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Linking Economic Development and Poverty: The Role of Innovation and Innovation Capacity in the South

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Abstract

While most economic development research views poverty as a sign of need for development or poverty reduction as an outcome of successful development, this study treats poverty as an independent variable alongside contemporary measures of innovation capacity that reflect state potential for economic development, examining the combined impact of poverty and innovation capacity on economic development outcomes. The study examines the effect poverty has on economic development outcomes given levels of innovation capacity, and the effect poverty has on formation of state innovation capacity. The methodology consists of pooled cross-sectional time-series analysis with panel corrected standard errors with lags. The findings show mixed support for the effect of poverty on innovation capacity formation, weak support for the negative direct effects of poverty on economic growth, and strong support confirming important differences between the south and the rest of the nation. Poverty appears to impact economic growth only indirectly through its effect on the components of capacity that lead to economic growth.

Introduction

This study utilizes measures of innovation capacity and poverty in a state level study that begins to illuminate the relationships between the two constructs, as well as their combined effect on economic development outcomes. In considering these relationships, this study bridges public policy, economic development, and poverty literatures in an attempt to stimulate the use of better cross-cutting information in public policy decision making practice. States face important tradeoffs among their objects of expenditure. Understanding the role poverty plays in mitigating economic development for given levels of innovation capacity will help to inform states as they improve policies designed to address social and economic policy goals simultaneously. Effective policies will be able to target key resources to their most productive uses as state policymakers strive to overcome barriers and stimulate growth while protecting society's more vulnerable populations.

This essay considers the possibility that poverty may serve as one of many causal components that impact economic development at the state level. In the poverty literature, place of residence is viewed as the locus of a set of opportunities and barriers (Weber, et al, 2005). Capacity is the ability to produce, and represents opportunity, whereas high poverty may impede production, acting as a barrier. Therefore, the research questions of interest here are: (1) does poverty have a dampening effect on state economic growth, given levels of capacity for development and growth, and what is the magnitude of that effect? and (2) does the level of state poverty negatively impact innovation capacity formation, and at what magnitude? In other words, does poverty limit states' development of innovation capacity, or does poverty directly limit states' economic growth, or both?

This research conforms generally to the framework of a community, rather than a contextual, study in that it considers aggregate characteristics and policy impacts on poverty

levels and related measures of the extent of poverty (Weber, et al, 2005). To that end, the analysis seeks to determine the combined effects of positive and negative capacity elements at the state level. I begin by contextualizing this study within broader poverty and economic development literatures which are then used to generate theory and specific hypotheses about the relationships described above. The essay continues with a brief discussion of methodology and findings, concluding with discussion of the results and their importance and limitations in policy decision settings.

Background

Weber, et al, (2005) prescribe a poverty research agenda that includes asking how concentrated poverty affects communities. Significant research has concentrated on the correlation between positive aspects of state or community capacity and economic development (Florida, 2000; Porter & Stern, 2001; Hall, 2007b), but surprisingly little research investigates the relationship between aspects of negative capacity, such as poverty, and economic growth. Numerous studies have measured development capacity in terms of human capacity (Porter, 2002), entrepreneurial capacity (Feldman, 2001; Freshwater, 2003), or financial capacity (Milken Institute, 2001; Progressive Policy Institute, 2002). Each of these studies overlooks the effects of concentrated negatives such as poverty which may present barriers to states' realization of their economic development objectives. To date, no research has examined the mitigating effects poverty may have on economic growth considering given levels of innovation capacity.

For example, a state may have numerous doctoral scientists and engineers, but having lots of Ph.D.s in no way implies that poverty rates are low in the state or its communities. "Indeed, in many places in the rural South, poverty and employment are not contradictory" (Tomaskovic-Devey & Roscigno, 1997). Although terminology has confounded the meanings of

economic growth and economic development (Wolman & Spitzley, 1996), much economic development research acknowledges the role of targeting funds and assistance to combat poverty (see Shipman, 1968; Eisinger, 1988; Flowers, et al, 1981).

Measures of community need and local demand have previously been shown to affect federal grant distributions; Rich (1989) finds, in fact, that the federal government's ability to target funds to the most distressed areas increased over time from the 1950s to the 1980s. The most commonly used indicators of community need for federal program targeting purposes are poverty, income, unemployment, and population. In other words, communities that have greater need are often the explicit targets of federal programs, and thus their eligibility heightens the likelihood that they would receive greater numbers of grants and larger amounts of targeted federal revenue than their less-needy counterparts. Need and capacity, unfortunately, are usually inversely related. Other research examines the limited effect such targeted interventions have had on systematic poverty (Tomaskovic-Devey & Roscigno, 1997). Under both paradigms, a reduction in poverty is viewed as an outcome of development policy rather than an input that should be considered.

Economic development and poverty are often discussed in concert, with economic development seeking to alleviate poverty, but with little recognition that poverty might itself impede development efforts. South Africa, for example, had turned to tourism as an economic development strategy intended to combat poverty by increasing jobs and foreign earnings, but this strategy has failed to meet those objectives (Muhanna, 2007). Tourism was viewed as a viable strategy for alleviating poverty because, among other reasons, it redistributes wealth and it is consumed at the point of production (Muhanna, 2007). In the domestic sense, however, there

is some evidence that officials do not view poverty as an important goal for economic development programs.

The National League of Cities surveyed leaders in 188 cities with populations of greater than 100,000 to inquire about the role of economic development as it regards poverty. Their results showed that local leaders have a strong tendency to consider economic development as a means to generate jobs and enhance the tax base, not to abate poverty (Furdell, 1993). Poverty was viewed by these leaders as a problem resulting from lack of jobs—a view that was strengthened by their consensus that efforts to reduce poverty were less politically popular than traditional economic development (National League of Cities, 1995). Though the National League of Cities focused on urban official's opinions, it is rural areas where a disproportionate share of U.S. poverty population is located (Tickamyer & Duncan, 1990). The structure of work opportunities has prevented rural residents from escaping poverty (Tickamyer & Duncan, 1990).

The rural South has been particularly vulnerable to economic development efforts that took advantage of the natural profit-maximizing efforts of labor-intensive industries at the bottom of the product cycle as they relocated production to low-wage, nonunionized areas (Tickamyer & Duncan, 1990). The traditional smokestack chasing (Eisinger, 1995) economic development activities of low-wage states have been instrumental in exacerbating these effects, particularly in the South. Recruitment is still viewed as a viable approach to job creation today, and many states emphasize it in their economic development strategies. Low wage, low skill employment may have been a good temporary solution in the past, but increasingly, places that have been traditionally dependent on the manufacturing sector for employment will find it much more difficult to compete in a global market.

