Party System Nationalization
and the Provision of Public Health Services[1]

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Abstract: In this paper we examine the consequences of party system nationalization. We argue that the degree to which party systems are nationalized or fragmented should affect the provision of public benefits by governments. When political competition at the national level occurs between parties that represent specific sub-national constituencies, then the outcomes of policy debates and conflicts can lead to an oversupply of pork-barrel policies and an undersupply of nationally-focused public services. We test our argument using data on DPT and measles immunization rates for 58 states. We find that party system fragmentation is a barrier to improvements in these health indicators. Specifically, fragmentation hinders states' convergence towards international heath standards.

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1.0 Introduction

In this paper we examine the consequences of the nationalization of party systems. A party system is nationalized when party competition at local and regional levels looks similar to party competition at the national level – that is, when the major political parties at the national level are locally competitive across a country's districts and regions. We propose that the degree to which party systems are nationalized affects the delivery of public services by governments. After offering an argument for why this should be the case, we show evidence that party system nationalization in fact covaries with the delivery of health benefits after controlling for other commonly studied factors.

Our research builds on an extensive literature on the *causes* of party system nationalization. An earlier generation of research focused attention on electoral system characteristics as the main drivers of the number of political parties (Duverger 1954, Rae 1967, Lijphart 1994, Taagepera and Shugart 1989, Cox 1997; see Morelli 2004 for a contemporary version).[5] More recent empirical work has exposed the interaction of other factors with electoral institutions that ought to be taken into account. Specifically for this paper, a good portion of contemporary research has devoted attention to relationships between local factors and national factors that influence national party systems. Using various kinds of data, scholars have discovered that societal cleavages (e.g. ethnicity, religion, class) hinder nationalization, especially when cleavage groups are geographically concentrated (Lipset and Rokkan 1967; Kim and Onh, 1992; Ordeshook and Shvetsova 1994; Amorim-Neto and Cox 1997; Cox 1999, Brancati 2003). Chhibber and Kollman argue that political and economic centralization cause party system nationalization (1998, 2004). Similarly, Brancati argues that political decentralization increases the strength of regional parties within the national

[5] As an example of theoretical development relevant to this paper, Morelli (2004) models a situation where politicians decide whether to become candidates, candidates decide whether to link across districts under a common party label, and winning candidates commit to vote with party comrades in the legislature to pass policies. Voters are then offered a menu of parties within their districts. What is relevant for this paper is the fact that Morelli's model explicitly studies the incentives of both voters and candidates to coordinate on party labels within districts and across districts. Morelli's model is specific to single member, plurality systems, but nevertheless offers a valuable theoretical approach for others to follow.

legislature (2008). Caramani (2004) shows evidence that cross-regional sectoral and religious similarities actually promote party system nationalization, while Meguid demonstrates that mainstream party strategies affect the fortunes of minor/niche parties (2008). And Hicken (2009) expands the study of party system nationalization by focusing on factors that affect the distribution power *within* the national government.

Here, we turn the dependent variable in these previous research programs, the degree of party system nationalization in a country, into the main independent variable. Put simply, we want to know whether the degree of party system nationalization actually matters for outcomes we may care about. Does a nationalized party system have distributive and redistributive consequences? Is it good or bad for the delivery of public benefits and services to the population? To us, answering these questions is a crucial next step in the literature on party system nationalization. Given that we know quite a bit now about the causes of party system nationalization from previous work, if we learn that more or less party system nationalization has serious consequences for citizens' well-being, then we can begin to make normative arguments about the kinds of institutions that are likely to promote (or discourage) nationalization, and hence promote or discourage the provision of certain kinds of policies.

Our work is firmly embedded in a larger literature that links institutional variation to public goods outcomes. Existing work has focused on the role of regime type (Lake and Baum 2001) and, among democracies, the number of actors or veto players in the policy process (e.g. Tsebelis 2002; Cox and McCubbins 2001; Hallerberg 2002; Keefer and Stasavage 2003; MacIntyre 2002), features of the electoral system (e.g. Persson and Tabellini 2003; Milesi-Fereti et. al. 2002; Chang and Golden 2007; Hicken and Simmons 2008); and the nature of the relationship between the national and subnational governments (Samuels 2003; Burki, et. al. 1999; Khaleghian 2004; Robalino et. al. 2001; Enikolopov and Zhuravskaya 2003; Triesman 2002), among other institutional differences. Perhaps closest to the logic of our argument is the growing literature on how the nature of politicians' constituencies shapes their incentives to provide broad public goods. Specifically, this line of work demonstrates the intuitive result that the broader the constituency to which decision makers are accountable, the stronger the incentives to provide services to a

large, national population. Alternatively, where decision makers have very narrow constituencies, they prefer goods and services that can be targeted to smaller groups (e.g. Bueno de Mesquita et. al. 2004; Cox and McCubbins 2001; Franzese, Long-Jusko, and Nooruddin 2004; Lake and Baum 2001; Olson 2000; Stasavage 2005; Hicken and Simmons 2008). Our argument is, in part, that the degree of party system nationalization is one key determinant to the breadth of politician's constituency.

To summarize our argument, we contend that when party systems are nationalized, political cleavages are more likely to fall along functional, ideological, or class lines, rather than along lines that correlate with geography, which in many countries means along tribal, ethnic, religious, or linguistic lines. Thus, political conflict in nationalized systems can occur over issues that unite interests across geographic boundaries. This kind of political conflict has a better chance of leading to nationalized, comprehensive policy programs. In contrast, regionalized/sub-national party systems will tend to lead to more particularistic policy programs that result from cross-geographic log-rolls or policies that distribute benefits unevenly across geographic areas. When political competition at the national level occurs between parties that represent specific sub-national constituencies, then the outcomes of policy debates and conflicts should lead to two potentially damaging kinds of public policy outcomes: a) an oversupply of pork-barrel policies resulting from log-rolls across sub-national units that do not benefit the broader population but end up benefiting local political and economic elites, and/or b) an undersupply of nationally-focused public policies. Depending on the country, these latter, geographically targeted policies will benefit specific ethnic, religious, industrial, linguistic groups, but they will be less comprehensive and all-encompassing, and thus less effective and efficient, than if the parties were nationalized.

Our theoretical argument is intuitive, though to our knowledge it has not been made and tested before with cross-national data across many regions.[6] Our findings are consistent with the argument that party system nationalization facilitates the distribution of public services to broader constituencies. Controlling

[6] Lago-Pena and Lago-Pena (2009) examine the effect of nationalization on spending, but do not consider the effects of nationalization on the provision of public services. They test their argument using data from 18 Western European democracies.

for country-specific assets and constitutional features, the governments of countries with nationalized party systems are more likely to distribute public resources to improve public health across their entire populations. (Below we justify our use of immunizations as a good test case for public goods and services.) The data show that a) governments resulting from nationalized party systems deliver broader public services to their people, and b) produce better health outcomes. Put simply, public health improvements are more pronounced in those countries with more party system nationalization. Our interpretation of these results is that party systems that are fragmented geographically (regionalized) can be barriers to the types of public goods production that benefits the entire population.

2.0 The Concept and Measurement of Party System Nationalization

Our independent variable of interest is party system nationalization. Recall our earlier definition: a party system is nationalized when party competition at local and regional levels looks similar to party competition at the national level. By "similar" we mean the same political parties compete and their shares of the vote are approximately the same in most localities nationwide. Given this conceptualization, two comments are in order. First, similarity can be a matter of degree, and our measurement reflects this. Second, the level of vote aggregation used to compare the local to the national level can affect the degree of similarity according to our measure. For instance, if we were measuring the degree of nationalization of the U.S. party system, and we compared precincts to the national level, this would give us a different measure than if we compared states to the national level. States, because they are larger units of aggregation, would tend to look more similar to national-level electoral data.

We have chosen to use electoral constituencies---the smallest unit for which there is representation to the national parliament---as our units of comparison to the national level. This offers a relatively straightforward way to compare across countries, and has the advantage of being consistent with much previous work in this area (see Caramani 2004, Cox 1997; Chhibber and Kollman 2004). (For other ways to measure nationalization---measures which typically are highly correlated with our measure---see Jones and Mainwaring 2003, Morgenstern and Pothoff 2004; Morgenstern and Swindle 2005).

We compare the effective number of parties in the national party system to that in the local party system. The difference between the effective number of parties nationally (ENPnat) and the average effective number of parties in the district (ENPavg) is a measure of the extent of party system nationalization (D=ENPnat-ENPavg). The higher this difference, the worse the nationalization. For the purposes of this we paper we convert this difference into a measure of how much larger the national party system is than the average district-level party system. This party system fragmentation measure (*F)* is computed by dividing the difference between ENPnat and ENPavg (D) by ENPnat (Cox 1999, 17).[7] *F* = (ENPnat - ENPavg)/ ENPnat. The resulting fragmentation score tells us what portion of the size of the national party system is due to poor nationalization, and what percentage reflects the extent of coordination within districts. If *F* is .10 this suggests that 10% of the size of the national party system can be attributed to different parties garnering votes in different parts of the country (poor nationalization), with the other 90% ascribable to the average number of parties at the district level. *The larger the fragmentation score, the lower the level of nationalization.*

3.0 Effects of Party System Nationalization

The patterns of party politics in geographic space should have predictable consequences for policymaking processes and outcomes. More specifically, the degree of party system nationalization should shape the incentives of policymakers.[8] How? Let us take a simple example.

Imagine two countries—1 and 2 (see Figure 1). In each country there are two regions (X and Y), each of which is also an electoral district for the purposes of electing the national legislature. In each country there are four parties that compete in national elections, A, B, C, and D. Let the distribution of those parties

[7] Note, this is equivalent to Cox's Inflation score (I) (1997). See also Moenius and Kasuyo, 2004). Because the word *inflation* can be confusing due to the its use as an economic term, we use the term "fragmentation".
[8] It should also affect their capabilities. We know that less nationalized party systems will have more political parties, ceteris paribus. The more parties there are in a given party system, the more actors there are likely to be in the policymaking process. The more actors are involved in the policy process the more difficult it is for any single actor to change the status quo unilaterally. Where there are multiple actors (veto players) one actor's attempts to change the status quo can be blocked by other actors with different interests (Tsebelis 2002).

across districts vary between Country 1 and 2. In Country 1 parties A and B compete for votes nationally—campaigning and winning votes in both region X and Y. C and D by contrast compete only in one region, C in X and D in Y. In Country 2 none of the parties are national parties—each competes in only a single region. Assuming the parties in each region split the votes evenly the fragmentation score for Country 1 is .17 and .5 for Country 2—reflecting the fact the Country 1 has a more nationalized/less fragmented party system than Country 2.

[INSERT FIGURE 1 HERE]

Given these scores we would expect Country 1 to supply public services to larger swath of population than Country 2. Why would this be the case? To answer this, we focus first on voters, and then on the government formed following the vote.

Voters who support Party A or B in Country 1 are casting votes for a party that has a national constituency. The voters, presumably, know the party has a national constituency. Bargains between supporters across the two regions are embedded within each party and in the decisions by voters to support the party. In effect, voters know they are delegating negotiating rights to a *party* representative—*geographic* representation is subsumed within and secondary to party representation. For supporters of the regional parties (C and D in Country 1, and all of the parties in Country 2), however, geographic and partisan representatives are one in the same. They are sending a representative for whom a major task will be to represent a particular geographic region.

