# State economic growth and growth policy impact

## Roger F. Riefler*

University of Nebraska-Lincoln

...the imagination and effectiveness of state, provincial, and municipal governments in the United States and many other countries in the 1990's is a far cry from the 1970's.

(Porter 1996, p. 93)

The concern over [state development] incentives will probably intensify both regionally and nationally as the federal government cuts taxes and the states are left to shoulder an increasing tax burden.

(Kale 1984, p. 31)

A federal model in which provincial and local governments wield greater discretion over infrastructure provision and economic development incentives is currently in vogue. This shift may decentralize economic activity, but it may also do so in an uneven and costly manner without achieving regional policy goals.

(Markusen 1996, p. 52)

Over the past two decades, state governments have become the major setting for innovations in U.S. economic development policy... Several analysts have argued that there has been a qualitative shift in the strategy underlying these programs.

[Leicht and Jenkins, 1994, p. 256]

## 1. Introduction

Commentators on the rise of the entrepreneurial state are legion. All seem to agree that growth policy in the 1990s is qualitatively, if not quantitatively, different from that in earlier decades. While scholars (and policy makers) differ in their description of current efforts, a common theme seems to be a melding of industrial and regional policy into a more focused or targeted development pol-

icy; gone are the days when policy "shoot(s) anything that flies" (Rubin 1988, p. 236). The statements, if not the actions, of state-level policy makers center on the need to attract growth industries, high wage (or value added) firms, and/or small and medium-sized establishments.

Implicit in such a combination of regional and industrial policies is the increased targeting of traditional policy tools such as infrastructure provision and economic development incentives as well as newly developed initiatives such as enterprise zones and business incubators. Such targeting, naturally, leads one to the case study method of policy evaluation (Fosler 1988; Feldman 1994; Marvil and Shkurti 1993; Yanarella and Green 1993).

Although such microstudies have added to our knowledge of policy channels and efficacy, it is still necessary, as noted by the quotations preceding this introduction, to develop more comprehensive or summary measures of policy effectiveness. This has been the objective of recent studies by Goss and Phillips (1994) and Loh (1993), and it is also the ultimate goal of the research reported in the present paper.

## 2. The model

We start our comprehensive evaluation of state-level development policy with a generalized labor demand function:

$$L = f(Q_o, P_o, I_1, ...I_n, ...I_m, P_1, ..., P_n, P_{n+1}, w^{-1})$$ (1)

where:

| | | |
|---|---|---|
| $L$ | = | Employment; |
| $Q$ | = | Output; |
| $I_1, ....I_m$ | = | Nonlabor inputs including n private sector inputs and m - n public inputs; |
| $w$ | = | The wage rate; |
| $P_o$ | = | The output price; and |
| $P_1, ....P_{n+1}$ | = | Nonlabor input prices including n private inputs and $P_{n+1}$ representing government taxes. |

The focus on the quantity of labor employed reflects regional data availability as well as the pivotal role played by the number of jobs in the policy maker's view of the social welfare function.

Simplifying equation (1) and concentrating on the direct role of state-level development policy on employment growth we obtain:

$$\Delta L = f(\Delta Z_i, \Delta G_i)$$ (2)

or

$$\Delta L = f(Z_i, G_i)$$ (3)

where:

| | | |
|---|---|---|
| $\Delta L$ | = | Employment growth; |
| $Z_i (\Delta Z_i)$ | = | The level of (change in) nongovernment locational factors; and |

$G_i$ ($\Delta G_i$)   =   The level of (change in) government locational factors.

As explained by Newman and Sullivan (1988, pp. 219-221), equation (2) when applied to a cross-section of states, emphasizes labor market disequilibrium, while equation (3) places emphasis on equilibrium conditions.

The existing literature concentrates on the proper specification of the right side variables (especially the policy variables) and/or tests the efficiency of the equilibrium versus disequilibrium model. A major question pursued by this paper is different: What is (are) the appropriate dependent variable(s) for capturing the effectiveness of development efforts?

Three alternative specifications of the left side variable in equations (2) and (3) are investigated. First we attempt to isolate the impact of state level policy initiatives on differential growth in total employment. Second, using the recent research of Polzin (1997), we investigate the differential impact of policy on basic and nonbasic employment growth. Finally, we rely on shift-share analysis to isolate changes in state competitiveness and investigate whether policy has had an effect on this crucial variable.

Much of the early literature on the effect of state development policies focused on their impact on an aggregate measure of overall state activity. Prime candidates considered include total employment, gross state product, personal income, and per capita income. In keeping with this tradition as well as with equations (1) to (3) above, we adopt total employment growth as our first policy objective and investigate the effect of *changes* in policy measures on *differential* employment growth.

In export base theory the basic or export sector is the exogenous driver of the regional economy. Nonbasic (and therefore total) employment responds to changes in basic employment in a predictable fashion as determined by the export base multiplier. This theory leads to two alternative, but possibly complementary, views of the channels through which state development policy might influence regional growth.

Consistent with the competitive view of the regional development process, state policy might be directed toward the stimulation of growth in the export sector. Regional scientists have been somewhat dubious of the effectiveness of such policies, often labeling them *smokestack chasing*, but some recent evidence might suggest a more sanguine evaluation. Export industries, being outward-oriented by definition, are likely to be influenced by locational factors outside the control of state and local policy makers. Referring to equation (1), however, it is clear that while policy can do little to affect output (Q) and output prices ($P_o$), policy makers can pursue avenues to influence relative input prices, productivity, and availability. We therefore will investigate the effectiveness of differences in development packages on the differential growth of basic employment.

A second channel for possible policy impact is through programs designed to influence the export base multiplier and the growth of nonbasic employment generated by any given increase in export employment. Such policies, consistent with a generative view of the regional growth process, emphasize the role of endogenous locational factors in determining impact leakages from the local economy. Focusing on changes in the growth rate of nonbasic employment, can we identify a policy impact on such endogenous growth?