The current economic restructuring away from manufacturing and toward a service-based economy is part of the larger new economy along with growth of the IT sector and globalization Hall, 2007b). These macroeconomic trends present new challenges for individuals living in poverty as they are forced to compete for jobs in an economy based not on cheap labor but on knowledge and skills. Whereas job creation and welfare may have been the path to addressing poverty in the past, in today's economy welfare and investments in educational opportunity for low-income persons may be the only solution. As Duncan (1999) notes, "In every case, a good education is the key that unlocks and expands the cultural tool kits of the have-nots, and thus gives them the potential to bring about lasting social change in their persistently poor communities" (p. 208). Or as Jensen, McLaughlin and Slack (2003) put it, "a good argument can be made that there is a link between the human capital of residents and the ability of communities to successfully organize to attract and retain good jobs…Communities that lack human, social, and financial resources face severe deficits in competition with other communities for jobs and external investment" (p. 128). "Creating, retaining, and attracting well-educated individuals, especially those with a Bachelor's degree or higher, will be vital to the long-term social and economic health of rural areas" (Beaulieu, Israel & Wimberley, 2003, p. 288). There is widespread agreement that poverty abatement efforts must concentrate more on building capacity to succeed in the new economic paradigm than on simply creating jobs.

So, the literature on poverty and economic development presents poverty reduction as one possible outcome of economic development efforts, though they focus on job creation with an assumed linkage between jobs and poverty. To examine the problem from the reverse angle, let us consider briefly the effect of economic growth on poverty levels. Rodgers, Jr. and Payne (2007) find that child poverty is lowest in those states that are wealthiest, that have low

unemployment, high per capita personal incomes, and more taxable resources, and in those states with the strongest welfare programs. That is, economic development is a condition that appears to affect poverty levels. To this end, strong economic development outcomes certainly seem to decrease the incidence of poverty, and especially so in those places with strong welfare programs. "The economy and demographics play a major role in explaining state variations" (Rodgers, Jr. & Payne, 2007). But this leaves unanswered the question of which happens first. If poverty impedes economic development, then efforts geared toward economic development may be lost so long as poverty persists. So the question remains, does poverty limit economic development, or more importantly, does poverty inhibit formation of innovation capacity needed to succeed in the new economy?

Theory

The literature referenced above suggests that poverty limits economic growth. It also suggests that innovation capacity stimulates growth. The call for investment in education and human capital supports the view that poverty limits communities' abilities to rise out of poverty through their own action.

Following this literature, I formulate an initial pair of hypotheses to guide an empirical assessment of the relationship between poverty and innovation capacity and their combined effect on economic growth:

> **H1: Poverty levels will be negatively related to levels of state innovation capacity, including state levels of Human Capacity for Innovation, Federal Financial Capacity for Innovation, and State/Local Financial Capacity for Innovation, indicating that poverty impedes formation of innovation capacity; and**

H2: Overall state economic performance will be positively affected by the three categories of innovation capacity but negatively affected by poverty, indicating that poverty and innovation capacity work against each other in state economic progress.

These hypotheses serve as the basis of a series of models that seek to estimate the actual observed effects over time. I also expect the negative effects of poverty to be enduring; that is, poverty in one year should have a negative effect on economic growth for many years, increasing over time. A strengthening negative effect such as this would support arguments regarding deep poverty's systematic nature to limit economic opportunity.

Many studies convey the importance of historical economic structure as a key determinant of persistent poverty in the South, setting it apart as a region with unique problems (Tickamyer & Duncan, 1990). Harris and Worthen (2003) go so far as to say that strategies intended to address southern poverty must be "sensitive to the peculiar history and dynamics of the Southern political economy" (p. 42). To explore the possibility that southern states are indeed different, a third hypothesis is included to consider that regional difference. The sixteen Southern states represent a region where poverty is particularly high, and where economic development and growth has typically lagged, so:

H3: Southern states will demonstrate greater negative effects of poverty on innovation capacity formation and on economic growth, but weaker positive effects of innovation capacity on economic growth, than non-southern states.

A series of models are developed to address the key theoretical questions posed by these hypotheses, and to assessing the change in effect over time. There are two sets of equations, and each set represents analysis of a separate component of the model with a lead in the dependent variable up to five years for most models, and ten years for select models. Models 1-18 examine

the effects of poverty on formation of each component of innovation capacity. Models 19-25 examine the combined effects of poverty and innovation capacity on gross state product.

The specific models following these hypotheses are listed below. Each model represents a test of the same-year relationship; not listed are those models that estimate the relationship of current year inputs on future year outcomes using leads of the dependent variable of up to 5 years, plus a 10-year lead on the economic growth models:

M1: $Human_{it} = \beta_1 + \beta_2 Poverty_{it} + \beta_3 Unemp_{it} + \beta_4 AFDC_{it} + \beta_5 Pop_{it} + \beta_6 Density + \beta_7 Recession + \beta_8 South_{it} + \varepsilon_{it}$

M7: $FedFin_{it} = \beta_1 + \beta_2 Poverty_{it} + \beta_3 Unemp_{it} + \beta_4 AFDC_{it} + \beta_5 Pop_{it} + \beta_6 Density + \beta_7 Recession + \beta_8 South_{it} + \varepsilon_{it}$

M13: $SLFin_{it} = \beta_1 + \beta_2 Poverty_{it} + \beta_3 Unemp_{it} + \beta_4 AFDC_{it} + \beta_5 Pop_{it} + \beta_6 Density + \beta_7 Recession + \beta_8 South_{it} + \varepsilon_{it}$

M19: $RGSP_{it} = \beta_1 + \beta_2 Poverty_{it} + \beta_3 Human_{it} + \beta_4 FedFin_{it} + \beta_5 SLFin_{it} + \beta_6 Population_{it} + \beta_7 Density_{it} + \beta_8 Recession_{it} + \beta_9 South_{it} + \varepsilon_{it}$

Where:

Human = Human Capacity for Innovation state factor scores (also HCI),
FedFin = Federal Financial Capacity for Innovation state factor scores (also FFCI),
SLFin = State/Local Financial Capacity for Innovation state factor scores (also SLFCI),
RGSP = Real Gross State Product,
Poverty = state poverty rate,
Unemp = average annual state unemployment rate,
AFDC = Number of state AFDC/TANF recipients,
Pop = state population,
Density = state population density,
Recession = any portion of the observation year is designated an economic recession,
South = the observation is one of the sixteen southern states.

