México Evalúa – Program on Poverty and Governance (Stanford University) – Center for U.S.-Mexican Studies (University of California, San Diego)

2012 Electoral Geography

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Acknowledgements

This report initiates a collaboration between México Evalúa, the Program on Poverty and Governance at Stanford University, and the Center for U.S.-Mexican Studies at the University of California, San Diego in order to disseminate academic research to a broad public audience that may not otherwise have access to academic journals and other subscription-based information services.

We are confident that readers will understand and appreciate a strenuous statistical analysis based on hard data and methods. These strategies are canonically accepted in the social sciences but commonly ignored in public discussions in Mexico, especially when the topics come with ideological or partisan overtones.

Alberto Díaz Cayeros, Beatriz Magaloni, Edgar Franco, and Jorge Olarte prepared the maps, graphics, tables, and analysis contained with this report according to data collected during the 2012 Mexican national elections. The cartography used in the maps comes from the Federal Electoral Institute and National Institute of Statistics and Geography (IFE-INEGI) project entitled "Estadísticas Censales a Escalas Geo-electorales" (Census Statistics on Geo-electoral scales), which was completed with updated information from the 2010 census.

The electoral results come from exit polls conducted by the Preliminary Electoral Results Program (PREP), and updated from the district result tallies, which constitute the official election results. Any errors and misinterpretations are the exclusive responsibility of the authors of this report, not of the affiliated institutions.

I. **Introduction: Analysis of the 2012 electoral geography**

On July 1, over 50 million Mexicans went to the polls to elect the next President of the Republic. The official count showed the Institutional Revolutionary Party (PRI) candidate, Enrique Peña Nieto, as winning with 38.21% of the vote. He was followed by Democratic Revolutionary Party (PRD) candidate Andrés Manuel López Obrador, who received 31.59% of the vote and National Action Party (PAN) candidate Josefina Vázquez Mota with 25.41% of the vote.

Electoral geography is a tool we use to visualize the overarching factors that divide Mexican society and motivate the citizens to express their distinct electoral preferences. Using a statistical analysis that encompasses the more than 66 thousand electoral sectors based on the 2010 census cartography (created through a noble and intense effort by the IFE and INEGI), this report discusses which factors best explain voting behavior on election day. Our analysis differs notably from those based on exit polls, which more accurately reflect the actual vote, but by their nature do not contain enough questions to capture in more depth the determinants behind that vote.

One of the great advantages of working with electoral section data is that it reflects the voting decisions of millions of voters. The risk associated with census data and exit polls is that they represent aggregated rather than individualized data due to secret ballot. With aggregated data, we cannot be absolutely certain that what happens in the aggregate also applies to all individuals within the group. Nevertheless, the margin of error is diminished as we work with a large number of highly disaggregated jurisdiction units.

What determines an effective Mexican vote analysis?

Our analysis permits the reader to understand why López Obrador's post-election allegations of vote buying has had a strong resonance among many citizens: the data shows that the left faced many challenges in garnering the vote of the poor, who showed more support for Vázquez Mota and Peña Nieto than López Obrador.

As such, our results also show that, contrary to what would be expected, the poorest in the country voted for the right-wing PAN candidate over the PRI candidate. This suggests that the poor are inclined to endorse the PAN due to that party's work on social programs like *Oportunidades* and *Seguro Popular*, despite the alleged delivery of PRI-issued gift cards to box-retailer *Soriana,* and other patronage practices that, while illegal did not seem to negate the impact of the aforementioned programs.

It should be noted, however, that the effect of poverty on the ballot is not uniform and varies depending on the location of the electoral sector. In states with PRI governors, the PAN's vote advantage over the PRI among the poor is negligible, suggesting that Peña Nieto was more successful at mobilizing the votes of the poor in places ruled by his party, presumably through the use of state resources and more entrenched patronage practices.

This study also presents an analysis of the impact of violence on voting patterns in the presidential election. During Felipe Calderón's term, Mexico experienced a significant escalation of violence as a result of the domestic drug war and government confrontations with various criminal organizations. In many northern cities and municipalities, such as Guerrero, Michoacán, and more recently Tamaulipas and Veracruz, the violence has reached fatality levels on par with that of some of the bloodiest civil wars. Through violence data from the "Database on deaths occurring from alleged criminal rivalries," published by the federal government, we are able to measure how the violence affected voting decisions across Mexico.

The results paint a varied picture in regards to effects of violence on voting. There was lower voter turnout in the country's most violent localities, which suggests that many citizens did no go to the polls out of fear. An important finding is that López Obrador firmly captured the vote in violent areas: there was a direct, positive relationship between the number of narco-related deaths and number of votes for the PRD. In this way, Peña Nieto's victory cannot be interpreted as a reaction against the government of Felipe Calderón and its presumed relationship with escalating violence in Mexico. In fact, in the violent zones of states lead by the PAN or the PRD governors prior to the elections, citizens voted more strongly in favor of the PAN candidate.

We also measured the effects of mass media, particularly television, on boosting Peña Nieto's vote advantage, and the effects that Internet access played to counter that advantage, especially among younger voters. Many people blamed biased television coverage of the candidates prior to the election for assisting the PRI. Discontent with traditional television coverage also led to the strong student movement #YoSoy132, which protested media manipulation.

Given the indignation of a grand part of the citizenry, and strong accusations against television networks, it is important to ask if the television coverage did affect the electoral outcome. Our results show strong evidence that the media coverage did help to sway the vote towards Peña Nieto: of all the potential factors considered, this appears to be the single factor that most assisted the PRI candidate with his win, because Peña Nieto's vote advantage was much lower in areas with low television usage.

Without a doubt, the wide expansion of Internet access in Mexico has been one of the most important changes in the electoral landscape since the last presidential election. According to the Mexican Association of the Internet (AMIPCI), today there are over 40 million Internet users in Mexico. Since 2006, the number of people using the Internet has doubled, adding 20 million new users. The relevance of this fact in the electoral process became increasingly obvious in the months leading up to the elections, especially with the surge of the #YoSoy132 movement. For the first time in the country, the Internet challenged traditional media as an important source of information about the candidates, as well as a tool to mobilize people. Through

blogs and social networks, the political parties and their supporters tried to capture the vote of millions of users, turning cyberspace into a prominent stage in the electoral battle.

Surprisingly, Internet access is the variable that seems to have the strongest effect on electoral outcomes by section, even when controlling for income level and other demographic variables. Specifically, our results indicate that Internet access negatively affected the electoral outcome for Peña Nieto more than either other candidate.

Finally, through our section-level census analysis of the electoral geography, we can also gain an understanding of the labor profile of the voting constituency for each candidate, and the effect of unemployment on both the electoral turnout and support of the incumbent party candidate.

From our study emerges a clear electoral profile of each candidate. Andrés Manuel López Obrador is a candidate with a strong base in workers from the formal sector and the government (a group formerly referred to as the Mexican State Corporative Machine), but does not earn any support from the very poor. In places with a higher number of wageworkers, state bureaucrats or federal bureaucrats, all of who benefit strongly from social security through the Mexican Institute for Social Security, the PRD candidate experienced stronger electoral support. Areas with a greater proportion of active voters between the ages of 18-24 also favored the PRD.

Perhaps most relevant to understanding Lopez Obrador's vote is to recognize his ability to capitalize on the discontent and indignation of Mexicans in places with high rates of unemployment or high levels of civil disruption due to the country's rising violence rates.

Josefina Vázquez Mota, despite being from the center-right party, is shown in our analysis to be the favored candidate in the poorest and most marginalized areas of the country. Vázquez Mota was the candidate of the poorest citizens, and of the citizens who benefit most from government aid programs, which is to say informal workers surviving on the lowest incomes. In this way, the PAN could capitalize on poverty alleviation programs it had run over the previous 12 years of presidential rule that, thanks to an excellent institutional design, (devised by economist Santiago Levy in 1997 with the creation of Progresa—now Oportunidades—during the presidency of Ernesto Zedillo) have been better targeted to benefit the poorest people in the country.

Vázquez Mota also had a slight boost in vote share in areas with greater Internet usage, suggesting that the PAN also received support from higher income citizens. She also had an electoral advantage in regions with recent migrants, in areas where the population has lower ties to their current location because they were not born in the state where they currently reside. A notable finding is that the PAN candidate

was preferred slightly over Peña Nieto among citizens who live in electoral areas most affected by violence, especially in PRI-ruled states.