For the third variant of our model, note the presence of $Q_o$ or $P_oQ_o$, the quantity of output, in equation (1) and its absence in equations (2) or (3). The existing literature implicitly assumes that state output, and therefore employment, is directly or indirectly (in the export base sense) tied to an increase in national demand.[1] Thus, application of equations (2) and (3) to a cross section of states emphasizes how well a state is competing for a piece of this national action. Shift-share analysis, however, suggests a second factor (a state's industrial mix going into the period of concern) that may significantly affect the observed pattern and rate of employment growth. For example, California's employment might have increased faster than did Arizona's in the 1980s not only because the Z's and G's of equations (2) and (3) favor California, but simply because that state went into the period with a favorable mix of nationally growing industries. Either the left side or right side of equations (2) and (3) must be adjusted for differences in industrial mix; the vector of $Q_o$s of equation (1) cannot be eliminated.[2]

The research reported below uses the competitive effect of a traditional shift-share model as the left side variable, thereby correcting for the influence of national growth and, more importantly, the varying industrial mix of states.[3] By focusing on differential competitive effects we hope to better capture the dimensions of observed state employment change amenable to state-level policy initiatives.

Total, basic, and nonbasic employment growth rates are calculated from the Polzin (1997) database. These data are generated from BEA employment statistics. State annual average growth rates for the 1970s (1980s) are subtracted from annual growth rates for the 1980s (1990s) in order to define our first set of

[1] In econometric modeling this effect is usually handled by including a demand factor, such as GSP, in the labor demand or employment function.

[2] See McHone (1984) for an earlier attempt to link shift-share and development incentives at the multistate SMSA level.

[3] Various authors have criticized what we have labeled the *competitive effect* as not being purged of industry mix effects (Arcelus 1984; Estaban-Marquillas 1972), but also note the view of Andrikopoulos, Brox, and Carvalho (1990). For our purposes it seems that any benefits from further refining the competitive effect would not justify the costs in terms of eschewing the traditional model.

dependent variables: change in total employment growth (TE1 and TE2), basic employment growth (B1 and B2), and nonbasic employment growth (NB1 and NB2).[4] State competitive effects also are generated using BEA employment data. These statistics allow the computation of competitive effects at the 65-sector level of detail. For testing of our versions of equations (2) and (3), the resulting sectoral effects are aggregated to yield relative (i.e., 1980s versus 1970s) annualized average change in competitive effects for 1) total employment (CT1 and CT2); 2) manufacturing (CM1 and CM2); and 3) services (CS1 and CS2).[5] The latter includes trade, finance, insurance, and real estate as well as business and personal services.[6]

Several authors, including those cited in the quotations introducing this paper, have pointed to the possibility of a change (or changes) in policy regimes over the period utilized by this study. This motivates our decision to divide our evaluation of policy into two (overlapping) periods. First, we compare state economic development in the 1980s (defined as 1983 to 1989) with that in the 1970s (1975 to 1979). These decades encompass a period of what might be called traditional (or supply side) policies. Second, we focus on a period of more entrepreneurial policies by comparing policy effectiveness in the 1990s (1991 to 1997) with that of the 1980s. It is important to emphasize that our dependent variables either measure the change in average annual (total, basic, and non-basic) employment growth rates for each of the 50 states in the 1980s (1990s) versus the 1970s (1980s) or the change in average annual competitive effects for these same periods.

The particular years representing each decade's growth episode are chosen on the basis of NBER benchmarks for recession troughs and peaks. The terminal

---

[4] State average annual growth in total, basic, and nonbasic employment from 1983 through 1989 was normalized by dividing by 1983 employment. In a similar fashion, average annual growth in the 1970s (1975 to 1979) was divided by 1975 employment. The resulting average annual percentage change in the 1970s was subtracted from that in the 1980s. The difference was multiplied by 100 to calculate TE1, B1, and NB1, respectively. An analogous calculation was made for the 1990s versus the 1980s. In the case of B2 and NB2, however, the Polzin (1977) calculations extended only to 1995, so changes in these variables refer only to the 1991 to 1995 period.

[5] The change in total (manufacturing, service) competitiveness is calculated by first determining the appropriate aggregate competitive effect for both the 1983 to 1989 and 1975 to 1979 periods. The results are divided by the number of years in each period in order to express the effect as an annual average. The 1975 to 1979 figure is then subtracted from the 1983 to 1989 values and the result normalized for state size by dividing by 1979 total state wage and salary employment. Finally, the result is multiplied by 100 to determine CT1, CM1, and CS1. Similar procedures are used to calculate CT2, CM2, and CS2.

[6] In discussing our results we tend to equate this rather broad definition of service competitiveness (really better stated as nonmanufacturing, nongovernment activity) with Polzin's nonbasic employment growth. Obviously, this is an approximation.

year of 1997 is dictated by data availability at the time the study was completed. It was felt that expansionary periods for the national economy would represent a fairer test of the utilization of employment growth as a proxy for the theoretically preferred competitive effects. Of course, the failure of all states (or regions) to track national growth in a congruent fashion will influence our results.[7] We adopt the disequilibrium version of the growth model as summarized by equation (2). Thus, we investigate the effect of changes in state development policy on *changes* in growth or competitiveness. Emphasis is placed on adjustment at the margin rather than on average policy effects. Given the time frames utilized, this seems appropriate.

The main characteristics differentiating the existing literature pertaining to the effectiveness of government policy initiatives on employment growth has been the treatment of right side variables. Not surprisingly, given the current state of applied location theory, studies differ on what nongovernmental locational attractors to include. Various measures of, or proxies for, input availability and cost and market access, as suggested by equation (1), are utilized. Considering the focus of this paper on adjustment at the margin, identification of such locational factors is less imperative. Input availability and market access, for instance, are unlikely to change significantly over the inter-decade periods applied in this paper. It is hypothesized that where changes in relative locational factors are possible (e.g., energy costs) such changes would vary in a geographically homogeneous fashion. Hence, regional dummy variables (DUM) are used to proxy variations in nongovernment locational attractors. Eight regions are defined, using traditional BEA designations, and DUM1 to DUM8 are used to represent, respectively, the Mid East, Great Lakes, Plains, Southeast, Southwest, Rocky Mountains, Far West, and New England.[8]

More important from the viewpoint of our objective is the specification of the change in G in equation (2). Here, we choose to rely on the existing literature to specify the relevant policy parameters. Reviewing that literature suggests, at the risk of oversimplifying, two genre of studies. The first, which might be called the *budgetary approach*, utilizes traditional state budgetary

---

[7] I hope the use of relatively long expansionary periods as well as the application of a disequilibrium formulation [equation (2)] will mitigate the effects of a lack of exact congruence. Limited experiments entailing changing the time periods utilized suggest the results are insensitive to small (one or two year) changes in the definition of growth episodes.

