The Political Determinants of Life Expectancy in Mexico

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March 30, 2013

Paper prepared for presentation at at the 2013 Annual Meeting of the Western Political Science Association, Hollywood, CA.

Abstract

This paper examines the influence of variance in sub-national political structures on life expectancy in 31 Mexican states and one Federal District over the period 1994-2009. A lengthy empirical literature addresses the challenges accompanying political and economic transitions in Latin America (Snyder 1999; 2001; O'Donnell 1999; Gibson 2005; Giraudy 2010 to name a few). Of particular note is the extensive work detailing uneven democratization and the retention of authoritarian regimes at the state and local level (in particular Snyder 1999; Giraudy 2010). The results of our cross-sectional time series regressions suggest that political capacity (tax extraction capacity) of Mexican states is associated with higher life expectancy as state political accountability increases. Further, we find that poverty seems to have a deleterious effect on life expectancy only in states with lower levels of political accountability.

1 Introduction

In this paper we examine the political determinants of life expectancy. Recent estimates for life expectancy in Japan are over 83 years of age, 76 in Mexico, while in Russia they are only 66. Life expectancies in much of sub-Saharan Africa are less than 55 year of age (CIA, 2012). Wealth, demographics, and

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military conflict clearly explain part of this variation, but there is a significant body of evidence that political institutions moderate public health outcomes (Navia & Zweifel, 2003). While not completely orthogonal to each other, we posit two attributes of institutions are particularly salient to explaining health (and other development) outcomes; democracy as well as government capacity.

2 Democracy

The first institutional attribute we focuses on to explain health outcomes is democratic accountability. Democratic systems function by imposing limits on political leaders, functionally requiring accommodation of demands of the population in order to remain in power (Dahl 1971). Competition, political participation, and the ability to remove leaders from office are important elements included in the practice of procedural democracy (e.g. Schumpter 1971). The main mechanism by which democracy leads to improved development outcomes is by expanding the number of relevant political actors, or increasing the subset of the population an individual needs to satisfy in order to attain and retain office, which limits elites ability to implement unpopular policies, or distribute benefits to a small subset of supporters. Elites are conversely required to consider resource allocation, such as expensive public health service delivery programs, that benefit large subsets of the population (Bueno de Mesquita et al, 2005). In other words, instead of allocating public goods as private benefits attained through political control, polities with broad political accountability necessarily expand their patterns of public goods provision and service delivery to much larger swaths of the population.

However, circumstance and experience within even a consolidated democracy can vary dramatically. Numerous studies of democratic transitions cite substantive differences in the quality of democracy within geographically distinct political units within a country. This is even more likely to be the case in societies experiencing transitions to democracy, and variance in implementation of democratic reforms may be substantial when decentralization of political authority occurs in federalist regimes. Snyder (1999) suggests that focus on within nation variation is warranted; major processes of political and economic transition are likely to vary across territorial political units. Substantial differences in state level democratic exercise are washed out in national analysis. The phenomenon of subnational democratic variance is widespread, with scholars examining subnational authoritarian enclaves in countries ranging from Mexico and Venezuela (Giraudy 2010; Gervanosi 2010), Russia (Petro 2004), India (Beer and Mitchell 2006), Honduras and the Philippines (Blair 2000) among others.

A second and complementary approach often recommended as a mechanism for increasing political accountability within a country is the decentralization of political authority and policymaking (Seabright 1996; Besley & Case 1995). Following this logic, decentralization and the devolution of decision making and policy implementation results in political leaders to whom the population has ac-

cess, administration of programs and policies that directly address needs within a specific locality, and can avoid the capture of resources and redistribution at the central government level (Bardhan 2002). Several empirical examinations of decentralization and public service provision to date note a trend in the expansion of service delivery when regional or state level governments become responsible for the allocation of resources and implementation of policies (Bardhan & Mookhengee 2000). For example, state level administration of Mexicos *Progresa* program found that state level governments were much more effective at targeting poor locations and providing poverty abatement strategies than the central government (Coady 2001).[1] However, the effectiveness of decentralization in policy administration is predicated on the capacity of a state to implement its policy preferences, a subject to which we now turn.

3 Government Capacity

Given that democracy, and particularly, subnational democracy, is a potentially important institutional variable that can explain development outcomes, what about government capacity? While democracy can be thought of as the "will" or policy preferences of governments, their ability to implement their desired policies and programs are also relevant. Government capacity can be thought of as the ability of nations to transparently plan and implement public policy (Fukuyama, 2004). Both human development and economic growth are often attributed to the quality of governance in a country (e.g. United Nations 2012; World Bank 2010; Kauffman, Kray & and Zoido-Lobat'on (KKZ) 1999; 2000 among others). While numerous characterizations and definitions of "good governance" exist, most concentrate on the formal arrangement of authority and decision making within a country. For example, the World Bank development project defines governance as:

> "the traditions and institutions by which authority in a country is exercised. This includes (1) the process by which governments are selected, monitored and replaced, (2) the capacity of the government to effectively formulate and implement sound policies, and (3) the respect of citizens and the state for the institutions that govern economic and social interactions amongst them." (KKZ, 1999:1).

