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PUERTO RICO'S DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS (DTOP) AND POLITICAL BIAS

INTRODUCTION

Puerto Rican public administration is renowned for its paternalistic bureaucracy, nepotism, and politicization. Governors are often career politicians, state department heads maintain high rankings within their respective political parties, and Mayors often scream foul with allegations of political discrimination. Local and state departments have often become party machines that utilize their manpower, influence, and resources to keep their political party in power. Or at least that is the common perception.

This paper wishes to evaluate such allegations and to test them against actual data using the hypergeometric probability distribution. This paper's topic was inspired by a question in Chapter 10 of "Applied Statistics for Public & Nonprofit Administration" by Kenneth J. Meier, Jeffrey L. Brudney, and John Bohte concerning the probability of bias among the awarding of various city grants. This paper seeks to apply a similar technical to real and available data for Puerto Rico.

From 2005 to 2008 I acted as the Director of a city agency for the Municipality of Aguas Buenas, Puerto Rico. During this time I acted as liaison between my city government and the various federal transportation programs administered by the state Department of Transportation and Public Works (DTOP in its Spanish acronym). The Secretary of the DTOP is nominated by the Governor, who during that time was allied to the same political party that controlled the Municipal administration that I worked for. The November 2008 elections brought about a radical shift in island politics as well as a fresh, new round of federal funding thanks to the American Recovery and Reinvestment Act (ARRA). These events provided an interesting opportunity to identify and measure any bias in the awarding of federal dollars through the DTOP.

2004 and 2008 electoral information was obtained via the Elections in Puerto Rico Website¹ as well as the State Electoral Commission². Information concerning the usage of federal

¹ <http://electionspuertorico.org>

transportation funding was obtained via the state's Statewide Transportation Improvement (STIP) Plan³ and the official DTOP list of projects to be funded with new ARRA funds⁴.

The STIP outlines a number of programs and projects planned by the previous administration, but only a few are of interest. Projects funded through programs such as Section 5307, 5340, 5316, 5309 and 5310 are generally proposed by city governments and state departments on an annual basis. Eligible activities are included by default and members of regional Metropolitan Planning Organizations (MPO) vote periodically on proposed amendments to these projects. Generally, the MPO refrains from setting off heated battles between localities, thus it is rare for eligible projects not to make it to the final stage of funding.

Of interest is the STIP's Highways Program section, which contains larger, multi-million dollar public improvement projects. The Highway Program's lists of projects can be found on page 74 of the STIP PDF file. These projects are often planned and created by DTOP officials. Mayors are able to make petitions to the DTOP for Highway Program funding, but it is often the DTOP that has the financial capacity to cover the 20% cost share requirements imposed by the federal government. Though the MPO can propose and reject the STIP, the DTOP could assign and withdrawal its cost sharing of big budget items as it sees fit. For that reason, this paper will concentrate primarily on this portion of the STIP.

The full extent of any alleged bias is yet to be revealed, as a revised STIP under the new administration is still under works. Despite this, the ARRA injection of funding provides a considerable sample size (19 to the STIP's 46) to make a comparison. This is especially true considering the fact that STIP projects were to be carried out during the following three years.

METHOD

Electoral maps from the 2004 and 2008 local elections will be utilized to establish whether or not a Municipality had affiliated itself with one of the two primary parties: the Popular Democratic Party (PPD) or the New Progressive Party (PNP). The previous administration that saw the authorship, approval, and incorporation of the STIP was affiliated to the PPD while the ARRA list was drafted by the recent PNP administration.

I will then proceed to tabulate all of the STIP and ARRA projects that directly benefit a specific Municipality, excluding the "islandwide" projects that often tend to general road maintenance and debt payments. I will identify what portion of each of these waves of funding was spent on PPD and PNP Municipalities and then I will identify what portion of the actual projects took place in said localities. Projects that encompass various Municipalities will be treated as multiple projects and their funding will be divided among the Municipalities affected. This practice of dividing the funding among affected Municipalities is already utilized in portions of the STIP.

