes 1 to the total variance. The table tells us that the variance of the first factor is 15.412, or that it contributes 35.843% of the total variance. This is a very large percentage. The second factor has a variance of 6.588, and explains a further 15.320% of the total variance. We decide that the second factor is important because its cumulative variance is greater than 0.5. In conclusion, we have reduced our data set from seven variables to two factors. There has been a loss in explanatory power, now we only explain 51.163% of the total variance. We have simplified the data set and we have independent factors, and this may pay for the information loss in the data set.

What variables are well explained by the factors and what variables are poorly explained? To answer this question we need to look at the communalities². (FIGURE E. Communalities)

The first column gives the correlation between the first factor and each one of the variables. For example, the correlation between the first factor and the percentage of people above 65 is .879. The values in the extraction column indicate the proportion of each variable's variance that can be explained by the retained factors. It appears that the daily water supply and percentage houses owned is important in the definition of the first factor, but the number of marriages is not important in the definition of the first factor. This part will help us answer the second and third question of our research.

The table in FIGURE D1 will help attach a meaning to the factors by identifying high component loadings.

Variables that load high on the first factor are:

% 15 Per Cent or more literate	0.897
GDP Per Capita	0.83
% People with income less than one min wage	-0.847
% People with income higher than two min wage	0.815
% between 05 y 9 yrs	-0.893
Average number of occupants per dwelling no matter if owned or rented	-0.869
% between 10 and 14 yrs	-0.891
% between 40 and 44 yrs	0.867

² This is the proportion of each variable's variance that can be explained by the factors.

% between 45 and 49 yrs	0.845
% between 50 and 54 yrs	0.845

It appears that the first factor measures socioeconomic wealth.

Variables that load high on the second factor are:

% 15 Per Cent with incomplete education	0.575
% Rural Population	0.58
(# Of houses owned / num people) * 100	0.704
% between 20 and 24 yrs	-0.651
% between 25 and 29 yrs	-0.693
% between 30 and 34 yrs	-0.434
% of people 65 or above	0.74

It appears that the first factor measures Social-educative instability.

RESULTS

CORRELATIONS AND DESCRIPTIVES

Generally, in Veracruz, the majority of populations are women (54 against 48). Children and teenagers compose the majority of the people. The other big sector are the old people, there are 7.7 percent of people older than 64 years old.

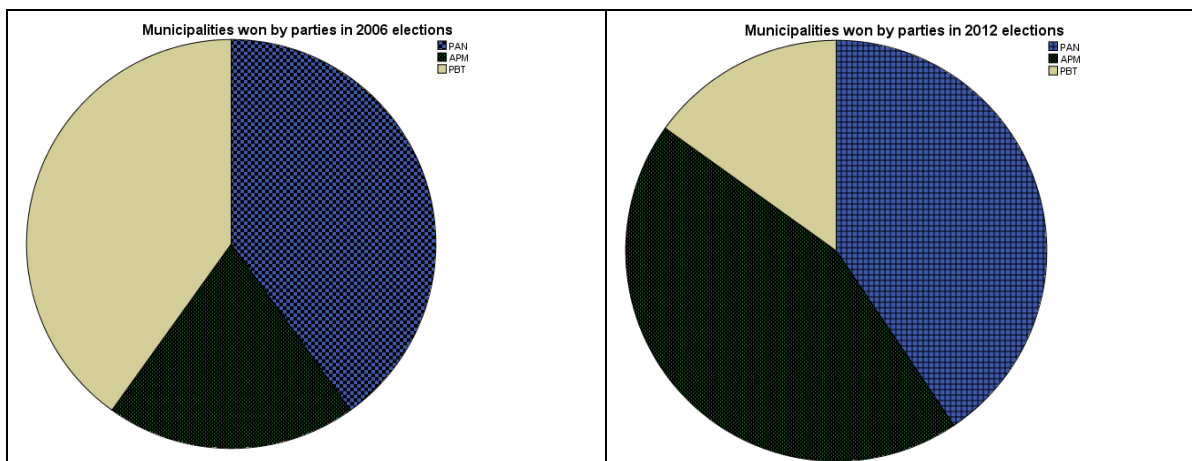
We cannot expect that there is a large growth in Veracruz due to that the fertility rate is close to the rate of replacement. This means that there is good public policy on maternity or, there is a diminishing interest in having children.

On the other side, one third of the population in Veracruz has incomplete education and more than half is literate. The 70% of the municipalities in Veracruz are located in rural areas, whereas approximately 15% are in urban areas.

Veracruz average GDP per capita is approximately -0.7% less than the average of the country. The distribution of safe drinking water is completely unequal in the different municipalities, as well as the supply of water, health services and the distribution of income. There is a high stability in the couples living in the same house. On average, there are 4 people living in each house and mostly, they are owners of the homes they live in. On average, 6% of the homes are rented.

The three main parties mostly divided the votes in 2006: PAN, APM, and PBT. The participation was around 60.8 per cent in average. In 2012, it was almost divided by two parties, the PAN and the APM. The participation rose from 60% in 2006 to 70% in 2012 in average.

Based on Table A2 the graphs shown below describe voting tendency:



ANALYSIS OF PAN VOTERS

The profile of the voters of the PAN is the next: Mostly, they were people with incomplete education and old adults in 2006. In 2012, they moved, mainly, to the rural population, while the people had least wage voted more for the PAN. Those municipalities who had more owned houses voted more for PAN. The PAN voters tend to have more men than women.

ANALYSIS OF APM VOTERS

In 2006, the people who voted for APM had high fertility rates, incomplete education, high illiteracy and were located in rural areas; their income was less than one minimum salary. People who own their houses tend to vote more for them. Also, men voted for APM much more than women. In addition, young people were the sector that voted more for them, while most of the adults did not. The municipalities that have higher GDP per capita income did not vote for this party.

In 2012 the pattern remained the same as in 2006, with the difference that the people who had have safe drinking water was negatively correlated with the votes.

ANALYSIS OF PBT VOTERS

The voters for this party, differently from APM, where those who have low fertility rate, more literate, and more urban. Those who have higher incomes and GDP per capita were mostly the voters for PBT. For less crowding in the houses, it increases the vote for the PBT. In this case, more women voted than men, as well as people from 40 to 60 years.

In 2012, the pattern is repeated. The main difference was that they changed the age profile, which was from 40 to 60 years in 2006, to the one from 20 to 40 years in 2012.

ANALYSIS OF ASDC

TheY participated only in 2006 and their market share were mainly the literate, urban and with higher income; mainly, women. In 2012 they did not participate.

CANCELLED VOTES

In 2006, people who cancelled their vote tend to be illiterate people, rural, with low income and that live in overcrowded homes. These populations have big numbers of children. In 2012, the same the conditions remained.

PARTICIPATION

In 2006, the people who usually vote more are those living in overcrowded homes and mostly young people. In 2012, the voters who participated more in the elections were the people who had higher fertility rates,

higher illiteracy, and low income, low water distribution, located mostly in rural areas. The men voted more than women. The populations that have more children voted more. Adults 35 to 64 voted less.

LOGISTIC REGRESSION

2006 ELECTIONS

PAN

First, we measure the predictability of the model, with the following table:

PAN 2006

Observed	Predicted		
	PAN binary variable 1 won, 0 lost		Percentage correct
	0	1	
PAN binary variable 1 won, 0 lost	0 109	19	85.2
	1 32	52	61.9
Overall Percentage			75.9

We see immediately that the prediction level model is approximately 75%. It is stronger to predict the losers, than to predict the winners. Still, its reliability is quite high. To find the goodness of fit we used the following results:

Model Summary

Step	-2 Log Likelihood	Cox & Snell R Square	Nagelkerke's statistic R Square
1	225.498To	.244	.330

The Nagelkerke's statistic coefficient has a very low value in a range from zero to one, that is to say, that even though that the model hits 75% of the times, the model's ability to sort results is quite poor.

In the FIGURE F and F1 we can see in detail the results of the regression, and the main part is summarized where we excluded all those variables that their significance is not less than .05, which means that they are not significantly different from zero. We have then, a reliability of 95% to predict the variables.

	B	S. E.	Wald	DF	GIS.
Incomplete Education	.182	.071	6,508	1	.011
Bought Houses	.123	.060	4,256	1	.039
Houses Houses built by others	.113	.054	4,357	1	.037
Houses built by owner	.098	.056	3,007	1	.083
Women Percentage	-.396	.196	4,104	1	.043

The independent variables account for about 76% of the voters' decision for choosing PAN. There is a strong positive relationship between the voter turnout in 2006 elections and homes bought, houses built, incomplete education. There is a strong negative relationship between the voter turnout in 2012 elections and the percentage of women on each municipality.

The B value for this incomplete education is 0.182. This means that for every 1% increase in the incomplete education, there was a corresponding 0.182% voting for PAN; for 1% increase in bought houses, a 0.123% voting increase in PAN.

This means that for every 1% increase in the women percentage, there was a -.396% voting for the PAN. The candidate for the PAN on 2006 elections was Felipe Calderón. He won these elections. Nevertheless, for the next elections, on 2012, this party changed the candidate for a woman, Josefina Vazquez Mota, which supposedly should have helped to pick up more votes in the women sector.

For the first three variables $B > 0$, we will look how big is $\exp(B)$, on the other hand, we will look the inverse of $\exp(B)$, those with $B < 0$.

Variable	B	Exp(B)
Incomplete Education	0.182	1.199
Bought Houses	0.123	1.13
Houses built by others	0.113	1.119

Variable	B	Exp(B)
Percentage of Women	-0.396	0.673

That is to say that, the percentage of women is the most important negative factor in the election results toward the votes for the PAN of a municipality. The positive factors are by order of weight: incomplete education and housing situation. For the second one, in regard to the way in which they were acquired, either bought or built will be the third and fourth variables that define the results for this party.

APM

We will proceed in a similar way to this party as we did for the past. First we get a table that will define its prediction capabilities:

APM 2006			
Observed	Predicted		
	APM binary variable 1 won, 0 lost		Percentage correct
	0	1	
APM binary 0 variable 1 won, 0 lost 1	163	8	95.3
	25	16	39
Overall Percentage			84.4

We note, that just like in the last party, their ability to predict the loss is greater than to predict the win. We note that the model predicted 85% of the results, which is an excellent indicator of the model. We shall proceed to analyze the goodness of fit:

Model Summary

Step	-2 Log Likelihood	Cox & Snell R Square	Nagelkerke's statistic R Square
1	139.244	.278	.444

We noticed that the coefficient Nagelkerke's statistic remains low but greater than the one from the analysis of the PAN, but is still far from one.

In the same way, we are not ruling out all those which their level of significance is less than .05, leaving only the variable that measures the people without access to safe drinking water, that is to say, that what most influences if the APM loses or wins is the distribution of water from the municipality.

	B	S. E.	Wald	DF	GIS.	Exp(B)
People without access to drinking water	.077	.034	5,109	1	.024	1,080

FIGURE G and G1 show the results of a logistic regression measuring the tendency of people voting for APM (primarily composed by the PRI), instead of voting for other parties. The independent variables account for about 84% of the voter's decision for choosing PAN. There is a strong positive relationship between the

voter turnout in 2012 elections and people without access to drinking water. A good water system in a municipality reflects in basic policies of health for the population.

The B value for this incomplete education is 0.077. This means that for every 1% increase in the people without access to drinking water, there was a corresponding 0.077% voting for APM.

PBT

Proceeding similarly we find:

PBT 2006

Observed	Predicted		
	PBT binary variable 1 won, 0 lost		Percentage correct
	0	1	
PBT binary variable 1 won, 0 lost	102	25	80.3
	32	53	62.4
Overall Percentage			73.1

The ability of the model, as in the past, is bigger to predict losses than the wins achieved, which gives the total result of approximately 73 %. We find then, that it is a usable model since the probability is high.

Model Summary

Step	-2 Log Likelihood	Cox & Snell R Square	Nagelkerke's statistic R Square
1	222.789	.256	.346

The Nagelkerke's statistic coefficient is low and is very similar to the PAN.

Variables in Equation						
	B	S. E.	Wald	DF	GIS.	Exp(B)
People without access to safe drinking water	-0.082	0.027	9,381	1	0.002	0.921

Houses with Piped water vs #people ratio	0.248	0.104	5,646	1	0.017	1,281
Women Percentage	0.483	0.204	5,606	1	0.018	1,621

FIGURE H and FIGURE H1 show the results of a logistic regression measuring the tendency of people voting for PBT (primarily composed by the PRD), instead of voting for other parties. The independent variables account for about 73% of the voter's decision for choosing PBT. There is a strong positive relationship between the voter turnout in 2012 elections and, the percentage of women in the municipality and the ratio of total number of houses with those who have piped water. A strong positive relationship between the voter turnout in 2012 elections and the number of people without access to safe drinking water is found.