Others suggest that governance comprises the dynamic process through which citizens articulate interests and mediate differences through institutions, transparency, and provision of public goods or service delivery (Rodrik 2008).

However, operationalizing indicators for governance capacity have proven difficult. Many researchers have relied on the Worldwide Governance Indicators (KKZ) for the operationalization of government quality and government effectiveness (KKZ, 1999). As discussed in Kaufmann, Kraay, and Mastruzzi (2009),

[1] Of note is the extended finding that municipalities did not effectively target households in further decentralization of poverty abatement efforts.

government effectiveness covers the following concepts: quality of publicly provided goods, quality of the civil service and the degree of its autonomy vis--vis the political establishment, the quality of policy implementation and formulation, as well as the level of governmental commitment to policies set into motion. Values for each of these dimensions of government effectiveness are subjectively assigned by expert judgements and a unifying index is calculated.

A significant drawback to these indicators is that they are only available at the national level, which obfuscates measurement of key local variables that are largely responsible for variations in health outcomes. Eriksen and Kelly (2007) find low reliability of vulnerability rankings across countries. They argue that subnational contextual factors influence adaptive capacity rankings that are not measured in national indicators. Haddad (2005) is also critical of national adaptive capacity rankings because they exclude the political priorities of the national government. The next generation of empirical adaptive capacity research that focuses on the subnational can be found in O'Brien et al (2004). Nonetheless, for most health studies, state/provincial or local governmental capacity indicators are essential. In sum, the three key requirements for a valid and reliable indicator of governmental capacity then appear to be; sub-national in scale, empirically derived, and representing a clear and consistent latent construct.

Despite a number of operationalizations of the concept, KKZ (1999) note that hundreds of indicators potentially exist, a substantive and established literature links government accountability and responsiveness to the provision of services and policies that improve development outcomes for populations.[2] These findings enjoy empirical support in the extant literature on topics ranging from the ability to effectively implement development projects (Rodrik XXXX) to increases in the quality and longevity of life independent of income (for example cross national studies of life expectancy) (Reidpath & Allotey 2006).

Organski and Kugler (1980) operationalize government capacity as the ability of elites to extract resources (taxes) from society and to use these resources to achieve national goals. Tax extraction capacity can be considered a type of "infrastructural" capacity where funds are raised and social objectives pursued in spite of elite, interest group or class-based opposition (Robinson, 2008). If a government is incapable of approaching its potential tax extraction rate, given the economic resources of the jurisdiction, then we can infer that the quality of its policy intervention, on average, is equally limited. Reflecting upon the importance of taxation effectiveness on governmental effectiveness, Rouyer (1987) notably argues that, "without revenue, there can be no preservation of order, no redistribution of resources, and, indeed, no government" (p. 457). Tax effort indicators are a valid measure of government capacity for public health and vector control efforts specifically for several reasons. First, due to market failures, many health related public goods will be undersupplied and there is a persuasive logic for public funding. Poverty, or lack of access to capital, can restrict private consumption of measures. Government capacity is a necessary but not

[2]In fact, most of these perspectives identify particular policies and in some instances the ability of governments to effectively implement policies as endogenous (collective choices of a given society) (Balard, Moene & Robinson 2009).

sufficient condition of effective policy interventions: in effect *sine qua non*.

Relative Political Extraction (RPE) reflects the ability of a state government to implement a set of desired policy preferences and reflects institutional efficiency. A robust measure of government performance , governments with high RPE can intervene or influence policy that encourages economic growth (Leblang 1997), decrease inflation (Alacazar 1997), increase private investment (Feng and Chen 1997, Feng 2004). Furthermore, Arbetman (1990, 1994,) and Arbetman and Ghosh (1997) demonstrate the relationship between government inefficiency and the level and rate of change of black market activities in both national and sub national contexts. In the health sector RPE has shown to predict survival outcomes in terms of infant mortality (Swaminathan 2008) and disease management (Giselis 2010), and malaria (Boussalis et al., 2012).

4 Government Capacity & Democratic Transitions in Mexico

We chose Mexico to examine sub-national health sector outcomes for several reasons. First, there is significant variation in both democracy and government capacity, our two key independent variables. There is also considerable variation in life expectancy in Mexican states. These considerations make Mexico an important case study for investigations of the political determinants of health outcomes.