Consider then a situation where the government only includes parties from the same region (e.g. A and C in Country 2). We would expect government goods and services to flow disproportionately to the supporters in that region, since the incumbents derive no electoral benefit from providing support to voters in the other region. Such targeted policy provision obviously leaves certain segments of the population under-served. In addition, because policy that is directed to a narrow constituency is particularly vulnerable to reversals (Ahuja 2008), if a government of AC is replaced by BD in Country 2, we might expect BD to scrap many of the X region-centric policies adopted by the previous government and pursue instead a pro-Y

region agenda, at some cost to efficiency and effectiveness.

Where the government includes parties from different regions (e.g. A and B in Country 2), geographic log-rolls become possible. Under this scenario each region gets some share of national resources, but this could come in one of two forms. First, the government could provide nationally-targeted policies that benefit voters in each region. However, given that such policies, by definition, are not targetable, it is difficult for A or B credibly to claim primary credit for providing such policies to voters in their region, leaving them more vulnerable to a challenge from other regional competitors. A less risky strategy is to provide resources to their supporters in the form of regional particularism that can be directly credited to the party. Where this is the case broader public services are undersupplied and the government loses any economies of scale that might arise when goods or services are provided through nationally-planned and nationally-implemented policies.

By contrast, if the government is composed of parties with national constituencies, then supporters of those parties will expect those parties to focus on national-level policies, and the representatives within those national parties will have incentives to respond to those expectations. The key here is the breadth of the constituency to which politicians respond (and the constituency to which voters believe politicians *should* be responding). Our central argument, then, is that the degree of party system nationalization ought to affect the breadth and nature of the constituency to which political parties respond. Nationalized parties should have broader constituencies, ceteris paribus, because those parties have already managed to accommodate regional demands into the process of forming the party, running candidates, and developing a list of policy programs. Parties have already internalized the geographic bargaining and so have incentives to go into the national government with proposals for broad public benefits that cut across geographic lines.[9]

We acknowledge that institutional factors besides nationalization might matter in determining public

[9] The link between the breadth of an actor's constituency and that actor's incentives to press for broad national policies has been explored elsewhere, though not through the lens of party system nationalization (e.g. Cox, 1987; Bueno de Mesquita et. al. 2004; Hicken, Satyanath, and Sergenti 2005; Hicken and Simmons 2008).

services provision. Some scholars, for example, have compared the provision of public goods in proportional representation systems versus plurality systems, and argue that the former provide more (e.g. Persico and Lizzeri 2001).[10] Others have drawn a link between fiscal federalism---the degree of autonomy given to subnational governments to tax and spend---and overall public goods production by the national government, arguing that fiscal decentralization induces more overall government spending on education and health (but not necessarily at the national level). (Arze et al, 2005). And some have focused on the same independent variable we have, arguing, for example, that party nationalization affects the structure of spending in countries (Lago-Pena and Lago-Pena, 2009). We control for these factors in our analysis (described below) and show that even when doing so party system nationalization remains a key factor explaining variance in public services provision.

Note that we do not argue here that nationalized party systems will lead to centralized political and economic systems, and that regionalized party systems will lead to decentralized or devolved political and economic systems. This is an interesting proposition and is essentially the reverse of the Chhibber and Kollman (2004) thesis (see also Filippov, Ordeshook, and Shvetsova 2004). However, centralization and decentralization is about authority across levels of governments, whereas our interest here is in the mix of national policies versus subnational pork/logrolls, holding fixed the level of (de)centralization. Regardless of the level of national government spending relative to sub-national units, the distribution of that spending should vary across countries according to their level of nationalization.

To summarize, we hypothesize that party system nationalization (fragmentation) should be positively (negatively) associated with public services provision. Before turning to how we go about evaluating this hypothesis, consider a short illustrative example of how the logic of our argument could play out in a give country.

4.0 An Illustrative Example

If our argument is correct, we should observe that decreasing levels of nationalization/increasing

[10] See also Milesi-Ferreti, et al, 2002 and and Persson and Tabellini 2003.

levels of regionalism in the party system corresponds with an under-provision of public services like health care. Anecdotal evidence supports this claim and the case of India is particularly instructive. As Chhibber and Kollman, (1998) have shown, the Indian party system exhibited a sharp increase in the level of nationalization for a temporary period. At elections in 1971 and 1977, for example, the difference between the effective number of parties at the national and district levels was 2.15 and 1.33 respectively, suggesting a high level of nationalization. Between 1977 and 2000 however, the degree of nationalization eroded– evidence of increasingly poor cross-district coordination among politicians and greater regionalism in the party system. The average difference between the effective number of parties locally versus nationally after 1977 was 3.06 with a minimum value of 1.49 in 1984 and maximum value of 4.20 in 1998.

Given our claims here, this trend of increasing regionalism in India should coincide with a couple of observations. First, the subnational disparity in public health spending should widen as increasing regionalism in the party system leads to a less-nationalized health program and to increasing geographic particularism in the provision of public services. That is, given that spending is subject to reversal, increasing regionalism should lead to starker differences in health spending between India states. Second, because of the decline in nationally-oriented health policy and the corresponding spending inequality, national-level statistics should reveal that, public service provision in health worsens as regionalism in India increased. Figures 2-4 depict these trends. Figure 2 tracks the standard deviation of public health expenditures across the Indian states over time.[11] The results are clear: over time, as India has become more regionalized, the distribution of spending across the Indian states has become increasingly unequal. This is consistent with our claim that increasing regionalism leads to increasing geographic particularism.

[INSERT FIGURE 2 HERE]

Moreover, the greater inequality in spending has led to slower improvements in health in India. The solid lines in both graphs of Figure 3 show non-immunization trends – for measles and DPT respectively – over time for India. The dashed line is the average immunization trend among developing countries, shown

[11] Data from Chhibber and Nooruddin (2004)

for comparison. Clearly, the trend is one of decreasing numbers of unimmunized in India. This is certainly a positive sign, but notice however, that the pace of improvement varies quite a bit from year to year. At some points, there are sharp decreases but as the period continues, the improvements begin to slow and sometimes we observe increases in the percent unimmunized. One might argue that the pace of improvement slows due to the fact that there is less room to improve given the substantial advances made earlier in the period. There is certainly something to this argument and we address it more systematically below, but the fact that India always has significantly higher rates of unimmunized than other less developed countries leads us to suspect that something else is going on as well that affects the pace of improvements.

[INSERT FIGURE 3 HERE]

Figure 4 tells the rest of the story. It tracks the change of party nationalization/fragmentation along side changes in the percent of population not immunized. The black line in this graph shows *the change in unimmunized* from one year to the next. Here, smaller values represent greater improvements in immunization statistics. We smooth the trend using lowess and this line is to be evaluated according to the left Y-axis. The dashed line represents the level of nationalization/regionalism over the same time, with higher fragmentation scores corresponding with greater regionalization. This line is to be evaluated by the right Y-axis. This graph shows clearly that the increasing regionalism in India is associated with smaller reductions in the percent unimmunized over time and for much of the period there is an *increase* in the percent of the target population unimmunized. This is precisely what our theoretical claims would lead us to expect.

[INSERT FIGURE 4 HERE]

This illustration reveals a couple of important findings:

1: Increasing regionalism over time appears strongly correlated with increasing inequality of public health spending across the India states.

2: Consequently, increasing regionalism in India has corresponded to poorer performance on public health statistics that are indicative of spending on public health services.

These data are for a single case and we cannot demonstrate conclusively a causal relationship, but it appears that increases in fragmentation from one election to the next are followed by poorer health service provision in subsequent years. We offer this as suggestive evidence. We now provide a more rigorous analysis of data from many countries.

5.0 Research Design

Our population of interest is the set of countries with democratic elections. We have collected the data necessary to calculate the party system fragmentation, using the fragmentation score (F) discussed earlier, for more than 1600 elections in over 120 countries. Not all of the countries that held elections can be considered suitably democratic however. We include in our estimation sample only countries with a score greater than 0 on a scale of -10 to 10 in the Polity database. This choice reduces our usable sample. So too does the fact that the temporal coverage of our control variables is typically much shorter than what we have for our nationalization measure, (which we have back to the 1800s for some countries). Undoubtedly, countries left out of the analysis for lack of data are systematically different than those included in the sample. They will be poorer, less stable politically, and probably rank near the bottom in terms of ability to deliver public services. Nevertheless, our sample contains a wide swath of the world's democracies for all ranges of wealth and state strength and our sample incorporates a considerably wider array of cases than existing studies of the effects of nationalization on public spending.[12] We believe that our sample contains enough countries from across the various regions of the world to provide valuable tests of our hypotheses.

5.1 Independent Variable

We operationalize the extent of party system nationalization using the fragmentation score (*F*) discussed earlier. Recall that *F* ranges from 0 to 1 with higher scores indicative of a less nationalized/more fragmented party system. The primary source for the election data we use to calculate the fragmentation scores is the

[12] Lagos-Pena and Pena (2009) for example have nationalization data for 18 Western European democracies between the years 1970 and 1998.

Constituency Level Electoral Archive (CLEA).[13] CLEA is a multi-institutional effort housed at the University of Michigan, Ann Arbor with the goal of collecting, archiving and making public all available constituency-level electoral results. We also supplemented our dataset with fragmentation data calculated from the election returns collected in Dawn Brancati's Constituency-Level Elections dataset.[14]

5.2 Dependent Variables

We use three dependent variables to assess the link between party system nationalization and national public service provision, each of which is related to the provision of public health services and benefits. The three dependent variables are the percentage of the target population receiving the measles immunization vaccine, and percentage of the target population receiving the DPT immunization vaccine, and infant mortality rates.[15] These data come from the World Bank's World Development Indicators database. The two immunization variables measure the percent of children under the age of 12 months that have been immunized for measles and diphtheria respectively. Infant mortality records the number of deaths per 1,000 live births. In order to ease the interpretation of our results we convert the two immunization variables into the percentage of the under 12 month population that is *not* immunized. Thus for all three variables higher values correspond with poorer outcomes. We use all three indicators of public health to indicate the robustness of our results.

These public health measures are useful for testing our argument for several reasons. They are measures of outcomes, but these outcomes reflect a commitment by the government, usually in the form of public health spending. Public health spending, if done right, can lead to services for which there is much demand in virtually every country. These are also services that have positive externalities (economic growth, for one example--Barro 1997; Bloom, Canning and Sevilla 2004; Baum and Lake 2003) which place them squarely within the government's comparative advantage.[16] Also, public health spending can be targeted

[13] Available from http://electiondataarchive.org/ .
[14] Available from http://www.people.fas.harvard.edu/~brancati/CLE.htm.
[15] The DPT immunization includes immunizations for diphtheria, pertussis and tetanus.
[16] For a similar argument, see Lake and Baum (2001).

rather easily to particular geographic areas or distributed across geographic regions depending on the prevailing political incentives. Note however that our health data are measured at the national level. While sub-national data would be ideal to test our hypotheses, we do not have such data, save for only a handful of countries, and for these countries, the data are not comparable cross-nationally. Given the national-level data on public health that are available, our approach is the best we can do and takes us some way toward answering our questions about the relationship we hypothesize. Additionally, we are comfortable with the assumption that our national-level data reflect decisions politicians make regarding the geographic distribution of public service spending. We suggest that where parties are fragmented, citizens in particular regions may show improvement in health outcomes, but the starkly unequal distribution of public services and decreases in efficiency will be revealed in the form of poorer statistics at the *national* level. When spending is done unevenly across regions, it will be reflected in lower national numbers in our measures. When spending is done comprehensively across the entire country, it will be reflected in higher numbers in our measures. The India example above bears out this expectation.