The B value for Women Percentage is 0.483. This means that for every 1% increase in the women percentage, there was a corresponding 0.483% voting for PBT. And for an increase of 1% of the houses with piped water with number of people, there was a corresponding .248% voting for PBT. On the other side, for a decrease of .082% of people without to safe drinking water, there was an increase for voting for PBT. Sorting by importance of exp(B), the most relevant positive is women percentage, due to its 1,621 value, much higher than 1,281.

NVAA 2006 AND ASDC 2006

For these two last political parties, there is no result because it lost in all the elections and this information is not predictable with the software that is used in this thesis.

2012 ELECTIONS

PAN

We have the following:

PAN 2012

Observed	Predicted		
	PAN binary variable 1 won, 0 lost		Percentage correct
	0	1	
PAN binary variable 1 won, 0 lost	104	22	82.5
1	29	57	66.3
Overall Percentage			75.9

Compared with the results of the 2006, this party's reliability does not change much and is still around 75 %, in turn, it predicts better the loses than the triumphs.

Model Summary

Step	-2 Log Likelihood	Cox & Snell R Square	Nagelkerke's statistic R Square
1	208.549	No. 307	Hit .414

The Nagelkerke's statistic coefficient increased with respect to the year 2006 but is still very far from one.

FIGURE I and FIGURE I1 show the results of a logistic regression measuring the tendency of people voting for PAN in 2012 elections, instead of voting for other parties. The independent variables account for about 75% of the voter's decision for choosing PAN, the same number as in the 2006 elections.

There is a strong positive relationship between the voter turnout in 2012 elections with: the percentage of women in the municipality and the ratio of total number of houses with those who have piped water. There is a strong positive relationship between the voter turnout in 2012 elections and the incomplete education, and the water supply periods. There is a strong negative relationship between the voter turnout in 2012 elections and population married (or together), women percentage and young people population.

We noticed a big change with respect to the significant variables of the same party in 2006 and we are faced with a greater amount of factors that explain the result. As we mentioned on the 2006 elections, they changed the candidate on 2012 for a woman, Josefina Vazquez Mota. Even if they did this, there was still a negative relationship between the women's voting and the support for the party.

Sorting by importance of exp(B), the most relevant positive variable is the type of water supply the municipality has and next marriage status³

	B	S. E.	Wald	DF	GIS.	Exp(B)
Incomplete Education	.172	.070	6,000	1	.014	1,188
People without Health Service	.031	.015	4,413	1	.036	1,032
Population together or married	-.317	.146	4,715	1	.030	.728
Daily water supply	1,201	.497	5,833	1	.016	3,325
Water supply each third day	1,208	.499	5,867	1	.015	3,346
Water supply 1 or 2 times a week	1,232	.499	6,090	1	.014	3,429
Sporadic water supply	1,179	.499	5,581	1	.018	3,252

APM

We find the following table:

³ Being B<0 it is used 1/exp(B)

APM 2012

Observed	Predicted		
	APM binary variable 1 won, 0 lost		Percentage correct
	0	1	
APM binary variable 1 won, 0 lost	95	23	80.5
	29	65	69.1
Overall Percentage			75.5

We noticed a strong change in the percentage of reliability of the same party in 2006 with regard to this year and the pattern is repeated so that we can predict better the results for when they lose than for when they win.

Model Summary

Step	-2 Log Likelihood	Cox & Snell R Square	Nagelkerke's statistic R Square
1	215.517	.300	.402

The Nagelkerke's statistic coefficient is quite similar to that of the past six years although it is still far from being a good result.

Variables in the Equation

	B	S. E.	Wald	DF	GIS.	Exp(B)
Incomplete Education	-.142	.065	4,681	1	.030	.868
People without Health Service	-.033	.014	5,482	1	.019	.967
Daily water supply	-.766	.385	3,966	1	.046	.465
Water supply each third day	-.776	.386	4,042	1	.044	.460
Water supply 1 or 2 times a week	-.785	.385	4,149	1	.042	.456

FIGURE J and FIGURE J1 show the results of a logistic regression measuring the tendency of people voting for APM in 2012 elections (mostly integrated by PRI), instead of voting for other parties. The independent variables account for about 75% of the voter's decision for choosing PAN, the same number as in the 2006 elections.

We found that the explanatory variables are these: Incomplete education, and the provision of safe drinking water (depending on the frequency) .

There is a strong negative relationship between the voter turnout in 2012 elections and incomplete education. The same happens for people without health services, and water supplies

PBT

Observed	Predicted		
	PBT binary variable 1 won, 0 lost		Percentage Correct
	0	1	
PBT binary variable 1 won, 0 lost	175	5	97.2
	8	24	75.0
Overall Percentage			93.9

There is an amazing capacity for accuracy of nearly 94%, which is reinforced by the Nagelkerke coefficient we see in the following table:

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	70,573 ¹⁰	.403	.704

It is the first model, in which this coefficient is close to one and talks about his great predictive ability.

Variables in the Equation

	B	SE	Wald	df	Sig	Exp(B)
GDP Per Capita	-0.001	0	4,816	1	0.028	0.999
Income Lower than 1 min wage	0.752	0.223	11,337	1	0.001	2.121
Income Higher than 2 min wage	0.749	0.248	9,151	1	0.002	2.115
Bought Houses	-0.317	0.149	4,535	1	0.033	0.729
Houses Built by Others	-0.391	0.147	7,064	1	0.008	0.677
Houses Built by Owner	-0.312	0.139	5,031	1	0.025	0.732
Women Percentage	1,967	0.64	9,455	1	0.002	7.149

FIGURE K and FIGURE K1 show the results of a logistic regression measuring the tendency of people voting for PBT in 2012 elections (mostly integrated by PRD), instead of voting for other parties. The independent variables account for about 94% of the voters decision for choosing PBT, the highest percentage we've seen in our logistic regressions .

We found that the explanatory variables are GDP Per Capita, Income Lower than 1 min wage, Income Higher than 2 min wage, Bought Houses, Houses Built by Others, Houses Built by Owner, Women Percentage.

There is a strong positive relationship between the very low wages (less than 1 min wage) and high (more than 2 min wage) and the support of the party. We can tell by the high exp(b) these two variables have. The percentage of women voting for this party is also high, with a high exp(b) as well. There is a strong negative relationship between the voter turnout in 2012 elections and bought houses, both ways of being built (by themselves or by others were negatively related too).

NVAA 2006 AND ASDC 2012

For these two last political parties, there is no result because it didn't win any majorities in all the elections and this information is not predictable with the methodology that is used in this thesis.

LINEAR REGRESSION ANALYSIS

CANCELLED VOTES 2006

This is the model summary for the 2006:

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.811 ^a	.657	.575	.90376

We note the "Adjusted R Square" coefficient is located at approximately on the half on a scale from 0 to 1, that is to say that approximately 57.5% of the variability is explained by the variables defined at the beginning of the paper. In some fields, in the attempt to predict human behavior, it is entirely expected that the R-squared values are low, even lower than 50%. The p value for the F statistic is < .05. This means that at least one of the independent variables is a significant predictor (see FIGURE L)

We can still draw important conclusions about how changes in the predictor values are associated with changes in the response value. Regardless of the R-squared, the significant coefficients still represent the mean change in the response for one unit of change in the predictor while holding other predictors in the model constant. This type of information can be extremely valuable.

The summarized table of coefficients is presented here the complete is in FIGURE L1

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
% Population semi	-.010	.004	-.169	-2.784	.006
Average number of occupants per dwelling is no matter if you own or rent	-3.108	1.261	-1.049	-2.465	.015
% Of the houses that are owned	.183	.070	1.022	2.623	.009
(# Of homes owned / num people) * 100	-.618	.253	-1.007	-2.441	.016
% Housing with daily water supply	-.269	.135	-5.659	-1.996	.048
% Housing with water supply each third day	-.275	.135	-3.527	-2.035	.043
% Housing with water supply 1or2 per week	-.268	.134	-3.151	-1.996	.048
% Housing with sporadic water supply	-.286	.135	-1.961	-2.122	.035

a. Dependent Variable: % cancelled vote in 2006

We can see that in the 90% confidence range, the percentage of houses owned is significant, having a positive relationship where the higher the number of houses, the greater the cancelling of the vote. Moreover, there was negative relationship with semirural population number and cancelling, and the proportion between homes of people was also negative.

CANCELLED VOTES 2012

The model summary for the 2012:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.723A	.523	.408	.67608

Coefficients					
Model	Unstandardized Coefficients		Standardized Coefficients	T	GIS.
	B	Std. Error	Beta		
% Population semi	-.005	.003	-.131	-1.824	.070
% Persons without health service	-.007	.004	-.121	-1.915	.057
Average number of occupants per dwelling is no matter if you own or rent	-2.423	.943	-1.290	-2.570	.011
% Of the houses that are own	.132	.052	1,158	2,521	.013
(# Of homes owned / num people) * 100	-.390	.189	-1.001	-2.057	.041

The variability of the percentage of people who cancelled their votes is explained in a 40.8 % by the variables that we have defined. The p value for the F statistic is < .05. This means that at least one of the independent variables is a significant predictor.

We found that the average number of people occupying a room, i.e. the overcrowding affects in a cancelling vote tendency. That is to say that if there is less crowding, there will be less vote cancellation. Just like in 2006, if highest percentage of homes owned, the greater will be the vote cancellation.

In 2012, the same pattern is repeated (FIGURE M and M1). We can see that the semi-rural populations, with overcrowding and no health services are those sectors where there is less cancelling of the vote.

FACTOR ANALYSIS

VOTE CHANGE

In the graphs of FIGURE N the main factors are the two axis; clusters are divided in two: 0 for no changing vote from 2006 to 2012, 1 for changing vote from one election to the other.

We note that if a municipality has more rural, incomplete education, higher fertility rates and illiterate population it will tend to change the vote. On the other hand, the more urban population has less change in their vote. The largest factor influencing to change and not change effects is literacy. From semi-rural and illiterate population is difficult to determine the phenomenon since both appear in similar proportions.

In the upper left quadrant many municipalities changed their vote, this is congruent with those whose income is less by one and two minimum wages. As we appreciate in the first graph, we see that there are

more rural municipalities, illiterate and fertility rates on that quadrant. The municipalities with high minimum wages and GDP per capita will be those who will not change their vote.

If the ratio of owned houses by number of people or if the couple is a resident ratio increase, then a vote change is more common. If the number of rented homes decreases their vote will be constant.

The lower the water supply, the greater the likelihood of changing the vote. When there is sporadic water supply, it is unpredictable what will happen as we found that both phenomena occur and may or may not change their vote. This means, increasing the water supply may be part of political campaigns and can help earn many followers if these municipalities. The same campaign could not be effective for people with constant water supply.

The municipalities with the younger population are easier to change their vote, while those where there are more elderly adults, the voting tendency will be more difficult to change. Those in middle age are difficult to interpret, since both results can occur.

We see that the most vulnerable people i.e. those whose population is rural, illiterate, with few water supply, with few access to education, earning less than one or two minimum wages and the ones who are younger, were those who changed their vote.

This phenomenon is known in Mexico as the "political patronage", where patronage practices are given as an exchange of goods and services for votes, where "it is organized around a principle of reciprocity 'give, receive and return'" (Tosoni Maria Magdalena). These practices are seen as opposed to a free, independent, and secret vote; it is considered as a bribe to the voter.

In clientelism "appears at first glance like an asymmetrical relationship in which the politician offers resources to manipulate the poor" (Tosoni Maria Magdalena) where the actors involved in a network of patronage are politicians who are, or not in the government, to solve individual and collective problems. The exchange is camouflaged with being a social support of a political party that targets vulnerable sectors in the form of food, grants, jobs, and social work.

PARTICIPATION

In the graphs of FIGURE O the main factors are the two axis: socioeconomic wealth (x) and Social-educative instability (y); clusters are divided in four: 1 for low voting participation, 2 for medium low, 3 for medium high, 4 for high participation.

In 2006 elections graphs, we can see the following results. We note that, i.e. the purple dots (4), which represent the highest participation quartile, are mostly found in the upper left square. Arrows for high fertility, rural, and illiterate people increase towards this square. The conclusion we draw is that, surprisingly, the population with most of these features is the most involved. It has a coincidence with those with those with lower income and who lack access to health services. To complement, it is observed that few water distribution is another factor contributing to the high electoral participation. The housing situation does not seem to be a major factor in this matter.

These results are counter-intuitive as it shows that people living in poverty are those who are more interested in being part of democratic changes in the governance of their municipalities, while many of the people with more services and opportunities are living in indifference. This is probably because the poor can find major changes in the results of various welfare policies. They could depend on what governments decide. It can be a big change whether your water supply increases or not, and that health services exist or not. On the other side, for the wealthier classes these changes are not as drastic and perhaps their standard of living will not be severely affected.

Also, we found that young people between twenty and thirty years, along with middle-aged adults 45-64 years are those who are more interested in voting. Men have higher levels of participation than women.