Finally, the candidate who ultimately won the election, Enrique Peña Nieto, was favored by a broad coalition of diverse voters across the country. When facing López Obrador, this candidate had a stronger advantage among rural voters, a contingent traditionally dominated by the PRI, and among poor voters (although they weren't able to gain a stronger foothold among the poor than Vázquez Mota). Peña Nieto also gained an advantage over the other two candidates among indigenous communities. He benefitted strongly from broader television access, the largest factor in his victory. Internet was able to challenge television as a useful electoral tool against the PRI candidate, but ultimately Internet access was not broad enough to counter television's wider societal penetration.

The following sections of this report describe the data and statistical models that support the findings described above.

II.   Geographic Vote Distribution

On election day, a total of 143,435 polling stations were set up, grouped into 66,740 sections across the country (the IFE failed to install just two station's boxes, meaning the administrative process was successful in 99.99% of the voting locations). To analyze the geographic distribution of the vote, we studied the percentage of votes obtained by each candidate in each of the voting sections across the country. There is no evidence that electoral authorities used algorithms or any other cybernetic mechanism to change the results of the election. The data reported by the IFE therefore reflects the actual electoral will of the citizens as exercised by their vote.

As expected, candidates received their highest vote shares in states and municipalities already controlled by their own party. The candidate who benefited most from this effect was López Obrador, who won up to 54% of the vote in already PRD-controlled municipalities and states, as compared to his 32% national average. Equally, Vázquez Mota had higher vote margins than her national vote average in states and municipalities controlled by the PAN, an effect that was greater when her party controlled both the state governorship and municipal presidency. Although Peña Nieto obtained greater vote margins in PRI-controlled states and municipalities, they were not radically different from his national vote share average.

Vote for Enrique Peña Nieto

		Municipal President				
		PRI	PAN	PRD	OTHER	AVERAGE
Governor	PRI	40%	38%	39%	43%	40%
	PAN	37%	41%	37%	36%	38%
	PRD	40%	29%	27%	40%	33%
	AVERAGE	40%	39%	31%	39%	**38%**

Vote for Andrés Manuel López Obrador

		Governor				
		PRI	PAN	PRD	OTHER	AVERAGE
Municipal President	PRI	29%	25%	31%	28%	28%
	PAN	33%	18%	36%	32%	28%
	PRD	41%	40%	54%	37%	46%
	AVERAGE	31%	23%	46%	33%	**32%**

Vote for Josefina Vázquez Mota

		Governor				
		PRI	PAN	PRD	OTHER	AVERAGE
Municipal President	PRI	26%	32%	24%	23%	27%
	PAN	25%	35%	22%	23%	28%
	PRD	14%	27%	15%	17%	16%
	AVERAGE	25%	33%	19%	22%	**25%**

Note: the percentages in each cell represent the average weighted by number of electoral sections, which means that the marginal averages do not necessarily coincide with the simple average.

Enrique Peña Nieto

Historically, the PRI has had a large part of its base of support in northern Mexico. This pattern was reconfirmed in the last elections. The dominance of Peña Nieto is clear in the vast majority of municipalities in the states of Chihuahua, Durango, Sonora, Coahuila, Nayarit, and Zacatecas, where he earned over 50% of his national-level support. Peña Nieto also performed well in various sections of the center of the country. Nevertheless, the greatest change in support for the PRI is seen in a few southern states, where the candidate was practically eradicated by the PRD. The PRI candidate earned the lowest number of votes by section in Oaxaca and Guerrero, followed by Veracruz and Tabasco. It is also important to note that the Mexico City federal district still largely rejects the PRI party and its candidate, earning him few votes in the most populated district in the country.

EPN

- 0.3% - 25.2%
- 25.3% - 50.1%
- 50.2% - 75.1%
- 75.2% - 100%
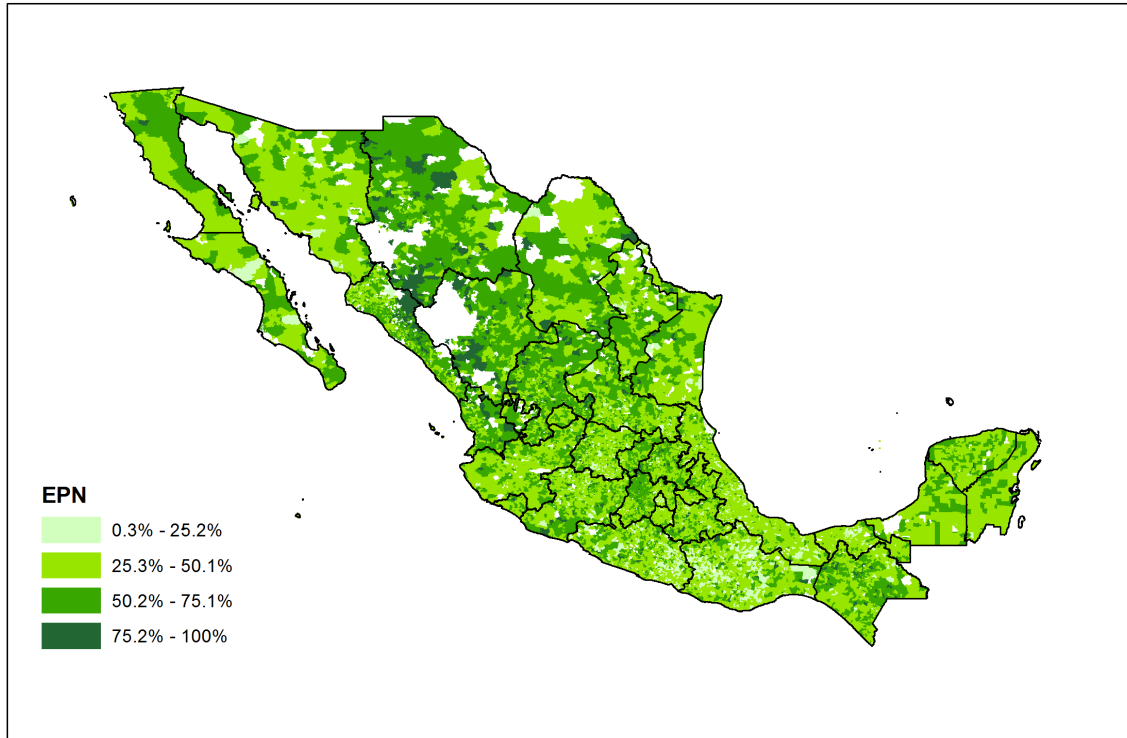
The support for Peña Nieto is relatively strong in the majority of states in the country, including several in the south. This is obvious in that there are very few voting sections where he received less than 25% of the vote. No other candidate was able to earn over 25% of the vote in the vast majority of electoral sectors across the country.

Andrés Manuel López Obrador

The geographic distribution of votes for López Obrador is clear: he dominated in southern Mexico and Mexico City. Areas where López Obrador received over 50% of the vote are concentrated primarily in Tabasco, Oaxaca, Guerrero, Michoacán, and the Federal District. The support for the PRD candidate is also relatively high in parts of Morelos and Quintana Roo, where he obtained an average of over 25% of the votes in each section. Nevertheless, the vote share earned by López Obrador outside of the aforementioned states is low. The majority of voting sections in the north and central parts of the country reported less than 25% of the vote for the PRD candidate.