4.1 Mexican Sub-national Political Changes

Over the last two and a half decades Mexico's political reforms have resulted in increases in political competition, succession in office by opposition parties and candidates, and increasing free and fair elections at the national level. Nearly all assessments of democracy in Mexico attribute substantial gains in procedural and liberal democracy to the concurrent economic reforms occurring in Mexico throughout the 1990s which required dismantling long enduring clientalist networks. No longer able to distribute "public goods privately", 70 years of *Partido Revolucion Institutional* (PRI) rule ended when Vincente Fox, a candidate from the *Partido Acción Nacional* (PAN) won the 2000 Presidential election. These changes cemented previous institutional reforms of the 1990s, including the 1996 establishment of an independent Federal Election Commission, elimination of formal political corporatism, and the 1997 loss of a PRI majority in the National Chamber of Deputies (Tulchin and Selee 2003). The political reach of the PRI had long been concentrated in resource control and the distribution of economic benefits; the disruption of resource distribution tied to the political party machine of the PRI and subsequent dismantling of the welfare state resulted in an expansion of relevant political actors.

An elaborate system of fiscal transfers from central to state governments was a key facet in the stability of Mexico's one party dominance (Brandenburg 1964). Citizens were induced to participate and actively maintain a one party

system through an allocation system where public expenditures to states were made based on the strength of the ruling party (Ames 1970). Mexico endured two major economic contractions, the debt crisis and the peso crisis, without the PRI losing its dominant position. The threat of loss in fiscal resources prompted support for local dominant parties even when the opposition parties were preferred by local citizens (Geddes 1999), an empirical finding throughout Mexico in local government support for the PRI in the 1980s and 1990s Diaz-Layeros, Magoloni, and Weingast (2000). As Mexico began to develop a multiparty system, retaliatory cuts in fiscal transfers were evident in states where opposition leaders gained office (Diaz-Layeros, Magoloni & Weingast 2000).

Cracks appeared in the façade of Mexico's one party dominance when divisions among elites resulted in movement away from development programs and projects that directly targeted the poor along patronage lines to a more a generalized subsidy of impoverished populations in the 1980s (Fox 1994). The political apparatus of the PRI concentrated subsidies and direct support to industrial workers and small farmers. The advent of NAFTA in 1994 changed the political landscape by no longer designating these groups as primary recipients of public goods and exposing their vulnerability to the economic impacts of agricultural and manufacturing liberalization (Foster 2010). The end result was the expansion of the provision of public goods to broader populations as they became increasingly relevant.

Given the magnitude of Mexico's transition from a one party system, differences in levels of political accountability and responsiveness across territorially defined political units (states) is not surprising, particularly considering Mexico's federalist structure. Snyder (1999) argues that not only can the process of democratization be better understood by focus on within nation variation; major political processes of political and economic transition are likely to vary across territorial political units. Substantial differences in state level political accountability are washed out in national analysis. Regime juxtaposition, where authoritarian sub-national structures exist in conjunction with national democratic practice is common in Mexico; decentralization accompanying national level reform has facilitated uneven democratization in Mexico that has penetrated some states far more than others (Solt 2003; Snyder 1999, 2001a, 2001b; O'Donnell 1999; Eisenstadt 2004; Gibson 2005; Giraudy 2010). Empirical studies of state and local governments in Mexico reveal substantial variation in the dispersion of democracy, with enclaves of persistent authoritarian political structures contrasted with democratic practice in Mexican states (Giraudy 2010).

In some regions, electoral competition is broadly acknowledged, alternation in office common, and margins of victory in elections are close; in other regions alternation in office does not occur, electoral fraud remains rampant, and political power consolidated in single party dominance (Moreno 2005). Studies of authoritarian persistence in Mexico's sub-national governments identifies the retention of party machines and sub-national mobilization for national candidates as remaining structures of the patron-client network in existence under the PRI one party system (Giraudy 2010). In a "democratic tradition" these

function as population based constraints on the executive, or allow the executive to function outside the purview of civic oversight. Precedents to this work establish that the persistence of sub-national authoritarianism has substantial policy implications ranging from response to recovery following economic crisis (Hiskey 2005), economic policy implementation (Snyder 2001a), the ability of a state to procure resources in the form of transfers and subsidies from the central government (Giraudy 2010), and educational attainment and outcomes at the primary and secondary levels (Peiro 2006).