[8] Replacing the dummy variables with more explicit variables describing changes in locational attraction is of high priority for our research agenda. The $R^2$s of our results (see footnotes 19 and 23) and the fact that over 90 percent of the regional (non-interaction) dummy variables are significant at the 90 percent or better level suggest that these variables are useful proxies for the change in underlying locational factors. This enables us to focus on the main goals of this paper: (1) the proper specification of the left side variable and (2) evidence of regionally differentiated policy impact.

classifications of expenditures and revenues, as reported by sources such as the *Census of Governments*, to investigate the impact of education or infrastructure (e.g., highway) spending and corporate tax revenue on employment growth. Examples of this type study are reviewed by Eisinger (1988, Chart 8-2, p. 211). Much of the broader literature on tax incidence could be included here. See the literature cited in Newman and Sullivan (1988).

The second group of studies takes a narrower view of state development efforts. These studies, for instance, focus on the employment impact of government-fostered "business climate" (Riefler 1995), of state-issued industrial development bonds (Marlin 1984), of pollution control stringency (Aske 1994), of economic development agency spending (McCone 1984 and de Bartolome and Spiegel 1997), or of a composite index of development effort (Heaney and Rives 1996). Recent surveys of this literature appear in Gerking and Morgan (1991) and Bartik (1991).

The recently published study by Grant, Wallace, and Pitney (1995) and its supporting documentation provide the right side economic development policy variables applied in this study.[9] Given the central role these measures play in our research, a brief summary of the Grant, Wallace, and Pitney approach is provided. The reader is referred to the published Grant, Wallace, and Pitney study for further details of their methods. Grant, Wallace, and Pitney attempt to discern whether distinct state-level economic development policy packages existed over the 1970 to 1992 period. Using data published by Conway Data, Inc. identifying the presence or absence in each year of some 67 policy initiatives and strongly confirmatory factor analysis, Grant, Wallace, and Pitney identify those policies differentiating state development efforts.[10]

For the period 1970 to 1985 Grant, Wallace, and Pitney find five factors that successfully differentiate policies. Following Eisinger (1988) they label these differentiating policy dimensions as *supply-side* initiatives. The five are: 1) regressive tax policies (TAX); 2) debt financing (DEBT); 3) labor market deregulation (LMD); 4) geographically targeted policies (GT); and 5) pollution control incentives (PC1). Given the importance of these factors in our research, the specific programs loading on each factor are given in Appendix A of this paper.[11] Grant, Wallace, and Pitney find that, post - 1985, "so many states had adopted key pieces of the supply-side approach that distinct approaches could no longer be distinguished" (Grant, Wallace, and Pitney 1995, p. 139).

---

[9] I wish to thank Don Sherman II for providing factor regression scores by state for each year between 1970 and 1992. A similar study by Leicht and Jenkins (1994) also attempts to identify the general strategies underlying state development efforts.

[10] The Conway Data, Inc. statistics are published annually in the "50 States Legislative Climate Survey" of the *Industrial Development and Site Selection Handbook*.

[11] See Grant, Wallace, and Pitney (1995, p. 139) for specific values for the loadings.

For the 1988 to 1992 period, applying the same methods, Grant, Wallace, and Pitney find two *demand side* (again using Eisinger's terminology) factors differentiating state development efforts: 1) entrepreneurial policies (EI); and 2) enterprise zones (EZ). In addition, pollution control incentives (PC2) again significantly differentiate states in this period. The 1992 termination date for the Grant, Wallace, and Pitney study, recognizing the likely temporal lags of policy, dictates that extension of our results beyond the 1997 cut-off date for analysis would be questionable.

Again, given our choice of the disequilibrium model summarized by equation (2), in comparing the effectiveness of state policy in the 1980s versus the 1970s the *change* in factor scores for each policy variable between 1975, the start of our 1970s, and 1982 (the year preceding what we identify as the 1980s growth episode) were utilized.[12] Given the construction of Grant, Wallace, and Pitney's factor scores, a positive correlation would indicate that an increase in supply side policy effort resulted in an increase in employment growth (or competitiveness).[13] Similarly, for Grant, Wallace, and Pitney's demand side initiatives, it is hypothesized that the 1988 to 1992 change in factor scores for each of these policy packages would be positively correlated with improved employment performance 1991 to 1997 versus 1983 to 1989. Further, it is anticipated that comparison of the 1990s with the 1980s would give more consistently positive results than those for the earlier period, reflecting the increased prominence of the entrepreneurial state.

Finally, because Grant, Wallace, and Pitney note that their findings suggest "that some regions show clear preference for particular policies and that the particular policy configuration in each region tends to be unique" (1995, p. 142), interaction terms are defined.[14] These are generated by multiplying the change in various policy factor scores by the regional dummy variables (i.e., DUM1*TAX, etc.). The inclusion of these interaction effects also allows us to test the Grant, Wallace, and Pitney/Markusen(1996) hypothesis of uneven regional policy impacts.

The resulting statistical model applied when comparing the 1980s (1990s) to the 1970s (1980s) is:

$$\Delta E = {}_1b_1DUM1 + \ldots + {}_1b_8DUM8 + {}_1c_1\Delta G_j * DUM1 + \ldots {}_1c_8\Delta G_j * DUM8 + \varepsilon \quad (4)$$

where:

---

[12] It is also felt that the disequilibrium approach, by emphasizing adjustment at the margin, minimizes the twin problems of simultaneity and leads/lags in response to policy changes.

[13] The state-specific factor regression scores for 1975 are subtracted from those for 1982 to calculate the change in policy intensity. A positive (negative) result should capture the increase (decrease) in policy intensity over the period. See Grant, Wallace, and Pitney, p. 144. An analogous procedure is utilized for the 1988 to 1992 period.