If the results confirm H3 with significant results on the variable *South*, then a second set of models will be necessary to explore the effects within the region, as follows:

M1b: $Human_{it} = \beta_1 + \beta_2 Poverty_{it} + \beta_3 Unemp_{it} + \beta_4 AFDC_{it} + \beta_5 Pop_{it} + \beta_6 Density + \beta_7 Recession + \varepsilon_{it}$

M7b: $FedFin_{it} = \beta_1 + \beta_2 Poverty_{it} + \beta_3 Unemp_{it} + \beta_4 AFDC_{it} + \beta_5 Pop_{it} + \beta_6 Density + \beta_7 Recession + \varepsilon_{it}$

M13b: $SLFin_{it} = \beta_1 + \beta_2 Poverty_{it} + \beta_3 Unemp_{it} + \beta_4 AFDC_{it} + \beta_5 Pop_{it} + \beta_6 Density + \beta_7 Recession + \varepsilon_{it}$

M19b: $RGSP_{it} = \beta_1 + \beta_2 Poverty_{it} + \beta_3 Human_{it} + \beta_4 FedFin_{it} + \beta_5 SLFin_{it} + \beta_6 Population_{it} + \beta_7 Density_{it} + \beta_8 Recession_{it} + \varepsilon_{it}$

I expect poverty rate and other measures of need to be negatively correlated with Gross State Product, reflected by a negative beta coefficient, while innovation capacity measures (Human, FedFin, & SLFin) will be positively correlated. I expect this relationship will grow stronger over time, which would indicate a systematic nature of both poverty and state capacity. I also expect that poverty and measures of need will be negatively correlated with each measure of innovation capacity, with the relationship strengthening over time. If both hypotheses are confirmed it will suggest that the effects of poverty on economic performance are cyclical. As Blank (2005) notes, multiple causal factors affect place-specific outcomes and interact, making "outcome" and "cause" difficult to untangle (p. 441). This essay makes an initial foray into disentangling the cause from the effect in considering poverty, innovation capacity, and economic development.

Data & Methods

Data

Data utilized for this study fall into four categories based on the constructs identified above—measures of innovation capacity, poverty, and economic performance—plus a set of control variables. Data limitations currently restrict innovation capacity measurement to state-level observations, so the units of analysis are the fifty U.S. states. Because the effects of various inputs and catalysts are not immediately realized, it is necessary to evaluate these effects over time; hence, panel data representing states/years are assembled covering a period of

approximately two decades. To assess the effects over time, it is necessary to construct a dataset that includes as many observations as possible, and the innovation capacity measures are, again, the limiting factor. The study covers the period from 1980 to 1999.

Innovation capacity is recognized as a key driver of economic development and growth, and especially so in the current 'new economy' (Hall, 2007b; Clinton, et al, 2002; DeVol, Koepp, & Ki, 2004). The measures of innovation capacity encompass three dimensions—human capacity in each state, federal financial effort for research and development in each state, and state/local government financial effort for research and development in each state. These innovation capacity measures are scores that were created using factor analysis, and collectively represent sixteen independent variables (Hall, 2007a). These measures are broad characterizations of innovation capacity which include measures that have been shown to affect poverty levels, such as education attainment (Partridge & Rickman, 2005) and labor market conditions such as occupational structure (Weber, et al, 2005).

State innovation capacity scores cover the period from 1980 to 1999 and are the limiting variables for the study, as noted. Hall (2007a) generated three measures of innovation capacity using factor analysis, including human capacity, federal financial capacity, and state/local capacity for innovation. Hall (2007a) develops two sets of indices—one using raw data and one using population-controlled data. The factor scores were obtained from the author and are used here with permission. Although raw data factor scores were found to be superior predictors of economic development outcomes (Hall 2007a), the population-controlled factor scores are used as variables in this study because poverty and unemployment rates are also dependent on population (they are expressed as a proportion rather than a number). This enables a more consistent comparison among the components.

In spite of recognition that local areas would be more appropriate units of analysis, data limitations were offered as an explanation for the less desirable state-level analysis that generated the factor scores (Hall, 2007a). The data constraint becomes relevant for this study in that the true effects of poverty on the economy are likely to be masked through aggregation at the state level, making local area level analysis a preferable option for future efforts. This limitation notwithstanding, the state level is a useful point of departure for such a study given that both economic development policy and poverty/welfare policy are driven by state-level decisions.

A series of poverty measures are utilized to represent the level of societal need present in each state. These include a short-term cyclical measure—the state unemployment rate (U.S. Bureau of Labor Statistics), a measure of persistent need—the state poverty rate (U.S. Census), and a measure of deep poverty—the number of AFDC/TANF recipients (U.S. Dept. of Health and Human Services).

Fording & Berry (2007) show that both the income enhancement and the work disincentive hypotheses are at play in welfare policy, indicating that the poverty rate underestimates the true effect of poverty. The presence of in-kind benefits, such as food stamps or medical care, fails to alter the poverty rate although they have a meaningful impact on poverty levels (Fording & Berry, 2007). Moreover, the U.S. poverty rate doesn't provide a good measure of well being (Blank, 2002). That is, it conveys the extent, but not the depth of poverty that other means-tested measures, attached to reducing the poverty gap, provide. The use of AFDC/TANF recipients as a variable is intended to reflect deeper poverty or need that is not reflected in the poverty rate.

The measure of economic performance used is Gross State Product (U.S. Bureau of Economic Analysis). Gross state product is the most general measure of economic performance, and it can be affected by simple expansion (quantitative change) or productivity enhancements that are more consistent with development than simple growth (qualitative change). It is also affected by macroeconomic factors such as recessions and expansions. These considerations lead to the inclusion of a set of control variables in the study.

In the way of control variables, inflation is accounted for by using a standard GDP deflator (U.S. Bureau of Economic Analysis) to adjust Gross State Product to real dollars. Population corrects for state size in real terms. Population density captures differences that may exist between sparsely-populated rural states and more urbanized states that reap the benefits of agglomeration economies. Recession years are marked by a dichotomous variable to indicate those years of which any portion is designated a recession (1 = recession, 0 = no recession). For the initial set of models, the sixteen southern states are also distinguished by a dichotomous variable (1 = southern, 0 = not southern).

Methods

These data are used to estimate the models identified above, using pooled cross-sectional time-series analysis as suggested by Beck and Katz (1995). Beck and Katz (1995) use Monte Carlo simulations to demonstrate that previously preferred methods of time series analysis, such as that suggested by Parks (1967), present significant concerns for reliability and interpretability as a result of overconfidence. They propose a new method using Ordinary Least Squares regression with Panel-Corrected Standard Errors, and then use Monte Carlo simulation to demonstrate that the method is at least as good as the OLS method when OLS standard errors perform well, and better when OLS standard errors perform poorly (Beck and Katz, 1995, p.

641). As a result, many past studies have presented results that are "either logically impossible to obtain, or are completely a function of numerical inaccuracies" (Beck and Katz, 2005, p. 644). To ensure that the present analysis is robust, the cross-sectional analysis will be performed using panel-corrected standard errors in OLS, as Beck & Katz recommend.