4.2 Mexican Government Capacity

Given these dramatic changes to the nature of Mexican politics, let us briefly examine variation and trends in Mexican government capacity. As discussed above, we use RPE as an indicator of governmental capacity as it has a strong track record predicting health outcomes. RPE has shown to predict survival outcomes in terms of infant mortality (Swaminathan 2008) and malaria (Boussalis et al., 2012) at the subnational level, and disease management at the national level (Gizelis 2010). RPE has a mean value of 1 for the panel of states in each year with higher levels of the indicator predicting greater government capacity to design, implement, monitor and evaluate health sector programs. The Appendix presents the methodology used to derive the indicator as well as the average value for each Mexican state for 2008 / 2009. Figure 1 presents the change in RPE for each state between 1994 / 1995 and 2008 /2009. The largest increase in government capacity occurred in Guerrero and Hidalgo, while Nuevo León, Jalisco, and Baja California exhibited the largest declines. Our hypothesis is that the levels and changes associated with governmental capacity either directly or indirectly affect life expectancy in Mexican states.

4.3 A Model of the Political Determinants of Life Expectancy

We utilize life expectancy at birth as a measure of health sector outcomes as it is one of the most widely examined health indicators along with infant mortality rate. We prefer life expectancy because it incorporates estimated health impacts over a cohort's entire life, rather than from birth to one year of life as infant mortality rate does. Life expectancy is also an indicator of the overall quality of life in a country and is necessary for the calculation of various actuarial measures of risk. Our working definition of life expectancy is:

> "Life expectancy is average number of years to be lived by a group of people born in the same year, if mortality at each age remains constant in the future for both males and femalesand summarizes the mortality at all ages. It can also be thought of as indicating the potential return on investment in human capital..." (CIA, 2012)

Figure 2 shows a scatterplot of the dependent variable of life expectancy in Mexican states over the sample period. Two trends are clear from Figure 1.