AMLO
- 0.1% - 25.1%
- 25.2% - 50%
- 50.1% - 75%
- 75.1% - 100%
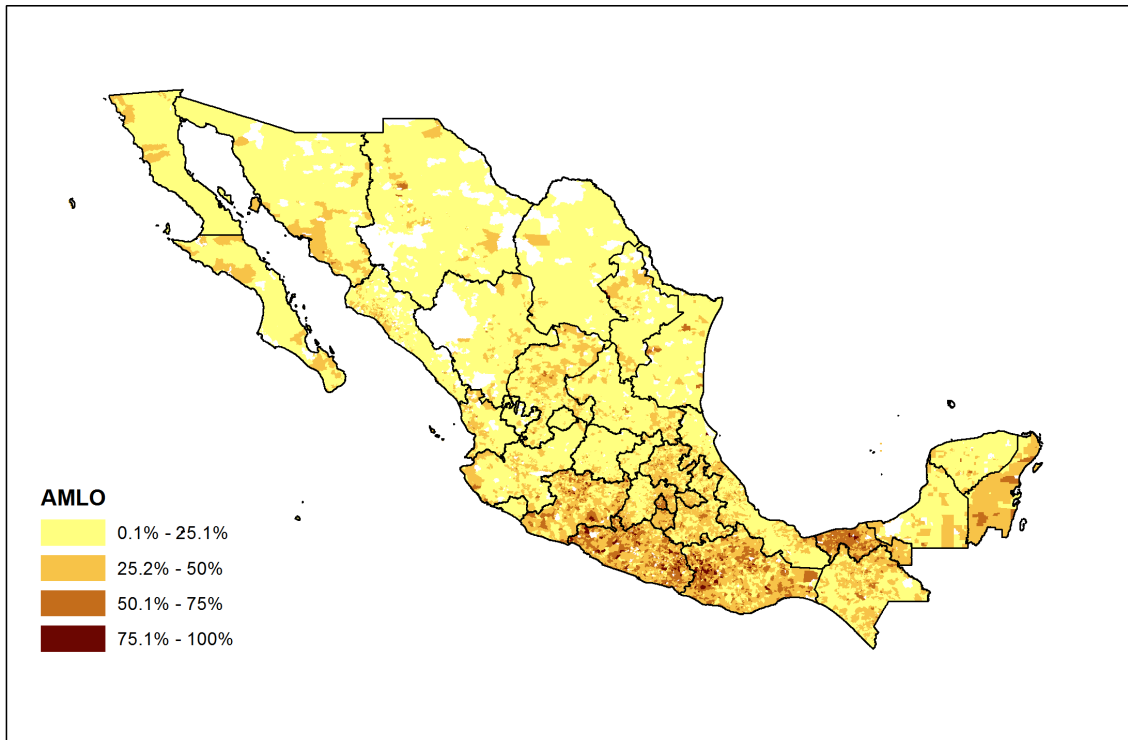
Despite the fact that the PRD had a strong voting presence in only a limited number of states, López Obrador was able to capture a third of the nationwide vote because of strong support in the most populated parts of the country. Even though the strength of his party was notable, the data proved that to win future elections, the PRD must expand its presence in the central and northern parts of the country.

Josefina Vázquez Mota

The PAN candidate competed primarily against Peña Nieto for votes in the north and the Baja peninsula. The vote for Vázquez Mota was relatively low nationwide, and she received well under 50% of the vote in the vast majority of electoral districts. The strongest areas for the candidate were in the states of Nueva León, Tamaulipas, and Veracruz (the three most violent states), followed by Baja California, Baja California Sur, Coahuila, Aguascalientes, Guanajuato, and San Luís Potosí. In the rest of the states, and especially in López Obrador strongholds, the vote for Vázquez Mota was below 25%.

JVM
- 0.1% - 25.1%
- 25.2% - 50%
- 50.1% - 75%
- 75.1% - 100%
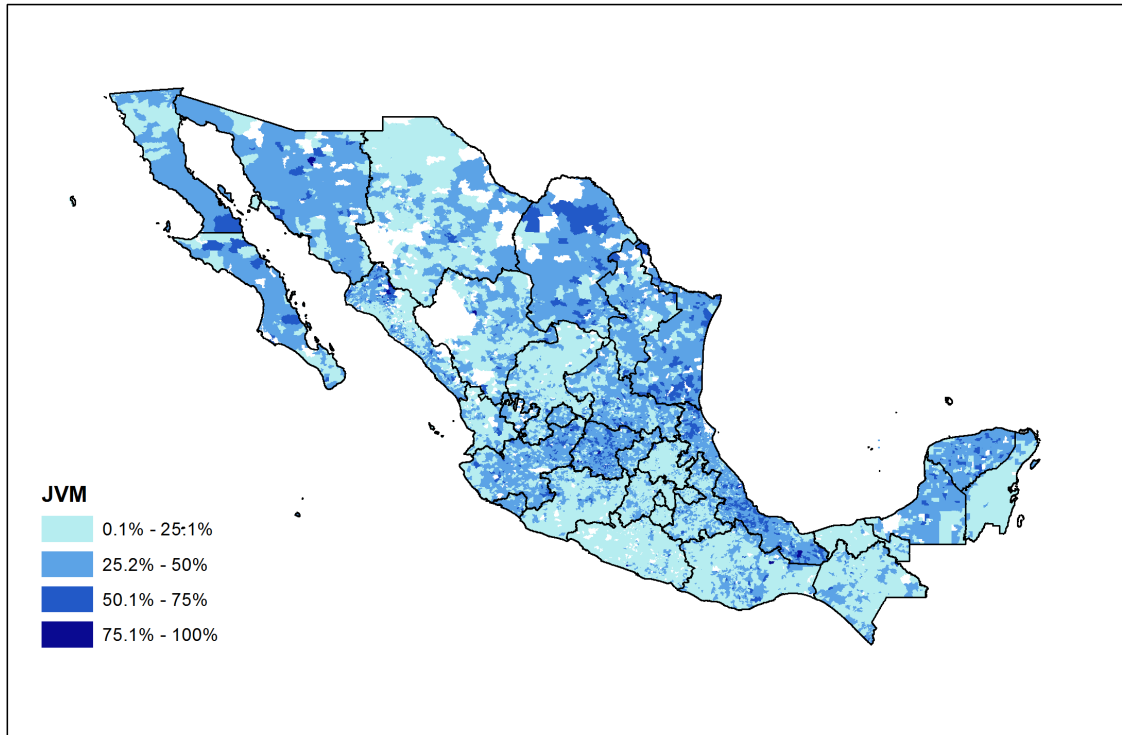
To put this into perspective, recall that the areas dominated by the *Cristero* movement (especially the central *Bajío* lowlands that spread across parts of Guanajuato, Querétaro, Aguascalientes, Jalisco, and Michoacán) have supported the PAN from the party's inception. Another area with strong PAN support is the Yucatán. More recently, the National Action incursion in the country's northern states has its roots in the triumphs of that party in Tijuana in 1989 (as well as the fraud and eventual triumph in Chihuahua). All of these support bases can be seen in the map, although support has diminished overall. The one trend that is relatively new is the PAN's more homogenous penetration in rural areas across all of the states, which is something that has only been observed since the 2006 presidential election.

III.   Analyzing the vote

To systematically analyze the vote, we used a linear regression model. As voters make their selections by comparing the three candidates, the variable of interest is the difference in votes received (voting differential) between the three parties, with the options being: Enrique Peña Nieto versus Andrés Manuel López Obrador, Peña Nieto versus Josefina Vázquez Mota, and López Obrador versus Vázquez Mota. Our analysis allows us to draw conclusions as to why a person might choose the PRI candidate over the PRD or PAN, or vice versa. We present three regression models, one for each dyad. We also introduce a fourth model on voter turnout.

We ran each model using all of the electoral districts. We also present models that segment the body of observations based on whether the electoral district is in a state with a PRI, PAN or PRD governor, and whether the district is in the northern part of the country.[1] Our aim is to provide a complete sense of the political cleavages that divide Mexican society and manifest in electoral trends.[2] The results of these regression models, as well as the technical details of the estimates are presented in the appendix. The following sections discuss the main results.
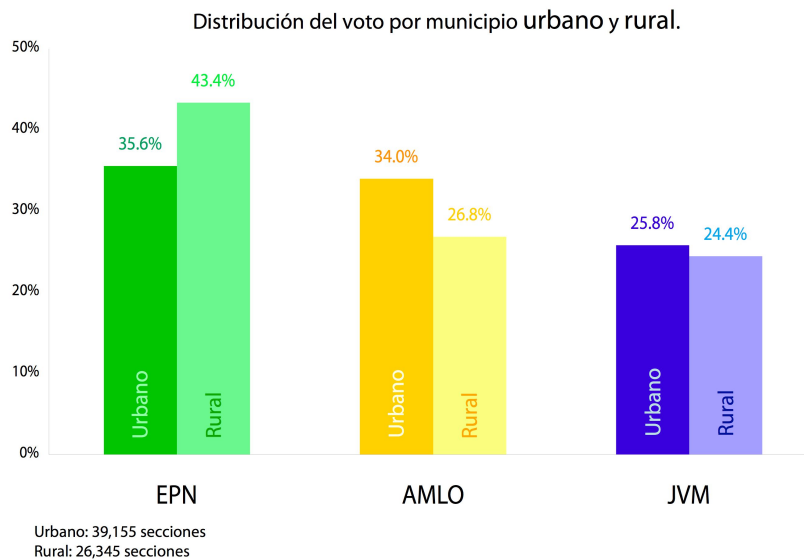
1. Poverty and voting patterns

Traditionally, the PRI benefitted from strong electoral support in the rural, marginalized parts of the country. What has been called the "green vote"—the fidelity of the poorest people toward the PRI—was cemented through clientelistic practices and the distribution of assistance that strategically obligated peasants to vote for the PRI and therefore guaranteed votes well in advance of the elections. The poor voted for the PRI because they otherwise ran the risk of being excluded from public services such as land titles, fertilizer credits, groceries, medicine, etc. The majority of the assistance and social programs during the long era of PRI party hegemony were managed with significant party bias.