Finally, note also that the three variables represent slightly different parts of the public services puzzle. Immunization measures the direct provision of public services while infant mortality measures the outcome of a host of public spending programs, including improvements in the quality of drinking water, sewage, epidemic control, and the delivery of antibiotics and basic health. Where such public services are provided we should see major health improvements, such as the decline in infant mortality. There are certainly other possible health measures we could use apart from immunization rates and infant mortality but data for the variables we use have the advantage of being reasonably complete for a large sample of countries.

That said, health outcomes have some peculiarities that warrant discussion as they affect the specification of our empirical model. The first is the trend of global improvement in health outcomes. The three graphs in Figure 5 show the global mean and standard deviation in the percent of the under 12-month population not immunized for measles and diphtheria and in infant mortality. The downward trends are clear and occur in virtually every country for which we have data. Figure 6 showed immunization statistics

over time for countries in sub-Sahara Africa and industrialized democracies respectively.[17] Virtually all countries exhibit a decline in infant mortality since the start of the data series.

[INSERT FIGURES 5 & 6 HERE]

In addition, public health outcomes exhibit a process of convergence wherein the best-performing countries typically experience only minimal improvements in those areas in future periods, while the worst performing countries exhibit much more marked improvement. It is not surprising that countries that have high immunization (low non-immunization) rates will experience comparatively small improvement in that statistic over time. These countries simply have less room to improve. In addition, greater improvements in the worst performing countries may reflect the fact that they are frequently targets of foreign aid agencies or the fact that existing health technologies that spillover from industrialized economies into developing countries may have a larger marginal effect on public health outcomes in developing contexts due to the overwhelming need (Papageorgiou, Savvides, and Zachariadis 2007; Owen and Wu 2007).

At issue then is how we can test our argument in light of these trends. Ross (2000) warns that failing to account for these global health trends can lead to erroneous conclusions. Creating cross-section averages for all our dependent and independent variables over some period of time would appear to conceal more than it reveals as it would fail to pick up the convergence process clearly evident in the data. A time-series cross-section (TSCS) database that regresses the change in a given health statistic from one period to the next on the initial value of that health statistic along with other independent variables of interest would be an improvement, however the nature of our data is not conducive to such an analysis.[18] At issue is the fact that we collect data on party system fragmentation only for election years. This is problematic because the number of years between elections differs by country. A TSCS approach would almost certainly require us

[17] We do not show the trends for the other regions of the world, or for the other dependent variables to preserve space. The trends for those data are similar to those presented here and are available from the authors upon request.

[18] In this specification, the lagged level of the health indicator would model the convergence process. See for example the empirical literature on economic growth (Barro 1997), which often argues of convergence in growth rates.

to include lagged values of our independent variables, as contemporaneous effects are unlikely to exist. However, the varying number of years between elections means that lagged values of the party system fragmentation variable would not have a consistent meaning across countries.

The specification we choose allows us to model both the convergence process and our nationalization/fragmentation distinction. Specifically, we estimate the following equation.

[Eq. 1] $\Delta Health_{(t2-t1)} = \alpha + \beta_1 Health_{t1} + \beta_2 Frag + \beta_3 Health_{t1} * Frag + \beta X + \varepsilon.$

Health refers to whichever of the three dependent variables we include in the analysis. We capture the general improvement in health outcomes over time by using the change in the health outcome between two points in time. Time t_1 is the first year in the time period 1990-2000 that a given country has a Polity score greater than zero (on a scale of -10 – 10), making it at least marginally democratic and for which the health data exist.[19] We also require the country to be at least one year removed from a transition from autocracy to democracy. The second period (t_2) is the last observation for time period covered that fulfills the same requirements.[20] Notice that $\Delta Health(t_2 - t_1)$ is the absolute change in the health statistic. Using the absolute change more accurately models the convergence process than using the percent change would. (We also analyzed the model using percentage change and the results are consistent with those presented here.) Also, since we take t_2's value minus t_1's, smaller numbers indicate greater reductions in the percent of the population not immunized for disease and greater reductions in infant mortality.[21]

Turning to the right-hand side of the model, *Frag* is the measure of party system fragmentation, which is measured as the average fragmentation score between t_1 and t_2 for the country in question. We also include the starting level of a country's health outcome as a way to model the convergence process.[22]

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[19] We restrict our model to the period 1990-2000 because this period offers the largest cross-section of at least marginally democratic countries. If we extend the data back to, say, 1980 we lose about twenty countries whose average polity score fall below 0. We do extend the time period covered in robustness assessments discussed below.

[20] Typically, this is the year 2000.

[21] For example, if in year t_1 a country's infant mortality rate was 20 the $\Delta Health$ variable would be -5 if the infant mortality rate was 15 in year t_2 and -10 if the infant mortality rate in year t_2 was 10.

[22] We recognize that countries performing well at the beginning of the period will not see much of an

The key test of our claims is the interaction term between *Health* and *Frag*. We expect that the kinds of public policies governments put in place will affect the *pace* at which countries converge. That is, we suggest that the pace of convergence is not entirely exogenous from the party system. Holding all else constant, a nationalized party system should lead to more nationally comprehensive public health investments, which will lead to a faster improvement in national-level health indicators. Additionally, by including the interaction term we are assuming that even when aid donors are involved in public health projects, or when health technologies and knowledge spillover from industrialized economies, the structure of the party system affects the magnitude of their effects. Where the party system is fragmented, funds given to national governments by aid agencies will have a smaller impact on immunization rates, as governments will fail to allocate those resources in a nationally comprehensive way. Similarly, insofar as governments are asked to cost-share with aid donors, fragmented systems may do so in a way such that politically important geographic constituencies receive a disproportionate share of government spending. For the same reasons, the knowledge and technologies spillover from industrialized economies will have smaller effects on health outcomes when put to use through the policies of a fragmented party system. Fragmented systems may also experience improvements, of course, but the fact that governments are less effective at providing public goods means that, at the level of the country as a whole, improvements will be less pronounced.

Given this model specification, the relationship between β_1 and β_3 informs us about the accuracy of the argument. If our argument is right, β_1 should have a negative coefficient. This would tell us that when the party system is nationalized (i.e., when *Frag* = 0), countries experience faster convergence, consistent with our claim that under such conditions, politicians allocate healthcare spending in a more nationally comprehensive way. β_3 however should be positive. As nationalization decreases and fragmentation increases, politicians provide fewer national public services and focus their attention on specific geographic

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improvement and that some countries—specifically the industrialized democracies may have so little room for further improvement that it will be difficult to assess the impact of nationalization. To rule out this possibility and show that the effects we present below are, in fact, due to nationalization, we also include robustness checks where we estimate the equation using the extended time periods of 1980-2000, 1970-2000 and 1960-2000.

constituencies, with the consequence being slower health improvements in the population as a whole.

Finally, *X* in equation 1 represents the set of control variables, each of which is measured as the average for the country in question for the years that country observation is included in the sample. We include controls for the level of democracy to account for differences that may exist between marginally democratic countries and those that have the highest values of the Polity scale.[23] We also control for the extent to which the democratic regime is institutionalized by including the age of the democratic regime as of the first year the country in question enters our sample. We control for the effective number of parties in government to ensure that our nationalization measure captures accurately the argument that we offer instead of the effects that multiple parties in the national government might have on policymaking (for example, Tsebelis' (2002) veto players argument). Finally, we include a full set of regional controls (with the industrialized democracy "region" being the excluded category) to account for regional trends in the data.[24]

We estimate our model using Huber/White "robust" standard errors. Table 1 provides summary statistics for all variables that we include in the model.[25] The countries in the estimation sample are listed in Appendix A along with their average level of party system nationalization between 1990-2000.

[INSERT TABLE 1 HERE]

6.0 Results

Models 1-3 in Table 2 estimate Equation 1, each using a different version of the dependent variable. Starting with Models 1 and 2, the models of measles and DPT immunization respectively, we observe that

[23] We have replicated our analysis using Przeworksi, Alvarez, Cheibub, and Limongi's (2000) dichotomous democracy measure and we obtained the same substantive results that we report here.

[24] In the robustness assessments we perform below, we also include controls for per capita GDP, district magnitude, parliamentary government, plurality electoral rules, rural population, total population, and federalism, and ethnic diversity. The inclusion of these variables does not change the substantive results. We discuss these variables and the related results in more detail below.

[25] While we will only report the results from separately-estimated equations based on Equation 1, we also estimated our models using the seemingly unrelated regression (SUR) approach, jointly estimating a system of three equations, one for each of the health indicators. This strategy allows for more efficient estimation by allowing cross-equation correlation in the residuals. The SUR approach will be effective in this case since at least one regressor (the initial health value and its interaction with *Frag*) differs in each equation. The SUR results appear more efficient than those we report here, but the substance of the results does not change.

the coefficients on the initial value of the immunization rate and its interaction with party fragmentation have the expected signs. The coefficient on the initial value indicates that when the party system is nationalized countries with worse initial health values converge towards international health standards at a faster rate, experiencing steeper declines in percentage unimmunized over the decade. The coefficient on the interaction term, however, is positive indicating that increasing fragmentation slows that convergence process, consistent with our claim that national public services are undersupplied in fragmented systems. We obtain substantively similar results with respect to our key independent variable in Model 3, which replaces the two immunization variables with infant mortality.

[INSERT TABLE 2 HERE]

While the signs of the coefficients are in the predicted direction, we need to do more to assess whether these results support the argument. We recognize, for example, that the coefficient on the interaction term in Model 3 is not significant at typical levels. However, we know from the works of Kam and Franzese (2007) and Brambor, Clark, and Golder (2006) that it is difficult to assess the significance of the quantity of interest (i.e., the convergence rate at varying levels of fragmentation) with these estimates alone. Accordingly, we show two kinds of graphs. First, we graph the marginal effect of the initial value of the health outcome over the range of party fragmentation.[26] Second, we graph the marginal effect of party fragmentation over the range of the initial values of the health outcomes. Figure 7 shows three graphs for the first of these, corresponding to the coefficients in Models 1-3. In each figure, the solid line represents the marginal effect of the initial point of the health outcome on the change in that health statistic. It indicates the convergence rate over the range of party system fragmentation. Smaller values indicate stronger convergence. The dashed lines represent 95% confidence intervals around the marginal effect.[27] The underlying histogram in each figure shows the distribution of the party fragmentation modifying

[26] That is, we graph the equation (using the notation in Equation 1): $\delta(\Delta Health)_{(t2-t1)}/\delta Health_{t1} = \beta_1 + \beta_3 * Frag$.

[27] We use the code provided by Brambor, Clark, and Golder to make these graphs. Their STATA code is available at http://homepages.nyu.edu/~mrg217/interaction.html.

variable and is useful in assessing whether the marginal effect has the expected direction and is statistically significant for a sizeable set of cases in the sample. The histogram is to be evaluated according to the right side Y-axis.

Looking at the three marginal effects graphs in Figure 8, a couple of patterns are immediately evident. First, in each graph, the marginal effect line is negative for virtually the entire range of the modifying variable. Additionally the marginal effect of the initial health value is statistically significant for virtually the full range of fragmentation, evidenced by the fact that the error bands do not include zero. This lends credence to our claim of a general convergence process in health outcomes. Of particular importance however is the fact that, in each graph, as party system fragmentation increases, the marginal effect line rises toward the zero horizontal line. This positive slope is exactly what our argument predicts and it is consistent with our claim that fragmented party systems do a poorer job providing public services, either because the distribution of those goods is geographically uneven, or because parties in fragmented systems fail to prioritize those goods in the first place. Increasing fragmentation slows the pace of convergence in health outcomes. The effect of fragmentation is especially evident in the fact that at the very highest levels of fragmentation, convergence virtually stops--at high levels of fragmentation the marginal effect of the initial value of health outcomes is insignificant (at 95% confidence). So far so good.