The low participation is distributed at all levels of the population regardless of income or the type of population there is. There is not a defined profile to find which factors influence low participation. This phenomenon can only be contrasted with the characteristics mentioned in high participation and take it as a complement.

In 2012, this pattern was repeated more pronounced. The Illiterate sector with educational delays, and rural segments were most involved in these elections. Along with those with lower incomes were those who had greater participation. There was an increased participation in newly acquired right to vote adulthood. The explanation of this phenomenon is not different in that in 2006, although the fact that they were more contrasting patterns is noteworthy.

SUMMARY OF THESIS AND CONCLUSIONS

In the last part of the study we will think as of its essentialness to academia and policy makers. A rundown of the study is made followed by our fundamental discoveries inside our confinements. Bearings for future research likewise are set out.

SIGNIFICANCE OF THE STUDY

This paper provides evidence that supports the hypothesis of using socioeconomic variables to explain voting tendency in Veracruz, Mexico. It contributes with new data to the study of the electoral variables, innovating in this kind of studies. There are few papers that include so many demographic data to sustain their conclusions. This study is useful and will have an impact on the development of electoral campaigns.

Political parties need to predict vote tendency and relate it to socioeconomic and demographic variables. This will help evaluate the type of voters: which people keep voting for them, which will vote for others, which will cancel their votes, and the ones that will participate or decline assisting the voting day. For future research, this paper widens the perspective in the field of electoral statistics, and proposes new areas of study.

SUMMARY OF THESIS

This paper has been made in five major steps. The first step is an overview of the state-of-the-art analysis of what has been made in papers like this one; the second step was the description of the political parties that participated in the elections in Veracruz. The third step is finding the socioeconomic variables that influence people to vote for one party or another. The fourth step, we supply an analysis of what makes people cancel their votes. In the fifth and last step, the properties of the municipalities that change vote are described and what are the principal variables that makes them participate.

LISTING OF MAIN CONCLUSIONS

The listing of this section will be organized according to the order of the last two research questions, and conclusions to each of these questions will be made.

Research Question 2: Is there a relationship between how the vote will turn, due to the socio-economic conditions of the people?

Yes there is a relationship; after statistical analysis carried out, these specific conclusions were obtained:

The percentage of women influenced especially in the PBT and PAN. The percentage of women in a municipality is negatively related to the number of votes for PAN in year 2006, but for the PBT in years 2006 and 2012 is positively related.

In 2006, of the factors we found is that access to clean water is one of the determinants highly influencing voting elections. Proportion of people without access to safe drinking water are positively related to choosing APM and negatively related to PBT.

In 2012, the water supply becomes one of the main factors that determine the vote it is positively related to PAN winning and negatively related to APM. Percentage of people without health services is positively related to PAN in year 2012 and negatively for APM. The married population is negatively related to electing PAN in this same year.

Incomplete education is positively related to deciding vote for PAN in years 2006 and 2012.

For the party APM in year 2012 this same aspect is negatively related. The home ownership is a factor in both elections. The numbers of homes purchased are positively related to PAN in year 2006 and negatively with the PBT in year 2012.

Research Question 3: What makes voters change vote? What make them to participate? What makes them cancel their vote?

a) Cancelled votes. In 2006, the cancellation of the vote increases if the percentage of houses owned is higher in the municipality. The tendency of population to be semi-rural has a negative relationship with cancelling vote. In 2012, the overcrowding is the main factor affecting the cancelation of the vote. As well, where there are no health services there is less cancellation of the vote.

b) Participation In 2006 and 2012, the population with high fertility rates, rural, and illiterate people is the one who is most involved in the elections. People who have lower incomes and who lack health services are part of the description of the people who participate. People between twenty and thirty years, along with middle-aged adults (45-64 years) are more interested in voting. In 2012, the pattern was stronger. To the participative sector the new young voters (18+) can be added.

c) Vote change from 2006 to 2012 elections If a municipality has more rural, incomplete education, higher fertility rates and illiterate population, it will tend to change the vote. The municipalities with high minimum wages and GDP per capita were those who do not change their vote. The lower the water supply, the greater the likelihood of changing the vote will be. The younger populations are easier to change the vote.

LIMITATIONS OF THE STUDY & FUTURE RESEARCH DIRECTIONS

The first limitation of this study is that when using binary variables, the differences in the percentages among the different parties are not studied. These can be very small, but, when you convert the percentage variable to binary, although the difference is very little, the result is a 0 or a 1. The simplicity and delicacy of the logistic regression was the reason for its use. However, there could future research doing a study on the differences of percentage in the voting.

Another limiting factor is to assume that the demography and economy are kept constant. These have a change during the six electoral years. It would be ideal to compare election year and census of the same year to the next election year and the census of the corresponding year. However, in Mexico the census and elections do not have the same cycles.

The study was purely statistical, but involving politics, the results could be very interesting. This is, to try to analyze, in addition to the economic variables, the economic policy.

Finally, each of the variables has an importance in the elections. Analyzing them one by one would allow a major understanding of the subject.

This answers the first question of the research question: What kind of further studies can be done? What this thesis can give to this kind of studies?

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APPENDICES

TABLE A1

Correlations		% Votes for PAN 2006	% Votes for APM 2006	% Votes for PBT 2006	% Votes for New Alliance 2006	% Votes for ASDC 2006	% No Participatio n 2006	% Participatio n 2006	% Votes for PAN 2012	% Votes for APM 2012	% Votes for PBT 2012	% Votes for New Alliance 2006	% no Partici pa- tion 2012	% Participati on 2012
Total Fertility Rate	Pearson	-.037	.277**	-.216**	-.102	-.450**	.136*	-.005	.136*	.324**	-.310**	-.354**	.063	-.017
	Sig	.594	.000	.002	.140	.000	.047	.939	.049	.000	.000	.000	.365	.809
% 15 Or more with incomplete education	Pearson	.230**	.262**	-.267**	.064	-.345**	-.096	.013	.313**	.261**	-.423**	-.259**	-.118	-.030
	Sig	.001	.000	.000	.352	.000	.163	.851	.000	.000	.000	.000	.085	.668
15 Per Cent or more illiterate	Pearson	-.162*	.290**	-.193**	-.136*	-.538**	.626**	.008	.063	.285**	-.257**	-.448**	.572**	.080
	Sig	.018	.000	.005	.047	.000	.000	.912	.360	.000	.000	.000	.000	.246
15 Per Cent or more Literate	Pearson	.149*	-.252**	.210**	.107	.466**	-.610**	-.039	-.033	-.238**	.202**	.378**	-.543**	-.075
	Sig	.030	.000	.002	.121	.000	.000	.576	.631	.000	.003	.000	.000	.276
% Urban Population	Pearson	-.023	-.315**	.241**	.125	.537**	-.233**	-.087	-.225**	-.340**	.407**	.401**	-.156*	.056
% Rural Population	Sig	.740	.000	.000	.069	.000	.001	.209	.001	.000	.000	.000	.023	.421
% Semirural Population	Pearson	.071	.304**	-.326**	-.071	-.526**	.331**	-.007	.313**	.303**	-.475**	-.361**	.276**	-.021
% Urban Population	Sig	.304	.000	.000	.301	.000	.000	.920	.000	.000	.000	.000	.000	.764
% Rural Population	Pearson	-.069	-.031	.151*	-.055	.065	-.168*	.115	-.152*	.001	.154*	.005	-.187**	-.039
	Sig	.319	.656	.028	.427	.350	.015	.096	.027	.994	.025	.947	.006	.570
GDP per capita	Pearson	.023	-.356**	.245**	-.004	.612**	-.360**	-.046	-.144*	-.432**	.402**	.416**	-.302**	-.001
	Sig	.738	.000	.000	.955	.000	.000	.502	.036	.000	.000	.000	.000	.984
% People without access drinking water	Pearson	-.005	-.100	-.093	.116	.324**	-.216**	-.002	-.019	-.208**	.148*	.204**	-.158*	-.067
	Sig	.943	.146	.178	.091	.000	.002	.975	.785	.002	.031	.003	.022	.335
% People without access drinking water	Pearson	-.038	-.053	.104	-.060	.017	-.161*	.108	.058	-.057	-.006	.040	-.167*	.004
	Sig	.580	.440	.133	.385	.806	.019	.118	.401	.407	.935	.566	.015	.956
% people with income lower than 1 min wage	Pearson	-.057	.291**	-.239**	-.018	-.494**	.467**	.013	.128	.311**	-.317**	-.435**	.380**	.096
	Sig	.406	.000	.000	.794	.000	.000	.848	.063	.000	.000	.000	.000	.163
% people with income between 1	Pearson	.106	-.002	-.014	.028	.024	-.261**	.075	.096	.070	-.123	.155*	-.198**	-.077
	Sig	.122	.978	.839	.687	.733	.000	.279	.164	.307	.074	.024	.004	.267

and 2 min wages														
% people with income higher than 2 mins wages	Pearson	-.011	-.345**	.283**	.007	.568**	-.405**	-.082	-.208**	-.398**	.440**	.422**	-.334**	-.069
	Sig	.869	.000	.000	.921	.000	.000	.236	.002	.000	.000	.000	.000	.320
% Persons of 12 years or more united in marriage	Pearson	.020	.012	.158*	-.083	.092	-.214**	-.040	.017	.008	-.011	.101	-.171*	-.056
	Sig	.774	.866	.021	.229	.180	.002	.562	.810	.909	.869	.141	.012	.416
% Number of marriages , or those who live in the same house	Pearson	.040	.156*	-.077	-.040	-.124	.069	-.009	.073	.124	-.138*	-.094	-.005	-.154*
	Sig	.562	.023	.265	.562	.072	.321	.899	.287	.071	.044	.173	.940	.025
Average number of occupants per dwelling no matter if owned or rented	Pearson	-.074	.154*	-.203**	-.019	-.300**	.332**	.109	.051	.122	-.131	-.201**	.247**	.029
	Sig	.282	.025	.003	.787	.000	.000	.112	.463	.076	.057	.003	.000	.669
% houses owned	Pearson	-.070	.410**	-.245**	-.134	-.602**	.395**	.033	.153*	.341**	-.353**	-.473**	.341**	-.022
	Sig	.309	.000	.000	.051	.000	.000	.637	.026	.000	.000	.000	.000	.752
% rented houses	Pearson	.037	-.394**	.261**	.173*	.659**	-.322**	-.074	-.208**	-.400**	.433**	.472**	-.252**	.020
	Sig	.593	.000	.000	.012	.000	.000	.282	.002	.000	.000	.000	.000	.769
(# Of houses owned / num people) * 100	Pearson	.032	.204**	-.010	-.109	-.204**	-.026	-.089	.106	.167*	-.191**	-.198**	.014	-.047
	Sig	.639	.003	.888	.113	.003	.708	.196	.122	.015	.005	.004	.836	.498
% Of houses owned that were purchased	Pearson	.005	-.313**	.241**	-.020	.513**	-.302**	-.022	-.197**	-.394**	.427**	.313**	-.252**	-.057
	Sig	.946	.000	.000	.771	.000	.000	.750	.004	.000	.000	.000	.000	.411
% Of houses owned that were built by others	Pearson	.075	.039	-.056	.088	-.130	-.074	-.056	.230**	.163*	-.307**	-.045	-.004	-.037
	Sig	.280	.570	.418	.204	.059	.283	.414	.001	.018	.000	.518	.959	.597
% Of houses owned that were built by owner	Pearson	-.074	.254**	-.165*	-.100	-.348**	.387**	.056	-.047	.190**	-.085	-.266**	.299**	.076
	Sig	.281	.000	.016	.145	.000	.000	.415	.492	.005	.218	.000	.000	.270
(Houses with piped water / num people) * 100	Pearson	.061	-.169*	.032	.103	.460**	-.312**	-.015	-.047	-.261**	.211**	.272**	-.249**	-.030
	Sig	.381	.013	.640	.134	.000	.000	.832	.494	.000	.002	.000	.000	.661
% Houses with daily water supply	Pearson	.055	-.073	-.007	-.028	.194**	-.087	.036	-.005	-.101	.064	.072	-.012	.011
	Sig	.426	.291	.920	.684	.004	.207	.606	.943	.141	.353	.294	.863	.870
% Houses with water supply each third day	Pearson	-.115	.052	.123	.020	-.051	.031	-.028	-.049	.008	.049	-.077	-.055	-.050
	Sig	.095	.453	.074	.775	.460	.657	.691	.478	.912	.479	.264	.425	.468
% Houses with wáter supply one or two times a week	Pearson	.017	.011	-.045	.091	-.135	.073	.006	.020	.056	-.057	.025	.039	.004
	Sig	.804	.877	.513	.189	.050	.288	.934	.773	.421	.410	.722	.576	.956
% Houses with sporadic wáter supply	Pearson	.023	.115	-.139*	-.104	-.266**	.083	-.067	.077	.199**	-.193**	-.119	.071	.049
	Sig	.745	.095	.044	.130	.000	.229	.331	.263	.004	.005	.084	.304	.481