An important question is whether after 12 years of PAN party rule, the poor remained loyal to the PRI or shifted their allegiances to the new party in power. It may be recalled that during those 12 years, and especially during the government of Vicente Fox, Mexico experienced an important expansion of poverty alleviation programs such as *Oportunidades* and *Seguro Popular*. Academic research suggests that these programs differed from patronage programs, such as *Solidaridad* or *Banrural*. There is also strong evidence that *Oportunidades* has had a positive impact on welfare indicators such as infant mortality, malnutrition, and extreme poverty. During the last decade, similar programs have been adopted in almost all countries in Latin America and even parts of Asia and Africa.

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[1] The states with PRI governors are Chihuahua, Coahuila, Nueva León, Tamaulipas, Durango, Zacatecas, San Luis Potosí, Veracruz, Nayarit, Querétero, Hidalgo, Puebla, Tlaxcala, Colima, Michoacán, Estado de México, Tabasco, Campeche, Quintana Roo, and Yucatán. The states with PAN governors are Baja California Norte, Baja California Sur, Sonora, Jalisco, and Guanajuato. Puebla and Oaxaca are governed by a PRD-Pan alliance. The PRD governs the Federal District (Mexico City), Chiapas, and Guerrrero.

[2] Cleavage is a concept utilized in political scene that refers to diverging votes in blocks according to social status regarding certain terms and/or parties. For example, a society might be divided in their opinions about the role of the Church and the state, or about support for workers or businesses. If we imagine a straight line that represents an important societal theme, a cleavage is the perpendicular line that divides the two sides into opposite categories.

Our data analysis of electoral districts allows us to identify, with higher precision than opinion surveys, what the correlation is between living in rural areas, extreme poverty, and voting choices. The PRI continues to be the strongest party among the rural poor and indigenous villagers. Nevertheless, the electoral results suggest that the PAN, and to a lesser extent the PRD, have expanded their popularity in rural parts of the country since the PRI's defeat in 2000. Before the PAN arrived to power, the probability that a *campesino* would vote for the right-wing party was extremely low. Today, the data suggests that the PAN has no statistically significant disadvantage against the PRI in rural areas as compared to urban, which is to say that the PAN vote has ceased to only be an urban vote.

Distribución del voto por municipio urbano y rural.

Urbano: 39,155 secciones
Rural: 26,345 secciones

To study the impact of poverty on voting in past elections, we have created an index of marginalization at the electoral district level that corresponds to the index of marginalization constructed by the National Council for Evaluation of Social Development Policy (CONEVAL). The index was constructed using census variables that indicate the number of extreme poor by electoral district, the coverage (or lack) of basic needs such as potable water, sanitation systems, and concrete floors in the home, among others. Our analysis has the advantage of using a lack of public services as a proxy for poverty as opposed to relying on self-reporting as many surveys do. Asking people to self-report their poverty level causes significant bias in the surveys that makes the data difficult to model (for example, individuals tend to underreport the severity of their condition out of pride, but others overstate it as being worse than it is, such as wealthier people who tend to underreport their income). Therefore, to more accurately model how poverty impacts the vote, it is necessary to use alternative measures that are not derived from these opinion polls.

Índice de pobreza a nivel sección

- 0.00 - 0.10
- 0.11 - 0.18
- 0.19 - 0.29
- 0.30 - 0.44
- 0.45 - 1.00
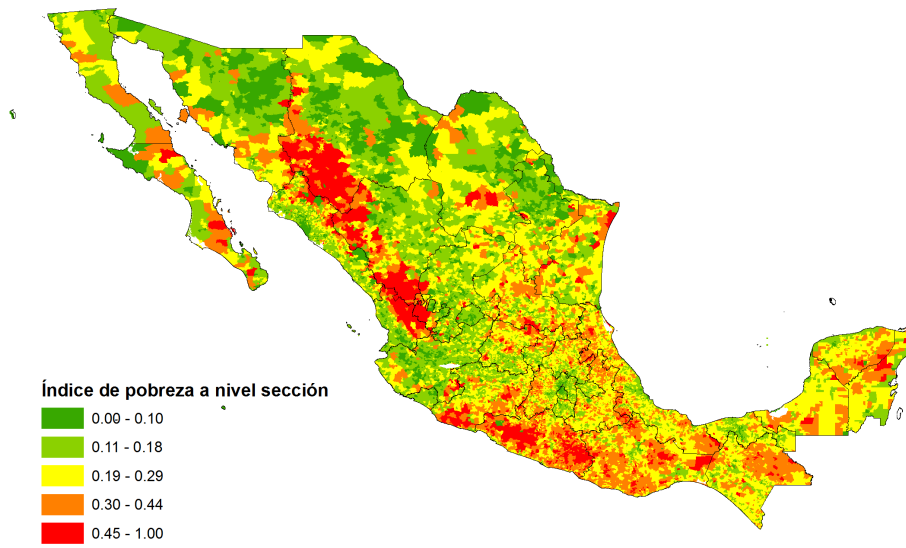
Our regression models indicate the presence of an important realignment of votes from the poor: votes in the more marginalized parts of the country favored the PAN over the PRI. This breaks with the voting patterns that persisted throughout the PRI's 70 years of hegemonic rule. With regards to the PRD, our statistical analysis reflects an important paradox in the left vote in Mexico: the poor do not support the left-wing party. The poor are more likely to vote for Enrique Peña Nieto or Josefina Vázquez Mota than for Andrés Manuel López Obrador.

A factor to emphasize is vote buying and its impact on electoral outcomes. Many people have commented that vote buying may have been crucial to the victory of the PRI and its candidate. Even though our data does not allow us to definitively respond to any concerns about vote buying, we can say based on our analysis that the extreme poor were not pushed to support Peña Nieto by alleged illegitimate campaign favors or handouts.

The poorest people prefer to support the creators of social programs that have had the greatest impact on their wellbeing. Our data allows us to statistically evaluate the correlation between *Seguro Popular* beneficiaries and voting outcomes: the higher the proportion of *Seguro Popular* beneficiaries in a voting district, the higher the probability that the vote would favor Vázquez Mota over Peña Nieto or Andrés López Obrador.

It is worthwhile to note that the PAN's advantage among the poor is obvious and conclusive only in areas where the PRI does not control government at the state level. In PRI-controlled states, the poor have the same probability of voting for the

PRI as the PAN, and always less probability of voting for the PRD, which suggests the importance of an incumbent party to garner the votes of the poor.

Simulaciones del impacto del Nivel de Marginación.
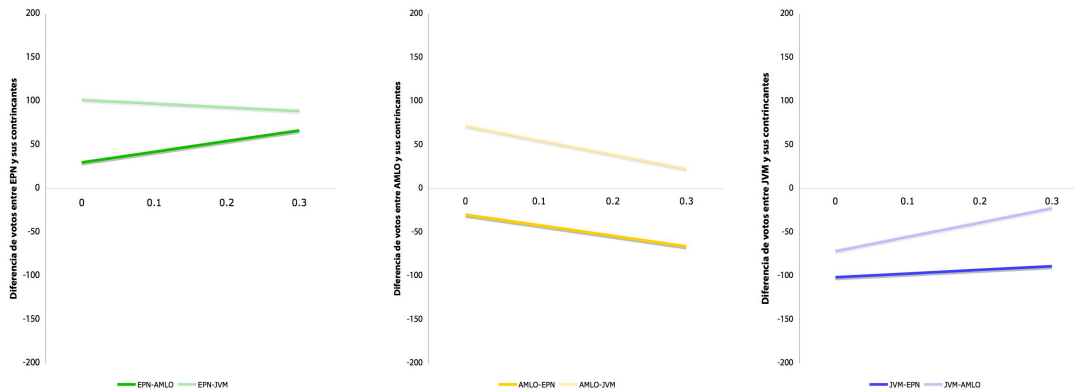
As far as López Obrador, the study shows that the poor always voted against that candidate except in states governed by the PRD, where they instead supported him at the same level as they supported Peña Nieto. In this way, it is clear that the PRD only counteracted its disadvantage among the poor in states controlled by PRD governors. However, it should be noted that the poor always favored the PAN above the PRI regardless of what party governed the state.