[INSERT FIGURES 7 and 8 HERE]

The second set of graphs, in Figure 8, shows similar information from these regression coefficients, but this time we plot the marginal effect of party fragmentation over the range of initial values for the health indicators. We do so to assess whether increasing party system fragmentation has deleterious effects regardless of a county's initial health indicators. These graphs strongly support the conclusions for the immunization. On immunization, the marginal effect of party fragmentation should be positive---increases in fragmentation lead to worse public service provision. The graphs show that indeed this is the case. This provides strong confirming evidence in favor of our story. The only exceptions to the trend are those countries that had little room for further improvement at the beginning of the period. For the rest of the

sample however, increasing fragmentation resulted in lower immunization rates. On infant mortality, these graphs are inconclusive. These weaken our results for infant mortality; we cannot reject that null hypothesis that party fragmentation has no effect on improvements in infant mortality over the range of initial health indicator values.

5.1 Robustness and Sensitivity

The results on immunizations strongly support our arguments, and we have limited support from the data on infant mortality. How robust are the immunization results? We assess robustness in a variety of ways. To start, in Table 3 we include a set of potentially confounding variables into our baseline model to assess the stability of the estimates. In each model in the table, the measles immunization is the dependent variable.[28] Model 4 controls for the number of years between a country's first and last observation of infant mortality. This accounts for the fact that countries enter and exit the sample at different times and so the number of years over which convergence can occur varies. Model 5 controls for district magnitude, Model 6 for whether a country is parliamentary, assembly-elected presidential, or directly-elected presidential. Model 7 includes a dummy variable for plurality systems. Model 8 includes GDP per capita and Model 9 includes total population. Model 10 includes a control for ethnic diversity, which might be correlated with both party system nationalization and the provision of public services.[29]

Finally, Model 11 includes a dummy variable for whether a country is federal. A number of economists and political scientists have investigated the link between decentralization and public goods outcomes, with a particular focus on heath care. (e.g. Treisman 2007; Burki et. al. 1999; Khaleghian 2004; Enikolopov and

[28] The results for the other dependent variables are also robust to this set of tests. These results are available in the appendix.

[29] The district magnitude variable comes from Golder (2005). Replacing average magnitude with the median district magnitude does not alter our main results. The parliamentary/presidential and plurality/proportional representation variables come from the World Bank's *Database of Political Institutions* (Beck et. al., 2001). Substituting a presidential/parliamentary variable from Golder for the World Bank's measure does not change the substantive results of our main variables. GDP and total population come from the World Bank's *World Development Indicators* (2004). Ethnic diversity comes from Fearon (2003).

Zhuravskaya 2003).[30] The results of these studies are decidedly mixed, depending very much on the nature of the sample used, (developing versus developed, democracies versus all countries, etc.) and more importantly on the way in which decentralization in operationalized. Even so, we find it plausible to expect an effect of decentralization on spending. In addition, decentralization is hypothesized to affect nationalization (Chhibber and Kollman 1998, 2004) and so the exclusion of it from the model may expose the results to omitted variable bias. There is no consensus on an appropriate measure of decentralization however; not surprising given that decentralization is a multifaceted phenomenon that encompasses such diverse things as local fiscal autonomy, representation for subnational units in a separate legislative tier, and local elections. The attribute of decentralization most likely to confound our empirical specification is the share of total spending for which sub-national units account. Unfortunately, we have reliable data for this variable for only a handful of countries and including this variable reduces substantially the size of our already small sample. As an alternative, we include the federalism indicator from Henisz (2000), in which an observation is coded as "1" if sub-national entities possess constraints on national fiscal policy.[31]

The results of the models with respect with measles immunization are presented in Table 3. To preserve space, we do not show the marginal effect graphs, but the direction, magnitude, and pattern of significance for the coefficients of interest in these models when compared to Model 1 in Table 2 indicate that our baseline model is robust and is not due simply to the set of control variables in that particular specification. The results of our baseline models do not seem to suffer from omitted variable bias with respect to political institutions or socio-economic factors. In fact, in many instances, the interaction of the initial health value and fragmentation increases in size with the addition of the extra control variables, which would indicate that the results of our baseline specification might be a bit conservative.

[INSERT TABLE 3 HERE]

[30] See Treisman 2007 for a thorough review of this literature.

[31] In other sensitivity checks, we have estimated the model controlling for the percent of the population living in rural areas and also the total number of electoral districts. These are not included in Table 3 to preserve space, but they are available from the authors upon request. The inclusion of these variables did not change the substantive results. These results are available from the authors upon request.

A second test of robustness is to expand the time period covered in our models. One could argue that our results are specific to the time period examined--1990 to 2000--or that this period is not long enough to accurately observe the kind of effects about which we hypothesize. This is certainly plausible given that a few countries enter the sample toward the end of the period or exist in the sample for only a couple of years. One might also question whether significant improvement was possible for industrialized countries between 1990 and 2000, irrespective of whether the party system was nationalized. This second critique is the more serious of the two as it implies that a lack of improvement in health outcomes may be over determined in this sample. To explore these possibilities we extended the years covered in our sample. For immunization, we look at 1980-2000 (the data are not available prior to 1980). For infant mortality we looked at changes over the periods 1980-2000, 1970-2000, and 1960-2000 respectively. For every time period, a country is included in the sample if its average Polity score over the entire period is greater than zero *and* the country has a democratic episode in *each* decade of the time period in question. Thus, a country like Spain, which has an average Polity score greater than zero between the years 1960 and 2000, is included in the 1980-2000 and 1970-2000 samples, but is excluded from the 1960-2000 sample, because it did not have a democratic episode between the years 1960-1969. The dependent variable, as before, is the difference between a country's health outcome between times t_2 and t_1.

As we extend the starting date backward in this manner, we lose some cases. If we take as our starting date 1980 we lose many Eastern European countries, which did not have democratic episodes in the 1980s, but we retain many Latin American and Asian countries. Using 1970 onward drops many of these Latin American and Asian countries. Finally, when we take the data back to 1960 we drop all but the industrialized democracies (and we even lose a few of them: Spain and Portugal) and a handful of others countries. Because of the loss of cases, we estimate a more parsimonious model. We exclude the regional indicators, as our samples are increasingly OECD-centered, and we no longer make use of Huber/White standard errors. That said, using the longer time sweep allows us to see more dramatic changes in the dependent variables and should persuade that there is room for substantial improvement in health outcomes, even for

the OECD set of countries. The decline in the number of cases is a challenge for our estimation, while greater variation in the dependent variable in useful in assessing whether party nationalization matters.[32]

The results for all dependent variables can be found in Table 4. Once again, the coefficients on the initial value and its interaction with fragmentation retain their hypothesized signs, even when our sample is down to 20 cases in the 1960-2000 period for the infant mortality dependent variable (Model 16). Here, we observe the same substantive trends that we saw earlier. The positive slope provides further support for the claim that increasing fragmentation results in worse public service provision and reinforces the results in our baseline models. Turning to Figure 9, we obtain more confirmation of the accuracy of our argument. The graph to the left is for the measles immunization variable between 1980-2000. The graph to the right is for DPT immunization for the same period. Again, the positive slope provides support that party fragmentation undermines a country's convergence towards better health standards.[33]

[INSERT TABLE 4 HERE]

[INSERT FIGURE 9 HERE]

Nor are the results due to outliers. We assess this by using a bootstrapping technique whereby we estimate our equation of interest 1000 times, each time excluding a random set of cases from the model. (The excluded countries are then replaced back into the full sample and can be excluded from future runs of the model as well.)[34] From this set of estimates, we can examine the distribution of our coefficients and assess whether they are stable when we exclude cases. The coefficient estimates do not change much and their significance means we can have greater confidence that our baseline models are not the result of influential outliers. The results of this procedure are presented in the appendix.[35]

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[32] We also estimated the additional control variable models mentioned earlier on these alternative time period samples as well. The results that we report here were robust to those tests, providing even more confidence in our results.

[33] The infant mortality results for 1980-2000, 1970-2000, and 1960-2000 respectively can be found in the appendix and are generally supportive of the trends we report here.

[34] We repeated this procedure using 5000 replications and retained the same substantive results we report here.

[35] As another outlier check, we make use of the bounded-influence estimation processes described in Welsch

7.0 Summary and Possible Extensions

Our results show that party system fragmentation can be a barrier to improved health care provision and outcomes, especially in areas with direct policy-outcome connections such as immunizations. By using health care measures we are trying to capture the degree to which governments are committed to and deliver broad public services to the population in contrast to governments that have problems in the delivery of those public services because of the payoffs that need to be made to sub-national groups.

In the future, we hope to combine the data presented here with data on spending by the national government on these health programs. This would give us an estimate of the efficiency of that spending, and should shed further light on the way in which party fragmentation affects the provision of public services. For example, data showing high levels of government spending on specific government projects in specific geographic areas without accompanying national benefits for the population (especially where combined with evidence of corruption in government) provides evidence that the government is not prioritizing broad public services.

We could also add more nuance to our measurement of outcomes from public services. There is no perfect summary measure of policy performance, but we could explore several possibilities in order to create useful and comparable measures. For one thing, future research could add educational outcomes to this analysis. Other possibilities that we hope to include in future work include measures of governmental commitment to World Health Organization and World Bank programs in health and education and measures of portions of government budgets that are universalistic versus narrowly focused.

Moreover, to understand better the geographic affects of public policies and how those might relate to party nationalization, something difficult to quantify in a consistent manner across many countries given available data, it would be ideal to conduct in-depth analysis of government budgets and sub-national outcomes on a small number of cases in order to trace out causal effects.

(1980) and put to use by Granato, Inglehart and Leblang (1996). We obtain results that are substantively equivalent to what we have reported here. We do not show them here to save space.

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Figure 1

Country 1	
Region X	Region Y
A (.33) B (.33) C (.33)	A (.33) B (.33) D (.33)

Country 2	
Region X	Region Y
A (.50) C (.50)	B (.50) D (.50)

Figure 2

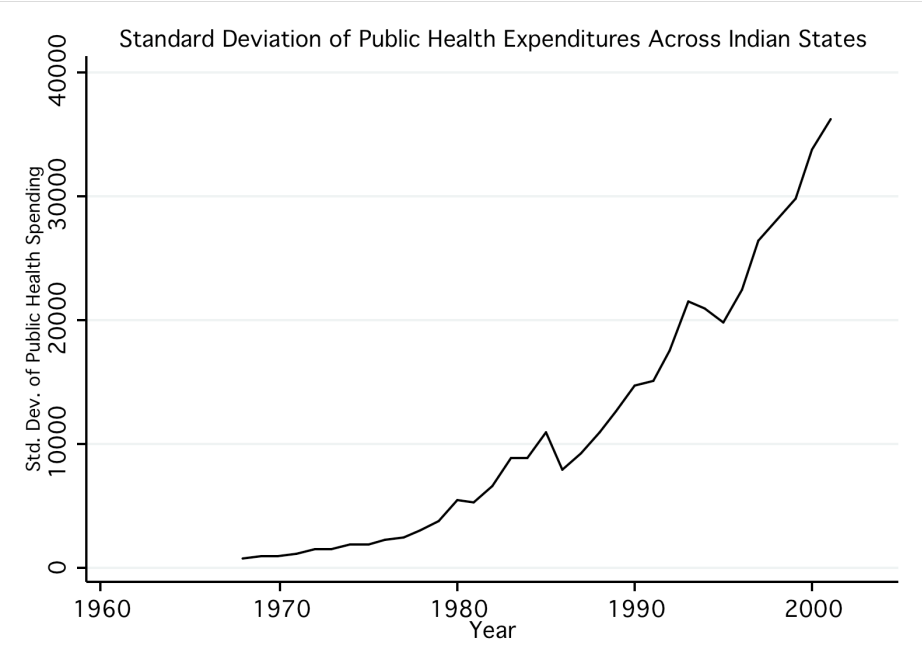

Standard Deviation of Public Health Expenditures Across Indian States
Std. Dev. of Public Health Spending
0
10000
20000
30000
40000
1960
1970
1980
1990
2000
Year