Each model is tested using same-year data and, to capture the effects of time, additional models are tested in which each dependent variable is also adjusted for leads up to five years. A longer 10-year lag is included in the models assessing change in gross state product. A comparison of the results provides evidence of the relationship(s), the magnitude of the effect(s), and the statistical significance of each predictor; comparing the trends over time demonstrates the extent to which each independent variable's effect plays out in state economic performance. Comparing each model to its counterpart (M1 to M1b, for example) demonstrates the difference between the fifty states collectively (M1) and the sixteen southern states (M1b).

Because endogeneity between the independent and dependent variables is a concern in this analysis, special care has been taken to address it in the statistical models developed. The potential bias stems from the fact that economic growth provides resources that may be put to use in developing innovative capacity or abating poverty, thus the variables may operate cyclically to some extent. Building time lags into the model enables the changes in both sets of variables to be monitored over time. Looking at the effect of poverty on innovation capacity and on economic growth, alongside innovation capacity, helps to alleviate concerns expressed regarding potential endogeneity. The pooled cross-section of time series data presents itself well to these tests of effects over time, but the potential endogeneity should be kept in mind in interpreting results.

The following section presents the findings of these analyses with the results of each model group presented in separate tables. Following the findings, the results are discussed and the implications of the findings for public policy making are evaluated.

Findings

The tables that follow present the results of each set of analysis described. Tables 1-4 present the results for all 50 states. Each of the models in these tables include the dummy variable for southern states. That variable's statistical significance in each model indicated the need to conduct a second set of analyses for the southern states by themselves, as indicated by M1b-M25b; these results are presented in tables 5-8.

Table 1 demonstrates the effects of poverty and controls on formation of human capacity for innovation. Model 1 presents the same-year effects, with models 2-6 examining the effects of current year capacity on outcomes 1-5 years in the future, respectively. The fit of these models is moderately good, with R-square values around 0.39. Poverty rate achieves significance ($p<.05$) with an unexpected, but weak, positive coefficient. This may signal that places with poverty are investing in human capital already, in an attempt to overcome it. Both the unemployment rate and AFDC/TANF caseloads are negatively affect formation of Human capacity for innovation. Population and density carry positive and significant coefficients in each model. Recession has no observable effect on formation of human capacity in the same or future years. Of particular interest is the fact that southern states are different, with significant and large negative effects of this variable on human capacity.

<Table 1 about here>

Table 2 shows the impact of poverty and control measures on formation of federal financial capacity for innovation. Though the models are fairly weak, with R-squared values

ranging from 0.16-0.18, the expected effects of poverty are revealed. Increasing poverty decreases federal financial capacity for innovation as demonstrated by negative and statistically significant coefficients in each model. This effect appears to gain in strength over time. Unemployment is not statistically significant in most models, but AFDC/TANF is significant and positive in each. This result is counterintuitive, unless greater deep poverty is revealed in greater targeting of federal funding. Population decreases formation of federal financial capacity for innovation, though increased density stimulates it. Recessions decrease formation of federal financial capacity. Finally, being a southern state increases FFCI significantly in each model. It is wise to keep in mind that there is a large amount of unexplained variance in these models, so while the effects are as described, other causal factors are also at work.

<Table 2 about here>

Table 3 presents findings of models 13-18, examining the effect of poverty on formation of state and local financial capacity for innovation. The models are moderate in strength, with R-squared values ranging from 0.27 to 0.30. Poverty has no observable effect on state investment in capacity for innovation. Unemployment has a limiting effect, as would be expected given that state balanced budget requirements link tax revenues and spending. AFDC/TANF caseloads have a positive and significant effect on State and local financial capacity for innovation. This is contrary to expectation, but may indicate that states with high caseloads are investing in capacity for innovation to combat poverty. Population and density increases have negative effects on state and local financial capacity for innovation. Recession years and southern states also have lower state/local financial capacity for innovation.

<Table 3 about here>

To review, higher poverty seems to increase, though slightly, human capacity for innovation while decreasing federal financial capacity for innovation, and with no effect on state/local financial capacity for innovation. Higher unemployment and TANF caseloads decrease formation of human capacity for innovation while increasing federal financial capacity. Unemployment decreases, while TANF caseload increases, state/local financial capacity for innovation. In other words, there is not a consistent effect of poverty on all dimensions of innovation capacity in the 50-state models. Models 19-25 consider the combined effects of innovation capacity and poverty on gross state product (table 4).

Models 19-25 have very high R-squared values (0.97), indicating a strong fit for the set of models. Poverty does not affect gross state product independently in the same year or any year up to five years in the future. However, a 10-year lead does show a negative and significant effect of poverty on gross state product. This may indicate that longer timeframes provide time for poverty's ill effects to be realized. It may also mean that childhood poverty "grows up" into negative effects on economic growth. Meanwhile, the three components of innovation capacity are all positive, significant, and have an enduring but declining effect. Both population and density increases lead to greater gross state product, and recessions decrease it, as expected. Southern states have lower gross state products than their counterparts.

<Table 4 about here>

As indicated above, the significance of the southern dummy variable in each model indicates that the southern states are different as poverty and economic development are concerned, and should be analyzed separately to better understand their differences. Models 1b-25b mirror the findings presented in tables 1-4 but for the sixteen southern states only. Tables 5-8 present the results of these southern-state analyses.

Table 5 examines the effect of poverty rates on formation of human capacity for innovation in the southern states. The results are moderately strong, with R-squared values around 0.47 for models 1b-6b. Here the effect of poverty is as expected, negative and statistically significant, though declining slowly over time. Unemployment also has a negative and significant effect, but AFDC/TANF caseloads have a positive effect. Population plays no role in explaining formation of human capacity for innovation in the south, but greater density decreases it. Recessions have no impact on formation of human capacity for innovation. The difference in the direction of the coefficients between table 1 and table 5 provides evidence that the unique environment in the south means that these states face different challenges and require different policies than other states.

<Table 5 about here>

Table 6 shows the effects of poverty on formation of federal financial capacity for innovation in the south. Unlike the 50-state models in table 2, these results are strong, with R-squared values around 0.80. Poverty rates have no effect on federal financial capacity for innovation in the southern states as evidenced by the non-significant coefficients. AFDC/TANF has a positive effect only in the same year and the year following. Unemployment has a negative and significant effect in each model. Population decreases federal financial capacity for innovation while density increases it. Recessions generally have no effect.