2. Unemployment and the Labor System

The effects of unemployment on voting merit a special mention, especially given that one of Felipe Calderón's central electoral promises in 2006 was the creation of new jobs. In general, unemployment at the national level is a relatively low 4.6% of the labor force unemployed at the electoral sector level. This percentage is, nevertheless, difficult to interpret because it doesn't represent underemployment. That is to say, many people report that they are employed even though they work very low paid jobs without benefits and are unable to support themselves.

The following map shows the distribution of unemployment in the country. The standard deviation for unemployment is 4.2%, which means that we expect to see that about 80% of all electoral districts have unemployment rates below 8%. However, there are parts of the country where we see a very high unemployment rate. For the aforementioned reasons, an elevated unemployment rate in Mexico is abnormal and could generate significant social pressures. The regions that are most affected include: the neighboring regions of Durango, Zacatecas, and Jalisco, the border between Sonora and Chihuahua, and the states of Querétaro and Hidalgo.

DESEMPLEO
- 0% - 2%
- 2.01% - 5%
- 5.01% - 10%
- 10.01% - 15%
- 15.01% - 20%
- 20.01% - 98.33%
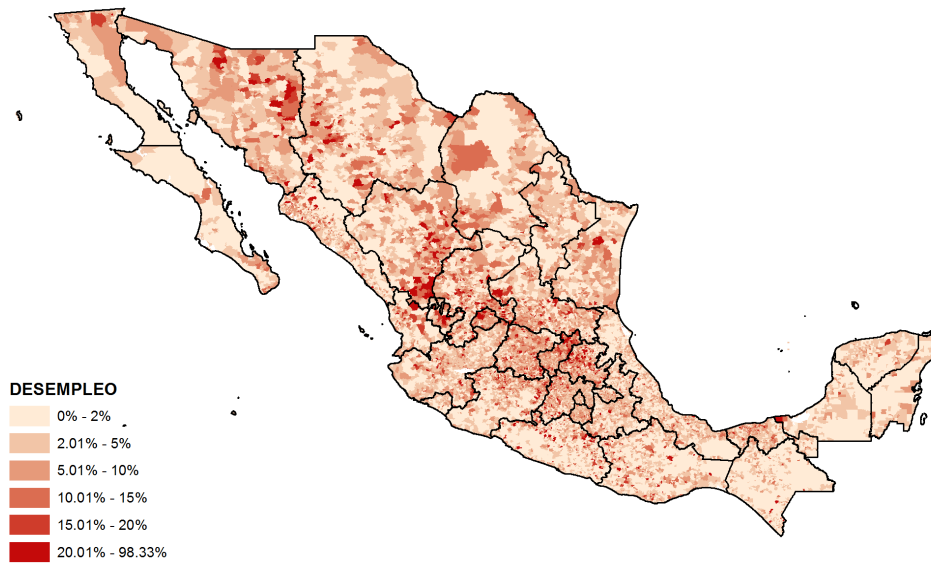
Unemployment has an unequivocal effect on the vote. Our regressions suggest that in all areas with higher unemployment, there is greater support for López Obrador over Peña Nieto and Vázquez Mota, even though this effect alone is not significant in PRD states. The low levels of unemployment and the homogeneity in this variable explain this across PRD-dominated states.

The second group that seems to benefit from the unemployed vote is Peña Nieto. That is to say, the voters punish the PAN, possibly because feel that Calderón did not uphold his campaign promises evenly and therefore the PAN had a weaker vote share in areas with higher unemployment. It should be clarified that despite the high concentration of unemployment around the mean, the general effect on the electoral outcome is very low, as show in the following simulations conducted with our econometric model. That is to say that while unemployment affects Vázquez Mota, the effect is not significant enough to have altered the electoral outcome.

Simulaciones del impacto del desempleo en el voto.
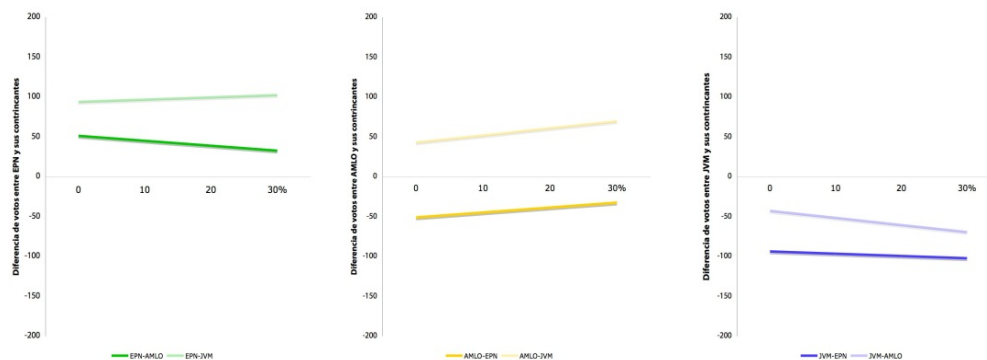
Another important effect to note is that of the population enrolled in the Social Security and Social Services Institute for State Workers (ISSSTE) either federal or state, which is a good approximation of the votes of government employees. On average, they favored López Obrador. Nevertheless, in states governed by the PRI, they tended to favor Peña Nieto. That is to say that the bureaucrats tend to favor the leftist candidate who promised to increase state capacity and provide better job security for civil servants. The fact that PRI-governed states tended to prefer Peña Nieto could indicate that the state governments had been working to mobilize local bureaucracy. The simulations show that this bureaucrat effect is particularly influential in generating support for Vázquez Mota.

Simulaciones del impacto de los trabajadores afiliados al ISSSTE Federal o Estatal en el voto.
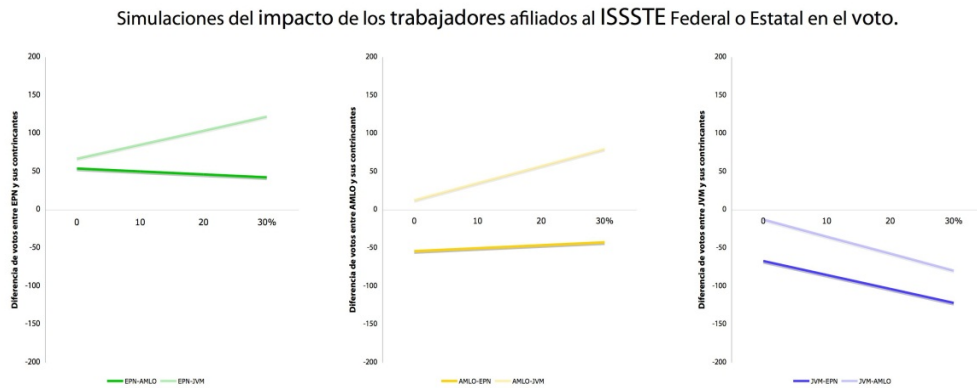
Finally, it is worth it to mention the IMSS affiliates, that is to say the formal economic sector. In this case, relations with the formal sector do not imply a significant difference in the vote with respect to what relates to the ISSSTE. The workers in the formal sector prefer by a wide margin López Obrador over Vázquez Mota in the national survey, while at the state level, when controlled for the PRI and the PAN, the formal private sector workers punish Vázquez Mota in favor of Peña Nieto and López Obrador equally.

3. The Media Revolution

Today, a large number of voters are submerged in a sea of information. The decision of how to vote depends in a large part on the knowledge of the different candidates, their proposals and their general image. One of the primary sources of information about candidates is media outlets, and, increasingly, the Internet. In the past elections these played a very important and controversial role. Given its growing relevance in both politics and public opinion, it is important to analyze the impact of television and Internet in electoral results.