Figure 3

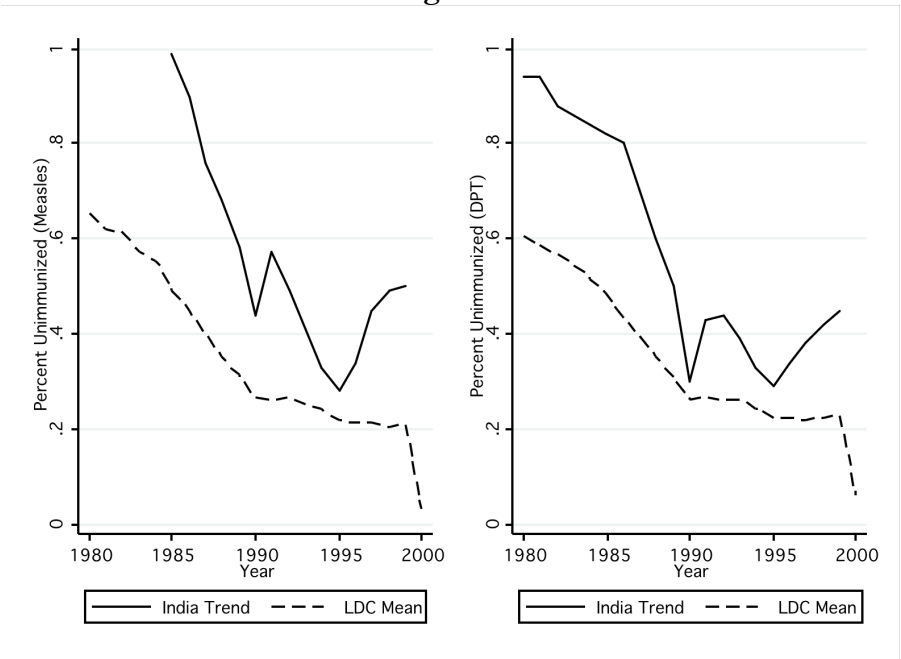

Percent Unimmunized (Measles)
0
.2
.4
.6
.8
1
1980
1985
1990
1995
2000
Year
India Trend
LDC Mean
Percent Unimmunized (DPT)
0
.2
.4
.6
.8
1
1980
1985
1990
1995
2000
Year
India Trend
LDC Mean

Figure 4

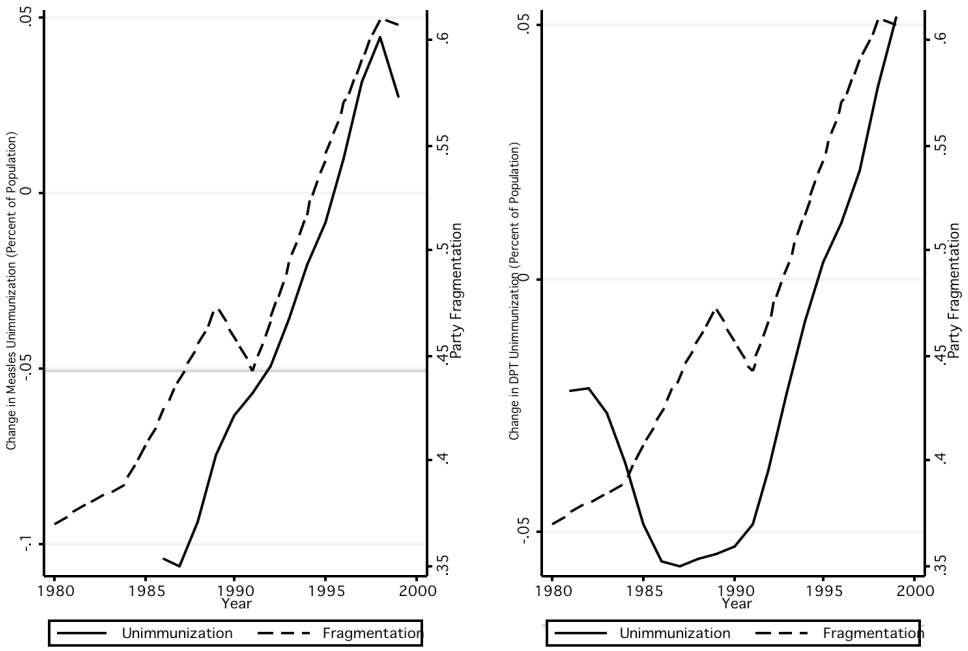

Change in Measles Unimmunization (Percent of Population)
.05
0
-.05
-.1
Party Fragmentation
.6
.55
.5
.45
.4
.35
1980
1985
1990
1995
2000
Year
Unimmunization
Fragmentation
Change in DPT Unimmunization (Percent of Population)
.05
0
-.05
Party Fragmentation
.6
.55
.5
.45
.4
.35
1980
1985
1990
1995
2000
Year
Unimmunization
Fragmentation

Figure 5: Global Trends in Measles Immunization Over Time

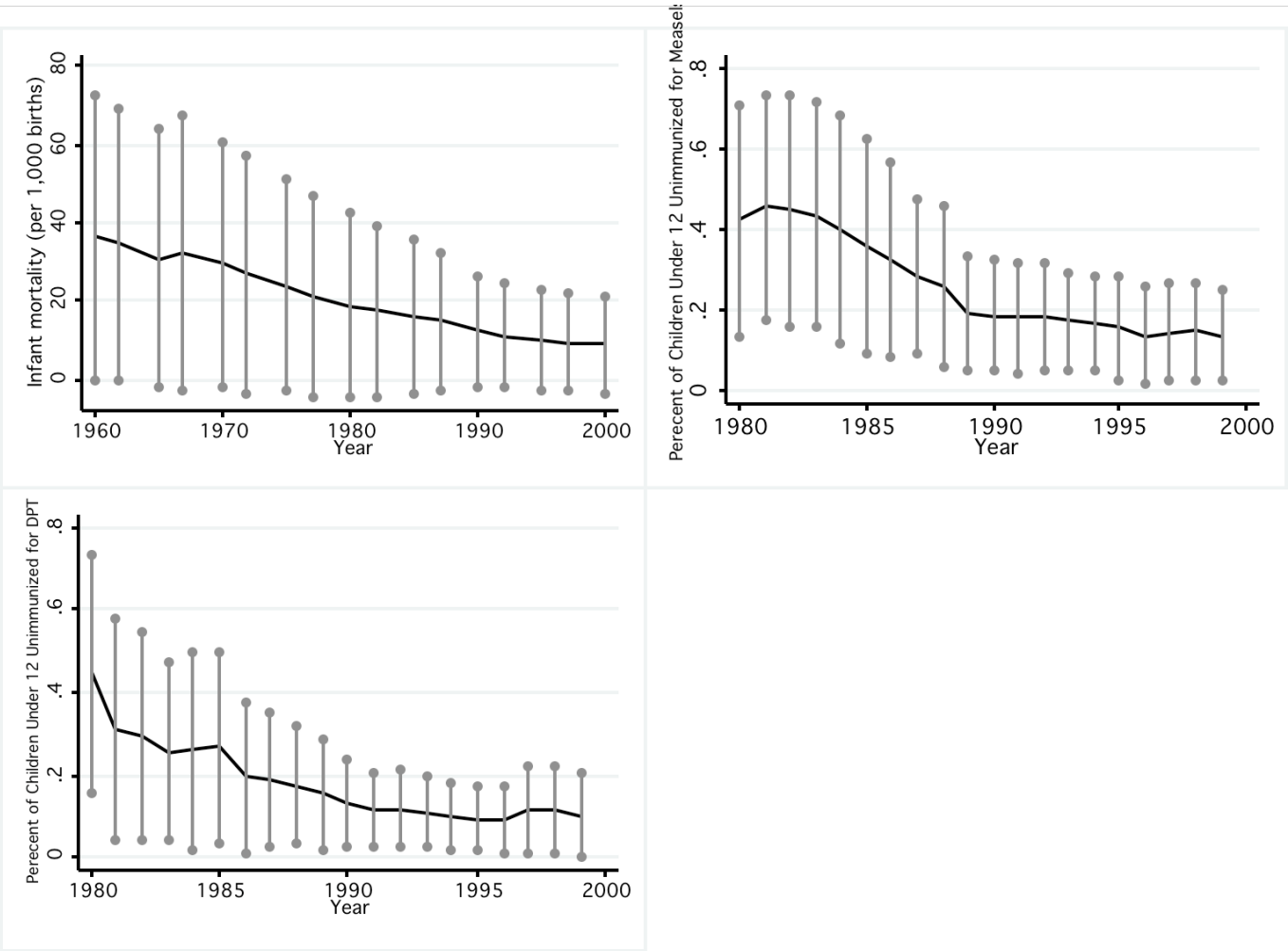


Figure 6: Measles Immunization Over Time: Africa

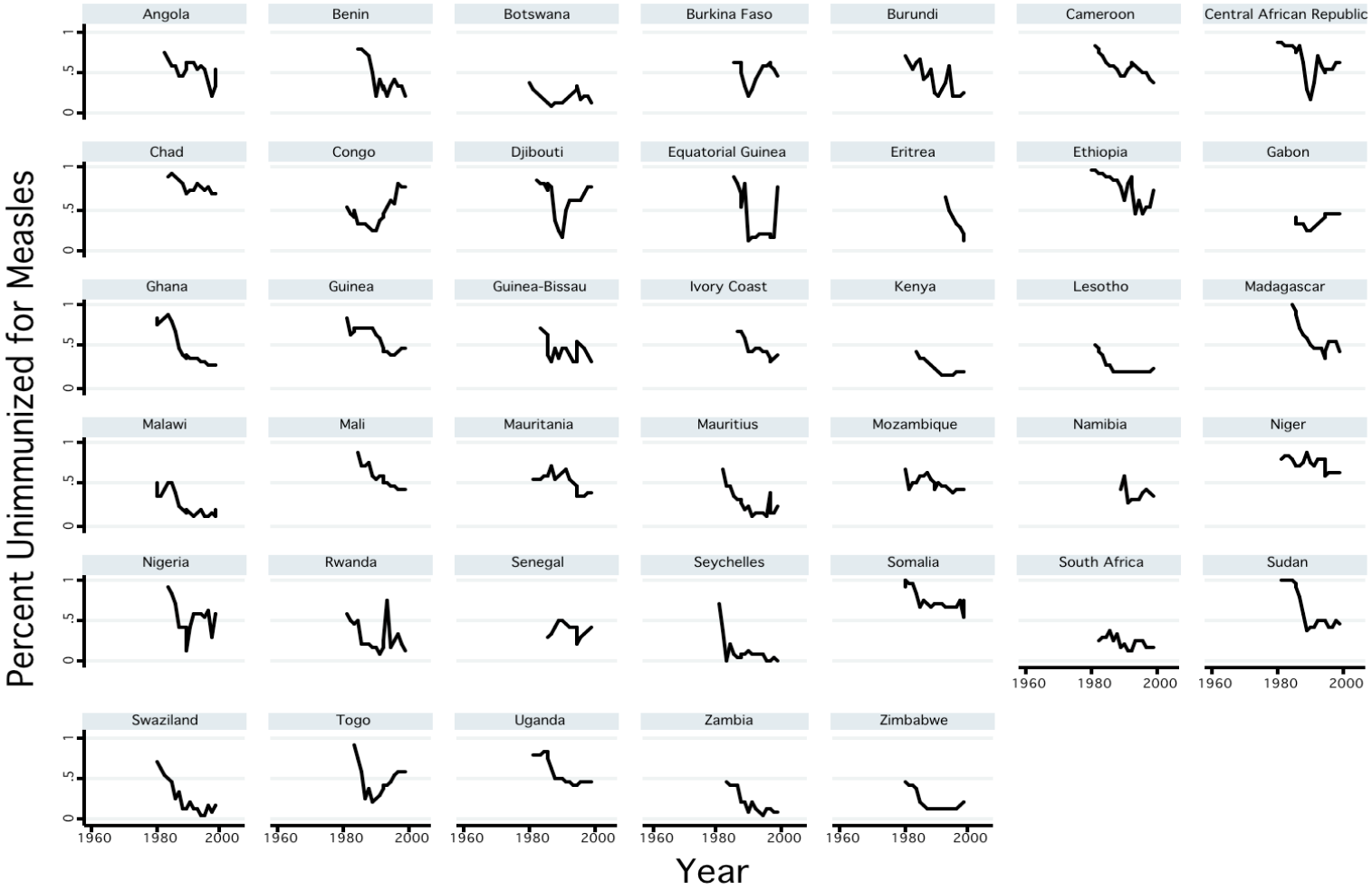


Figure 7: Marginal Effect of Health Initial Value as Party Fragmentation Changes (1990-2000)

