

Model Fit of Mexican Elections: From Binary to Quaternary Elections in the Dawn of Mexican Welfare State

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Abstract: - Chi-square Tests have been applied to identify Binary, Ternary and Quaternary elections to the national and regional level in Mexico. Results suggest that to the regional level votes are aggregated following a rational choice due to strong social relations. This also holds to the national level where three parties operate a ternary election that results from the overlapping of binary elections along the country. Quaternary elections can be interpreted as the consequence of the crisis of the political system that comes out from the end of the Welfare State in Mexico.

Key-Words: - Binary Elections, Duverger Law, Model Fitting, Rational Choice, Political Fragmentation, Chi-square Test

1 Introduction

Binary elections where two candidates concentrate most of the votes have been predicted by Duverger [1] in the case of majority elections due to the rational choice principle where voters select the stronger candidate. Following Riker, Duverger law was the first law concocted by political science, although by the end of the nineteenth century Henry Droop understood that plural elections should lead to a contend between the two most popular candidates [2]. Mass media clearly has an influence on public opinion and the enormous amount of money dedicated by Mexican Government to electoral campaigns favors the impact of mass media on elections so that voters may be well informed about the strongest candidates. Knowing who are the best candidates can lead to a rationalization process where voters will avoid wasting their votes and concentrate in choosing the best candidate. It is amazing that majority elections had been implemented in a time where mass media favor this binarization process without a proper counting of votes that prevents conflicts in a scenario where scarce differences in the number of votes obtained by the couple of strongest candidates. Mass media inform about the capabilities of each candidate and therefore participate in this process where the regional community decides which candidate is the stronger one. Internet provides real time information and can be a source for social synchronization that supports trends leading to binary elections, while quaternary elections could be understood as part of a social fragmentation which

could be a product of a crisis in the social system and a lack of leadership in the political elite. Leaders incorporate social needs in their agenda and voters choose a candidate that will lead their local community to welfare. This way parties assume positions identified with the center of the political spectrum gradually discarding extreme positions, which has been considered as a general process that produce moderate parties with a complex bureaucratic structure [3]. Spiritual links between parties and voters are developed so that a spiritual community is grounded which can turn political ideology into a quasi-religion [4]. Mass media can serve to the identification of those leaders that incarnate such social demands leveling cultural differences between subregions and ensuring the electoral convergence all along the regions.

Minority parties are discarded due to a psychological effect that inhibits the waste of votes for losing candidates. A party is defined as a minority one when it is favored with less than 5% of the total votes and can be excluded from the statistical analysis according to Duverger. A minority party needs to obtain at least 0.12 of total votes in a proportional system and 0.32 in the plural system, in order to be represented proportionally. In a ternary scenario the three strongest parties will be dominant unless special measures are taken to ensure the participation of these minority parties [5]. In Mexico minority parties have been favored by the representation system but in some cases this has been abused inasmuch as administering a minority party can be a very profitable business. Mexican Green

Party has made the transition from a minority party to a party that composes a quaternary scenario which might be related to the crisis of the Mexican System that provokes several demands for public intervention on social and environmental issues.

A third party with presence to the distrital or state level can explain a ternary scenario where a failing party wins the election because a third party makes an alliance with the failing party preventing a change in the dominant party [6]. This kind of alliances allow the permanence of a party that makes major mistakes which could be avoided in a binary election where voters could have rejected a failing party [7]. Where parties are sufficiently institutionalized, these alliances can help them to win again as has been shown in the case of Spain [8]. Government funding can lead to the reduction of the number of effective parties and is related to the efficiency in taxation as well as to effectiveness of social policies since both factors contribute to the level of electoral aggregation [9]. In third world countries, bipartidism is also linked to low levels of participation and multipartidism is related to fragility and fragmentation [10]. At the final stage of Mexican presidential elections in 2006, international analysts indicated that competition was fierce between the two strongest candidates and that this could lead to disastrous consequences. A collision was expected at that time which came out to be true when one of the two stronger candidates refused to accept the result of the presidential election. This was a failure of the very expensive electoral system which never devised an effective counting system like the one used by USA giving evidence of the theoretical poorness of its implementers. Nowadays Mexican electoral system has created new laws that seriously affect freedom of speech not only for individuals but also for mass media. Therefore a major revision of the grounds for funding such white elephant is needed and will be a part the political agenda for the following years.