% women	Pearson	-.149*	-.287**	.248**	.002	.290**	-.078	-.035	-.326**	-.258**	.449**	.155*	-.010	.087
	Sig	.030	.000	.000	.981	.000	.261	.615	.000	.000	.000	.024	.887	.208
% men	Pearson	.149*	.287**	-.248**	-.002	-.290**	.078	.035	.326**	.258**	-.449**	-.155*	.010	-.087
	Sig	.030	.000	.000	.981	.000	.261	.615	.000	.000	.000	.024	.887	.208
% between 0 and 4 yrs	Pearson	-.115	.101	-.162*	.006	-.213**	.404**	.038	-.006	.015	-.025	-.161*	.368**	.025
	Sig	.095	.143	.018	.930	.002	.000	.587	.933	.833	.716	.019	.000	.720
% between 5 and 9 yrs	Pearson	-.130	.142*	-.181**	-.076	-.332**	.452**	.056	.009	.142*	-.116	-.248**	.398**	.064
	Sig	.059	.039	.008	.269	.000	.000	.414	.896	.039	.093	.000	.000	.357
% between 10 and 14 yrs	Pearson	-.092	.248**	-.203**	-.031	-.481**	.416**	.075	.042	.316**	-.242**	-.365**	.343**	.072
	Sig	.181	.000	.003	.654	.000	.000	.274	.546	.000	.000	.000	.000	.300
% between 15 and 19 yrs	Pearson	-.090	.215**	-.128	-.069	-.338**	.196**	.069	-.007	.265**	-.158*	-.237**	.155*	.002
	Sig	.192	.002	.063	.321	.000	.004	.314	.917	.000	.022	.001	.024	.976
% between 20 and 24 yrs	Pearson	-.062	-.124	.000	.154*	.170*	-.058	-.030	-.113	-.289**	.282**	.098	-.061	-.114
	Sig	.372	.071	.999	.025	.013	.400	.665	.101	.000	.000	.154	.376	.098
% between 25 and 29 yrs	Pearson	-.090	-.229**	.096	.122	.308**	-.105	-.063	-.177**	-.404**	.407**	.190**	-.071	-.160*
	Sig	.194	.001	.164	.076	.000	.128	.365	.010	.000	.000	.006	.305	.020
% between 30 and 34 yrs	Pearson	-.046	-.255**	.062	.073	.264**	-.220**	-.021	-.088	-.396**	.330**	.184**	-.169*	-.121
	Sig	.507	.000	.370	.289	.000	.001	.763	.202	.000	.000	.007	.013	.078
% between 35 and 39 yrs	Pearson	.074	-.241**	.128	.136*	.398**	-.367**	-.029	.003	-.349**	.220**	.276**	-.257**	-.060
	Sig	.283	.000	.062	.048	.000	.000	.678	.966	.000	.001	.000	.000	.384
% between 40 and 44 yrs	Pearson	.092	-.164*	.234**	.045	.364**	-.386**	-.006	-.042	-.156*	.146*	.292**	-.329**	-.062
	Sig	.180	.017	.001	.510	.000	.000	.929	.542	.023	.033	.000	.000	.371
% between 45 and 49 yrs	Pearson	.076	-.136*	.210**	-.034	.303**	-.375**	.008	-.049	-.061	.099	.219**	-.344**	.003
	Sig	.272	.047	.002	.622	.000	.000	.908	.480	.378	.153	.001	.000	.962
% between 50 and 54 yrs	Pearson	.130	-.123	.191**	.022	.334**	-.352**	-.094	-.011	-.114	.093	.255**	-.319**	.046
	Sig	.058	.074	.005	.751	.000	.000	.171	.870	.099	.178	.000	.000	.508
% between 55 and 59 yrs	Pearson	.048	-.033	.162*	-.056	.120	-.252**	-.086	.028	.041	-.037	.062	-.216**	.029
	Sig	.489	.629	.018	.418	.082	.000	.210	.685	.551	.594	.368	.002	.676
% between 60 and 64	Pearson	.205**	.042	.098	-.048	.131	-.189**	-.048	.102	.125	-.159*	.086	-.197**	.043
	Sig	.003	.546	.153	.483	.058	.006	.483	.138	.069	.020	.213	.004	.531
% from 65 years and	Pearson	.163*	.028	.017	-.063	-.003	-.193**	-.022	.135*	.179**	-.223**	.046	-.177**	.044
	Sig	.018	.688	.805	.358	.960	.005	.749	.049	.009	.001	.502	.010	.521

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

TABLE A2

Descriptive Statistics									
Variable	Min	Max	Mean	Std. Dev	Variable	Min	Max	Mean	Std. Dev
Women Percentage	47.4	54.5	51.2	1.3	% Votes for PAN 2006	7.7	53.3	32.6	9.3
Men Percentage	45.5	52.6	48.8	1.3	% Votes for APM 2006	11.7	53.7	29.5	7.6
People between 0 and 4	5.7	14.9	9.3	1.8	% Votes for PBT 2006	6	65.3	32.1	11.3
People between 5 and 9	6.9	16.8	10.4	1.9	% Votes for New Alliance 2006	0	4.9	0.6	0.5
People between 10 and 14	6.8	15.1	10.7	1.7	% Votes for ASDC 2006	0.1	4.6	1.2	0.8
People between 15 and 19	7.9	13.1	10.4	1.2	% Cancelled votes for 2006	0.2	11.9	2.9	1.4
People between 20 and 24	4.9	11.3	8.2	1.1	% No Partipation 2006	18.7	51.4	39.2	5.6
People between 25 and 29	4.1	9.2	7	1	% Participation 2006	48.6	81.3	60.8	5.6
People between 30 and 34	4.4	9.6	6.8	0.8	% Votes for PAN 2012	7.1	52.6	35	9.7
People between 35 and 39	4.8	8.8	6.7	0.8	% Votes for APM 2012	23.2	54.1	37.2	6.6
People between 40 and 44	3.6	8.6	6	1	% Votes for PBT 2012	4.7	53.9	24.1	10.6
People between 45 and 49	3.3	9.1	5.3	1	% Votes for New Alliance 2012	0.1	3.8	1.1	0.6
People between 50 and 54	2.1	7.5	4.5	1	% Cancelled votes for 2012	0.5	6.8	2.5	0.9

People between 55 and 59	2	6.5	3.8	0.8	% No Participation 2012	17.1	43.2	30	5.3
People between 60 and 64	1.4	5.6	3.1	0.8	% Participation 2012	56.8	82.9	70	5.3

Table A3

Municipalities won by parties in 2006 elections

	Frequency	Percent	Valid Percent	Cumulative Percent
PAN	85	40.1	40.1	40.1
APM	42	19.8	19.8	59.9
PBT	85	40.1	40.1	100.0
Total	212	100.0	100.0	

Municipalities won by parties in 2012 elections

	Frequency	Percent	Valid Percent	Cumulative Percent
PAN	86	40.6	40.6	40.6
APM	94	44.3	44.3	84.9
PBT	32	15.1	15.1	100.0
Total	212	100.0	100.0	

FIGURE A3

For cancellation of votes 2006

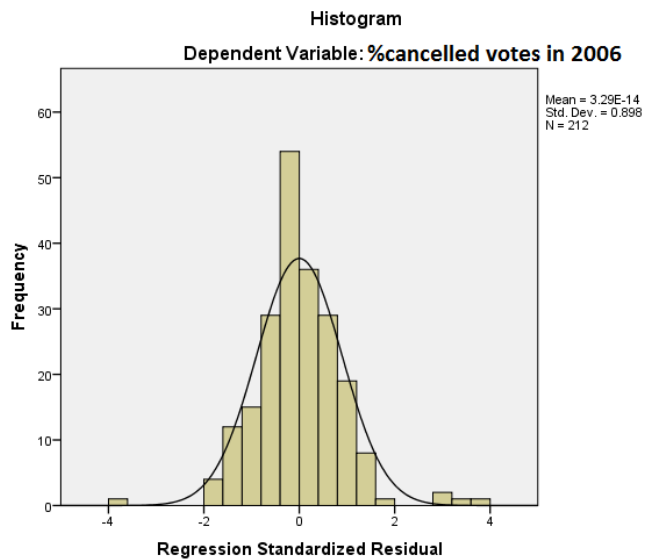
Verifying assumptions

When the model is proposed to adjust the data, assumptions are established on the variable error:

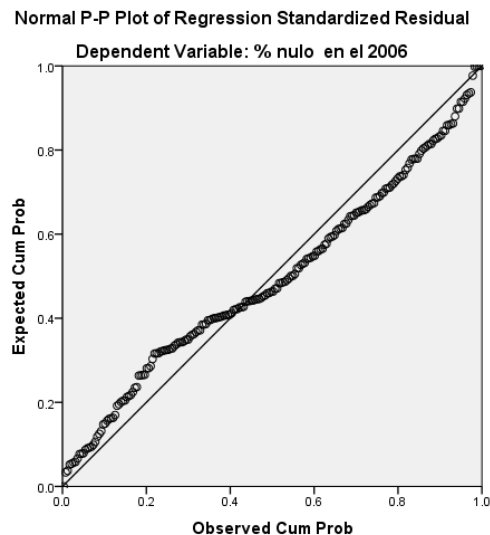
1. Errors are normally distributed
2. The errors are independent
3. The errors have constant variance

Procedure

1. Normality



The probability graph is built sorting residuals from smaller to bigger and plotting the couple (F (Waste, P). If the points appear to fit a straight line, it indicates that the data comes from a standard distribution.



To formally test the hypothesis is planted:

Ho: The residuals are normally distributed.

H1: The residuals are not normally distributed.

Kolmogorov Smirnov is used. For a sample, it is a process of "goodness of fit", which measures the degree of agreement between the distribution of a set of data and a rich theoretical specific distribution. Its aim is to

identify whether the data comes from a population that has the specified theoretical distribution, i.e. it contrasts whether the observations could reasonably have come from the specified distribution.

We check the level of significance, if less than 0.05, the distribution is not normal, if it is greater than 0.05 the distribution is normal. In this case the distribution of normal (n significations level 0.134)

One-Sample Kolmogorov-Smirnov Test

		Residual unstandardized
N		212
Normal Parameters ^{a, b}	Mean	0E-7
	Std Deviation	.81121122
	Absolute	.080
Most Extreme Differences	Positive	.053
	Negative	-.080
Kolmogorov-Smirnov Z		1.163
Asymp. Sig (2-tailed)		.134

a. Test distribution is Normal.

b. Calculated from data.

2. Errors independence

To formally do the test, the hypothesis should be proposed.

Ho: The residuals are independent

H a: The residuals are not independent.

The Durbin-Watson test is used, which is the test that correlates between residuals for testing the hypothesis above.

The value of the Durbin-Watson statistic ranges from 0 to 4. As a generally rule of thumb, the re uncorrelated residuals is the Durbin-Watson statistic is approximately 2. A value close to 0 Indicates strong positive correlation, while a value of 4 Indicates a strong negative correlation.

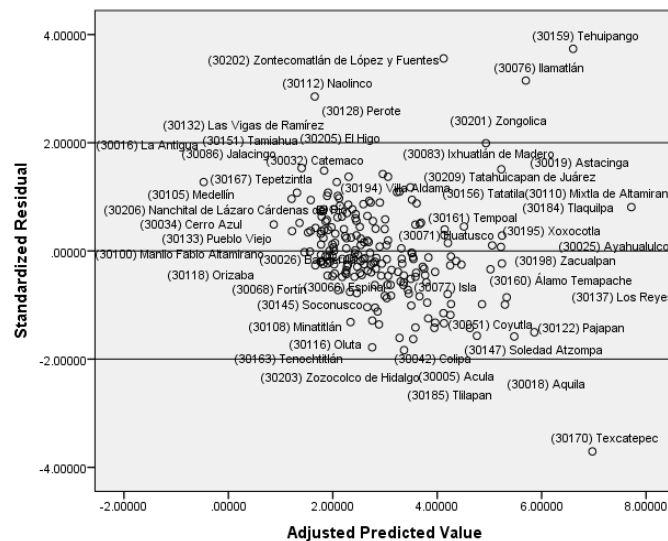
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.811	.657	.575	.90376	2.081

a. Dependent Variable:% cancelled votes in 2006

3. Test of homogeneity of pure errors

To validate the assumption of pure error homogeneity, a diagram is built between residualdispersions (Y axis) and the predicted values (X axis). If there is a pattern, it could indicate that the assumption of homogeneity of pure error may not meet. This doesn't happen on this test. We observe that most of the data in the parameters are given between -2 and 2 in the residual standardized. So the assumption of homogeneity of pure error is met.