I will then proceed to utilize the probability distributions noted in Chapter 10 of "Applied Statistics for Public & Non Profit Administration" to identify the possibility of bias on behalf of

² <http://www.ceepur.org/>

³ http://www.dtop.gov.pr/ACT/CoordFederal/STIP_2008.pdf

⁴ http://www.dtop.gov.pr/ARRA/Projects%20ARRA%27s%20Funds_FTA_FHWA_090717.pdf

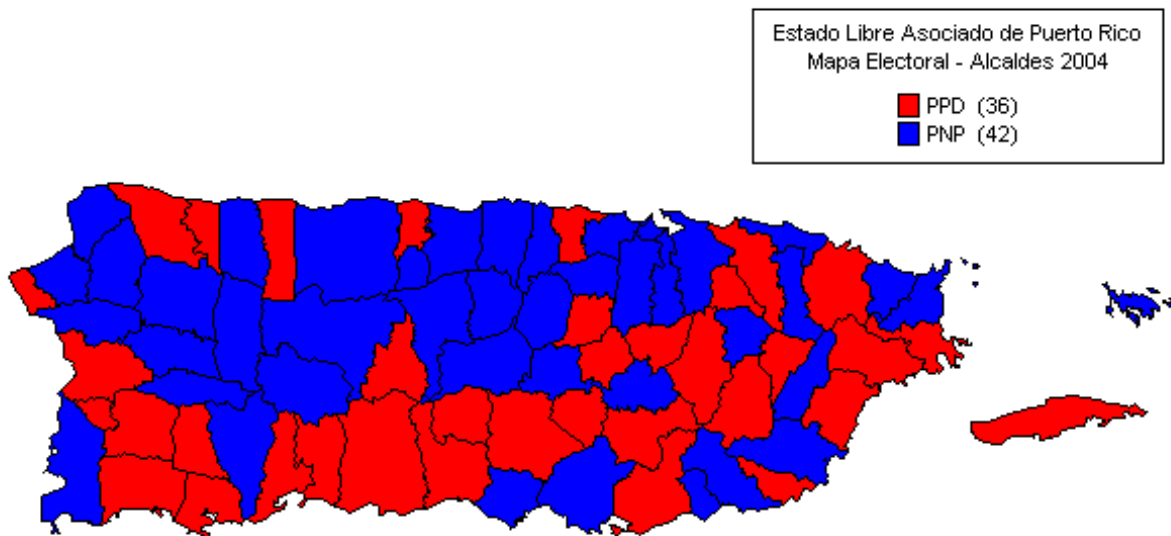
both administrations. I will then conclude by comparing the data and providing a summarized analysis of my findings.

POLITICAL AFFILIATION

Map 1. Map of Puerto Rico's Municipalities



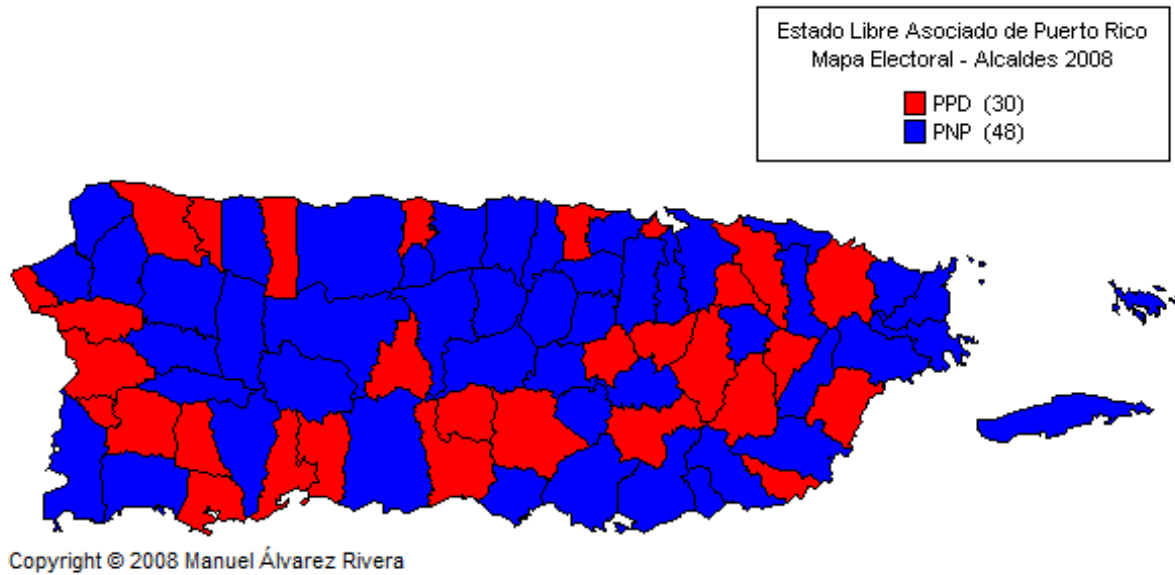
Map 2. 2004 Local Elections



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The 2004 local elections brought about a composition made up of 36 PPD administrations (46% of Municipalities) and 42 PNP administration (54%). The 2004 state elections simultaneously produced a governor aligned with the PPD.