<Table 6 about here>

Table 7 considers the third component of innovation capacity—state and local financial capacity for innovation—in the south. Models 13b-18b are moderate in strength, ranging from 0.39 in the same year to 0.29 in the five year lead model (18b). Poverty has an inconsistent effect in these models, with the same year and 1- and 3-year lead models having a significant and

positive coefficient. Unemployment and TANF have generally the same effects they did in the 50-state models (table 3), with unemployment showing a negative effect on state/local financial capacity for innovation and TANF caseloads showing a positive effect. Population decreases state/local financial capacity for innovation in the south as in the nation as a whole, but population density has no statistical effect on state/local financial capacity for innovation. Recessions decrease formation of state/local financial capacity in the south.

<Table 7 about here>

To recapitulate, the effect of poverty on formation of innovation capacity in the south is different than in the nation as a whole. Poverty rate increases impede formation of human capacity for innovation in the south, have no effect on federal financial capacity, and are inconsistent in their positive effects on formation of state/local financial capacity for innovation. In the south, TANF consistently increases the factors of innovation capacity while unemployment consistently decreases them.

Table 8 examines the combined effects of innovation capacity and poverty on generation of gross state product in the south. As in table 4 (models 19-25), models 19b-25b are very strong, with R-squared values near 0.98 in each case. Poverty has no significant effect on gross state product, even in the 10-year lead model. As in the full model (table 4), the three innovation capacity components are positive and significant in each model. Also as in the 50-state model, population increases lead to gross state product increases in the south. In the south, however, density has a negative effect on gross state product in the same year through the second year out, rapidly declining. This is quite unique when compared to models 19-25 (table 4). Recessions in the south have a negative effect on gross state product in the 1- and 2-year lead models only—greatly attenuated over the negative effect observed in the 50-state models.

To summarize these findings as succinctly as possible, poverty does not uniformly affect the formation of innovation capacity in the states, but it does negatively affect federal financial capacity for innovation in the 50-state models (table 2) and has a strong negative effect on human capacity for innovation in the southern state models (table 5). So H1 is partially confirmed.

As to whether the effects of poverty cancel out the positive effects of innovation capacity, it would appear that they do not—at least not within a short timeframe. Of course, studies have long held that systematic poverty, which takes a long-term view, is difficult to overcome. Poverty rates are not statistically significant in either the 50-state or the south-only models when controlling for innovation capacity and other factors. The one exception is in the 10-year lead model (M25) where poverty is shown to have a negative effect on GSP, displacing human capacity which falls out of significance in that model. It is only fair to say that these results imply a longer-term relationship among the factors herein considered than can be considered with the data that are presently available. It is also fair to say that poverty affects economic growth indirectly, rather than directly, through its effects on the individual components of innovation capacity. H2 is partially confirmed in that innovation capacity continues to positively impact gross state product given levels of poverty.

Finally, H3 is confirmed in spirit—that the southern states differ significantly from other places—but not in fact. Poverty has unique effects on the south compared to the national models. Moreover, the strength of innovation capacity is stronger in the south than in the national models; this was unexpected.

Discussion

The results above provide mixed support for the central hypotheses guiding the study. Whatever the specific cause of the relationships observed, a few things are clear. Were a longer timeframe of data available, the assumptions could be tested further. More importantly, the level of aggregation leaves much to be desired as concentrated pockets of poverty and innovation capacity are disguised through aggregation at the state level. The analysis provides an initial investigation to inform and frame future research at both national and sub-state levels. The value of the study's findings will be greatest when data permits investigation at the sub-state level where community characteristics are not masked by aggregation; as Weber, et al, (2005) note, poverty is not randomly distributed. This initial work develops the methodology at the state level to inform future investigations into county or city-level relationships. The laboratory of the states (or what Leman (1980) refers to as inductive policymaking) provides an opportunity to consider alternative comprehensive strategies that integrate concern for education, economic development and poverty in a coherent and logical fashion.

In developing policy to address poverty and economic development, a few guidelines seem in order. First, poverty does not impede economic growth resulting from innovation capacity at the state level. However, it does affect the formation of that capital at the state level, and surely has a more distinct effect at the local level that can not be observed here. It is thus incorrect to view poverty as simply a purpose of economic development—it is also important in that it affects some of the causal factors that lead to development and growth in important ways. It is also incorrect to consider job creation as a policy that simultaneously combats poverty and furthers economic development goals. Jobs are a short term patch in the global economy; human capital investments are a long term solution. More importantly, the jobs that can be performed by low-wage and low-skill workers are not likely jobs that will elevate those individuals out of

their impoverished state. So, the endeavor of economic development may proceed successfully, but the policies may not address poverty if the poor cannot perform the jobs created. The 'new economy,' characterized by globalization, growth of the service sector, and increase in the value of knowledge, does not mean poverty has been alleviated, and thus policy should reflect that need in the context of the current economic environment.

A second consideration is that policy must conform to local needs at the state level. The differences evident between the southern states and the nation as a whole are significant. Of particular note, poverty limits human capacity formation in the south—an expectation grounded in the knowledge that poverty is human in character. This was the expected finding for the nation as a whole, but the analysis did not bear that out as expected. In other words, poverty is different in the south, as is the economy, than in different parts of the country, and so policies must take these differences into account as states frame them to meet their poverty needs. As Fording and Berry (2007) have expressed, poverty rate is a measure of the breadth of need, but not the depth, and as such underestimates need. The use of AFDC/TANF caseloads in this study provides one deeper look at state poverty. This variable, too, shifts from a negative effect on human capacity for innovation in the national model to a positive one in the southern model (table 1 and 5). So, deep poverty seems to impede formation of human capacity at the national level, but it appears to stimulate it in the south—perhaps because so many individuals have been dependent on it for so long (welfare reform imposed time limits on benefits beginning in 1996, but the truncation of welfare rolls would only be evident in the last year or so of this dataset).

Poverty necessitates targeted effort and expenditure by federal, state, and local governments for equalization purposes, but funds used for these purposes necessarily come at the expense of alternative programs such as those geared toward economic growth. Investments in

appropriate infrastructure and capacity for economic growth may be reduced to fund poverty abatement. That is, systematic poverty may be a barrier to economic growth in that it reduces community capacity to engage in economic development. It is clear from this analysis that poverty does limit formation of some types of capacity for innovation, such as human capacity in the south, or federal capacity in the non-southern states. Linking the two policy areas in constructive ways that simultaneously achieve mutually desirable objectives will yield preferred policy solutions. Such linkages will need to take into account not only multiple policy goals, but knowledge of the fact that poverty has differential effects on distinct components of innovation capacity. This means that any policy must necessarily be tailored to suit the particular state/local needs given a solid understanding of the way the policy will affect not only poverty, but the indirect effects on innovation capacity that result.