For Cancellation of votes 2012

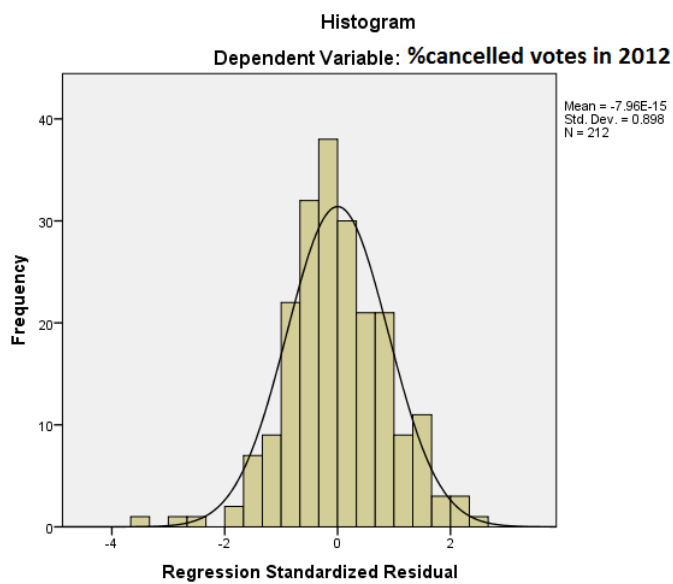
Verifying assumptions

When the model is proposed to adjust the data, assumptions are established on the variable error:

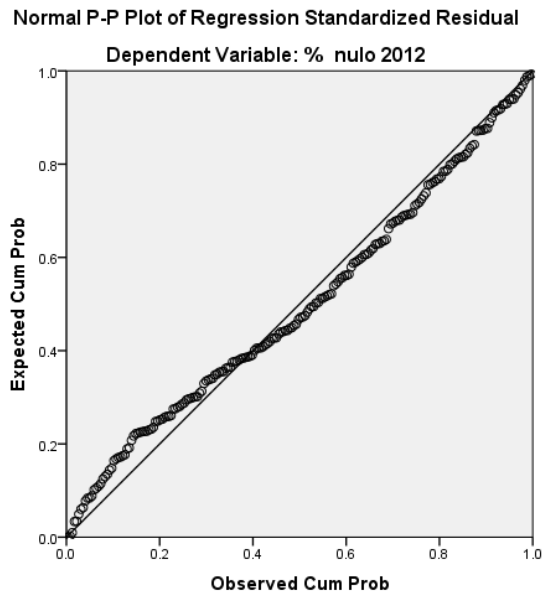
1. Errors are normally distributed
2. The errors are independent
3. The errors have constant variance

Procedure

1. Normality



The probability graph is built sorting residuals from smaller to bigger and plotting the couple (F (Waste, P). If the points appear to fit a straight line, it indicates that the data comes from a standard distribution.



To formally test the hypothesis is planted:

Ho: The residuals are normally distributed.

H1: The residuals are not normally distributed.

Kolmogorov Smirnov is used. For a sample, it is a process of "goodness of fit", which measures the degree of agreement between the distribution of a set of data and a rich theoretical specific distribution. Its aim is to identify whether the data comes from a population that has the specified theoretical distribution, i.e. it contrasts whether the observations could reasonably have come from the specified distribution.

We check the level of significance, if less than 0.05, the distribution is not normal, if it is greater than 0.05 the distribution is normal. In this case the distribution of normal (n significations level 0. 644)

KOLMOGOROV SMIRNOF

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		212
Normal Parameters ^{a,b}	Mean	0E-7

	Std. Deviation	.60685255
	Absolute	.051
Most Extreme Differences	Positive	.046
	Negative	-.051
Kolmogorov-Smirnov Z		.740
Asymp. Sig. (2-tailed)		.644

a. Test distribution is Normal.

b. Calculated from data.

2. Errors independence

To formally do the test, the hypothesis should be proposed.

Ho: The residuals are independent

H a: The residuals are not independent.

The Durbin-Watson test is used, which is the test that correlates between residuals for testing the hypothesis above.

The value of the Durbin-Watson statistic ranges from 0 to 4. As a generally rule of thumb, the re uncorrelated residuals is the Durbin-Watson statistic is approximately 2. A value close to 0 Indicates strong positive correlation, while a value of 4 Indicates strong negative correlation.

DURBIN WATSON

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.723	.523	.408	.67608	2.130

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.3994	5.3052	2.5478	.63590	212
Std. Predicted Value	-1.806	4.336	.000	1.000	212
Standard Error of Predicted Value	.208	.525	.297	.049	212
Adjusted Predicted Value	.8018	5.5215	2.5546	.65545	212
Residual	-2.29991	1.65783	.00000	.60685	212
Std. Residual	-3.402	2.452	.000	.898	212
Stud. Residual	-3.864	2.793	-.004	1.014	212
Deleted Residual	-2.96734	2.35539	-.00677	.77922	212
Stud. Deleted Residual	-4.034	2.851	-.004	1.023	212
Mahal. Distance	18.969	126.189	40.807	14.779	212
Cook's Distance	.000	.103	.007	.014	212
Centered Leverage Value	.090	.598	.193	.070	212

a. Dependent Variable: % nulo 2012

3. Test of homogeneity of pure errors

To validate the assumption of pure error homogeneity, a diagram is built between residual dispersions (Y axis) and the predicted values (X axis). If there is a pattern, it could indicate that the assumption of homogeneity of pure error may not meet. This doesn't happen on this test. We observe that most of the data in the parameters are given between -2 and 2 in the residual standardized. So the assumption of homogeneity of pure error is met.

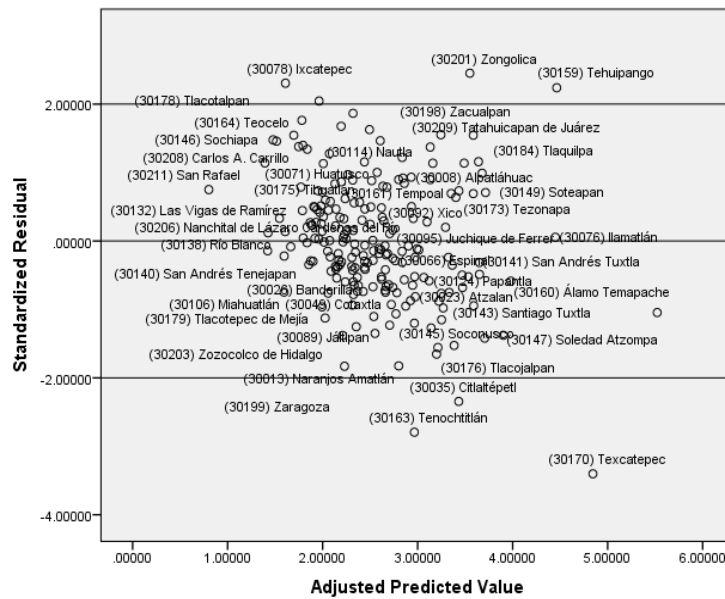


FIGURE D

Total Variance Explained

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	15.412	35.843	35.843
2	6.588	15.32	51.163
3	2.955	6.872	58.035
4	2.256	5.248	63.282
5	1.796	4.176	67.458
6	1.484	3.451	70.909
7	1.351	3.142	74.051
8	1.182	2.748	76.799
9	1.089	2.533	79.332
10	1.073	2.495	81.827
11	0.867	2.017	83.844
12	0.717	1.668	85.512
13	0.648	1.507	87.019
14	0.602	1.401	88.42
15	0.584	1.357	89.777
16	0.517	1.202	90.979
17	0.485	1.127	92.106
18	0.417	0.97	93.077

19	0.394	0.915	93.992
20	0.337	0.783	94.775
21	0.281	0.653	95.428
22	0.263	0.612	96.04
23	0.223	0.518	96.558
24	0.208	0.483	97.04
25	0.186	0.433	97.473
26	0.179	0.417	97.89
27	0.154	0.359	98.249
28	0.14	0.325	98.574
29	0.121	0.282	98.856
30	0.108	0.252	99.108
31	0.093	0.216	99.325

FIGURE D1

Component Matrix ^a		
	Component	
	1	2
Total Fertility Rate	-0.427	0.392
% 15 Or more with incomplete education		0.575
15 Per Cent or more illiterate	-0.764	
15 Per Cent or more literate	0.897	
% Urban Population	0.594	-0.496
% Rural Population	-0.565	0.58
% Semirural Population		
GDP per capita	0.83	-0.356
% People without access drinking water		
% Persons without health service		
% People with income less than a min wage	-0.847	
% People with income between one and two min wages		
% People with higher income to two min wages	0.815	-0.378
% Persons of 12 years or more united in marriage	0.593	0.53

% Number of marriages , or those who live in the same house		
Average number of occupants per dwelling no matter if owned or rented	-0.869	
% Of the houses that are owned	-0.728	0.39
% Of the houses that are rented	0.749	-0.475
(# Of houses owned / num people) * 100		0.704
% Of houses owned that were purchased	0.641	-0.503
% Of houses owned that were built by others		0.456
% Of houses owned that were built by owners	-0.602	
(Houses with piped water / num people) * 100	0.578	
% Houses with daily water supply	0.446	
% Houses with water supply each third day		
% Houses with 1or2 water supplies per week		
% Houses with sporadic water supply with		
% Women	0.398	-0.458
% Men	-0.398	0.458
% Between 0 and 4 yrs	-0.806	-0.453
% Between 05 and 9 yrs	-0.893	
% Between 10 and 14 yrs	-0.891	
% Between 15 and 19 yrs	-0.669	
% Between 20 and 24 yrs		-0.651
% Between 25 and 29 yrs		-0.693
% Between 30 and 34 yrs		-0.434
% Between 35 and 39 yrs	0.726	
% Between 40 and 44 yrs	0.867	
% Between 45 and 49 yrs	0.845	
% Between 50 and 54 yrs	0.845	
% Between 55 and 59 yrs	0.703	0.484
% Between 60 and 64	0.61	0.624
% of people 65 or above	0.509	0.74

FIGURE E. Communalities

Communalities

	Initial	Extraction
Total Fertility Rate	1,000	.669
% 15 Or more with incomplete education	1,000	.804
15 Per Cent or more illiterate	1,000	.867
15 Per Cent or more literate	1,000	.945
% Urban Population	1,000	.843
% Rural Population	1,000	.880
% Semirural Population	1,000	.936
GDP per capita	1,000	.873
% People without access drinking water	1,000	.942
% Persons without health service	1,000	.926
% People with income less than a min wage	1,000	.887
% People with income between one and two min wages	1,000	.799
% People with higher income to two min wages	1,000	.876
% Persons of 12 years or more united in marriage	1,000	.786
% Number of marriages , or those who live in the same house	1,000	.624
Average number of occupants per dwelling no matter if owned or rented	1,000	.901
% Of the houses that are owned	1,000	.900
% Of the houses that are rented	1,000	.880

% Of houses owned that were purchased	1,000	.771
% Of houses owned that were built by others	1,000	.953
% Of houses owned that were self built	1,000	.917
(Houses with piped water / num people) * 100	1,000	.939
% Houses with daily water supply	1,000	.995
% Houses with water supply each third day	1,000	.948
% Houses with 1or2 water supplies per week	1,000	.871
% Houses with sporadic water supply with	1,000	.873
% Women	1,000	.924
% Men	1,000	.924
% Between 0 and 4 yrs	1,000	.883
% Between 05 and 9 yrs	1,000	.908
% Between 10 and 14 yrs	1,000	.868
% Between15 and 19 yrs	1,000	.699
% Between 20 and 24 yrs	1,000	.760
% Between 25 and 29 yrs	1,000	.794
% Between 30 and 34 yrs	1,000	.779
% Between 35 and 39 yrs	1,000	.704
% Between 40 and 44 yrs	1,000	.814
% Between 45 and 49 yrs	1,000	.822
% Between 50 and 54 yrs	1,000	.856

Communalities

	Initial	Extraction
(# Of houses owned / num people) * 100	1,000	.918

Communalities

	Initial	Extraction
% Between 55 and 59 yrs	1,000	.795
% Between 60 and 64	1,000	.837
% of people above 65 for	1,000	.879

FIGURE F

	B	S. E.	Wald	DF	GIS.
Incomplete Education	0.182	0.071	6,508	1	0.011
Illiterate Population	-164	0.195	0.709	1	0.4
Literate Population	-173	0.178	0.941	1	0.332
Urban Population	0	0.011	0.001	1	0.972
Rural Population	0.003	0.009	0.077	1	0.781
GDP Per Capita	0	0	1,332	1	0.248
People without access to drinking water	0.025	0.026	0.995	1	0.318
People without Health Service	-0.013	0.015	0.764	1	0.382
Income lower than 1 min salary	-0.115	0.066	3,031	1	0.082
Income between 1 and 2 min salaries	-0.084	0.07	1,458	1	0.227
Income over 2 min salary	-0.089	0.071	1,575	1	-209
Population together or married	-).216	0.131	2,728	1	0.099
Resident Spouses	-0.03	.147	0.042	1	0.837
Overcrowding	2,704	3,396	0.634	1	0.426
Own Houses	-0.136	.,187	0.525	1	0.469
Rented Houses	-0.006	0.107	0.003	1	0.957
RelacionPropiasPorPersona	0.355	0.685	0.268	1	0.604
Bought Houses	0.123	0.06	4,256	1	0.039
Houses built by others	0.113	0.054	4,357	1	0.037
Houses built by owner	0.098	0.056	3,007	1	0.083