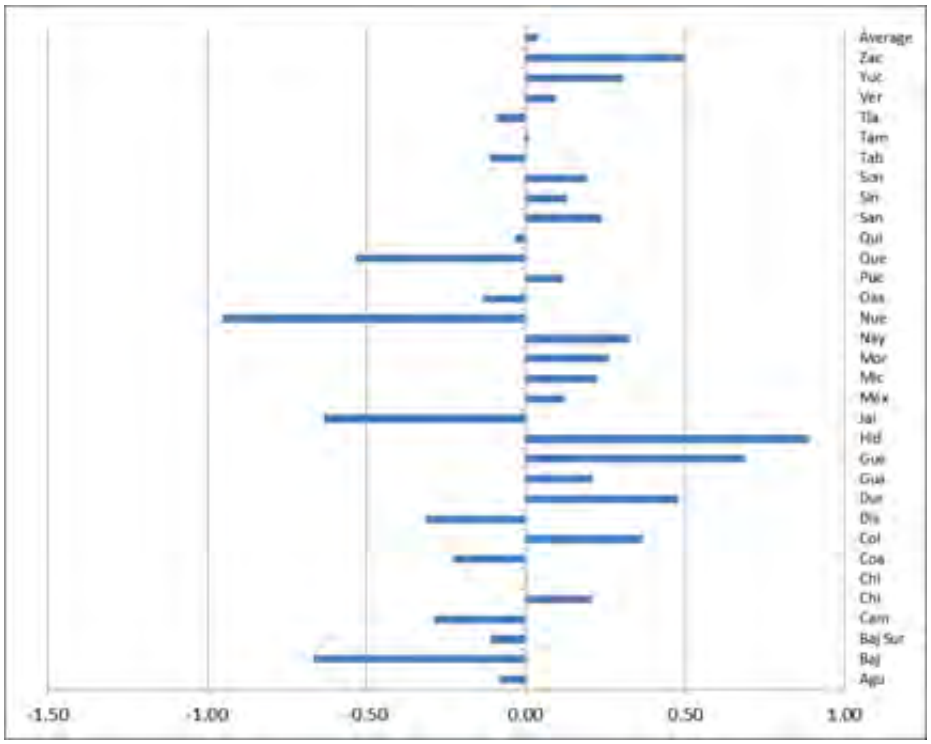

Figure 1: Change in RPE between 1994/1995 and 2008/2009 Averages

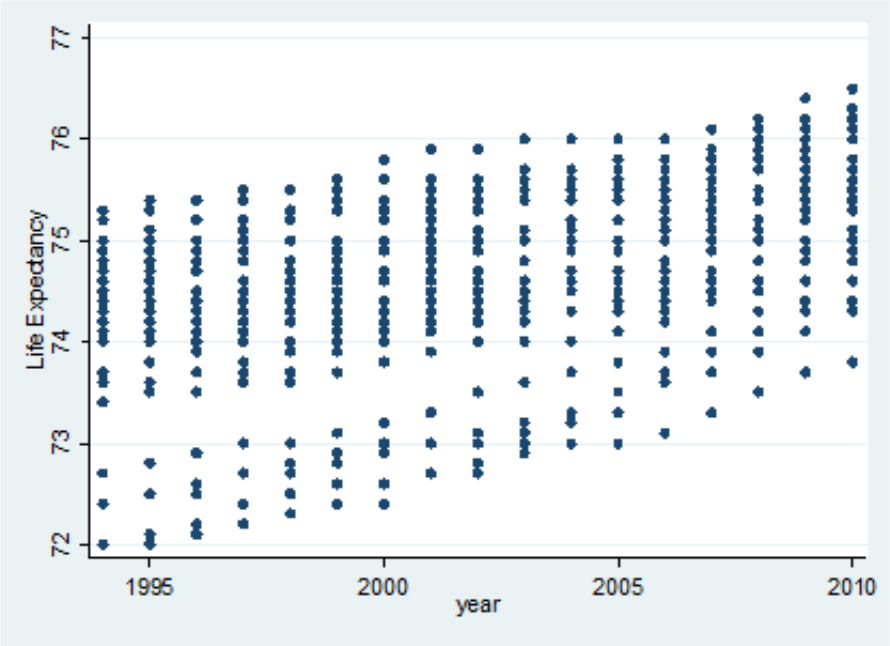

Figure 2: Life Expectancy in Mexican States

First is the increase in life expectancy for all Mexican states. The second trend is the poorly performing states in 1994 have seen life expectancies increasing at a faster rate than the rest of the country as evidenced by the decline in variation.

4.4 Independent Variables

Procedural Democracy: We consider governance to exist on a spectrum, with good governance comprising many of the elements of a minimal procedural democracy: fully contested legislative elections, turn over or alternation in office, and free and fair or clean elections (Schumpter 1974; Prezworksi 2000; Giraudy 2009; 2010). Democracy scores range from 0 (least democratic) to 1 (most democratic) and are based on a multiplicative relative index that include individual turn over in state level executive and legislative office, number of changes in a year, number of party changes in office, distribution of votes, margin of victory, number of seats awarded to the governor's party, and elections conducted without fraud (Giraudy 2010).

Government Capacity: Relative political extraction is measured by the ratio of actual to predicted tax revenues in a state year given the economic endowment of the state. RPE model estimates are detailed in the Appendix.

Poverty: The poverty measure utilized in this assessment examines the geographic distribution of poverty within a state, examining the percent of the population living below the poverty line (established by Mexico's national gov-

ernment) living in towns with a population under 5000. This is an important control variable as poverty concentrated in rural areas and small towns is likely accompanied by fewer health resources, particularly given the dissolution of Mexico's patronage network which previously had supported small farming and the bulk of economic activity in these areas. Poverty data are obtained from INEGI.

Net internal migration rates: To reflect the overall inflow and outflow of population in a state year, we rely on net internal migration rates. In part, this variable captures if more individuals relocate to the state or if more individuals move out of the state. Net internal migration allows for us to control for demographic changes that may be reflected in life expectancy at birth in a given state caused by population movement. Net internal migration rates are obtained from the Mexican Population Census through INEGI.

Medical Staff: We include a control variable for medical staff per population. Access and availability to medical care are a critical element in securing long term health outcomes. Consequently, this is potentially an important control variable to include in our analysis. Data are obtained from INEGI.

Service Ratio: Service sector revenues as a percent of GDP are obtained from INEGI and reflect the total income from the service industry as a percent of GDP in a state year. This is included as an structural variable to control for differential economic development trajectories.

The descriptive statistics for the model are presented in Table 1 below. It is clear that the data is far from a fully balanced panel, with considerable missingness for the democracy, poverty and medical staff variables.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
lifeexp	544	74.62886	0.890669	72	76.5
poverty	447	33.30236	16.72401	0.319999	69.62
transf_gdp	512	0.096133	0.055478	0.012646	0.504391
service	512	0.656239	0.105449	0.273198	0.990352
netmig	544	0.179173	0.582396	-1.45	2.99
medstaff	479	122.6063	43.19896	53.2	312.2
democ	322	0.135014	0.201887	0	1
rpc_use	512	1.002368	0.421747	0.336701	4.058745

The correlations between these variables can be found in Table 4 in the Appendix.

4.5 Methods

Our data structure is comprised of 32 Mexican states from the years 1994-2009 comprising and 16 time periods where the number of states (N) exceeds the time periods (T), excluding random effects econometric techniques (Beck & Katz, 1995). To account for the N x T issue, we estimate our models using ordinary least squares (OLS) regression with two way fixed effects. The two-way fixed effects models account for year and country invariant specific factors, reducing the potential impacts of unobserved heterogeneity. Standard errors are estimated using Huber-White sandwich estimators.