[14] Leicht and Jenkins (1994) also report geographical differences in development strategies.

$\Delta E$ = The appropriate change in employment growth or change in competitive effect for each state;

$\Delta G_j$ = The change in the appropriate governmental policy factor score (e.g., TAX, EZ, etc.),;

DUM1 to DUM8 = The regional dummy variables; and

$\varepsilon$ = The appropriate error term.

The expected sign the regional/policy interaction variables, is positive. The sample includes all 50 states, but excludes the District of Columbia.

## 3. The results: 1980s versus 1970s

The five factors differentiating state policy packages over this period are geographically targeted policies (GT), regressive tax policies (TAX), debt financing packages (DEBT), labor market deregulation (LMD), and pollution control incentives (PC1). We identify six possible measures of policy impact: total employment (TE1), basic employment (B1), nonbasic employment (NB1), and the competitive effect in total (CT1), manufacturing (CM1), and service (CS1) employment. Thus, we have a total of 30 OLS regressions to test.[15]

We first estimate each model suppressing the regional/policy interaction variables. This allows us to investigate whether the state policy packages were having a nationally homogenous impact on our alternative measures of state growth.[16] Our findings are summarized below in Section 3.1. Subsequent application of the full model allows us to test the Grant, Wallace, and Pitney/Markusen hypothesis of differential regional impacts.

A careful examination of the model summarized by equation (4) reveals that the use of regional dummy variables for both intercept and regional interaction terms results in a block diagonal matrix and therefore a misspecification of actual degrees of freedom.[17] For that reason, significant results obtained through the application of equation (4) are verified through the application of equation (5), which is referred to as the *region only model* in presenting the results below:

---

[15] All equations are tested for heteroskedasticity using a test based on White (1980). Where heteroskedasticity is found to be significant, a heteroskedasticity consistent covariance matrix is generated as suggested by White. Selected equations, where cross correlations of residuals (i.e., basic and nonbasic left side variables) might occur, are tested for such effects. No significant cross correlations of residuals are found. All estimation is performed using version 3.1 of E-views.

[16] We report below the results of a series of univariate policy regressions. While sample size considerations preclude testing multivariate or interaction policy regressions at the regional level such testing is done at the national level with no significant results.

[17] The author wishes to acknowledge the insightful comments of an anonymous referee for this journal for both pointing out this potential problem in relying solely on the results generated by equation (4) and suggesting a method for minimizing its impact.

$$\Delta E_{ir} = a_1 + a_2 \Delta G_{ir} \qquad (5)$$

where all variables are as defined above and the subscript r indicates the appropriate BEA region. The results of both models [equations (4) and (5)] are presented in Section 3.2 because the former simplifies the task of identifying likely significant outcomes and the latter serves to corroborate those findings. Given the small size of some BEA regions, comparing the results of both models is a useful check on the consistency of our findings.

## 3.1. National results

Only one significant, at the 90 percent confidence interval, positive policy impact is found.[18] Increased pollution control incentives, in the form of tax exemptions and credits for control activity, are positively correlated with an improvement in a state's competitiveness as a location for manufacturing. Equation (6) presents the results (with the value of the appropriate t-statistic in parentheses) of this model:

$$CM1 = +0.324PC1 + 0.122DUM1 + 0.406DUM2 + 0.041DUM3$$
$$\qquad (1.95) \qquad (1.45) \qquad (4.85) \qquad (0.57)$$

$$\qquad (6)$$

$$+ 0.016DUM4 - 0.141DUM5 - 0.149DUM6 - 0.029DUM7 - 0.718DUM8$$
$$\quad (0.29) \qquad (-1.49) \qquad (-1.78) \qquad (-0.37) \qquad (-9.21)$$

Adjusted $R^2 = 0.685$

F-statistic $= 14.333$.

Debt policy had a negative impact, again significant at the 90 percent level, on increases in the growth of basic employment [equation (7)] and total competitiveness [equation (8)].

$$B1 = -1.893DEBT + 0.699DUM1 - 0.851DUM2 - 1.361DUM3$$
$$\qquad (-1.72) \qquad (0.87) \qquad (-1.04) \qquad (-2.10)$$

$$\qquad (7)$$

$$- 1.622DUM4 - 4.199DUM5 - 4.534DUM6 - 1.537DUM7 - 4.150DUM8$$
$$\quad (-3.23) \qquad (-4.93) \qquad (-5.95) \qquad (-2.06) \qquad (-5.89)$$

Adjusted $R^2 = .40$

F-statistic $= 5.037$

$$CT1 = -1.202DEBT + 1.667DUM1 + 1.055DUM2 - 0.556DUM3$$
$$\qquad (-1.77) \qquad (3.36) \qquad (2.09) \qquad (-1.40)$$

$$\qquad (8)$$

---

[18] In addition to entering the changes in policy factor scores in individual equations a regression including all policy changes (for both the 1980s/1970s and 1990s/1980s comparisons) is tested. In neither case are the policy variables significant.

$$+0.047DUM4 - 1.848DUM5 - 2.867DUM6 - 0.261DUM7 + 0.145DUM8$$
$$(0.15)\quad (-3.53)\quad (-6.12)\quad (-0.57)\quad (0.33)$$

Adjusted $R^2 = 0.52$

F-statistic $= 7.598$.

For the remaining 27 national models, the policy variable is insignificant at the 90 percent (or better) confidence interval. As a precursor to our regional results, however, in four cases the coefficient on the policy variable is again negative and significant at the 80 to 89 percent level. No other positive coefficient approaches traditionally acceptable levels of significance.

## 3.2. Regional results[19]

Increased state activity in the area of debt financing initiatives (DEBT) seems to have a consistent negative impact on employment growth or competitiveness, especially in the nonbasic or service sectors in the Southeast and possibly the Rocky Mountain states. In the former region, the negative impact on total employment growth (95 percent, 99 percent)[20] and total competitiveness (99 percent, 99 percent) reflects the results found for nonbasic employment growth (99 percent, 99 percent) and service competitiveness (95 percent, 99 percent). While the Rocky Mountain States consistently recorded the largest negative coefficients for the impact of debt policy (again on nonbasic and service sectors), a sample size of only five states results in, with one exception, a lack of significance when the equation (5) (region-only) model is applied. The exception is a significant negative impact (95 percent, 90 percent) on competitiveness in the service sector. These results indicate that increased state activity in the area of loans or loan guarantees for expansion affects mainly the service/nonbasic, as opposed to the basic/manufacturing, sectors of the economy. The impact is confined, however, to certain regions (the Southeast and possibly the Rocky Mountains) and is detrimental to the development process.