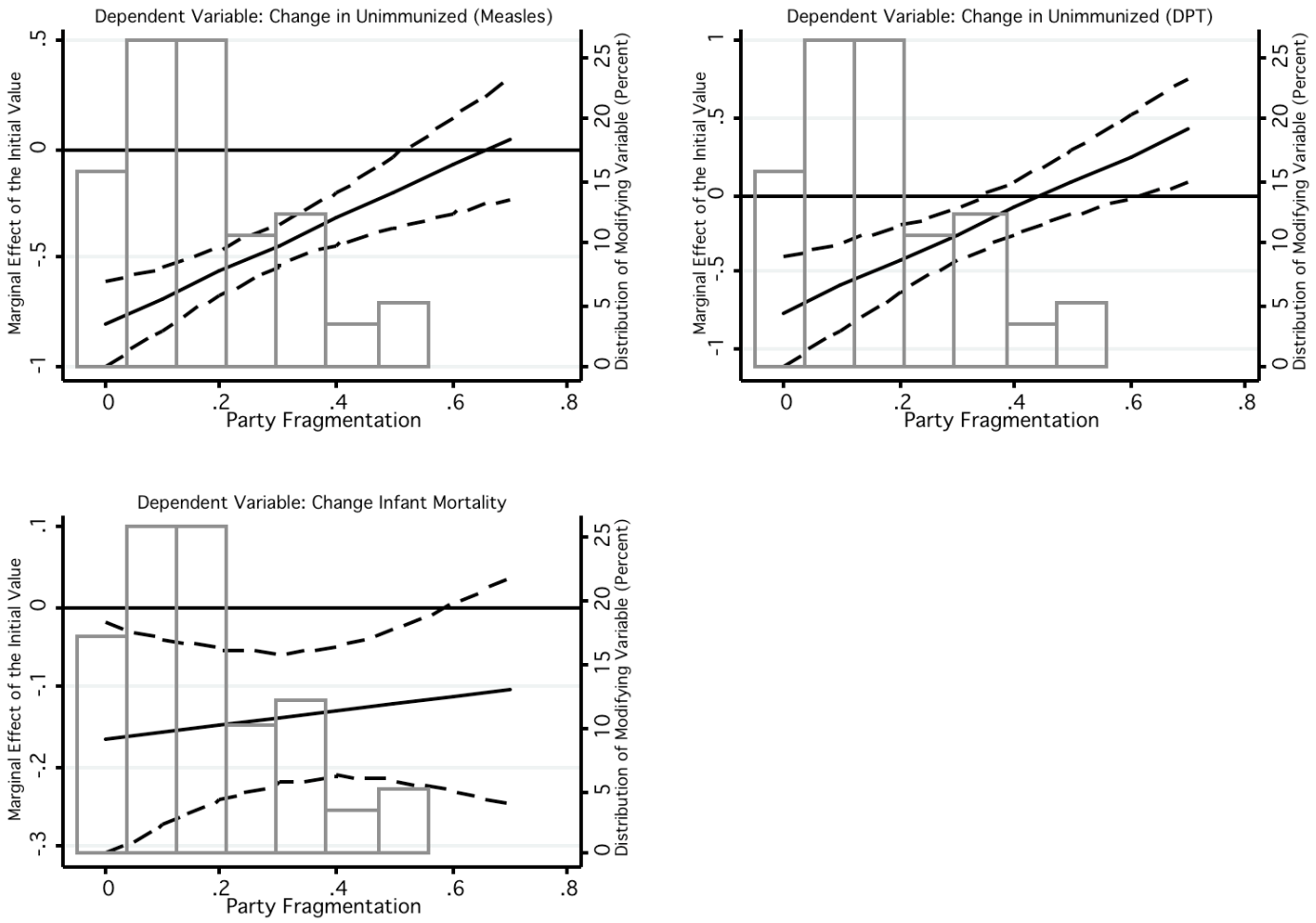


Figure 8: Marginal Effect of Party Fragmentation as Health Initial Value Changes (1990-2000)

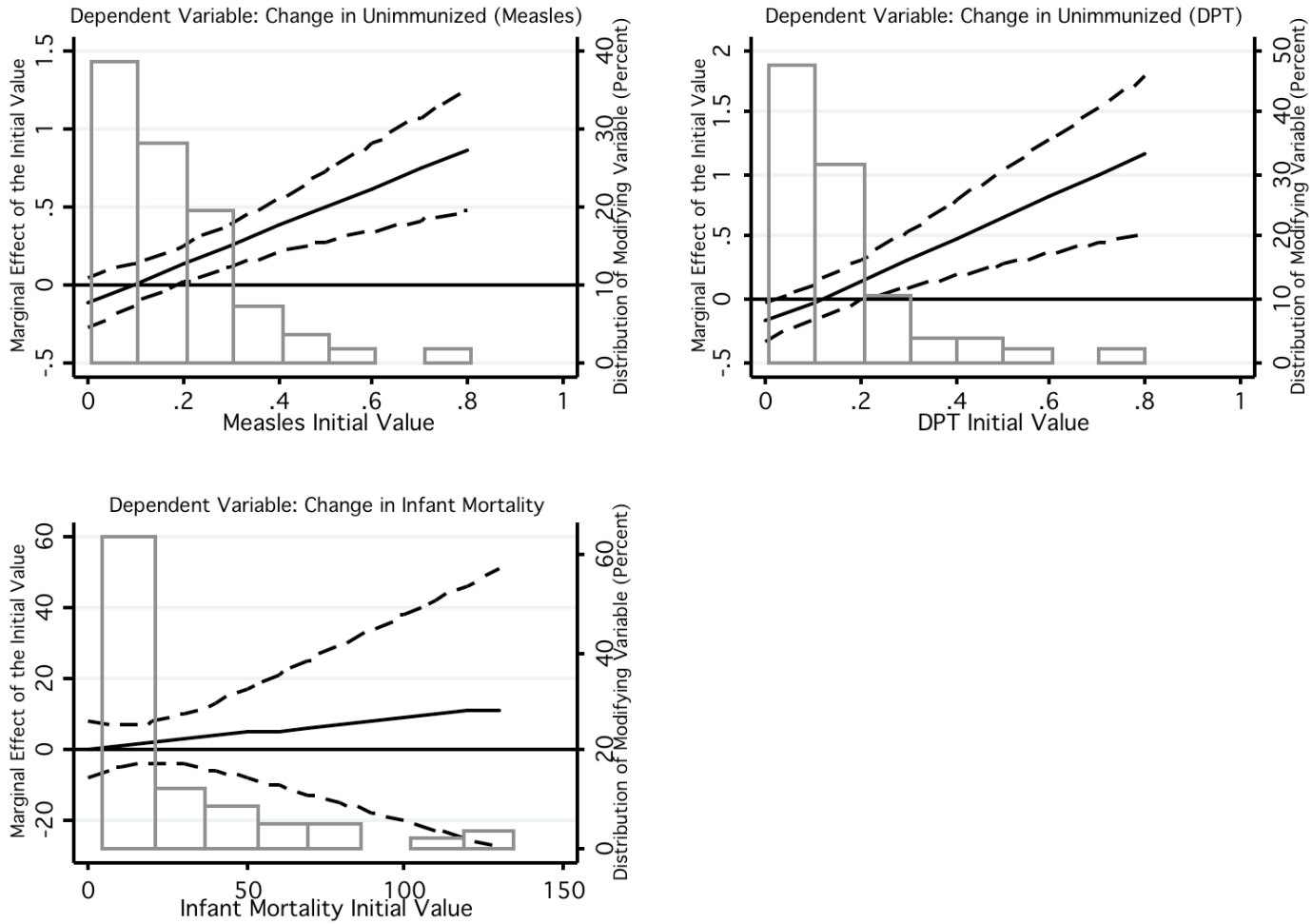


Figure 9: Marginal Effect Graphs for Immunization Models: 1980-2000

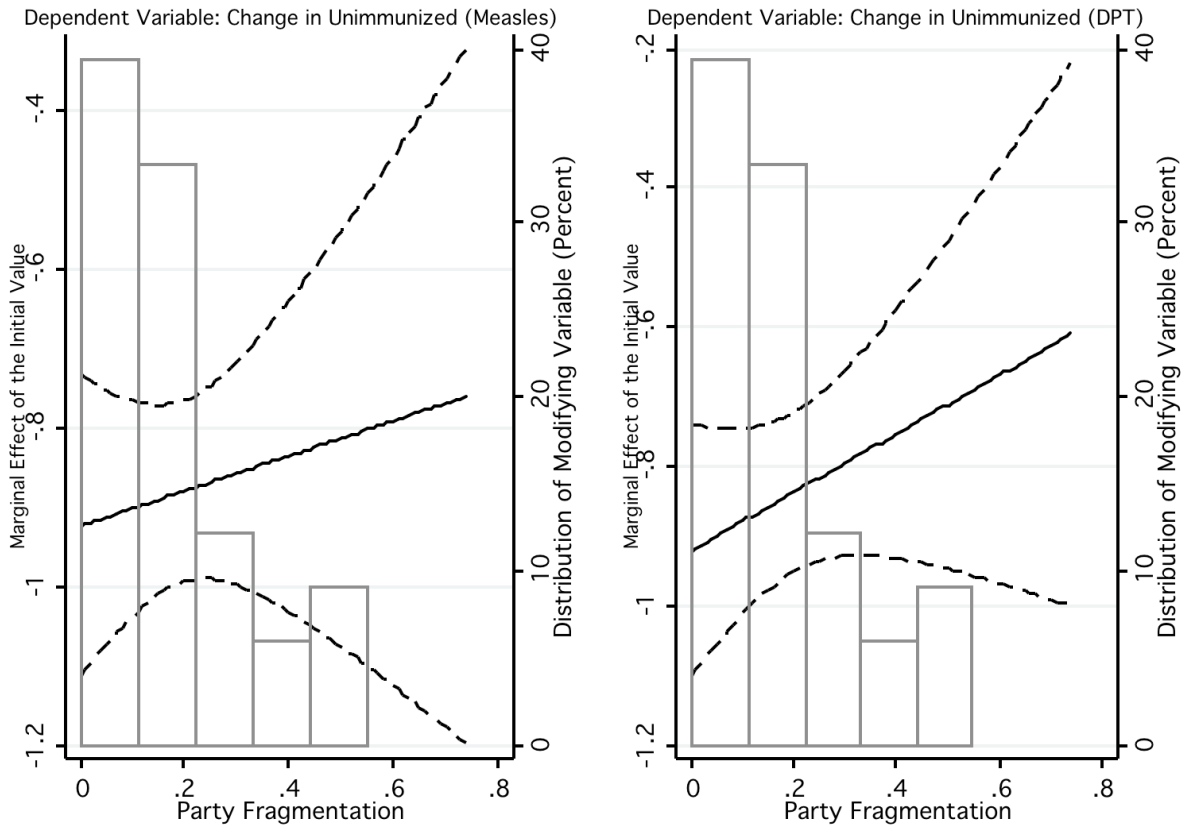


Table 1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ΔMortality	58	-4.86	5.24	-25.10	6.18
Mortality Initial Value	58	27.73	29.92	4.40	135.00
ΔMeasles	57	-0.05	0.09	-0.30	0.09
Measles Initial Value	57	0.18	0.15	0.01	0.81
ΔDPT	57	-0.02	0.08	-0.35	0.21
DPT Initial Value	57	0.15	0.15	0.01	0.80
Fragmentation	58	0.17	0.14	-0.05	0.56
Regime Age	58	2.44	1.49	0.69	5.21
Polity Score	58	8.48	1.82	2.00	10.00
Num. Government Parties	58	1.77	0.80	1.00	4.15