Using the data described in Sections 4.2 and 4.3, we estimate the following estimating equation:

$$Life_{i,t} = \alpha + \beta X + \delta C + \gamma i + \lambda t + \epsilon$$

Where, $Life_{i,t}$ is the dependent variable, life expectancy, for state i at time t; X represents a vector of key independent variables, including government capacity and democracy as well as their interaction; C represents a vector of control variables including poverty and its interaction with democracy; γ and λ represent country and time fixed effects, respectively; and ϵ represents the stochastic error term.

5 Results

Table 2 provides the main results on the correlates of state life expectancy. Turning to the economic control variables, the results suggest that *Poverty* is negatively and statistically significantly related to life expectancy in all specifications. Focusing on its economic effect from Model 2, we determine that a one standard deviation increase in Poverty above its mean value is related to roughly half a year decrease in the average state life expectancy. Central government transfers are negatively and significantly ($p < 0.10$) associated with life expectancy in Model 1 but lose statistical significance in subsequent specifications. A one standard deviation increase in Transfers leads to less than one tenth of a year increase in life expectancy on average, holding other variables at their mean values. The rate of internal migration was found to have a positive and significant effect on life expectancy in three of the four specifications. In terms of substantive effects, in Model 2 we find that a one standard deviation increase in internal migration rates leads to a less than one tenth of a year increase in life expectancy. The coefficients for the service sector control are negative and significant at the 1% error level in all specifications. A standard deviation increase in the size of the service sector is associated with a less than one tenth of a year decrease in life expectancy.

Turning next to the interactive effects of Democracy and Relative Political Extraction, we find significant support for the proposition of the moderating