Map 3. 2008 Local Elections



The 2008 local elections brought about serious losses for the PPD, as they only produced 30 Municipal administrations (38%) while the PNP retained or obtained 48 (62%). The 2008 elections produced a governor aligned with the PNP.

COMPARISON TO THE STIP

A “Party” column was added to the initial data base and each of the benefiting Municipalities for each project were labeled as “PPD” or “PNP”. Interestingly enough, under the PPD-authored STIP, only 19 out of 46 PPDs (41%) of the benefiting Municipalities were PPD, with the PNP benefiting from the remainder (59%). In terms of dollar amounts, only \$178,572,813 of the Highways Program total of \$507,858,210 (35%) was spent on PPD Municipalities, with PNP localities enjoying 65% of the funds. Project distribution is more or less corresponds with the political proportion of Municipalities (46% PPD and 54% PNP.)

In the PNP-authored ARRA project list, only 1 of 19 (5%) benefiting Municipalities was PPD while the remainder (95%) was PNP. In regards to dollar amounts, the ARRA list spends \$31,119,969 of \$162,412,233.01 (19%) on PPD Municipalities while the PNP benefited from the remainder (81%). This proportion at first glance does not correspond to the political proportion of Puerto Rico’s Municipalities (38% PPD and 62% PNP). One could quickly assume that the PNP has a radical bias in favor of its affiliated Municipalities, though this is a claim that I will test further below.

Utilizing the hypergeometric probability distribution the following data was compiled for the STIP:

STIP			
Party	Projects	Percentage	
PPD		19	41%

PNP	27	59%
Total Projects	46	

Party	Total Funding	Percentage
PPD	\$178,572,813.00	35%
PNP	\$329,285,397.00	65%
Total Funding	\$507,858,210.00	

STIP

Total Population (N)=	78	
PPD=	36	
PNP=	43	
n=	46	
PPD=	19	
PNP (x)=	27	
$\mu = n * p$		25.36
$\sigma = \sqrt{((N-n)/(N-1))(np)(1-p)}$		2.15
$z = (x-\mu)/\sigma$		0.76
Z score probability=	0.2236	

With a z score of 0.76, the probability of such an outcome is 0.2236, or one out of four. This is totally within realistic statistical probabilities. Even in such a case, spending patterns are tilted in favor of the PNP. On the other hand, analysis of the ARRA data provides the following data:

ARRA

Party	Projects	Percentage
PPD	1	5%
PNP	18	95%
Total Projects	19	

Party	Total Funding	Percentage
PPD	\$31,119,969.00	19%
PNP	\$131,292,264.01	81%
Total Funding	\$162,412,233.01	

ARRA

Total Population (N)=	78	
PPD=	30	
PNP=	48	
n=	19	
PPD=	1	
PNP (x)=	18	
$\mu = n * p$		11.69

$$\begin{aligned} \sigma &= \sqrt{((N-n)/(N-1))(np)(1-p)} = & 0.85 \\ z &= (x-\mu)/\sigma = & 7.40 \\ Z \text{ score probability} &= <0.00001 \end{aligned}$$

The chances that this many PNP Municipalities could be chosen without bias are statistically impossible (less than .001%).

CONCLUSION

Though Mayors from both sides of the political spectrum have long made claims of political bias against their projects, the previous administration under the STIP did a reasonably well job in distributing the funding equally among the various Municipalities. The in-coming administration, on the other hand, has applied a bluntly bias agenda to its distribution of ARRA funds, obviously favoring municipalities that have aligned themselves with their political affiliations. If the PNP does not quickly devise and implement a more egalitarian spending pattern, than such federal funding could very well be put at risk. Justifications that such spending is justified due to years of “political discrimination” are not proven statistically, as the data provided reveals statistically un-discriminatory spending patterns on behalf of the previous PPD administration.