Houses with Piped water vs #people index	-0.08	0.1	0.632	1	0.427
Daily water supply	0.006	0.36	0	1	0.986
Water supply each third day	-0.01	0.362	0.001	1	0.977
Water supply 1 or 2 times a week	.030 Inch Orifices	0.36	0.007	1	0.934
Sporadic water supply	0.036	0.362	0.01	1	0.922

FIGURE F1

	B	S. E.	Wald	DF	GIS.
Women Percentage	-0.396	..... 196	4,104	1	0.043
People between 0 and 4	-4.842	3,581	1,828	1	"176
People between 5 and 9	-5.052	3,522	2,057	1	0.151
People between 10 and 14	-4.703	3,549	1,756	1	0.185
People between 15 and 19	-4.742	3,553	1,781	1	182
People between 20 and 24	-4.795	3,538	1,837	1	0.175
People between 25 and 29	-4.496	3,526	1,626	1	202
People between 30 and 34	-4.253	3,556	1,430	1	"232
People between 35 and 39	-4.57	3,582	1,628	1	202
People between 40 and 44	-4.733	3,546	1,781	1	182

People between 45 and 49	-4.324	3,508	1,520	1	0.218
People between 50 and 54	-4.518	3,557	1,614	1	0.204
People between 55 and 59	-5.289	3,598	2,161	1	-142
People between 60 and 64	-4.548	3,545	1,646	1	..... 199
People over 64	-4.59	3,568	1,655	1	0.198
Constant	497,153	351,152	2,004	1	0.157

FIGURE G

Variables in the Equation						
	B	S. E.	Wald	DF	GIS.	Exp(B)
Incomplete Education	-.075	.080	.873	1	.350	.928
Illiterate Population	-.033	.277	Overlays from .014 sheet	1	.905	.968
Literate Population	.045	" . (266)	.028	1	.866	1,046
Urban Population	-.058	.036	2,566	1	.109	.944
Rural Population	.013	Overlays from .014 sheet	.881	1	.348	1,013
GDP Per Capita	.000	.000	1,479	1	.224	1,000
People without access to drinking water	.077	.034	5,109	1	.024	1,080
People without Health Service	.020	.016	1,560	1	.212	1,021
Income lower than 1 min salary	Decision.106	.105	1,015	1	.314	1,112
Income between 1 and 2 min salaries	.122	.112	1,179	1	.278	1,129
Income over 2 min salary	.130	.119	1,204	1	.273	1,139
Population together or married	.047	(162)	.086	1	.770	1,049
Resident Spouses	-.179	.194	.857	1	.355	.836
Overcrowding	1,481	3,886	.145	1	.703	4,396
Own Houses	.072	.223 Round .193	.104	1	.748	1,075
Rented Houses	.114	Discussions are now taking place	.346	1	.557	1,121
RelacionPropiasPorPersona	.674	.829	.662	1	.416	1,963
Bought Houses	-.092	.087	1,137	1	.286	.912

Houses built by others	-.105	.071	2,162	1	141)	.901
Houses built by owner	-.067	.072	.869	1	.351	.935
Houses with Piped water vs #people index	-.241	.127	3,583	1	.058	.786
Daily water supply	.417	.640	.424	1	.515	1,518
Water supply each third day	.407	.641	.402	1	.526	1,502
Water supply 1 or 2 times a week	.378	.644	.344	1	.558	1,459
Sporadic water supply	.401	.641	.391	1	.532	1,493

FIGURE G1

	B	S. E.	Wald	DF	GIS.	Exp(B)
Step 1a Women Percentage	-.122	.262	219	1	.640	.885
People between 0 and 4	5,093	4,587	1,233	1	.267	162,895
People between 5 and 9	5,029	4,583	1,204	1	.273	152,768
People between 10 and 14	4,986	4,569	1,191	1	.275	146,364
People between 15 and 19	4,592	4,602	.996	1	.318	98,692
People between 20 and 24	5,314	4,577	1,348	1	(246)	203,079
People between 25 and 29	3,694	4,518	.668	1	Hit .414 In	40,193
People between 30 and 34	5,509	4,638	1,411	1	.235	246,904
People between 35 and 39	4,108	4,599	.798	1	.372	60,853
People between 40 and 44	5,082	4,648	1,196	1	.274	161,092
People between 45 and 49	4,656	4,454	1,093	1	.296	105,224
People between 50 and 54	5,276	4,808	1,204	1	. (272	195,676
People between 55 and 59	4,832	4,664	1,073	1	.300	125,480
					
People between 60 and 64	5,850	4,521	1,675	1	.....	347,331
					..... 196	
People over 64	4,402	4,573	.927	1	.336	81,597
Constant	-537.758	454,354	1,401	1	.237	.000

FIGURE H

	B	S. E.	Wald	DF	GIS.	Exp(B)
Incomplete Education	-.118	) 0.65 -	3,300	1	.069	.889
Illiterate Population	.223 Round	.207	1,160	1	.282 Batting Average	1,250
Literate Population	.201	.185	1,180	1	.277	1,222
Urban Population	-.002	.011	.051	1	.821	.998
Rural Population	-.012	.010	1,632	1	.201	.988
GDP Per Capita	.000	.000	1,104	1	.293	1,000

People without access to drinking water	.082	.027	9,381	1	.002	.921
People without Health Service	.008	.013	.370	1	.543	1,008
Income lower than 1 min salary	.081	.067	1,481	1	.224	1,085
Income between 1 and 2 min salaries	.077	.070	1,218	1	.270	1,080
Income over 2 min salary	.061	.071	.735	1	.391	1,063
Population together or married	.241	.128	3,556	1	.059 Inches	1,273
Resident Spouses	.111	.131	.717	1	.397	1,117
Overcrowding	-4.837	4,123	1,376	1	.241	.008
Own Houses	.195	Hit .211	.855	1	.355	1,216
Rented Houses	-.031	.107	.084	1	.772	.969
RelacionPropiasPorPersona	-1.036	.789	1,724	1	.189	.355
Bought Houses	-.056	.059 Inches	.892	1	.345	.946
Houses built by others	-.063	.054	1,355	1	.244	.939
Houses built by owner	-.050	.056	.783	1	.376	.952
Houses with Piped water vs #people index	.248	.104	5,646	1	.017	1,281
Daily water supply	-.236	.372	.403	1	.526	.790
Water supply each third day	-.215	.373	.333	1	.564	.806
Water supply 1 or 2 times a week	-.245	.373	.431	1	.511	.783
Sporadic water supply	-(260)	.373	.485	1	.486	.771

FIGURE H1

Variables in the Equation						
	B	S. E.	Wald	DF	GIS.	Exp(B)
Women Percentage	.483	.204	5,606	1	.018	1,621
People between 0 and 4	5,407	4,448	1,477	1	.224	222,944
People between 5 and 9	5,855	4,424	1752	1	.186)	349,016
People between 10 and 14	5,310	4,441	1,430	1	"232	202,415

People between 15 and 19	5,510	4,451	1,532	1	.216	247,252
People between 20 and 24	5,291	4,443	1,418	1	.234 At	198,444
People between 25 and 29	5,652	4,460	1,606	1	.205	284,922
People between 30 and 34	4,612	4,458	1,070	1	.301	100,663
People between 35 and 39	5,422	4,472	1,470	1	.225	226,303
People between 40 and 44	5,736	4,459	1,655	1	.198	309,827
People between 45 and 49	4,835	4,422	1,196	1	.274	125,834
People between 50 and 54	5,231	4,418	1,402	1	(236)	186,889
People between 55 and 59	5,958	4,487	1,763	1	.184	387,006
People between 60 and 64	4,731	4,455	1,128	1	.288	113,410
People over 64	5,484	4,487	1,494	1	.222	240,794
Constant	-545.665	437,390	1,556	1	.212	.000

FIGURE I

Variables in the Equation						
	B	S. E.	Wald	DF	GIS.	Exp(B)
Incomplete Education	.172	.070	6,000	1	.014	1,188
Illiterate Population	(243)	.207	1,385	1	.239	1,275
Literate Population	.114	.191	.357	1	.550	1,121
Urban Population	-.011	.012	894	1	.344	.989
Rural Population	.016	.011	2,348	1	.125	1,016
GDP Per Capita	.000	.000	4,803	1	.028	1,000
People without access to drinking water	-.007	.027	.076	1	.783	.993
People without Health Service	.031	.015	4,413	1	.036	1,032
Income lower than 1 min salary	-.054	.070	.595	1	.440	.947
Income between 1 and 2 min salaries	-.093	.074	1,579	1	(209)	.911
Income over 2 min salary	-.046	.077	.349	1	.555	.956
Population together or married	-.317	.146	4,715	1	.030	.728
Resident Spouses	-.200	.137	2,148	1	.143	.819
Overcrowding	2,490	3,552	.491	1	.483	12,059
Own Houses	-.126	.194	.423	1	.516	.881
Rented Houses	-.175	.116	2,271	1	.132	.839
RelacionPropiasPorPersona	.144	.711	.041	1	.839	1,155
Bought Houses	.114	.067	2,897	1	.089	1,120
Houses built by others	.113	.061	3,377	1	.066	1,119
Houses built by owner	.084	.062	1,801	1	.180	1,087
Houses with Piped water vs #people index	-.023	.102	.049	1	.825	.978
Daily water supply	1,201	.497	5,833	1	.016	3,325
Water supply each third day	1,208	.499	5,867	1	.015	3,346
Water supply 1 or 2 times a week	1,232	.499	6,090	1	.014	3,429
Sporadic water supply	1,179	.499	5,581	1	.018	3,252

FIGURE I 1

Variables in the Equation

	B	S. E.	Wald	DF	GIS.	Exp(B)
Women Percentage	-.413	.204	4,100	1	.043	.662
People between 0 and 4	-8.659	4,997	3,003	1	.083	.000
People between 5 and 9	-10.153	4,978	4,159	1	.041	.000
People between 10 and 14	-9.889	5,018	3,884	1	.049	.000
People between 15 and 19	-9.325	5,022	3,448	1	.063	.000
People between 20 and 24	-9.911	5,011	3,912	1	.048	.000
People between 25 and 29	-9.875	5,041	3,837	1	.050	.000
People between 30 and 34	-9.124	5,004	3,324	1	.068	.000
People between 35 and 39	-8.417	5,009	2,824	1	.093	.000
People between 40 and 44	-9.187	5,002	3,373	1	.066	.000
People between 45 and 49	-10.095	5,026	4,034	1	.045	.000
People between 50 and 54	-8.648	4,955	3,046	1	.081	.000
People between 55 and 59	-9.383	5,038	3,470	1	.063	.000
People between 60 and 64	-9.877	5,014	3,880	1	.049	.000
People over 64	-9.697	5,072	3,655	1	.056	.000
Constant	856,313	486,094	3,103	1	.078	.