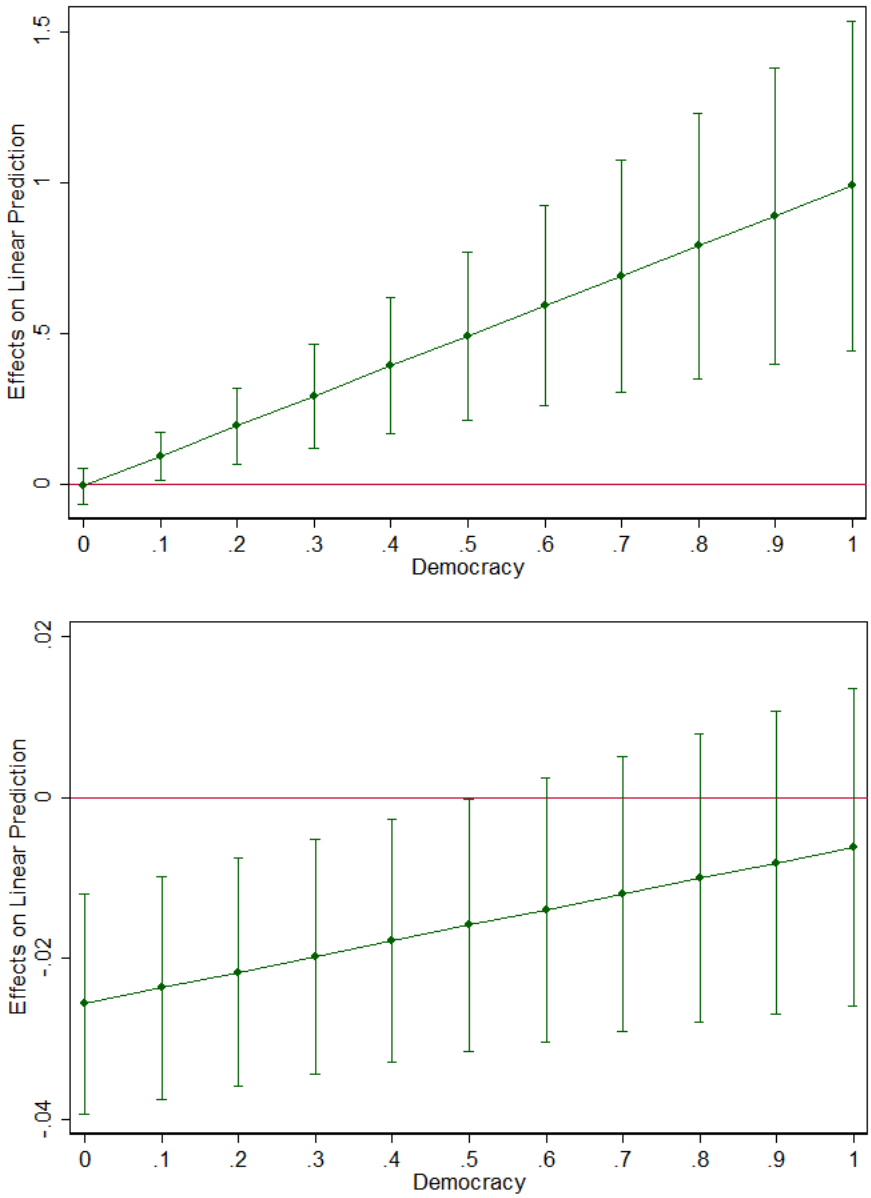

Figure 3: Effect of RPE on Life Expectancy at various levels of Democracy (above) and the effect of Poverty on Life Expectancy at various levels of Democracy (below). 95% confidence intervals.

Table 2: Two-Way Fixed Effects Regression (LSDV) Results

	(1) Life Expectancy b/se	(2) Life Expectancy b/se	(3) Life Expectancy b/se	(4) Life Expectancy b/se
Poverty	-0.031***	-0.031***	-0.021***	-0.026***
	(0.01)	(0.01)	(0.01)	(0.01)
Transfers / GDP	0.717*	0.421	0.245	0.333
	(0.42)	(0.35)	(0.27)	(0.32)
Rate of Net Interstate Migration	0.084***	0.062**	0.053*	-0.007
	(0.02)	(0.03)	(0.03)	(0.04)
Medical Staff	0.000	0.000	0.001	0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Service / GDP	-0.978***	-0.917***	-1.264***	-0.749***
	(0.26)	(0.28)	(0.30)	(0.25)
Democracy		0.068	-0.928***	-0.612**
		(0.08)	(0.26)	(0.24)
Relative Political Extraction		0.017	-0.008	0.008
		(0.03)	(0.03)	(0.03)
Democracy*RPE			0.996***	
			(0.28)	
Democracy*Poverty				0.019***
				(0.01)
Constant	76.791***	75.961***	77.086***	76.795***
	(0.27)	(0.51)	(0.43)	(0.44)
Time Fixed Effects	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
R-sqr	0.980	0.983	0.985	0.985
N	447	322	322	322
BIC	-311.1	-239.8	-270.5	-260.4

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.010$

influence of these variables on state life expectancy. The interaction term in Model 3 is statistically significant at the 1% error level. The top panel of Figure 3 examines the effect of Relative Political Extraction on life expectancy at various levels of Democracy. As democracy increases, the effect of a one unit increase of Relative Political Extraction strengthens, while in very undemocratic states, political capacity does not seem to have an effect.

We also test whether Democracy moderates the relationship between Poverty and life expectancy. The results for Model 4 indicate that the interaction term between these variables is statistically significant at the 1% error level. Again, to better understand the interactive relationship, the bottom panel of Figure 3 illustrates the effect of Poverty on life expectancy at various levels of Democracy. From the graph we can see that the deleterious impact of economic deprivation seem to only have an effect in states with less procedural democracy.

6 Concluding Remarks

One of the most important contributions of this study to the literature on governance is the influence of variance in institutional quality at the sub-national level on health outcomes. Since 1994, Mexico has been a member of the OECD, and identified as a consolidated democracy at the national level since 1997/1998 by organizations such as Freedom House and the Polity IV project. These as-

sessments belie the reality of accountability and capability at the sub-national level, where only 32% of states have experienced substantial improvement in political accountability (Giraudy 2010) and states widely vary in their capacity.

Our results strongly suggest that state level institutions play an important role in understanding the variance in health outcomes in Mexican states. Consistent with existing and theoretical work on governance, our results support an association between the accountability of leaders, state capacity, and increases in health outcomes in Mexico. Where leaders are held accountable, face political competition, and require broad based support in order to gain and retain office coupled with the *ability* to implement policies, populations experience increases in life expectancy. Poverty, while associated with lower levels of longevity, exerts the most influence on life expectancy in non procedurally democratic states. In sum, in states where resources and benefits can be distributed as private goods and where elites lack accountability, the overall health outcomes of the population are diminished. As accountability increases, so do health outcomes demonstrating that the larger the pool of relevant political actors in a state, the more likely resources and goods are distributed publicly.