2 Problem Formulation

A chi-square proof can be devised to proof the binarity, ternarity or quaternarity of Mexican elections. The effective number of parties can be computed following Laakso y Taagepera [11]. When k parties obtain the fractions of votes f_1, \dots, f_k , this effective number of parties is given by:

$$N_{eff} = \left(\sum_{i=1}^k f_i^2 \right)^{-1} \quad (1)$$

A signature of bipartidism is given by the sum of the relative frequencies of the two strongest candidates, which should be almost equal to one. When a ternary election is given, the frequency of the third party should be added in order to have a sum almost equal to one.

Another index used for signing binary elections is the empiric statistic SF of Cox [12], given by quotient between the relative frequency of the third party and the relative frequency of the second party, which should be almost zero in a bipartidist election, although this index can be almost zero in a multipartidist election [13]. In the case of the ternary presidential elections of Mexico at 2000, the mean SF Cox empiric statistic was equal to 0.43 with a standard deviation of 0.28, which is away from a zero value (Fig. 1).

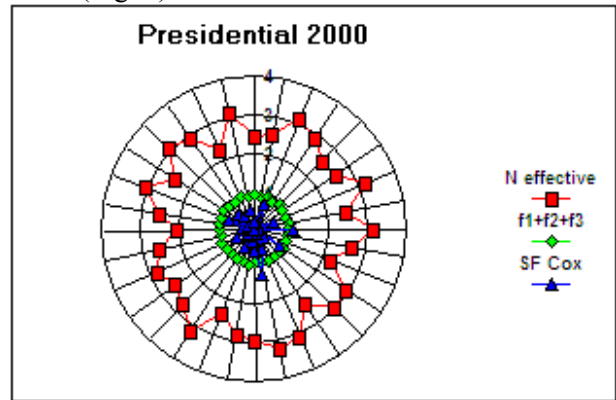


Fig.1.- Radar plot for Mexican presidential elections (2000) showing values of Neff close to 3 for most of the states counts, a sum of the frequencies corresponding to the three stronger parties almost equal to one, and SF Cox values in the range of 0.4. All these support for a ternary election, which was confirmed with computations performed hereby.

Binarity can be tested with the following statistics that incorporate Neff and the sum of frequencies criteria, as well as Cox empiric statistics:

$$\chi^2 = \sum_{i=1}^n (N_{eff,i} - 2)^2 / 2 + \sum_{i=1}^n (cp_i - 1)^2 / 1 + \sum_{i=1}^n ([SF_i + 1] - 1)^2 / 1 \quad (2)$$

where N_{eff} is equal to the number of effective parties in district (i), cp_i is equal to the accumulated frequency of the two stronger candidates, SF_i is equal to the quotient between the votes obtained by the second loser and the votes obtained by the first loser. Clearly a low value of this statistic indicates a binary election (Fig. 2).

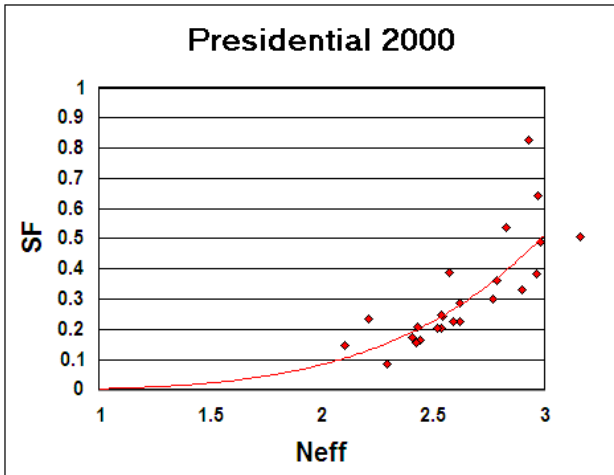


Fig 2.- Shows that SF has lower values when the effective number of parties is close to 2 for each of the states counts of Mexican presidential elections in 2000.

And the statistic used hereby to test the hypothesis of a ternary election is given by:

$$\chi^2 = \sum_{i=1}^n (N_{eff,i} - 3)^2 / 3 + \sum_{i=1}^n (cp_i - 1)^2 / 1 \quad (3)$$

where N_{eff} is equal to the number of effective parties in district (i), cp_i is equal to the accumulated frequency of the three stronger candidates. Clearly a low value of this statistic indicates a ternary election. A similar index has been built as a signature of a quaternary election:

$$\chi^2 = \sum_{i=1}^n (N_{eff,i} - 4)^2 / 4 + \sum_{i=1}^n (cp_i - 1)^2 / 1 \quad (4)$$

where cp_i is equal to the frequency accumulated by the four strongest candidates.

3 Problem Solution

When these signatures were applied to the case of several presidential and governor Mexican elections, we obtained a clear signature of binary governor elections and ternary presidential elections. Governor Binary elections indicate for 2001 and 2006 indicate that votes were aggregated to the couple of stronger candidates, which is a signature of homogeneity to the regional level (Fig. 3).