FIGURE J

Variables in the Equation						
	B	S. E.	Wald	DF	GIS.	Exp(B)
Incomplete Education	-(142)	) 0.65 -	4,681	1	.030	.868
Illiterate Population	-.185	..... 199	.861	1	.353	.831
Literate Population	-.053	.184	.083	1	.774	.948
Urban Population	.000	.011	.001	1	.973	1,000
Rural Population	-.020	.010	3,646	1	.056	.981
GDP Per Capita	.000	.000	1,964	1	.161	1,000
People without access to drinking water	.019	.026 ln.)	.533	1	.466	1,019
People without Health Service	-.033	.014	5,482	1	.019	.967
Income lower than 1 min	-.071	.066	1,153	1	.....	.931

salary					283	
Income between 1 and 2 min salaries	-.005	.071	.005	1	.944	.995
Income over 2 min salary	-.090	.072	1,576	1	(209)	.914
Population together or married	.155	.134	1,341	1	.247	1,168
Resident Spouses	.014	.132	.011	1	.918	1,014
Overcrowding	-1.575	3,482	(205) T	1	.651	.207
Own Houses	.018	".191 Down	.009	1	.926	1,018
Rented Houses	.055	.114	(236)	1	.627	1,057
RelacionPropiasPorPersona	[120]	.699	.029	1	.864	1,127
Bought Houses	-.039	.069	.323	1	.570	.962
Houses built by others	.009	.057	.026 ln.)	1	.872	1,009
Houses built by owner	.015	.059	.069	1	.792	1,016
Houses with Piped water vs #people index	.032	.099	.107	1	.744	1,033
Daily water supply	-.766	.385	3,966	1	.046	.465
Water supply each third day	-.776	.386	4,042	1	.044	.460
Water supply 1 or 2 times a week	-.785	.385	4,149	1	.042	.456
Sporadic water supply	-.729	.384	3,610	1	.057	.482

FIGURE J1

Variables in the Equation						
	B	S. E.	Wald	DF	GIS.	Exp(B)
Step 1a						
Women Percentage	.129 Under such	..... 199	.420	1	.517	1,138
People between 0 and 4	3,940	4,376	.811	1	.368	51,418
People between 5 and 9	4,721	4,323	1,192	1	.275	112,263
People between 10 and 14	4,685	4,402	1,133	1	.287	108,351
People between 15 and 19	4,426	4,373	1,024	1	.311 Lifetime Screen	83,565
People between 20 and 24	4,692	4,369	1,153	1	..... 283	109,033
People between 25 and 29	4,207	4,383	.922	1	.337	67,185
People between 30 and 34	4,085	4,377	.871	1	.351	59,424
People between 35 and 39	3,527	4,396	.644	1	.422	34,038
People between 40 and 44	3,948	4,365	.818	1	.366	51,849
People between 45 and 49	5,052	4,374	1,334	1	.248	156,393
People between 50 and 54	3,240	4,348	.555	1	.456	25,545
People between 55 and 59	4,662	4,414	1,116	1	.291	105,893
People between 60 and 64	4,488	4,369	1,055	1	.304	88,900
People over 64	4,577	4,421	1,072	1	.301	97,192
Constant	-352.740	428,436	.678	1	.410	.000

FIGURE K

Variables in the Equation		B	SE	Wald	df	Sig
Step ¹	Incomplete Education	.102	.148	.473	1	.492
	Illiterate Population	- .528	.493	1,147	1	.284
	Literate Population	- .550	.448	1,509	1	.219
	Urban Population	.033	.021	2,438	1	.118
	Rural Population	- .031	.026	1,461	1	.227
	GDP Per Capita	- .001	.000	4,816	1	.028
	People without access to drinking water	- .043	.062	.495	1	.482
	People without Health Service	.017	.039	.194	1	.659
	Income lower than 1 min salary	.752	.223	11,337	1	.001
	Income between 1 and 2 min salaries	.385	.202	3,626	1	.057
	Income over 2 min salary	.749	.248	9,151	1	.002
	Population together or married	.267	.307	.760	1	.383
	Resident Spouses	.482	.363	1,761	1	.184
	Own Houses	1948	9,179	.045	1	.832
	Rented Houses	.243	.524	.215	1	.643
	RelacionPropiasPorPersona	.215	.254	.713	1	.399
	Bought Houses	- .732	1,861	.155	1	.694
	Houses built by others	- .317	.149	4,535	1	.033
	Houses built by owner	- .391	.147	7,064	1	.008
	Houses with Piped water vs #people index	- .312	.139	5,031	1	.025
	Daily water supply	- .197	.269	.535	1	.465
	Water supply each third day	.320	.862	.138	1	.710
	Water supply 1 or 2 times a week	.360	.863	.174	1	.677
	Sporadic water supply	.292	.861	.115	1	.734
	Own Houses	.254	.850	.089	1	.765

FIGURE K1

Variables in the Equation		B	SE	Wald	df	Sig
Step ¹	Women Percentage	1,967	.640	9,455	1	.002
	People between 0 and 4	21,460	13,235	2,629	1	.105
	People between 5 and 9	24,244	13,240	3,353	1	.067
	People between 10 and 14	23,304	13,290	3,074	1	.080
	People between 15 and 19	21,492	13,416	2,566	1	.109
	People between 20 and 24	23,679	13,282	3,178	1	.075
	People between 25 and 29	24,733	13,420	3,397	1	.065
	People between 30 and 34	23,026	13,335	2,982	1	.084
	People between 35 and 39	24,775	13,513	3,362	1	.067

People between 40 and 44	23,688	13,147	3,247	1	.072
People between 45 and 49	22,823	13,190	2,994	1	.084
People between 50 and 54	26,159	13,446	3,785	1	.052
People between 55 and 59	21,310	13,261	2,582	1	.108
People between 60 and 64	24,329	13,461	3,266	1	.071
People over 64	22,835	13,368	2,918	1	.088
	-	1340.854	3,485	1	.062
Constant	2503.097				

FIGURE L

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	85.323	41	2.081	4.553	.000 ^b
Residual	77.705	170	.457		
Total	163.028	211			

FIGURE L1

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-67.566	133.211		-.507	.613
Total Fertility Rate	-.020	.672	-.002	-.030	.976
% 15 Or more with ed.incompat	-.031	.024	-.120	-1.304	.194
15 Per Cent or more illiterate	.048	.075	.189	.639	.523
15 Per Cent or more literate	-.122	.068	-.808	-1.797	.074
% Urban Population	-.007	.005	-.149	-1.469	.144
% Population semi	-.010	.004	-.169	-2.784	.006
GDP per capita	-1.111E-06	.000	-.002	-.016	.987
% People without access drinking water	-.012	.009	-.161	-1.259	.210
% Persons without health service	-.008	.005	-.087	-1.616	.108

% People with income less than a min wage	.020	.026	.266	.800	.425
% People with income between one and two wages min	.022	.027	.135	.838	.403
% People with higher income to two wages min	.036	.028	.395	1.311	.192
% Persons of 12 years or more or united in marriage	.031	.048	.066	.655	.513
% With respect to num marriages , those who live in the same house	.057	.050	.066	1.128	.261
Average number of occupants per dwelling is no matter if you own or rent	-3.108	1.261	-1.049	-2.465	.015
% Of the houses that are own	.183	.070	1.022	2.623	.009
% Of the houses that are rented	.070	.042	.264	1.660	.099
(# Of homes owned / num people) * 100	-.618	.253	-1.007	-2.441	.016
% Of households owned that were purchased	-.021	.022	-.144	-.923	.357
% Of households owned that were sent to build	-.006	.020	-.048	-.299	.765
% Of households owned that were self-built	.007	.021	.056	.315	.753
(Housing with piped water / num people) * 100	.044	.036	.179	1.202	.231
% Housing with daily water supply	-.269	.135	-5.659	-1.996	.048
% Housing with water supply each third day	-.275	.135	-3.527	-2.035	.043
% Housing with water supply 1or2 per week	-.268	.134	-3.151	-1.996	.048
% Housing with sporadic water supply	-.286	.135	-1.961	-2.122	.035
% Men	-.089	.073	-.082	-1.219	.225
% Between 0 and 4	1.175	1.353	1.562	.869	.386
% Between 05 and 9	1.135	1.324	1.574	.858	.392
% Between 10 and 14	1.012	1.347	1.225	.751	.454

% Between 15 and 19	.978	1.339	.814	.730	.466
% Between 20 and 24	1.206	1.334	.939	.904	.367
% Between 25 and 29	1.077	1.338	.762	.805	.422
% Between 30 and 34	.989	1.347	.576	.734	.464
% Between 35 and 39	1.203	1.352	.695	.890	.375
% Between 40 and 44	1.318	1.339	.973	.985	.326
% Between 45 and 49	1.023	1.327	.750	.771	.442
% Between 50 and 54	1.049	1.339	.759	.784	.434
% Between 55 and 59	1.142	1.358	.689	.841	.402
% Between 60 and 64	1.044	1.339	.596	.780	.437
% people above 65	1.197	1.351	1.824	.886	.377

a. Dependent Variable: % cancelled vote in 2006

FIGURE M

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	-37.828	99,653		-.380	.705
Total Fertility Rate	-.523	.503	-.082	-1.041	.299
% 15 Or more with ed.incompat	-.012	.018	-.075	-.695	.488
15 Per Cent or more illiterate	.068	.056	.420	1,203	.231
15 Per Cent or more literate	-.023	.051	-(.238)	-.449	.654
% Urban Population	.001	.004	.026 In.)	.216	.829
% Population semi	-.005	.003	-.131	-1.824	.070
GDP per capita	-7.283E-005	.000	-Hit .211	-1.442	.151
% People without access drinking water	-.004	.007	-.085	-.561	.576

% Persons without health service	-.007	.004	-.121	-1.915	.057
% People with income less than a min wage	.012	.019	.242	.618	.538
% People with income between one and two wages min	.021	.020	.203)	1,065	.288
% People with higher income to two wages min	.019	.021	.328	.922	.358
% Persons of 12 years or more or united in marriage	.006	.036	.020	171)	.864
% With respect to num marriages , those who live in the same house	Overlays from .014 sheet	.037	.025	.361	.718
Average number of occupants per dwelling is no matter if you own or rent	-2.423	.943	-1.290	-2.570	.011
% Of the houses that are own	.132	.052	1,158	2,521	.013
% Of the houses that are rented	.050	.031	.298	1,591	.113

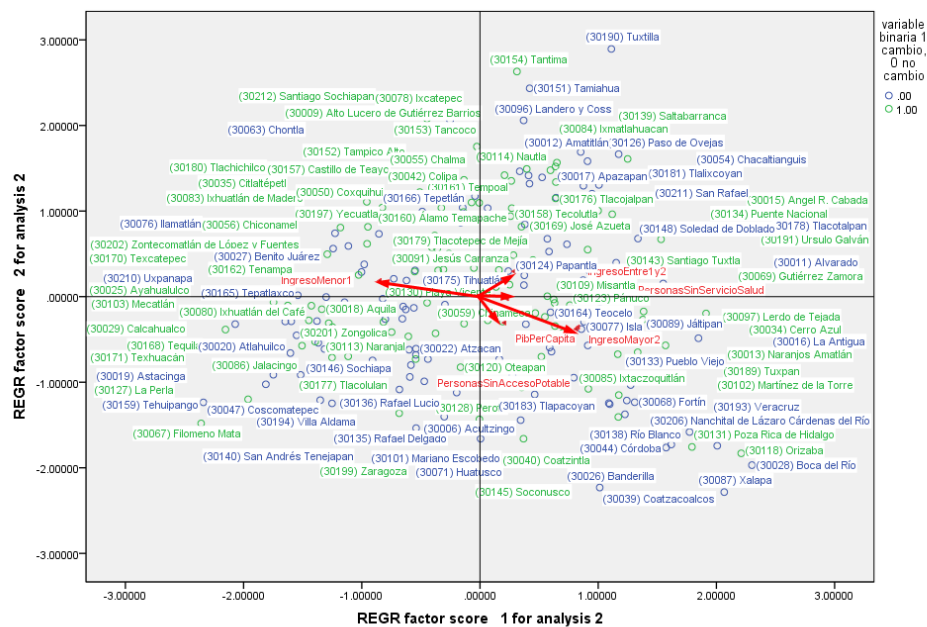
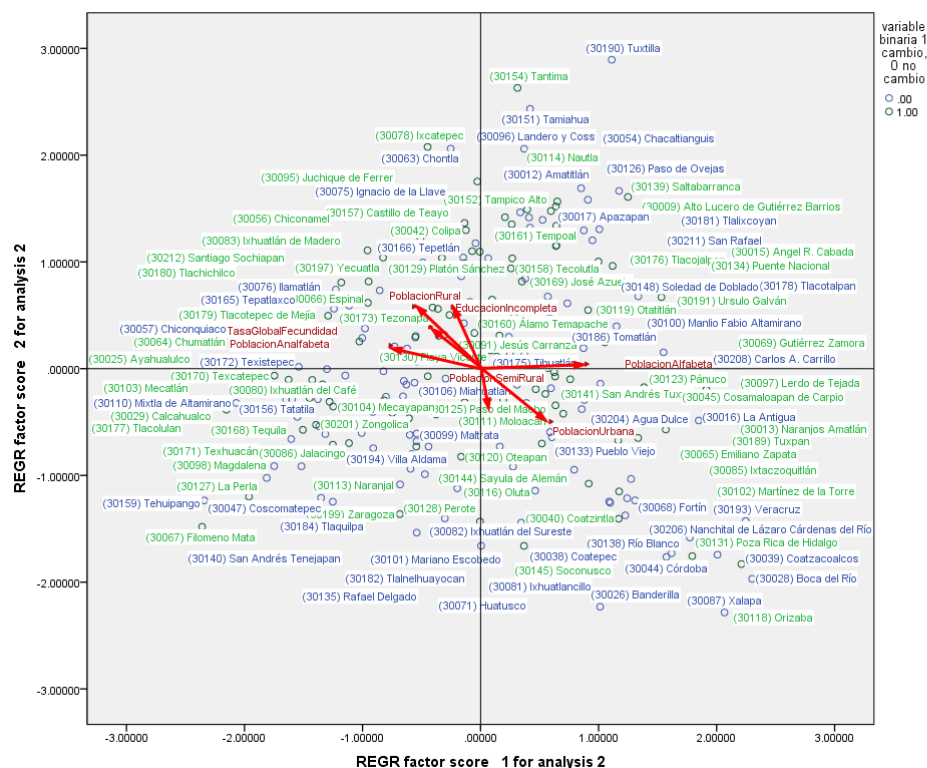
FIGURE M1