These impacts are most salient in the U.S. South where development policy has been traditional, typically associated with branch plant recruitment, and where poverty has been particularly high. Smart policy design using sound evidence may prevent states from slipping farther behind their national counterparts. The findings of the study, when placed in context, provide new information to decision makers at federal and state levels that may lead to improved policy design. The lessons gleaned from this initial analysis provide basis for further empirical examination through enhanced model specification, and through sub-state analyses at the city or county level. Among the possible angles for future analysis is a comparison of state policies that reflect not only policy approaches and mechanisms, but also the proportion of state spending already attributed to addressing poverty versus that dedicated to economic development. In the current economic environment, it has also become essential to also include education, both secondary and post-secondary, in such evaluations.

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Figures and Tables:

Table 1: Pooled Cross-Sectional Time-Series Analysis Results

Effect of Poverty Measures on Formation of Human Capacity for Innovation

				Independent Variables							
	Model	**Dep. Var.**	**Model R^2**	*CONSTANT*	*POVERTY*	*UNEMPLOY*	*AFDCTANF*	*POPULAT*	*DENSITY*	*RECESSION*	*SOUTH*
1		*HCI*	0.390	.1555889 (2.00)*	.0134862 (2.44)*	-.0957594 (-5.97)***	-3.67e-07 (-2.94)**	6.28e-08 (8.27)***	.0016032 (28.31)***	.0095004 (0.13)	-.7659393 (-27.41)***
2		HCI_{t+1}	0.391	.1739719 (2.14)*	0.0119444 (2.11)*	-.0950783 (-6.16)***	-4.59e-07 (-3.87)***	6.92e-08 (9.64)***	.0016175 (27.96)***	.040736 (0.57)	-.7625144 (-25.34)***
3		HCI_{t+2}	0.392	.1854372 (2.32)*	.0138485 (2.34)*	-.0985507 (-6.78)***	-5.52e-07 (-4.96)***	7.53e-08 (11.56)***	.0016448 (28.63)***	.0407509 (0.64)	-.7709237 (-24.50)***
4		HCI_{t+3}	0.391	.1958602 (2.47)*	.0146893 (2.40)*	-.0981533 (-7.11)***	-6.19e-07 (-5.77)***	7.96e-08 (12.98)***	.0016632 (30.50)***	.0174793 (0.30)	-.7764221 (-23.66)***
5		HCI_{t+4}	0.388	.1914473 (2.38)*	.0158251 (2.56)*	-.0951322 (-7.23)***	-6.73E-07 (-6.62)***	8.24e-08 (14.39)***	0.0016912 (34.73)***	-.0306647 (-0.55)	-.7805237 (-22.66)***
6		HCI_{t+5}	0.385	.2141095 (2.66)**	.0137838 (2.16)*	-.0876524 (-6.99)***	-7.17e-07 (-7.65)***	8.43e-08 (15.93)***	.0016977 (38.55)***	-.0861724 (-1.73)	-.7773576 (-21.38)***

** = p<.05; ** = p<.01; *** = p<.001. Standard (z) scores in parentheses.*

Table 2: Pooled Cross-Sectional Time-Series Analysis Results

Effect of Poverty Measures on Formation of Federal Financial Capacity for Innovation

				Independent Variables							
	Model	**Dep. Var.**	**Model R^2**	*CONSTANT*	*POVERTY*	*UNEMPLOY*	*AFDCTANF*	*POPULAT*	*DENSITY*	*RECESSION*	*SOUTH*
7		*FFCI*	0.159	0.7752804	-.08091	.0070147	9.85e-07	-6.04e-08	.0009531	-.0896458	.6581663
				(7.33)***	(-7.28)***	(0.52)	(6.69)***	(-6.66)***	(17.47)***	(-1.72)	(12.18)***
8		$FFCI_{t+1}$	0.164	0.8152276	-.0831102	.0092279	1.12e-06	-6.95e-08	.0009554	-.1335215	.6895294
				(7.35)***	(-7.36)***	(0.68)	(8.11)***	(-8.14)***	(16.59)***	(-2.41)*	(12.52)***
9		$FFCI_{t+2}$	0.165	0.8199118	-.0851422	.0158642	1.21e-06	-7.52e-08	.0009532	-.1516055	.7075764
				(7.01)***	(-7.42)***	(1.18)	(9.09)***	(-9.58)***	(16.10)***	(-2.61)**	(12.75)***
10		$FFCI_{t+3}$	0.166	0.85002	-.0876791	.0177259	1.27e-06	-7.90e-08	.000943	-.1226262	.7296387
				(7.29)***	(-7.49)***	(1.32)	(9.61)***	(-10.20)***	(15.19)***	(-2.21)*	(12.91)***
11		$FFCI_{t+4}$	0.172	0.9441793	-.0955677	.021179	1.35e-06	-8.29e-08	.0008965	-.094275	.7737823
				(8.55)***	(-8.24)***	(1.64)	(10.59)***	(-11.03)***	(14.13)***	(-2.08)*	(13.46)***
12		$FFCI_{t+5}$	0.178	1.014228	-.1030784	.0269597	1.41e-06	-8.53e-08	.0008633	-.0874592	.8200033
				(8.57)***	(-8.36)***	(2.05)*	(11.50)***	(-11.90)***	(12.92)***	(-2.08)*	(13.77)***

** = p<.05; ** = p<.01; *** = p<.001. Standard (z) scores in parentheses.*

Table 3: Pooled Cross-Sectional Time-Series Analysis Results

Effect of Poverty Measures on Formation of State and Local Financial Capacity for Innovation

				Independent Variables							
	Model	**Dep. Var.**	**Model R^2**	*CONSTANT*	*POVERTY*	*UNEMPLOY*	*AFDCTANF*	*POPULAT*	*DENSITY*	*RECESSION*	*SOUTH*
13		*SLFCI*	0.299	1.314563 (7.74)***	.0110703 (1.61)	-.1422934 (-4.63)***	3.03e-07 (1.41)	-3.53e-08 (-2.80)**	-.0012991 (-16.07)***	-.3699019 (-1.90)	-.5108243 (-13.26)***
14		$SLFCI_{t+1}$	0.295	1.355981 (7.81)***	.0116933 (1.69)	-.1398737 (-4.68)***	5.05e-07 (2.66)**	-4.85e-08 (-4.41)***	-.0012853 (-16.06)***	-.3516153 (-1.87)	-.4905256 (-12.13)***
15		$SLFCI_{t+2}$	0.296	1.424927 (8.28)***	.0072558 (1.06)	-.1285047 (-4.55)***	7.29e-07 (4.60)***	-6.37e-08 (-7.11)***	-.0012939 (-16.91)***	-.3764925 (-2.13)*	-.4529865 (-11.29)***
16		$SLFCI_{t+3}$	0.295	1.404117 (8.22)***	.008044 (1.18)	-.1135695 (-4.21)***	8.14e-07 (5.29)***	-7.07e-08 (-8.21)***	-.0012866 (-18.00)***	-.4128303 (-2.45)*	-.4554372 (-11.25)***
17		$SLFCI_{t+4}$	0.284	1.37628 (7.88)***	.0062713 (0.88)	-.0951291 (-3.58)***	8.68e-07 (5.06)***	-7.55e-08 (-7.87)***	-.0012875 (-19.95)***	-.4028453 (-2.41)*	-.4536853 (-10.47)***
18		$SLFCI_{t+5}$	0.272	1.325345 (7.72)***	.0066994 (0.92)	-.0778707 (-3.05)**	8.85e-07 (4.71)***	-7.81e-08 (-7.47)***	-.0012871 (-22.18)***	-.3619114 (-2.28)*	-.4696601 (-10.45)***