Table 2: Baseline Models

Model	**1**	**2**	**3**
Dependent Variable	Δ*Measles*	Δ*DPT*	Δ*Mortality*
Measles initial value	-0.81***		
	(0.097)		
DPT initial value		-0.76***	
		(0.17)	
Mortality initial value			-0.17**
			(0.072)
Measles Initial * Party Frag	1.23***		
	(0.30)		
DPT Initial * Party Frag		1.68***	
		(0.43)	
Infant Mortality * Party Frag			0.086
			(0.17)
Party Fragmentation	-0.12	-0.19**	0.040
	(0.083)	(0.079)	(3.95)
Regime age	-0.0057	-0.00049	0.99
	(0.010)	(0.0095)	(0.60)
Polity score	0.0035	-0.0018	-0.68*
	(0.0047)	(0.0053)	(0.35)
No. Government parties	-0.018	-0.012	-0.29
	(0.012)	(0.011)	(0.53)
East Asia	0.015	0.057	2.26
	(0.063)	(0.055)	(2.02)
South Asia	0.032	-0.025	-4.51
	(0.045)	(0.046)	(4.17)
Latin America	-0.0086	0.0069	-0.60
	(0.028)	(0.029)	(1.78)
Eastern Europe	-0.051	-0.037	0.46
	(0.032)	(0.033)	(1.85)
Middle East	0.055***	0.030	-10.4***
	(0.020)	(0.026)	(2.48)
Africa	0.11***	0.080**	11.1**
	(0.031)	(0.033)	(4.52)
Constant	0.076	0.099	2.10
	(0.055)	(0.065)	(3.92)
Observations	57	57	58
Adjusted R^2	0.600	0.335	0.675

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Sensitivity checks for Measles Immunization

Model	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Measles initial value	-0.80***	-0.84***	-0.82***	-0.80***	-0.82***	-0.82***	-0.82***	-0.81***
	(0.11)	(0.093)	(0.099)	(0.10)	(0.100)	(0.10)	(0.10)	(0.097)
Party fragmentation	-0.12	-0.16	-0.13	-0.073	-0.12	-0.12	-0.13	-0.13
	(0.093)	(0.10)	(0.091)	(0.098)	(0.085)	(0.084)	(0.087)	(0.090)
Measles Initial * Frag	1.18***	1.29***	1.25***	1.18***	1.22***	1.25***	1.22***	1.25***
	(0.36)	(0.30)	(0.32)	(0.32)	(0.31)	(0.32)	(0.31)	(0.31)
Regime age	-0.0044	-0.0015	-0.0060	-0.0071	-0.0053	-0.0058	-0.0065	-0.0059
	(0.011)	(0.010)	(0.010)	(0.010)	(0.011)	(0.010)	(0.011)	(0.011)
Polity score	0.0048	0.0071	0.0058	0.0044	0.0038	0.0028	0.0037	0.0020
	(0.0065)	(0.0056)	(0.0046)	(0.0050)	(0.0049)	(0.0054)	(0.0050)	(0.0054)
No. Government parties	-0.017	-0.012	-0.018	-0.023	-0.017	-0.018	-0.018	-0.018
	(0.012)	(0.011)	(0.012)	(0.015)	(0.013)	(0.012)	(0.012)	(0.012)
East Asia	0.020	0.032	0.0075	0.017	0.013	0.014	0.015	0.017
	(0.071)	(0.065)	(0.063)	(0.066)	(0.065)	(0.064)	(0.067)	(0.062)
South Asia	0.040	0.049	0.034	0.033	0.028	0.032	0.029	0.030
	(0.054)	(0.048)	(0.051)	(0.049)	(0.054)	(0.047)	(0.048)	(0.048)
Latin America	-0.0055	0.0040	-0.020	-0.0048	-0.012	-0.011	-0.011	-0.0095
	(0.029)	(0.028)	(0.032)	(0.027)	(0.033)	(0.030)	(0.031)	(0.027)
Eastern Europe	-0.047	-0.034	-0.056	-0.052	-0.053	-0.054	-0.055	-0.047
	(0.036)	(0.035)	(0.033)	(0.033)	(0.035)	(0.034)	(0.035)	(0.031)
Middle East	0.060**	0.072***	0.061***	0.040	0.053**	0.056***	0.054**	0.056***
	(0.024)	(0.020)	(0.021)	(0.024)	(0.024)	(0.021)	(0.021)	(0.019)
Africa	0.11***	0.11***	0.10***	0.11***	0.10**	0.10***	0.100**	0.10***
	(0.031)	(0.019)	(0.032)	(0.031)	(0.039)	(0.033)	(0.041)	(0.032)
Convergence Years	-0.0043							
	(0.012)							
District Magnitude		-0.0069						
		(0.0084)						
Pres/Parl			-0.0096					
			(0.012)					
Plurality				-0.025				
				(0.022)				
GDP per capita					-0.0032			
					(0.019)			
Population						-0.0024		
						(0.0065)		
Ethnic Diversity							0.016	
							(0.055)	
Federalism								0.013
								(0.025)
Constant	0.091	0.036	0.074	0.086	0.10	0.11	0.077	0.090
	(0.054)	(0.066)	(0.055)	(0.058)	(0.18)	(0.10)	(0.057)	(0.056)
Observations	57	54	57	57	57	57	56	56
Adjusted R^2	0.592	0.638	0.597	0.607	0.591	0.592	0.588	0.585

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Baseline Model for Various Alternative Time Periods

Model:	**12**	**13**	**14**	**15**	**16**
Dependent Variable:	Δ*Measles*	Δ*DPT*	Δ*Mortality*	Δ*Mortality*	Δ*Mortality*
Time Period:	1980-2000	1980-2000	1980-2000	1970-2000	1960-2000
Mortality initial value			-0.44***	-0.82***	-1.22***
			(0.01)	(0.10)	(0.17)
Measles initial value	-0.92***				
	(0.09)				
DPT initial value		-0.92***			
		(0.09)			
Initial Value * Frag	0.22	0.42	0.09	0.60**	5.74**
	(0.38)	(0.34)	(0.23)	(0.26)	(2.03)
Party fragmentation	0.13	(0.12)	5.02	-12.31	-160.13**
	(0.31)	(0.21)	(14.70)	(20.94)	(64.62)
Regime age	0.0078	-0.0053	0.86	1.65	2.99
	(0.02)	(0.01)	(1.25)	(1.22)	(2.62)
Polity score	0.0082	-0.02	-0.94	-7.80**	-4.51
	(0.02)	(0.02)	(1.25)	(3.18)	(3.20)
No. Government Parties	-0.01	-0.02	-0.99	-0.82	1.37
	(0.03)	(0.03)	(1.82)	(2.60)	(3.36)
Constant	-0.03	0.27	6.58	74.96**	45.43
	(0.17)	(0.16)	(11.45)	(31.24)	(27.00)
Observations	33	33	33	23	20
Adjusted R^2	0.89	0.88	0.81	0.90	0.94

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Appendix A: List of Countries In Estimation Sample[36]

Country	Nationalization	Country	Nationalization
Argentina	.2443071	Malawi	.3276715
Australia	.1675823	Mauritius	.0484367
Austria	.0396591	Mexico	.0657485
Bangladesh	.2600634	Mozambique	.1743271
Belgium	.4993353	Niger	.3499771
Bolivia	.205	Norway	.0502493
Botswana	.109742	Philippines	.3239313
Brazil	.3145	Poland	.1032633
Bulgaria	.0294	Portugal	.0479329
Canada	.2939746	Romania	.1670546
Chile	.3575593	Russian Federation	.3031021
Colombia	.2353	Slovenia	.0153
Costa Rica	.02455	South Africa	.0922134
Cyprus	.0045	South Korea	.2697874
Czech Republic	.0223	Spain	.1383643
Denmark	.0246549	Sri Lanka	-.0503496
Dom. Republic	.01485	Sweden	.0420547
El Salvador	-.0360538	Switzerland	.387525
Estonia	.1404333	Thailand	.5129371
Finland	.2194427	Trinidad and Tobago	.1852011
France	.3683	Turkey	.1731667
Germany	.1858	Ukraine	.1989873
Ghana	.1586202	United Kingdom	.1509195
Greece	.0409568	United States	.0921608
Honduras	.0281855	Uruguay	.0389903
Hungary	.07255		
India	.557816		
Ireland	.0696		
Italy	.2055333		
Jamaica	.0400342		
Japan	.1956989		
Latvia	.1381		
Lithuania	.3986709		

[36] Countries in bold are only the infant mortality sample.