The consistently significant and negative association of the service sector with life expectancy may be initially surprising, however, this result is consistent with our public/private goods provision framework. In Mexico, states with service sectors dominance in the economy tend to have economic activity concentrated in tourism, for example Quintana Roo or the Yucatan. Logically, the negative association between the tourist economy and health outcomes makes sense. Reliance on tourism for a substantial amount of revenue and employment in a population often results in the diversion of public services ranging from sanitation to infrastructure improvements in areas where tourists are most impacted. These resources tend to be zero sum, resulting in substantial improvement and reliable access to services in already affluent regions and are directed to support of tourist rather than permanent populations with the consequence that access to basic resources for surrounding populations is negatively impacted (Dahles & Keune 2002; Eugenio, Morales & Scarpa 2004; Harrison 1992). In addition, tourist employment is often seasonal, resulting in lower levels of job security and access to resources for the substantial populations employed to support major resort areas (as resort employees, support, vendors, tour guides, in restaurants, maintenance, etc.) (Dahles & Keune 2002). Employment in the tourist industry is additionally subject to insecurity resulting from cross national economic contraction, trends and fads in travel destinations, and perceptions of political stability. Mexico in particular has suffered a decline in tourism from both the 2007/2008 economic downturn and as a result of increased media attention to drug violence and potential insecurity.

Our examination of the Mexican case suggests that institutional quality should not be considered solely in a cross national context. Instead, particularly in federal societies where institutions are imbued with political authority and policy making authority, consideration of the sub national context is integral in making policy recommendations, evaluating potential pitfalls, and identifying where interventions are likely to succeed or fail.

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8 Appendix

8.1 Relative Political Extraction: Mexico Sub-national Model

$TaxRev_{i,t} = \beta_1 Year_{i,t} + \beta_2 AgriGDP_{i,t} + \beta_3 MiningGDP_{i,t} + \beta_3 ManufGDP_{i,t} + \epsilon$

Where:

- TaxRev = Total revenue non tax revenue in current prices divided by GDP in current prices for state i at time t.
- Year = temporal control
- AgriGDP: value added from agriculture in current prices divided by GDP in current prices for state i at time t.
- MiningGDP: value added from mining in current prices divided by GDP in current prices for state i at time t.
- ManufGDP: value added from manufacturing in current prices divided by GDP in current prices for state i at time t.

RPE = Actual tax revenue / Predicted tax revenue

Sample used to estimate sub-national RPE values: Mexico 1994-2009 31 states and the Federal District. Data were obtained from: INEGI (Instituto Nacional de Estadística y Geografía) (various years), *Finanzas Públicas Estatales y Municipales de México*, [Anexo A], México, DF.

This RPE model was chosen for Mexico given that a number of states are reliant on single sectors of production for the bulk of economic activity.

Table 3: Estimation of Predicted Tax Revenue

Dependent Variable: Tax Revenue (N=512)	
Year	0.003***
	(0.0005)
Ag	0.183**
	(0.067)
Mining	-0.2411***
	(0.0416)
Manuf	-0.3599***
	(0.0402)
Constant	-7.0114***
	(1.0215)
Adjusted R Sq.	0.29

Table 4: Correlation Table

	lifeexp	poverty	transf	service	netmig	medstaff	democ	rpc_use		
lifeexp	1									
poverty	-0.7169	1								
transf_gdp	-0.4933	0.7033	1							
service	0.2079	-0.2574	-0.0645	1						
netmig	0.5195	-0.3383	-0.2537	0.2568	1					
medstaff	0.2161	-0.394	-0.2142	0.1386	0.0461	-0.2243	0.0316	1		
democ	0.1878	-0.0624	-0.0255	0.0812	-0.1407	-0.233	-0.1565	0.1679	1	
rpc_use	-0.329	0.4561	0.4768	-0.0521	-0.0653	0.2131	-0.0915	-0.1927	-0.1069	1

Table 5: Average RPE for 2008-2009

State Name	Abbreviation	2008/2009 Avg RPE	State Name	Abbreviation	2008/2009 Avg RPE
Aguascalientes	Agu	0.85	Morelos	Mor	0.78
Baja California	Baj	0.85	Nayarit	Nay	1.21
Baja California Sur	Baj Sur	0.7	Nuevo Leon	Nue	0.67
Campeche	Cam	0.64	Oaxaca	Oax	1.67
Chiapas	Chi	1.35	Puebla	Pue	1
Chihuahua	Chi	0.74	Queretaro	Que	0.85
Coahuila	Coa	0.76	Quintana Roo	Qui	0.68
Colima	Col	1.03	San Luis Potosi	San	1.11
Distrito Federal	Dis	0.5	Sinaloa	Sin	0.72
Durango	Dur	0.83	Sonora	Son	0.84
Guanajuato	Gua	0.91	Tabasco	Tab	1.36
Guerrero	Gue	1.41	Tamaulipas	Tam	0.76
Hidalgo	Hid	1.86	Tlaxcala	Tla	0.88
Jalisco	Jal	0.73	Veracruz	Ver	0.74
Mexico	Mx	1.51	Yucatan	Yuc	0.83
Michoacan	Mic	0.92	Zacatecas	Zac	1.01
			Average		**0.96**