The impact of state policy in the form of increased labor market deregulation is sensitive to the measure of policy effectiveness utilized. In the Southeast,

---

[19] The number of models precludes presentation of detailed results (which are available from the author on request). Some indication of the overall robustness and consistency of results can be presented in terms of average (range) of adjusted $R^2$ for each policy variable:

   PC1 - $R^2 = .465$ (.356 - .691);
   LMD - $R^2 = .478$ (.325 - .625);
   DEBT - $R^2 = .538$ (.345 - .635);
   TAX - $R^2 = .457$ (.325 - .646); and
   GT - $R^2 = .590$ (.444 - .634).

Average F - statistics for these variables are 4.25, 4.76, 5.10, 4.01, and 6.44, respectively.

[20] Significance levels are given for equation (4) and equation (5) (region-only) models, respectively.

labor market policy is associated with slower growth in total (90 percent, 90 percent), basic (–, 90 percent), and nonbasic (90 percent, 88 percent) employment. No significant impact is found when measures of changed competitiveness are utilized. The Plains region also recorded negative impacts, confined to nonbasic employment growth (90 percent, 90 percent) and change in total competitiveness (95 percent, 90 percent). The Southwest, for improvement in total competitiveness, registered the only significant positive policy impact for labor market deregulation (99 percent, 78 percent). While the latter confidence level for the region-only model [equation (5)] is not significant (due to the small sample size of four states) at commonly acceptable confidence intervals, the fact that the absolute value of the coefficient (+4.089) is the largest found for any region in this equation is notable.

Increasing tax regressivity and increases in pollution control incentives had, for the most part, no significant impact in any region as measured by change in total, basic, or nonbasic employment growth. Significant impacts are found, however, on changes in state competitiveness as a location for employment growth. In the Southeast, increased tax regressivity is significantly (90 percent, 95 percent) correlated with improvements in a state's competitiveness as a location for manufacturing. Consistent with our national results, in both the Southeast (95 percent, 95 percent) and New England (95 percent, 90 percent), manufacturing competitiveness is improved by increased pollution control incentives. Some evidence of a positive impact of increased tax regressivity on the change in total (83 percent, 90 percent) and manufacturing (99 percent, –) competitiveness is found for the Mid-East, but as the confidence intervals suggest, the results are far from conclusive. Likewise, a negative association is found between pollution incentives and change in service competitiveness in the Great Lakes, but the impact is significant at only the 90 percent confidence interval and it disappears in the region-only model [equation (5)].

The most complex regional pattern of state policy impacts is found for increases in geographically targeted policies.[21] Increased policy emphasis in this area is found to have a favorable impact on growth in the Rocky Mountain and Far West states, but a negative impact in the Southeast and Plains regions. The positive effects in the two western regions are in the change of total (Rocky Mountain 99 percent , –; Far West 99 percent, 90 percent), basic (Rocky Mountain 95 percent, –; Far West 99 percent, –), and nonbasic (Rocky Mountain 95 percent, –; Far West 95 percent, 99 percent) employment growth. A favorable shift in the total competitive effect is recorded by the Far West (90 percent, 95 percent) and Rocky Mountains (99 percent, –) and in the service

---

[21] Note in Appendix A that these policies exclusively involve state funding of local development projects. As is the case with local growth policies in general, more intrastate variability in impact may be expected.

competitive effect in the Rocky Mountain states (90 percent, –); the Far West's positive effect for service competitiveness (88 percent, –) is close to the 90 percent confidence interval. The failure of the region-only model to capture a significant impact reflects the small sample size for the Rocky Mountain (n = 5) and Far West states (n = 6). When these regions are combined, the resulting coefficient on geographic targeting is always positive and, with the exception of manufacturing competitiveness, significant at between the 84 percent and 89 percent confidence interval.

The unfavorable impact of increases in geographically targeted policies is confined to the Southeast and Plains regions. In the Southeast, such policies result in slower growth in total (99 percent, 99 percent), basic (90 percent, 99 percent), and nonbasic (99 percent, 95 percent) employment growth as well as reduced competitiveness in the total (99 percent, 89 percent) and service sectors (95 percent, 99 percent)). For the Plains states, the negative effects are captured in total (88 percent, 95 percent), basic (90 percent, –), and nonbasic employment growth (90 percent, 99 percent) and total (95 percent, 99 percent) and service competitiveness (– , 95 percent).

Table 1 summarizes our regional results. Several tentative conclusions emerge at this point. First, although disaggregating total employment growth into basic and nonbasic components often yields little gain in knowledge (e.g., LMD, PC, and TAX), occasionally significant interpretative differences do emerge such as the effect of increased debt financing being confined to the non-basic component of total employment. Second, the change in competitive effects, by adjusting for state differences in industrial mix, seems to be empirically as well as theoretically more adept at capturing policy effects. Where impacts are recorded by our TE1, B1, and NB1 measures for certain regions, these effects also usually are reflected in at least one of our CT1, CM1, or CS1 variables. In addition, the competitive measures seem able to identify policy impacts in cases (e.g., PC1 and TAX) where employment growth is unable to discern policy impacts.