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	GIS.
	B	Std. Error	Beta		
1 (# Of homes owned / num people) * 100	-.390	.189	-1.001	-2.057	.041
% Of households owned that were purchased	.013	.017	.143	.775	.440
% Of households owned that were sent to build	.021	.015	.274	1,439	.152
% Of households owned that were self-built	.025	.016	.335	1,605	.110
(Housing with piped water / num people) * 100	.021	.027	.134	.762	.447
% Housing with daily water supply	-.137	.101	-.4544	-1.358	.176

% Housing with water supply each third day	-143	101	-2.889	-1.413	.160
% Housing with water supply 1or2 per week	.139	101	-2.575	-1.383	.169
% Housing with sporadic water supply	-141	101	-1.528	-1.402	.163)
% Men	-.052	.055	-.076	-.958	.340
% Between 0 and 4	.744	1,012	1,559	.735	.463
% Between 05 and 9	.670	.990	1,463	.676	.500
% Between 10 and 14	.514	1,008	.980	.509	.611
% Between15 and 19	.539	1,002	.707	.538	.591
% Between 20 and 24	.610	.998	.749	.612	.542
% Between 25 and 29	.611	1,001	.682	.611	.542
% Between 30 and 34	.437	1,007	.402	.434	.665
% Between 35 and 39	.728	1,011	.663	.720	.473
% Between 40 and 44	.749	1,001	.872	.748	.455
% Between 45 and 49	.548	.993	.633	.552	.582
% Between 50 and 54	.549	1,002	.627	.548	.584
% Between 55 and 59	.594	1,016	.565	.585	.560
% Between 60 and 64	.614	1,002	.552	.613	.541
Per cent of people above 65 for	.613	1,011	1,472	.606	.545

FIGURE N



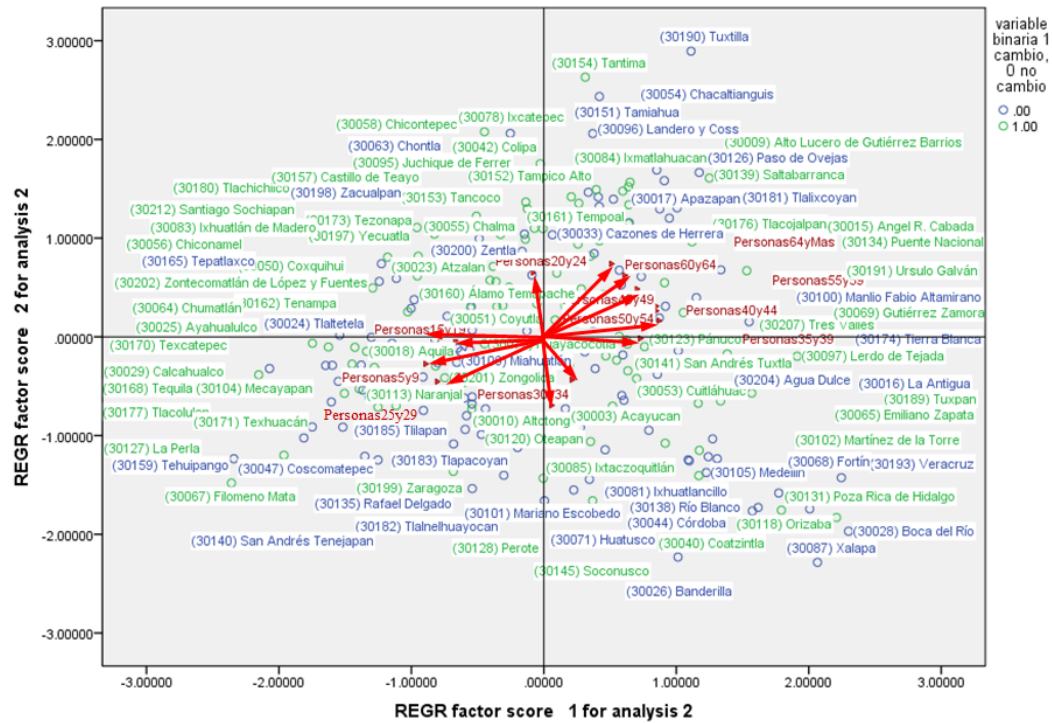
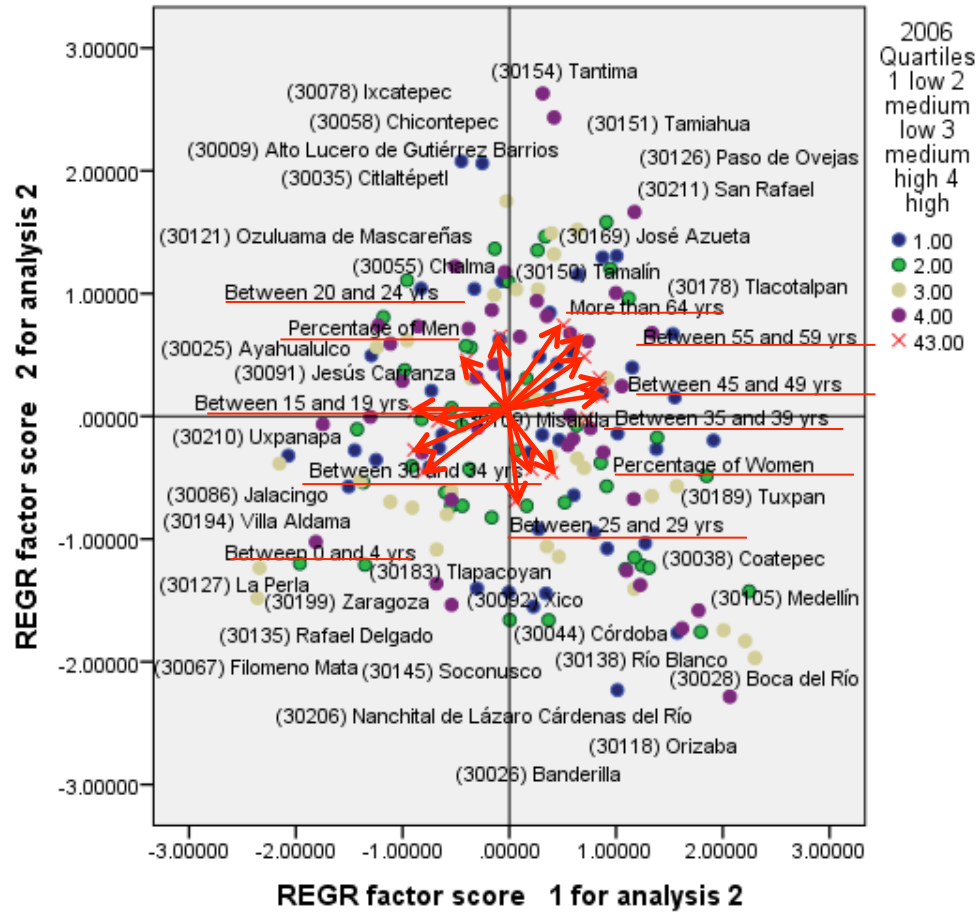
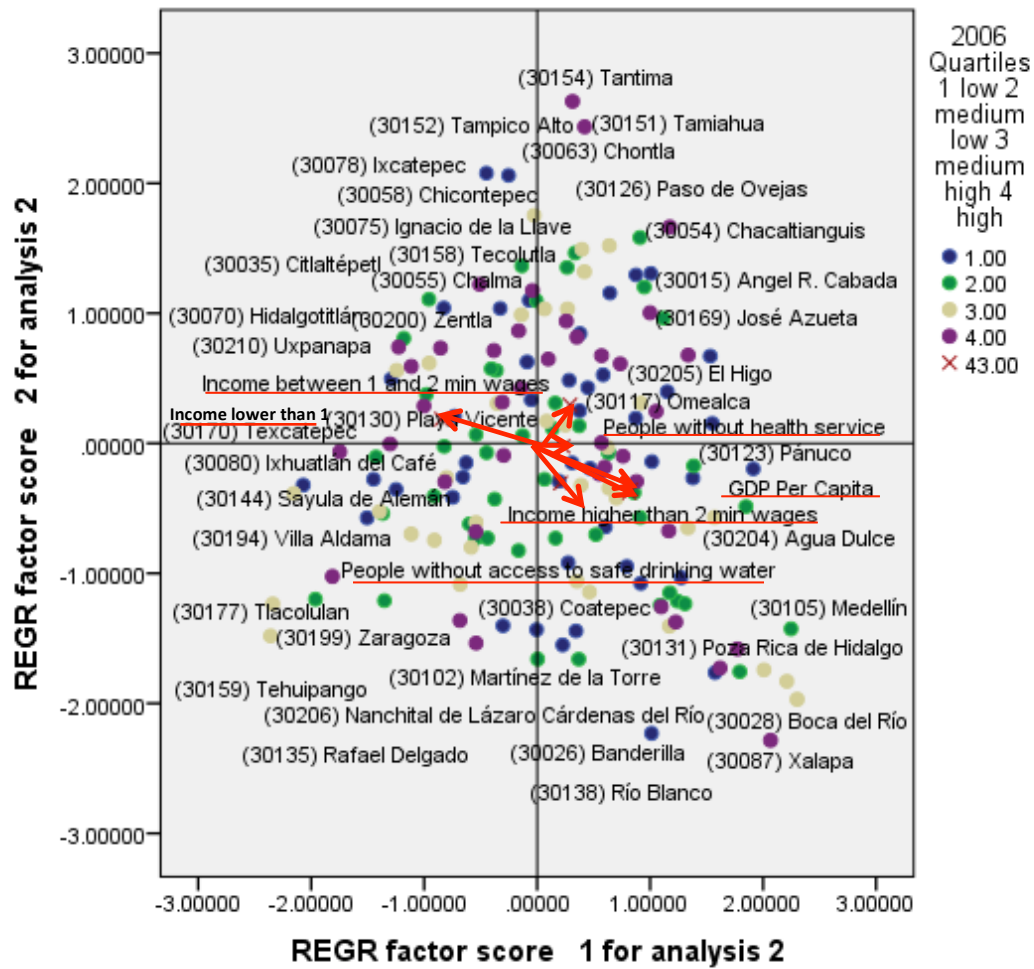
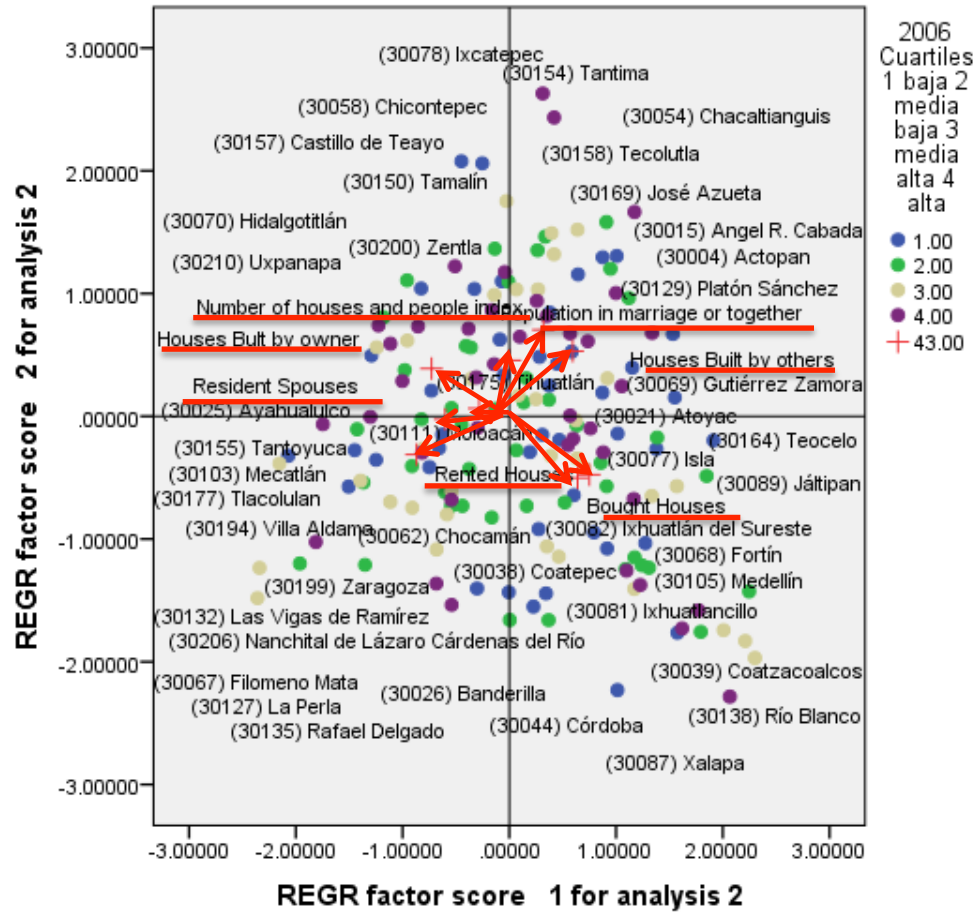


FIGURE O

2006







2012