Television

Televisions are now in 90% of inhabited Mexico. Not only are their televisions in virtually every house, but they are also the principle source of information for the

vast majority of Mexicans. Even though the impartiality, objectivity, and diversity of information are the most important qualities of an ideal democracy, unfortunately the reality tends to be far from the ideal. In this electoral cycle in particular, television was the object of many accusations of bias and unfair media preference for the PRI candidate. The discontent with traditional media erupted with the student movement #YoSoy132 that protested media manipulation. Given the indignation of a large number of students and the strong accusations against the various TV channels, it is important to ask if there is any effect of television coverage on electoral results.

TV
0.3% - 25.3%
25.4% - 50.2%
50.3% - 75.1%
75.2% - 100%
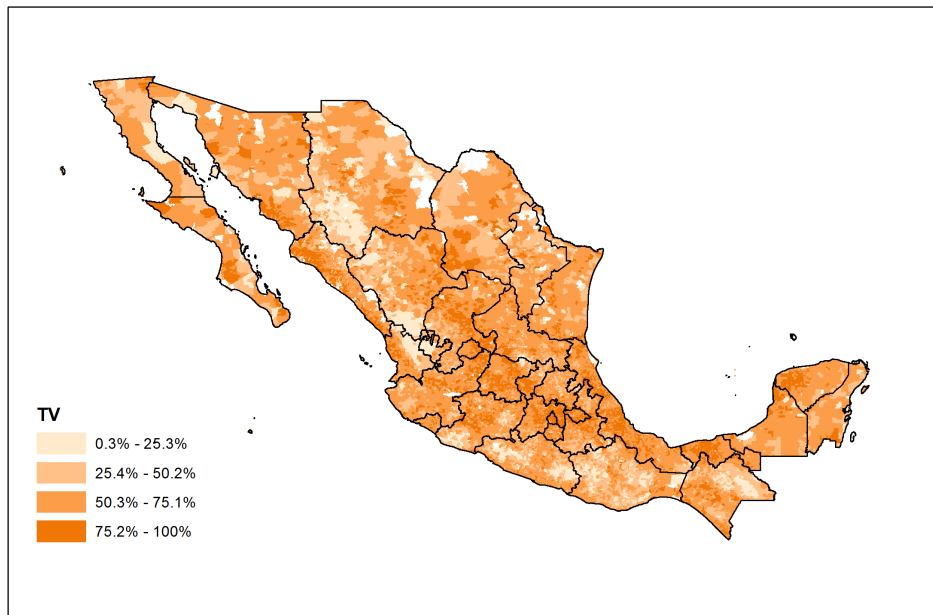
Our data does not permit us to decipher the particular effect of one television channel. Nevertheless, it is possible to analyze the effect of the presence of television as an indirect indicator of the effect of television content. For this we utilize a measure of the percentage of occupied private dwellings that have a TV, aware that the level of consumption varies independently of this measure. In other words, it is likely that the number of hours of television watched vary widely across homes. Unfortunately, we cannot quantify the number of hours, nor the types of programming watched by each voter, but our sample size does allow us to gauge the impact of television ownership.

Taking these concerns into consideration, we could find a significant effect of TV ownership on electoral results. In different ways for each candidate, TV principally benefitted Peña Nieto. As you can see in the simulation, a growth of 10% of homes with televisions represents approximately nine more votes for Peña Nieto above López Obrador and 12 more over Vázquez Mota. The same increase generated five more votes for López Obrador over Vázquez Mota. Finally, the candidate most

affected by television was Vázquez Mota, who lost a large number of votes to Peña Nieto and López Obrador in places with increased television presence.

Simulaciones del impacto de la penetración de la televisión en el voto.
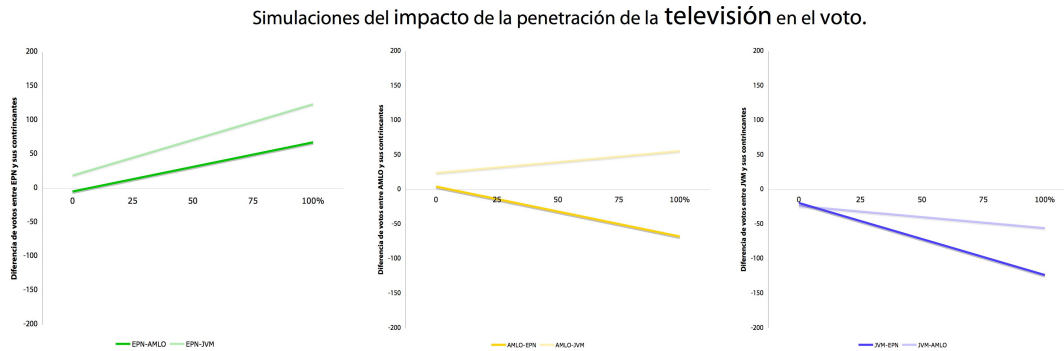
Even this result indicates a positive relationship between television access and votes for Peña Nieto, we cannot determine if this was due to campaign adds and announcements, news reports, debate coverage, or something else. It is very likely that the results were a combination of all of these factors. For example, it is possible that the Peña Nieto television campaign was successful because it was aired in conjunction with a generally positive image of the candidate during the preceding television program. On the other side, it is also possible that Vázquez Mota lost votes due to a critical television campaign, or for a weak television presence overall.

Something particularly interesting is that where there was low television presence, the vote spread between the three candidates was very small, which could be an indication of a polarizing effect of television media on the vote. When there is little information about candidates, the race tends to be close, whereas in places with high media coverage with many varied messages and signs about the candidates, we begin to see a bias towards certain candidates.

Deciphering the direct effect of the media and the mechanism by which it performs is a very complicated task. The influence of the media not only depends on the time when television is watched, but also the level of attention paid to each individual program and message in particular. In other words, a viewer watching a message on behalf of a candidate does not mean that he or she is paying enough attention to the message to let it influence the voting decision. Even so, we found a significant effect of television on electoral outcomes, so it is important to analyze further the exact causal connection between the media and the vote.
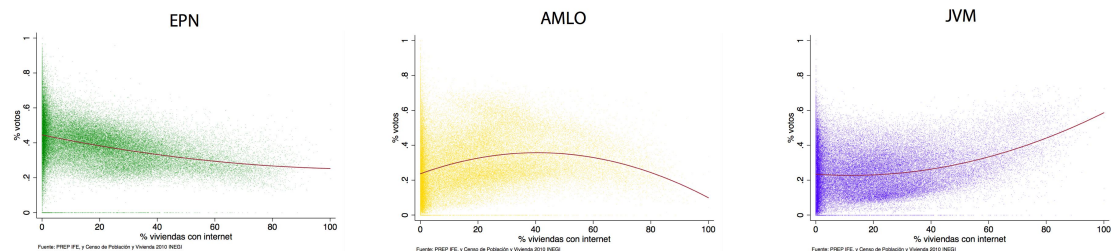
Internet

The inequality in Internet access in Mexico is evident. The following map shows the percentage of people that have access to Internet by municipality, and shows that the highest concentration of Internet access is in the cities in the northern and central parts of the country. It is important to note that this data only indicates the

presence of Internet in homes, and ignores access through Internet cafes or other places outside of individual homes.
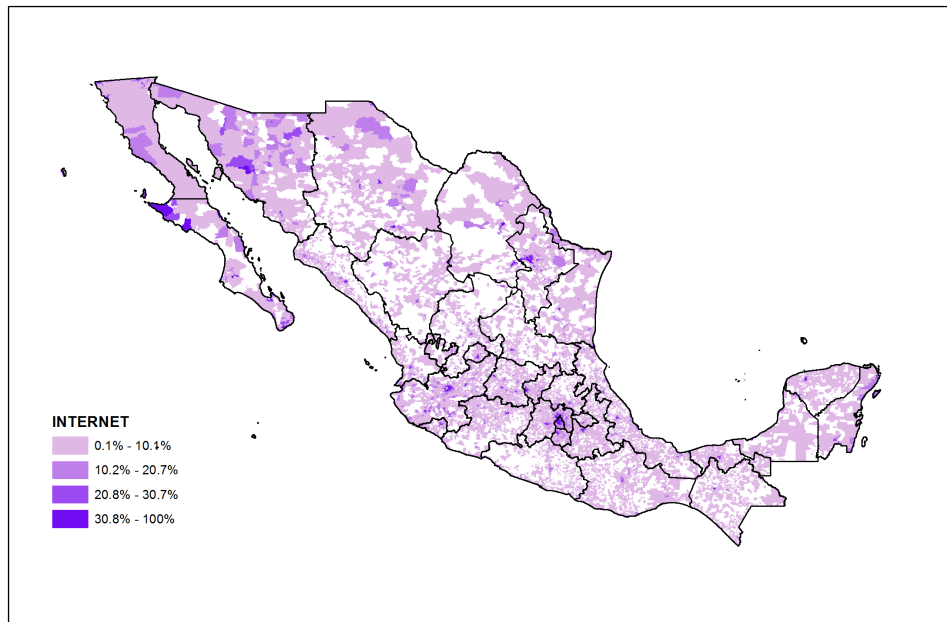
Given the importance of Internet in the 2012 elections, what is the impact on electoral outcomes? If we distribute the results of each electoral district according to the percentage of homes with Internet access (each electoral section is represented by one dot graphed according to the level of Internet coverage and the percentage of votes for each candidate), we can notice a strong relation between the presence of Internet and the electoral results.