Focusing on the basic issue of policy effectiveness in the 1980s versus the 1970s, our results consistently suggest two conclusions. Increased policy emphasis on pollution control incentives, labor market deregulation, tax regressivity, debt financing, and geographically targeted initiatives are likely to have regionally differentiated effects. All eight regions appear in Table 1, but only the Southeast is affected by all five policy packages. In three of these cases the policy impact is negative, slowing growth and/or decreasing competitiveness. Three regions are affected by two policy packages; in the Plains region, changes in geographically targeted policies and labor market deregulation slowed growth or competitiveness. For the Mid-East and Rocky Mountain regions, changes in one policy package had a favorable impact, while those in the second are negative. In New England, Great Lakes, Southwest, and

**Table 1.** Significant policy impacts: regional results, 1980s versus 1970s

| Panel A: Debt | | | | | | |
|---|---|---|---|---|---|---|
| Southeast | TE1 | - | Negative | - | 95% , | 99% |
| | B1 | - | Negative | - | - , | 99% |
| | NB1 | - | Negative | - | 99% , | 99% |
| | CT1 | - | Negative | - | 99% , | 99% |
| | CS1 | - | Negative | - | 95% , | 99% |
| Rocky Mountain | TE1 | - | Negative | - | 90% , | - |
| | NB1 | - | Negative | - | 95% , | - |
| | CT1 | - | Negative | - | 95% , | - |
| | CS1 | - | Negative | - | 95% , | 90% |
| Mid-East | CS1 | - | Negative | - | 90% , | - |
| **Panel B: Labor market deregulation** | | | | | | |
| Southeast | TE1 | - | Negative | - | 90% , | 90% |
| | B1 | - | Negative | - | - , | 90% |
| | NB1 | - | Negative | - | 90% , | - |
| Plains | NB1 | - | Negative | - | 99% , | 95% |
| | CT1 | - | Negative | - | 95% , | 90% |
| Southwest | CT1 | - | Positive | - | 99% , | - |
| **Panel C: Tax regressivity** | | | | | | |
| Southeast | CM1 | - | Positive | - | 90% , | 95% |
| Mid-East | TE1 | - | Positive | - | - , | 90% |
| | CT1 | - | Positive | - | - , | 90% |
| | CM1 | - | Positive | - | 99% , | - |
| **Panel D: Pollution control incentives** | | | | | | |
| Southeast | CM1 | - | Positive | - | 95% , | 95% |
| New England | CM1 | - | Positive | - | 95% , | 90% |
| Great Lakes | CS1 | - | Negative | - | 90% , | - |
| **Panel E: Geographically targeted policies** | | | | | | |
| Rocky Mountain | TE1 | - | Positive | - | 99% , | - |
| | B1 | - | Positive | - | 95% , | - |
| | NB1 | - | Positive | - | 95% , | - |
| | CT1 | - | Positive | - | 99% , | - |
| | CS1 | - | Positive | - | 90% , | - |
| Far West | TE1 | - | Positive | - | 99% , | 90% |
| | B1 | - | Positive | - | 90% , | - |
| | NB1 | - | Positive | - | 95% , | 99% |
| | CT1 | - | Positive | - | 90% , | 95% |
| Southeast | TE1 | - | Negative | - | 99% , | 99% |
| | B1 | - | Negative | - | 90% , | 99% |
| | NB1 | - | Negative | - | 99% , | 95% |
| | CT1 | - | Negative | - | 99% , | - |
| | CS1 | - | Negative | - | 95% , | 99% |
| Plains | TE1 | - | Negative | - | - , | 95% |
| | B1 | - | Negative | - | 90% , | - |
| | NB1 | - | Negative | - | 90% , | 99% |
| | CT1 | - | Negative | - | 95% , | 99% |
| | CS1 | - | Negative | - | - , | 95% |

Results reported at the 90 percent or above confidence interval. The first confidence interval is for the composite model [equation (4)]; the second is for the region-only model [equation (5)]. A dash indicates failure to equal or exceed the 90 percent confidence interval

Far West, only one policy cluster impacts growth/competitiveness and, with the exception of the Great Lakes, the effect is positive.

Overall, in those cases where policy effects are isolated, those impacts are as likely to be negative (that is, reducing growth or competitiveness) as positive. Such results are consistent with the uneven impact hypothesized by Markusen and the questioning of the efficacy of traditional smokestack chasing state level growth policy during this period.

## 4. The results: 1990s versus 1980s

Grant, Wallace, and Pitney identify three factors differentiating state economic development policy in the 1988 to 1993 period: entrepreneurial initiatives (EI), enterprise zone packages (EZ), and, the only carryover from the earlier period, pollution control incentives (PC2). Combining these three policy packages with our six measures of change in state economic growth results in 18 models of the form of equation (4); these are evaluated in Section 4.2 below. The results of another 18 equations, with regional/policy interaction variables suppressed, are analyzed first.

## 4.1. National results

For those anticipating more robust results consistent with the advent of the entrepreneurial state, our national findings are disappointing. The only significant nation-wide policy impact found, and that at only the 90 percent confidence interval, is for entrepreneurial policies. As equation (9) summarizes, increased state use of venture capital programs, business incubators, and research parks as well as increased emphasis on grant programs for R&D had a favorable impact, at the national level, on increases in state growth in the area of basic employment.[22]

$$B2 = + 2.609EI - 2.442DUM1 - 0.947DUM2 - 0.526DUM3$$
$$(1.72) \quad (-4.37) \quad (-1.73) \quad (-1.09)$$

$$(9)$$

$$- 0.577DUM4 - 0.707DUM5 + 0.564DUM6 - 3.449DUM7 - 1.236DUM8$$
$$(-1.63) \quad (-1.12) \quad (1.00) \quad (-6.91) \quad (-2.46)$$

Adjusted $R^2 = 0.453$

F - statistic = 6.068.

Overall, with this one exception, our results do not support the hypothesis that state development efforts in the 1990s are having a consistent positive

[22] Again, the number in the parentheses is the value of the t-statistic. As noted earlier, use of Polzin's data for the 1990s necessitated the use of a 1995 terminal date for the 1990s growth episode.

impact generating increased national growth. No other positive coefficient approaches commonly accepted levels of significance. On the other hand, unlike our earlier results, no close to significant (at traditionally accepted levels) negative results are uncovered.

## 4.2 Regional results[23]

The reason for the sparsity of national results demonstrating the effectiveness of recently formulated state development initiatives quickly becomes apparent when we turn to the results of our regional models, which are summarized in Table 2. The culprit is found in the Grant, Wallace, and Pitney/Markusen hypothesis of differential policy implementation and success. Of a possible 144 measures of regional policy effectiveness, only 36 (25 percent) are significantly different from zero at the 90 percent or better confidence interval.[24] In 24 (or 67 percent) of these 36 cases the expected positive coefficient is found, indicating an increased policy effort is rewarded by increased employment growth or competitiveness. In the remaining 12 cases policy changes lead to reduced employment growth. In such a milieu the finding of a nationally homogeneous (beneficial) impact is unlikely.