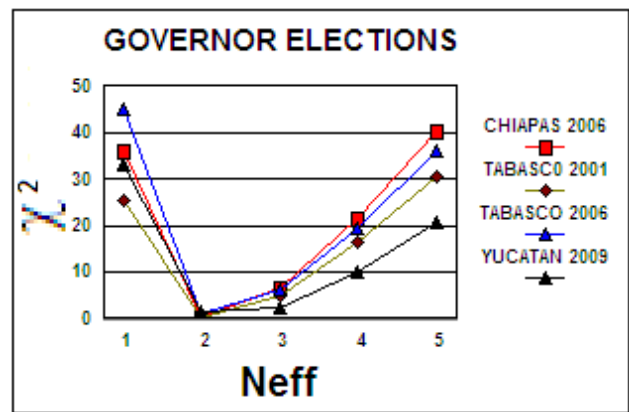


Fig 3.- Shows that regional elections in Mexico were binary in 2001, 2006 and 2009 which is a signature of aggregation of votes due to rational choice.

N_{eff} was almost always equal to 2, which is a signature of homogeneity to the regional level which concentrates votes on the couple of stronger candidates by the principle of rational choice even in the recent governor elections of Yucatan 2009.

Nevertheless, national elections turned out to be ternary due to two regions observed, each one with a bipartidist profile, which added up to a three parties contest (Fig. 4).

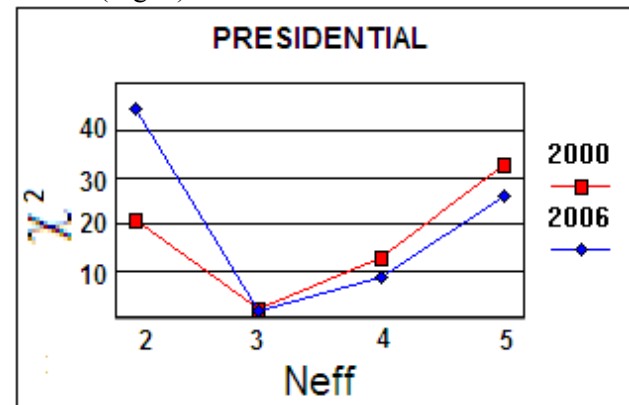


Fig.4.- Shows that national elections in Mexico were ternary in 2000 and 2006.

In the case of Mexican presidential elections of 2006 an even result between the two stronger candidates was a result of the intervention of a third party for some analysts. Nevertheless, such ternary profile of national elections changed this year into a quaternary elections profile (Fig. 5) maybe due to a systemic economic crisis where oil resources are exhausted, government is no longer spending in welfare but is concentrated in the army with dismal government funding, leading to a fragmentation of the political system. Mexican Green Party is gaining acceptance which could be related to the need of better funding in Public Welfare.

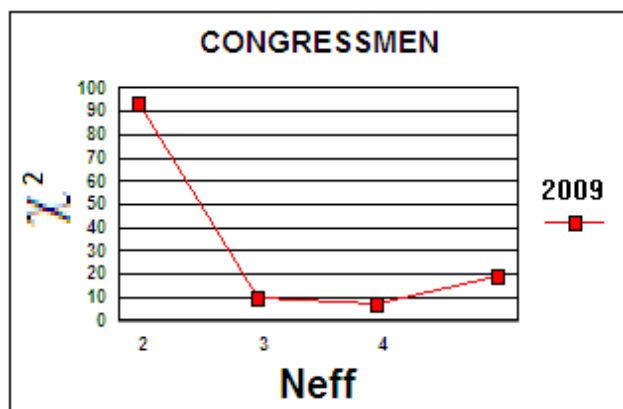


Fig 5.- Shows that for recent national elections in Mexico, there was a quaternary elections best model obtained by fixing the optimal chi-square statistics corresponding to an N_{eff} equal to 4.

4 Conclusion

Statistical analysis shows that governor elections have a tendency to bipartidism as expected for majority elections where the third candidate is suppressed. Nevertheless, presidential elections show a ternary pattern due to the heterogeneity of Mexico, where PRD contends PAN or PRI in some states while PAN and PRI are the best couple in most of the Mexican states. Hence ternary elections result from the overlap of two binary elections in the north and the south of Mexico. In this year this trend has been changed showing a quaternary scenario which could be explained as a fragmentation due to economical crisis and political instability. This multipartidist stage is part of the end of the Welfare State in Mexico that leads to political fragmentation where government funding has been concentrated in military concerns instead of education and social support.

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