Viviendas particulares habitadas que disponen de internet.

Surprisingly, the concentration of Internet coverage is the variable that has the greatest effect on electoral results at the section level, even when controlling for socioeconomic levels and other demographic variables. In other words, the effect that we are finding is not caused because a wealthier person has greater Internet

access, or because it is easier to connect in cities. The results can therefore be interpreted as the pure effect of Internet presence by itself.

Specific for each candidate, Internet negatively affected Peña Neito, especially when compared to Vázquez Mota. As we show in this simulation, an increase of 10% of houses connected to the Internet represents almost 50 fewer votes for Peña Nieto against Vázquez Mota. With respect to López Obrador, Internet moderately helped him when facing Peña Nieto by approximately 12 votes, but the PRD candidate lost an estimated 38 votes when facing Vázquez Mota. For each 10% Internet coverage increase, Vázquez Mota gained an estimated 50 votes over Peña Nieto and 38 over López Obrador.

Simulaciones del impacto de la penetración de internet en el voto.
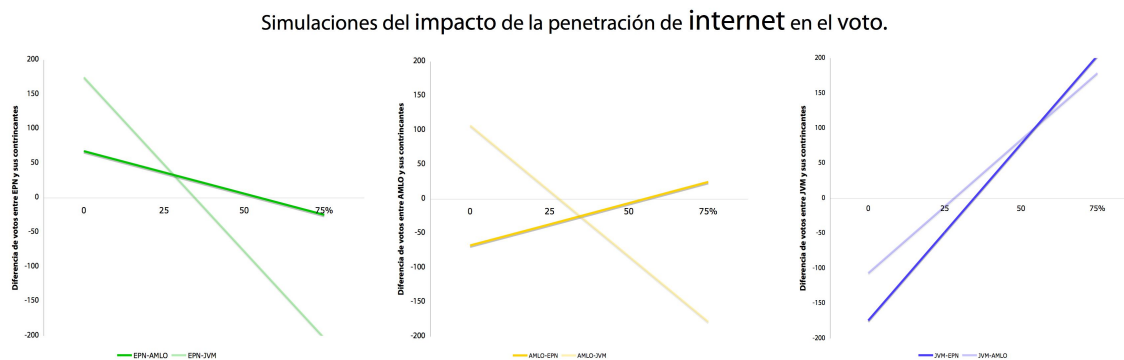
It is evident that Internet was one of the most important determinants in the electoral results. This is the first time that Internet access has had an effect of this magnitude in Mexico, and will probably be playing a central role in future elections. With the presented data, we cannot determine what exactly about the Internet affect the vote so strongly, but it will present interesting paths for research in the future.

The Internet as a means of information transfer has unique characteristics: principally, the content of the vast majority of pages is not regulated, and there are thousands of unique points of view and perspectives, as many false as true. Contrary to television and print media, in the Internet there is not just one channel to watch or just a few newspapers to read; instead, everyone can become their own reporter or journalist. It has been argued in other countries that when surfing the Internet, users typically seek out the information that reinforces their own point of view, which can encourage polarization and extreme viewpoints.

On the other hand, one of the peculiarities of social networks is their ability to spread relatively isolated incidents into viral sensations, as happened often with errors made by the candidates during their campaigns. In this election, the Internet was flooded with messages, videos, and photos slandering Peña Nieto. There were also strong debates against López Obrador, mainly in social networks. Vazquez Mota may have benefited greatly from the Internet because most concentrated attacks were on Peña Nieto and López Obrador, which may have alienated many citizens who in the end decided to vote for the "least worst" or less attacked candidate.

There may be hundreds more reasons why the Internet influenced voters. Regardless, the Internet has become such a powerful influence that it can no longer be ignored, as future election battles will take place primarily in cyberspace. Deciphering their effect on voting outcomes is certainly going to be a great new frontier of elections research.

4. Violence and the Vote

Felipe Calderón's presidency was characterized by the escalation of violence as a result of Mexico's War on Drugs and the bloody conflicts against criminal organizations. During the last few years, television news and newspapers have been inundated with chilling images. Estimates put the death toll from the war at over 50,000 people in just six year, and at least 10,000 more missing and an unknown number of displaced persons. For many of the country's inhabitants, especially in the states of Chihuahua, Sinaloa, Baja California Norte, Michoacán, Durango, Guerrero, Tamaulipas, Nuevo León, Veracruz, and more recently Jalisco, the war is an eminent daily threat that leaves irreparable traces in its wake.

Beginning with his home state, Calderón decided to deploy the army in nine joint operations aimed at containing criminal organizations.[3] While the violence has been contained in some of these states, in others it continues to escalate as criminal organizations diversify their portfolio of illegal activities and compete for territorial control, plazas, and strategic routes. It is expected that the effectiveness of federal government interventions in the war, as well as assessments of the military action vary widely depending on the region, as some regions are in a constant state of warfare, while the situations in other regions may be sensationalized and exaggerated by the media.

In many states, the attorney general and the state police are viewed as accomplices of the criminal organizations, protectors of the plazas, and responsible for the bloody crimes that go unpunished. It is not surprising that in many places the army has a better credibility reputation in opinion polls, despite allegations of violations of human rights in reports from watchdog organizations, both national and international. In other states, the army has been an institution feared by the public for decades. For example, in Guerrero, the dirty war of the 1970s and the repression of the peasant population contributed to entrenched and legitimate fears in the population, while in the poorest mountain regions, they gave way to a community

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[3] The joint operations are a federal force that comprise of a collaborative effort between parts of the Mexican Army and Navy, and the Federal Police. Up to now, they have launched operations in Michoacán, Baja California (Tijuana), Chihuahua (Ciudad Juarez), Oaxaca (the southern border isthmus region), Guerrero, The "Golden Triangle" (at the intersection of the states of Chihuahua, Sinaloa, and Durango), Nuevo León, Tamaulipas, and Veracruz.

policy force whose principle objective was, since its beginning, to defend its forces against allegations of police and authority abuse over targeting criminal organizations.

Therefore, we can hope that the violence affects voting patterns in a heterogeneous manner. Electoral results at the state level suggest that the PAN lost in the north of the country, except for in two states: Tamaulipas and Nuevo León, which currently suffer from high levels of violence and are therefore host to joint operation forces. In both states, the PAN won the majority of the vote in the presidential elections. Veracruz is another state where that party was strongly supported, and it also is experiencing an escalation of violence and daily clashes between criminal organizations. However, the aggregate data at the state level is very crude and can certainly mask important patterns in voting behavior.

Our analysis of the over 66,000 electoral sectors allows us to paint a more detailed picture of the ways in which violence affected the vote in the 2012 presidential election. To this effect, we utilize a database of deaths resulting from criminal rivalries as presented by the Mexican government. The analysis sums the number of homicides that occurred between December of 2006 and December of 2010 so as not to incorporate the effect of the most recent tendencies in the violence dynamic. As you can see in the subsequent map, the majority of the homicides were concentrated in northern Mexico, and in the states of Guerrero and Michoacán.

Furthermore, it is worth noting that many of the states with more drug-related deaths are currently governed by the PRI, such as Chihuahua, Coahuila, Nuevo León, Tamaulipas, Durango, Zacatecas, San Luis Potosi, Veracruz and Michoacán, so it is important to note whether in these places voters punish the PRI, the PAN or both parties for that scenario.