The one significant finding at the national level of a positive relation between increased entrepreneurial policies and increased growth can be explained by the fact that our regional models recorded 11 such positive associations at the regional level versus four negatives. In the Plains region, increased emphasis on entrepreneurial policies is associated with increased total (–, 99 percent), basic (90 percent, 99 percent), and nonbasic (–, 99 percent) employment growth. This favorable impact is mirrored in increased competitiveness as a location for overall (90 percent, 99 percent), manufacturing (95 percent, 95 percent), and service ( –, 90 percent) employment growth.[25] Increased emphasis on these policies also has a positive impact on the Far West's competitive position for total (99 percent, 90 percent), manufacturing (90 percent, –), and service employment (99 percent, 90 percent). Using

---

[23] Once again the number of models precludes presentation of detailed results. The average (range) of adjusted $R^2$s for each policy package was PC2 - $R^2$ = .468 (.079 - .605); EI - $R^2$ = .541 (.348 - .663); EZ - $R^2$ = .394 (.036 - .567). The average F - statistics are 4.59, 5.54, and 4.07, respectively.

[24] The 144 possible measures are derived from three policy packages, eight regions, and six possible measures of policy effectiveness. It should be noted that in 30 of the theoretically possible 144 regional/policy interactions no significant change in the policy factor scores occurs. In these cases the appropriate interaction variable had to be deleted from the final model tested. Thus, in a sense, 32 percent, rather than 25 percent, possible results are significantly different from zero.

[25] The correlation with increases in nonbasic employment growth in the Plains region was also positive, but was significant at only the 88 percent confidence interval.

changes in employment growth rather than changes in competitiveness seems to sacrifice information; for the Far West only changes in total employment growth also are associated (95 percent, -) with positive changes in entrepreneurial policies. The only region where significant negative effects are recorded is the Mid-East. Increased effort in the entrepreneurial arena in this region results in slower growth in total (-, 95 percent) and basic employment (90 percent, 90 percent) as well as reduced competitiveness in total (-, 95 percent) and manufacturing (99 percent, -) employment growth. While this presents a consistent picture of impact on the Mid-East, overall the positive policy results, especially in the Plains regions, seem more insensitive to model specification.

In the case of enterprise zone policy only five of the eight regions (New England, Great Lakes, Southeast, Southwest and Rocky Mountains) record a significant change in use of this policy package. A significant impact on employment growth or competitiveness is found only in the Great Lakes, Southwest, and Rocky Mountain States. In the former two regions, increased emphasis on enterprise zone initiatives is associated with more rapid growth in total (both regions 99 percent, -) and nonbasic employment measures (-, 95 percent and 90 percent, -, respectively). In the Great Lakes, increased competitiveness for services (-, 90 percent) is associated with increased reliance on enterprise zone policies.[26] The significant negative effect in the Rocky Mountain region is found in the impact on total (99 percent, -), basic (90 percent, 90 percent), and nonbasic (-, 90 percent) employment growth. Note the positive effect (-, 95 percent) of increased reliance on enterprise zones on manufacturing competitiveness in the Rocky Mountain region. This is the only case uncovered in the entire study of sign reversal for policy impact within a region as one proceeds through the various alternative measures of policy impact.

In the area of increased pollution control incentives, favorable effects are found in the Plains and Southwestern regions. Negative effects are confined to the Far West. For the Plains, significant effects are encountered for total (-, 99 percent), basic (90 percent, 90 percent), and nonbasic (-, 95 percent) employment growth and increased competitiveness in the total (-, 95 percent) and manufacturing (90 percent, 90 percent) areas. In the Southwest, positive effects are limited to improvements in basic (90 percent, -) and nonbasic (90 percent, -) employment growth. No significant impact on improved competitiveness is found in this region. In no case did significant results for the Southwest carry over to the region-only model. This undoubtedly reflects the small sample size (e.g., four states). In the Far West, negative effects are captured by five of the six measures of the employment situation. Increased pollution control initiatives are associated with reduced employment growth in

---

[26] A favorable impact on CT2, competitiveness for total employment growth, was also found, but it was only significant at the 89 percent confidence interval.

**Table 2.** Significant policy impacts: regional results, 1990s versus 1980s

**Panel A: Entrepreneurial policies**

| Region | Variable | | Sign | | Sig. 1 | Sig. 2 |
|---|---|---|---|---|---|---|
| Plains | TE2 | - | Positive | - | -, | 99% |
| | B2 | - | Positive | - | 90%, | 99% |
| | NB2 | - | Positive | - | -, | 99% |
| | CT2 | - | Positive | - | 90%, | 99% |
| | CM2 | - | Positive | - | 95%, | 99% |
| | CS2 | - | Positive | - | -, | 90% |
| Far West | TE2 | - | Positive | - | 95%, | - |
| | CT2 | - | Positive | - | 99%, | 90% |
| | CM2 | - | Positive | - | 90%, | - |
| | CS2 | - | Positive | - | 99%, | 90% |
| Rocky Mountain | NB2 | - | Positive | - | -, | 90% |
| Mid-East | TE2 | | Negative | - | -, | 95% |
| | B2 | - | Negative | - | 90%, | 90% |
| | CT2 | - | Negative | - | -, | 95% |
| | CM2 | - | Negative | - | 99%, | - |

**Panel B: Enterprise zones**

| Region | Variable | | Sign | | Sig. 1 | Sig. 2 |
|---|---|---|---|---|---|---|
| Southwest | TE2 | - | Positive | - | 99%, | - |
| | NB2 | - | Positive | - | 90%, | – |
| Great Lakes | TE2 | - | Positive | - | 99%, | - |
| | NB2 | - | Positive | - | -, | 95% |
| | CS2 | - | Positive | - | -, | 90% |
| Rocky Mountain | TE2 | - | Negative | - | 99%, | - |
| | B2 | - | Negative | - | 90%, | 90% |
| | NB2 | - | Negative | - | -, | 90% |
| | CM2 | - | Positive | - | -, | 95% |