** = p<.05; ** = p<.01; *** = p<.001. Standard (z) scores in parentheses.*

Table 4: Pooled Cross-Sectional Time-Series Analysis Results

Combined Effects of Poverty and Innovation Capacity on Gross State Product

				Independent Variables							
	Model	**Dep. Var.**	**Model R^2**	*CONSTANT*	*POVERTY*	*HCIpop*	*FFCIpop*	*SLFCIpop*	*POPULA*	*DENSITY*	*RECESSION*	*SOUTH*
19		*RGSP*	0.971	-1.37e+10	6.18e+07	1.40e+09	4.34e+09	1.02e+10	30458.44	2.57e+07	-1.12e+10	-1.25e+10
				(-4.04)***	(0.27)	(2.83)**	(8.08)***	(6.76)***	(43.47)***	(8.98)***	(-2.35)*	(-7.09)***
20		$RGSP_{t+1}$	0.970	-1.32e+10	4.16e+07	1.53e+09	4.73e+09	1.03e+10	31582.7	2.59e+07	-1.48e+10	-1.27e+10
				(-3.54)***	(0.17)	(2.71)**	(7.91)***	(6.59)***	(41.13)***	(9.67)***	(-2.95)**	(-6.71)***
21		$RGSP_{t+2}$	0.970	-1.47e+10	1.26e+08	1.87e+09	5.09e+09	1.04e+10	32648.44	2.63e+07	-1.58e+10	-1.33e+10
				(-3.66)***	(0.49)	(2.92)**	(7.98)***	(6.42)***	(40.98)***	(10.72)***	(-3.01)**	(-6.97)***
22		$RGSP_{t+3}$	0.972	-1.58e+10	2.44e+08	2.15e+09	5.18e+09	1.01e+10	33339.69	2.59e+07	-1.42e+10	-1.38e+10
				(-3.89)***	(0.95)	(3.01)**	(7.87)***	(6.10)***	(42.99)***	(11.24)***	(-2.67)**	(-7.44)***
23		$RGSP_{t+4}$	0.973	-1.64e+10	2.95e+08	2.44e+09	5.31e+09	9.86e+09	34058	2.50e+07	-1.21e+10	-1.39e+10
				(-4.00)***	(1.12)	(3.03)**	(7.84)***	(5.97)***	(45.84)***	(11.56)***	(-2.33)*	(-7.77)***
24		$RGSP_{t+5}$	0.974	-1.64e+10	2.97e+08	2.78e+09	5.53e+09	9.85e+09	34751.79	2.41e+07	-1.04e+10	-1.36e+10
				(-3.92)***	(1.09)	(3.01)**	(7.80)***	(5.93)***	(47.98)***	(12.11)***	(-2.05)*	(-8.10)***
25		$RGSP_{t+10}$	0.974	-2.55e+09	-8.53e+08	1.84e+09	5.87e+09	1.21e+10	38416.55	1.53e+07	-9.09e+08	-5.94e+09
				(-0.62)	(-3.26)***	(1.66)	(9.24)***	(5.53)***	(48.92)***	(5.70)***	(-0.16)	(-3.78)***

** = p<.05; ** = p<.01; *** = p<.001. Standard (z) scores in parentheses.*

Table 5: Pooled Cross-Sectional Time-Series Analysis Results

Effect of Poverty Measures on Formation of Human Capacity for Innovation

				Independent Variables						
	Model	**Dep. Var.**	**Model R^2**	*CONSTANT*	*POVERTY*	*UNEMPLOY*	*AFDCTANF*	*POPULAT*	*DENSITY*	*RECESSION*
1b		*HCI*	0.477	0.5370	-4.77E-02	-3.48E-02	9.36E-07	1.56E-08	-2.55E-03	-0.0674
				(4.45)***	(-5.85)***	(-2.62)**	(4.06)***	(2.18)*	(-11.63)***	(-1.08)
2b		HCI_{t+1}	0.475	0.5738	-4.86E-02	-3.55E-02	1.12E-06	8.71E-09	-2.61E-03	-0.0310
				(4.60)***	(-5.8)***	(-2.66)**	(5.06)***	(1.17)	(-10.79)***	(-0.5)
3b		HCI_{t+2}	0.474	0.6019	-4.78E-02	-3.79E-02	1.19E-06	5.31E-09	-2.64E-03	-0.0153
				(4.68)***	(-5.53)***	(-2.86)**	(5.56)***	(0.7)	(-9.98)***	(-0.26)
4b		HCI_{t+3}	0.473	0.6292	-4.73E-02	-3.75E-02	1.12E-06	6.93E-09	-2.69E-03	-0.0371
				(5.00)***	(-5.6)***	(-2.86)**	(5.10)***	(0.88)	(-9.66)***	(-0.63)
5b		HCI_{t+4}	0.474	0.6692	-4.75E-02	-3.60E-02	9.86E-07	1.12E-08	-2.76E-03	-0.0755
				(5.22)***	(-5.47)***	(-2.65)**	(4.13)***	(1.34)	(-9.29)***	(-1.22)
6b		HCI_{t+5}	0.479	0.7454	-5.11E-02	-3.00E-02	9.27E-07	1.30E-08	-2.87E-03	-0.1200
				(5.55)***	(-5.41)***	(-2.12)*	(3.57)***	(1.44)	(-9.32)***	(-1.94)

** = p<.05; ** = p<.01; *** = p<.001. Standard (z) scores in parentheses.*

Table 6: Pooled Cross-Sectional Time-Series Analysis Results

Effect of Poverty Measures on Formation of Federal Financial Capacity for Innovation