Our analysis generates results that point to a complex relationship between voting and violence. In analyzing all of the voting sectors, without separating north vs. south, there is a negative and statistically significant effect from the total number of deaths on the choice between Peña Nieto and López Obrador, although not between López Obrador and Vázquez Mota. In other words, the PRI party suffered the most electorally from the violence and not the PAN, while the PRD lost the most votes in violent and poor areas.

<div align="center">Expansion of Violence, 2007-2010</div>

Legend
homicidiosSEGOB
death0611
- 0
- 1 - 20
- 21 - 100
- 101 - 500
- 501 - 7643
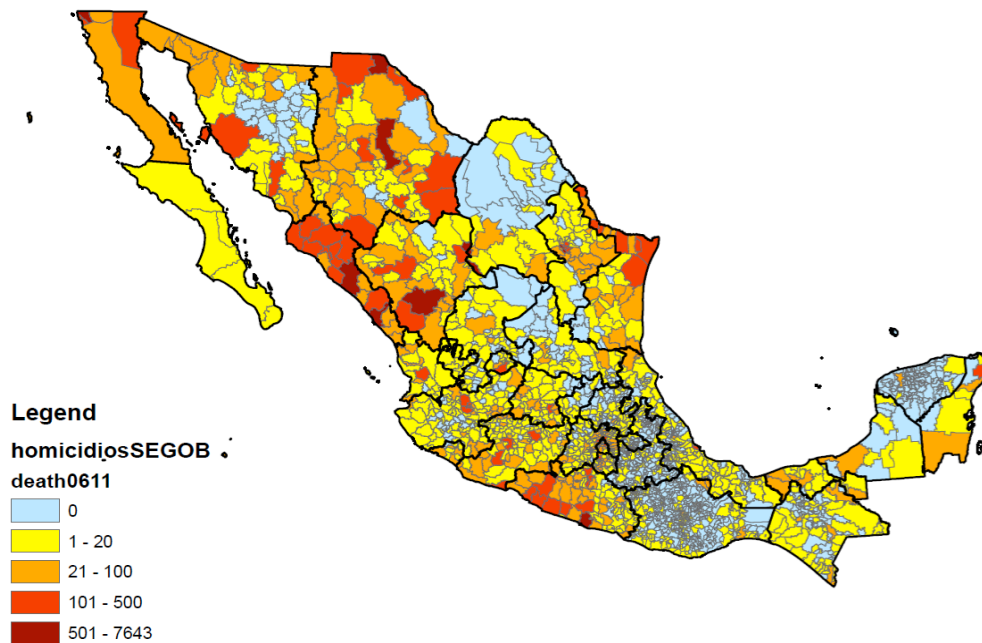
The relation between violence and the vote, as it affected our econometric model, is illustrated in the following table. Here you can observe that while the difference between Peña Nieto and López Obrador in a sector located in an area with zero homicides related to organized crime is 59 votes, a discrepancy that lessens as violence levels rise. For example, in an area with high levels of violence, like Tijuana or Guadalajara, the distance would be 41 votes. In places with even higher levels of violence, like Culiacán or Torreón, this distance is even less, a mere 30 votes per voting district. The voters fundamentally punished Peña Nieto for the violence and instead shifted their votes towards López Obrador.

When voters were deciding between Peña Nieto and Vázquez Mota, the former has a slight advantage in places with average levels of violence, in comparison with places void of significant levels of violence. However, as violence levels increase, the gap in voting share between the two candidates diminishes, meaning that violent locales are more likely to support the PAN.

Finally, we observe that the distance between López Obrador and Vázquez Mota is on average 35 electoral votes in each section without violence. This difference increases and benefits López Obrador more in areas with higher levels of violence. We can thus conclude that the PRD received the reactionary support of citizens in violent areas, and that both the PAN and the PRI, to different extents, were punished by voters in violent areas and therefore lost vote shares.

Vote share difference by level of violence (national averages of electoral sectors)

	Electoral sections in municipalities without violence (zero homicides attributed to organized crime)	Electoral sections in municipalities with average levels of violence	Electoral sectors in municipalities with high levels of violence	Electoral sectors in municipalities with extremely high levels of violence
Difference EPN-AMLO	59	48	41	30
Difference EPN-JVM	94	100	96	89
Difference AMLO-JVM	35	51	55	59

(EPN= Enrique Peña Nieto; AMLO=Andrés Manuel López Obrador; JVM=Josefina Vázquez Mota)

Finally, in states in the northern part of the country, violence seems to wrest votes from Peña Nieto in favor of López Obrador and, to a lesser extent, Vázquez Mota. Even though the electoral sectors in these states favor Vázquez Mota over López Obrador, the distance reduces as the violence increases.

Vote share difference by level of violence (averages of electoral sectors in the northern states)

	Electoral sections in municipalities without violence (zero homicides attributed to organized crime)	Electoral sections in municipalities with average levels of violence	Electoral sectors in municipalities with high levels of violence	Electoral sectors in municipalities with extremely high levels of violence
Difference EPN-AMLO	105	97	86	71
Difference EPN-JVM	41	48	43	37
Difference AMLO-JVM	-64	-49	-43	-34

(EPN= Enrique Peña Nieto; AMLO=Andrés Manuel López Obrador; JVM=Josefina Vázquez Mota)

When we segment the observations by state down one level further, to states governed by either the PAN or the PRD, we find that violence hurts Peña Nieto's vote share and favors Vázquez Mota.

This regression analysis describes systematic patterns that allow us to identify trends, but does not reveal the causal order. Thus while we can say that people living in violent regions tend to vote against the PRI, we cannot be certain whether violence is the reason for this trend. It could be that there are other factors not included in the model, such as poverty, geography, or demographics that are correlated with violence, but independently impact the vote.

Without performing a more sophisticated analysis of causality, we can conclude that citizens in the most violent areas vote for López Obrador, even though the aggregate data shows little presence of his PRD party` in the north of the country. Also, we can conclude that the *most violent areas in the north tend to punish the PRI* with their

votes, possibly because the party controls a large number of local governments in these states, suggesting that voters attribute more of the violence to the incompetence of the local authorities than it would seem at first glance.

The correct interpretation of the election results in relation to violence is essential, because it affects on how Peña Nieto and his team interpreted their mandate. The message for Enrique Peña Nieto is that citizens most affected by violence seem to attribute the very serious problems of violence and organized crime to state governors from his party.

In order to repair the PRI's outstanding political unpopularity, the president elect's party will have to begin at home by consoling voters with *deep reforms to institutions and practices at the state level* that allow for impunity, by punishing corruption and providing security to citizens at the state level. Since the federal government has no legal jurisdiction over matters of law enforcement in the states, this reform is not possible without a political compromise between the future president and the governors of his party.

IV Conclusions:

In this report on the 2012 Mexican presidential election we utilize electoral information from the voting sector level and census data at the same disaggregate level. The richness of this data allows us to draw solid conclusions that offer up a large vision of the political spectrum in Mexico today:

- **The vote from the poorest section of the population benefited Vázquez Mota over Peña Nieto and López Obrador. That is to say, the leftist party actually has the lowest support from the population living in the most marginalized parts of the country. This effect can be attributed to the impact of social programs expanded under the PAN party's rule that are viewed very positively among the poor population that received their benefits.**
- **Peña Nieto received his support from a broad swath of voters across the country. On the other side, the vote in favor of López Obrador was strongly concentrated in the southeastern states and the capital city, places where Vázquez Mota won the lowest voting percentage.**
- **Unemployment had a negative effect on the incumbent party's candidate, Vázquez Mota, but it helped López Obrador.**
- **Bureaucrats tend to support López Obrador, except in places governed by the PRI where they instead voted for Peña Nieto. In contrast, areas with high social security benefits payouts supported Vázquez Mota.**
- **The effect of television and Internet media was a strong determinant in this election. In general, areas with greater television presence turned out more strongly for Peña Nieto, while areas with more Internet**

coverage voted against him. Vázquez Mota benefited the most from this.

- Violence as it related with organized crime had a negative effect on the vote for Peña Nieto and Vázquez Mota. The PRI candidate suffered more than the PAN, which could signify that voters perceive the local government as responsible for their security. Our data does not, however, allow us to discern the causality between violence and the vote.