Appendix B: Sensitivity checks for DPT Immunization

	1	2	3	4	5	6	7	8
DPT initial value	-0.77***	-0.79***	-0.75***	-0.76***	-0.77***	-0.73***	-0.71***	-0.76***
	(0.18)	(0.18)	(0.18)	(0.17)	(0.18)	(0.18)	(0.16)	(0.18)
Party fragmentation	-0.19**	-0.22**	-0.19**	-0.18**	-0.19**	-0.21**	-0.070	-0.18*
	(0.080)	(0.10)	(0.080)	(0.084)	(0.081)	(0.078)	(0.11)	(0.096)
DPT Initial * Party Frag	1.76***	1.74***	1.68***	1.68***	1.67***	1.56***	1.57***	1.67***
	(0.44)	(0.47)	(0.43)	(0.43)	(0.44)	(0.45)	(0.41)	(0.46)
Regime age	-0.0029	0.0019	-0.00037	-0.00084	0.00049	-0.00016	0.0058	0.000060
	(0.0096)	(0.010)	(0.0095)	(0.0094)	(0.010)	(0.0093)	(0.0099)	(0.011)
Polity score	-0.0043	-0.0010	-0.0025	-0.0016	-0.0011	0.00076	-0.0039	-0.0022
	(0.0062)	(0.0065)	(0.0051)	(0.0052)	(0.0056)	(0.0058)	(0.0057)	(0.0063)
No. Government parties	-0.012	-0.0079	-0.012	-0.013	-0.011	-0.0097	-0.011	-0.011
	(0.011)	(0.013)	(0.011)	(0.012)	(0.012)	(0.012)	(0.011)	(0.011)
East Asia	0.048	0.065	0.059	0.057	0.053	0.060	0.042	0.055
	(0.056)	(0.055)	(0.058)	(0.056)	(0.054)	(0.053)	(0.052)	(0.056)
South Asia	-0.039	-0.018	-0.026	-0.025	-0.036	-0.025	-0.0041	-0.027
	(0.049)	(0.048)	(0.045)	(0.047)	(0.051)	(0.045)	(0.040)	(0.048)
Latin America	0.0011	0.015	0.010	0.0074	0.00019	0.015	0.039	0.0064
	(0.030)	(0.029)	(0.032)	(0.030)	(0.028)	(0.028)	(0.029)	(0.029)
Eastern Europe	-0.044	-0.030	-0.036	-0.038	-0.041	-0.027	-0.0079	-0.036
	(0.034)	(0.035)	(0.033)	(0.033)	(0.033)	(0.030)	(0.035)	(0.035)
Middle East	0.021	0.042	0.028	0.027	0.026	0.025	0.037	0.029
	(0.029)	(0.027)	(0.027)	(0.023)	(0.027)	(0.029)	(0.026)	(0.028)
Africa	0.084**	0.10***	0.081**	0.080**	0.070*	0.096***	0.14**	0.079**
	(0.036)	(0.030)	(0.035)	(0.033)	(0.040)	(0.027)	(0.058)	(0.034)
Convergence Years	0.0089							
	(0.010)							
District magnitude		-0.0075						
		(0.0094)						
Pres/Parl			0.0030					
			(0.012)					
Plurality				-0.0056				
				(0.020)				
GDP per capita					-0.0077			
					(0.017)			
Population						0.0081		
						(0.0091)		
Ethnic Diversity							-0.12*	
							(0.071)	
Federalism								-0.0036
								(0.033)
Constant	0.065	0.097	0.100	0.10	0.16	-0.0086	0.10	0.10
	(0.072)	(0.078)	(0.065)	(0.067)	(0.15)	(0.13)	(0.065)	(0.072)
Observations	57	54	57	57	57	57	56	56
Adjusted R^2	0.326	0.347	0.320	0.321	0.321	0.336	0.383	0.312

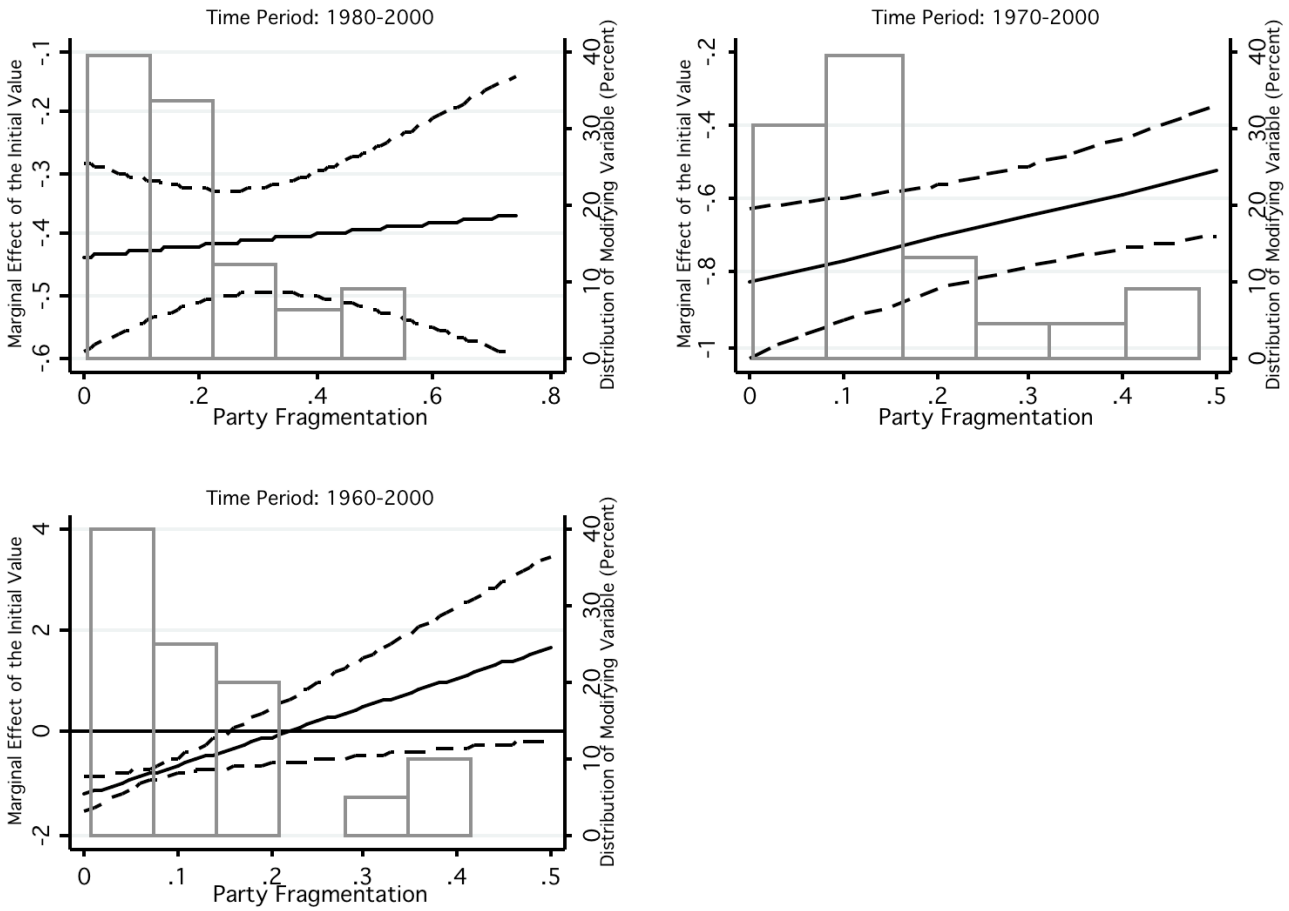
Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Appendix C: Sensitivity checks for Infant Mortality

	1	2	3	4	5	6	7	8
Mortality initial value	-0.16**	-0.25***	-0.16**	-0.17**	-0.14*	-0.16**	-0.17**	-0.17**
	(0.072)	(0.078)	(0.074)	(0.071)	(0.075)	(0.070)	(0.074)	(0.073)
Party fragmentation	1.51	-5.84	-0.41	0.24	-0.96	-2.00	-1.10	-2.34
	(4.34)	(6.25)	(3.70)	(4.83)	(3.83)	(4.49)	(4.53)	(4.13)
Inf. Mortality Initial * Party Frag	0.032	0.31	0.091	0.086	0.11	0.068	0.087	0.12
	(0.18)	(0.21)	(0.17)	(0.17)	(0.17)	(0.16)	(0.17)	(0.18)
Regime age	1.15*	0.98	1.01	0.98	0.97	0.97*	0.86	0.85
	(0.59)	(0.62)	(0.61)	(0.59)	(0.59)	(0.55)	(0.60)	(0.59)
Polity score	-0.47	-0.86**	-0.78**	-0.68*	-0.83**	-0.54	-0.64*	-0.65
	(0.36)	(0.36)	(0.32)	(0.34)	(0.38)	(0.33)	(0.36)	(0.43)
No. Government parties	-0.22	0.053	-0.24	-0.31	-0.37	-0.12	-0.40	-0.36
	(0.52)	(0.70)	(0.51)	(0.64)	(0.58)	(0.60)	(0.56)	(0.56)
East Asia	1.79	2.36	2.53	2.26	3.05	2.41	2.43	2.76
	(2.35)	(2.18)	(1.99)	(2.04)	(2.20)	(1.89)	(1.97)	(1.96)
South Asia	-3.38	-4.73	-4.81	-4.50	-3.51	-4.62	-4.78	-4.22
	(4.00)	(3.73)	(4.20)	(4.16)	(4.56)	(4.20)	(4.17)	(4.43)
Latin America	-0.67	0.47	-0.27	-0.58	0.26	-0.17	-0.93	-0.53
	(1.76)	(1.73)	(1.91)	(1.74)	(2.09)	(1.85)	(1.73)	(1.73)
Eastern Europe	1.40	0.30	0.55	0.45	1.25	0.84	0.014	0.41
	(1.84)	(2.09)	(1.85)	(1.85)	(1.67)	(1.59)	(1.87)	(1.72)
Middle East	-10.2***	-8.39***	-10.7***	-10.4***	-10.3***	-10.7***	-10.4***	-10.0***
	(2.44)	(2.39)	(2.51)	(2.71)	(2.47)	(2.55)	(2.52)	(2.47)
Africa	10.2**	10.7*	11.0**	11.1**	11.6**	12.1**	10.1**	11.1**
	(4.79)	(5.91)	(4.59)	(4.45)	(4.57)	(4.51)	(4.73)	(4.56)
Convergence Years	-0.70							
	(0.73)							
District magnitude		-0.31						
		(0.73)						
Pres/Parl			0.37					
			(0.50)					
Plurality				-0.10				
				(0.99)				
GDP per capita					1.40			
					(1.51)			
Population						0.51		
						(0.39)		
Ethnic Diversity							2.32	
							(2.86)	
Federalism								1.54
								(1.25)
Constant	5.37	5.26	2.30	2.18	-10.0	-4.12	2.06	2.32
	(6.40)	(5.24)	(3.91)	(4.07)	(12.7)	(5.16)	(4.05)	(4.44)
Observations	58	54	58	58	58	58	57	57
Adjusted R^2	0.678	0.693	0.671	0.668	0.676	0.684	0.674	0.675

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Appendix D: Marginal Effect Figures for Infant Mortality: 1980-2000, 1970-2000, and 1960-2000



Appendix E: Boostrapped Results: 1990-2000

Model	**1**	**2**	**3**
Dependent Variable	Δ*Measles*	Δ*DPT*	Δ*Infant Morality*
Measles initial value	-0.81***		
	(0.11)		
Measles initial * Frag	1.23***		
	(0.45)		
DPT initial value		-0.76***	
		(0.20)	
DPT Initial * Frag		1.68*	
		(0.98)	
Mortality initial value			-0.17*
			(0.087)
Mortality initial * Frag			0.086
			(0.24)
Party fragmentation	-0.12	-0.19	0.040
	(0.099)	(0.12)	(5.08)
Regime age	-0.0057	-0.00049	0.99
	(0.011)	(0.011)	(0.64)
Polity score	0.0035	-0.0018	-0.68
	(0.0061)	(0.0061)	(0.42)
No. Government parties	-0.018	-0.012	-0.29
	(0.012)	(0.012)	(0.61)
Eastern Europe	-0.051	-0.037	0.46
	(0.036)	(0.037)	(2.00)
Middle East	0.055*	0.030	-10.4*
	(0.033)	(0.031)	(5.29)
Africa	0.11***	0.080**	11.1**
	(0.039)	(0.038)	(4.97)
Latin America	-0.0086	0.0069	-0.60
	(0.028)	(0.032)	(1.90)
South Asia	0.032	-0.025	-4.51
	(0.062)	(0.10)	(5.25)
East Asia	0.015	0.057	2.26
	(0.069)	(0.064)	(2.32)
Constant	0.076	0.099	2.10
	(0.070)	(0.073)	(4.82)
Observations	57	57	58
Adjusted R^2	0.600	0.335	0.675

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$