				Independent Variables						
	Model	**Dep. Var.**	**Model R^2**	*CONSTANT*	*POVERTY*	*UNEMPLOY*	*AFDCTANF*	*POPULAT*	*DENSITY*	*RECESSION*
7b		*FFCI*	0.798	-1.0930	1.21E-02	-4.25E-02	6.73E-07	-6.81E-08	1.22E-02	-0.0043
				(-9.31)***	(1.42)	(-4.07)***	(2.52)*	(-8.4)***	(51.96)***	(-0.17)
8b		$FFCI_{t+1}$	0.798	-1.0584	8.07E-03	-3.64E-02	6.60E-07	-6.87E-08	1.23E-02	-0.0322
				(-8.16)***	(0.89)	(-3.32)***	(2.06)*	(-6.93)***	(49.57)***	(-1.1)
9b		$FFCI_{t+2}$	0.798	-1.0983	1.01E-02	-3.40E-02	5.00E-07	-6.35E-08	1.25E-02	-0.0777
				(-8.1)***	(1.09)	(-2.94)**	(1.41)	(-5.69)***	(48.14)***	(-2.43)*
10b		$FFCI_{t+3}$	0.797	-1.1299	1.07E-02	-3.24E-02	4.09E-07	-6.01E-08	1.27E-02	-0.0654
				(-7.92)***	(1.12)	(-2.66)**	(1.12)	(-5.2)***	(45.89)***	(-1.84)
11b		$FFCI_{t+4}$	0.797	-1.2090	1.53E-02	-3.51E-02	3.90E-07	-5.84E-08	1.31E-02	-0.0530
				(-8.42)***	(1.58)	(-2.8)**	(1.02)	(-4.95)***	(45.69)***	(-1.54)
12b		$FFCI_{t+5}$	0.798	-1.2909	2.00E-02	-3.86E-02	4.37E-07	-5.83E-08	1.34E-02	-0.0394
				(-8.54)***	(1.93)	(-2.84)**	(1.05)	(-4.65)***	(43.39)***	(-1.13)

** = p<.05; ** = p<.01; *** = p<.001. Standard (z) scores in parentheses.*

Table 7: Pooled Cross-Sectional Time-Series Analysis Results

Effect of Poverty Measures on Formation of State and Local Financial Capacity for Innovation

				Independent Variables						
	Model	**Dep. Var.**	**Model R^2**	*CONSTANT*	*POVERTY*	*UNEMPLOY*	*AFDCTANF*	*POPULAT*	*DENSITY*	*RECESSION*
13b		*SLFCI*	0.392	0.8049	2.97E-02	-2.15E-01	3.70E-07	-2.74E-08	-3.01E-04	-0.3930
				(4.82)***	(2.8)**	(-7.45)***	(0.58)	(-1.5)	(-1.2)	(-2.45)*
14b		$SLFCI_{t+1}$	0.384	0.8958	2.56E-02	-2.07E-01	8.56E-07	-4.36E-08	-3.72E-04	-0.4023
				(5.23)***	(2.43)*	(-7.34)***	(1.38)	(-2.35)*	(-1.46)	(-2.57)**
15b		$SLFCI_{t+2}$	0.382	0.9855	1.92E-02	-1.94E-01	1.44E-06	-6.41E-08	-4.37E-04	-0.4075
				(5.74)***	(1.88)	(-7.32)***	(2.57)**	(-3.66)***	(-1.84)	(-2.83)**
16b		$SLFCI_{t+3}$	0.370	0.9184	2.23E-02	-1.83E-01	1.59E-06	-6.98E-08	-3.21E-04	-0.4225
				(5.34)***	(2.24)*	(-7.19)***	(2.97)**	(-4.00)***	(-1.43)	(-3.1)**
17b		$SLFCI_{t+4}$	0.327	0.9052	1.74E-02	-1.62E-01	1.77E-06	-7.55E-08	-2.96E-04	-0.4078
				(5.00)***	(1.67)	(-6.07)***	(3.32)***	(-4.26)***	(-1.3)	(-2.9)**
18b		$SLFCI_{t+5}$	0.287	0.8446	1.65E-02	-1.44E-01	1.95E-06	-8.00E-08	-2.34E-04	-0.3849
				(4.8)***	(1.56)	(-5.34)***	(3.86)***	(-4.72)***	(-1.03)	(-2.81)**

** = p<.05; ** = p<.01; *** = p<.001. Standard (z) scores in parentheses.*

Table 8: Pooled Cross-Sectional Time-Series Analysis Results

Combined Effects of Poverty and Innovation Capacity on Gross State Product

				Independent Variables						
Model	**Dep. Var.**	**Model R^2**	*CONSTANT*	*POVERTY*	*HCIpop*	*FFCIpop*	*SLFCIpop*	*POPULAT*	*DENSITY*	*RECESSION*
19b	*RGSP*	0.978	5.21E+09	-1.74E+08	1.21E+10	7.82E+09	1.47E+10	28,689.91	-6.83E+07	-5.42E+09
			(1.03)	(-0.51)	(6.97)***	(8.61)***	(10.21)***	(48.45)***	(-3.99)***	(-1.76)
20b	$RGSP_{t+1}$	0.977	3.89E+09	-1.80E+08	1.26E+10	7.52E+09	1.51E+10	29,879.56	-6.00E+07	-8.04E+09
			(0.69)	(0.50)	(6.81)***	(7.95)***	(9.92)***	(42.50)***	(-3.18)***	(-2.39)*
21b	$RGSP_{t+2}$	0.976	1.02E+07	-6.83E+07	1.41E+10	6.94E+09	1.55E+10	30,952.75	-4.31E+07	-8.47E+09
			0.00	(-0.19)	(7.35)***	(7.04)***	(10.04)***	(39.87)***	(-2.10)*	(-2.40)*
22b	$RGSP_{t+3}$	0.977	-2.81E+09	5.68E+07	1.53E+10	6.43E+09	1.55E+10	31,641.48	-2.76E+07	-6.74E+09
			(-0.46)	(0.16)	(7.53)***	(5.70)***	(9.66)***	(38.71)***	(-1.17)	(-1.84)
23b	$RGSP_{t+4}$	0.977	-4.94E+09	1.55E+08	1.64E+10	6.07E+09	1.57E+10	32,373.85	-1.50E+07	-5.19E+09
			(-0.79)	(0.44)	(7.68)***	(4.71)***	(9.58)***	(37.64)***	(-0.56)	(-1.46)
24b	$RGSP_{t+5}$	0.978	-6.48E+09	2.17E+08	1.73E+10	5.63E+09	1.61E+10	33,112.19	-1.17E+06	-4.75E+09
			(-1.03)	(0.61)	(7.60)***	(3.90)***	(10.19)***	(36.32)***	(-0.04)	(-1.44)
25b	$RGSP_{t+10}$	0.978	-4.31E+09	-2.64E+08	9.57E+09	4.82E+09	2.13E+10	38,310.40	7.14E+05	-8.04E+08
			(0.55)	(-0.55)	(2.77)**	(2.59)**	(8.70)***	(34.62)***	(0.02)	(-0.20)

** = p<.05; ** = p<.01; *** = p<.001. Standard (z) scores in parentheses.*