**Panel C: Pollution control incentives**

| Region | Variable | | Sign | | Sig. 1 | Sig. 2 |
|---|---|---|---|---|---|---|
| Plains | TE2 | - | Positive | - | -, | 99% |
| | B2 | - | Positive | - | 90%, | 90% |
| | NB2 | - | Positive | - | -, | 95% |
| | CT2 | - | Positive | - | -, | 95% |
| | CM2 | - | Positive | - | 90%, | 90% |
| South West | B2 | - | Positive | - | 90%, | - |
| | NB2 | - | Positive | - | 90%, | - |
| Far West | TE2 | - | Negative | - | 95%, | – |
| | B2 | - | Negative | - | 95%, | 90% |
| | NB2 | - | Negative | - | 95%, | - |
| | CT2 | - | Negative | - | 99%, | - |
| | CS2 | - | Negative | - | 99%, | - |

*Entries indicate dependent variables impacted, sign of impact, and level of significance for the composite model [equation (4)] and region-only model [equation (5)], respectively. TE2, B2, and NB2 refer to relative growth in total, basic, and nonbasic employment growth. CT2, CM2, and CS2 denote relative total, manufacturing, and service competitive effects

the total (95 percent, -), basic (95 percent, 90 percent), and nonbasic (95 percent, -) areas. In addition, competitiveness as a location for total (99 percent, -) and services (99 percent, -) growth is reduced.

Two regions are not mentioned in our above comparison of policy change and relative economic performance in the 1990s versus the 1980s: New England and the Southeast. In previous comparisons of the 1980s and 1970s, all regions recorded some significant response to policy ministrations. The exclusion of the Southeast in the later period is especially noteworthy because in the earlier interdecade comparison this region recorded significant policy impacts (albeit as likely negative as positive) for all five possible policy packages. While these results do not indicate that the southeastern states dropped out of the economic development game with the advent of the entrepreneurial state, they do suggest that these more recent policy packages are not impacting development in this region to the extent earlier policy did.

# 5. Conclusions

The objectives of this paper are both analytical and methodological. From the methodological viewpoint, we want to investigate the relative efficiency of six measures of possible policy impact. From an analytical perspective, our objective is to:
(1)  Evaluate the effectiveness of state economic development policies;
(2)  Test whether these effects are nationally homogeneous or, following what we label the Grant, Wallace, and Pitney/Markusen hypothesis, regionally differentiated or uneven; and
(3)  Determine if there are grounds for the increased optimism, present in much of the current literature, concerning the efficacy of recent state development initiatives.
We conclude by briefly outlining our findings with respect to these issues.

At the theoretical level equation (1) makes clear that use of the competitive effect to capture policy impact, by adjusting for industry mix effects or for $Q_0$ ($P_0 Q_0$) in that equation, is the preferred left side variable. At the applied level, however, how much do we sacrifice by replacing the appropriate differential competitive effect with employment growth in the equivalent variable? Further, how much do we gain by disaggregating total employment growth or competitiveness into its basic/nonbasic or manufacturing/services components? The second question is answered easily. Not surprisingly, disaggregation is better. It allows, for instance, one to capture the fact that increased debt financing incentives affect the nonbasic or service components of growth/competitiveness in the earlier interdecade period. It suggests that increased enterprise zone initiatives might have their most favorable impact on these same sectors in the later period, while entrepreneurial policies may be effective in both the basic/manufacturing and nonbasic/service areas.

It appears that in many cases employment growth is an adequate proxy for the relevant competitive effect in empirical analysis. This is the case, for

instance, for increased use of entrepreneurial policies in the Plains region in the 1990s versus the 1980s. All three policy impacts on competitiveness also are found for the equivalent employment growth variable. For the same period and policy variable in the Far West, however, only the increase in total competitiveness is reflected in increased total employment growth. The impact on manufacturing or service competitiveness is not reflected in changes in basic/nonbasic measures. Thus, for instance, using nonbasic employment growth, one would miss the impact of such policies on the nonbasic sector, an impact captured by using changes in state competitiveness as a location for service growth. For enterprise zones, the opposite effect is found. Of seven significant policy impacts in terms of employment growth, only two are confirmed using competitive measures. One clearly uses employment growth at great risk. Doing so would largely miss the impact of increased tax regressivity or increased pollution control incentives on differential growth in the earlier period. And, in the case of the Rocky Mountain region, the effect of enterprise zones on manufacturing growth is negative using basic employment as an indicator, but positive using the change in competitiveness. At best, employment growth might be considered a first approximation of the preferred measure.

Turning to the analytical issues raised, it appears that in the confines of the model being tested (e.g., recognizing the shortcomings of Grant, Wallace, and Pitney's measures of, for instance, intensity of policy use as well as the representation of nonpolicy location factors through the use of regional dummy variables) there is ample evidence that changes in state development policy are having an impact on changes in regional competitiveness.[27] Although there is some evidence of a nationally homogeneous impact in the case of pollution control incentives (1980s versus 1970s) or entrepreneurial policies (1990s versus 1980s), that evidence is weak. Results support the Grant, Wallace, and Pitney/Markusen hypothesis. Not only are policies regionally differentiated, as found by Grant, Wallace, and Pitney, but their impacts are regionally differentiated as hypothesized by Markusen. Not only are regional impacts uneven—they are, especially in the earlier period, as likely to be negative as positive.

On the final question of the relative effectiveness of more recent entrepreneurial state policies, any conclusion advanced must be tentative at this point. There are grounds for optimism, however. Policy had an impact in 25 percent of the cases comparing the 1990s to the 1980s in contrast to only 17 percent for the earlier interdecade comparison. The number of negative findings (25) in the earlier period exceeds the positive policy impacts found (16), suggesting, if not proving, a competitive or zero-sum-game view of policy impact. For the later

---

[27] One problem in using measures of intensity of development effort, such as state (tax) expenditures on development policy, is the simultaneity problem: they may reflect growth rather than cause that growth.

period plusses (67 percent) exceed minuses, leading one to hope for a generative or positive-sum-game view of policy impact.[28] Thus, the evidence suggests a positive policy impact for what has been called *the entrepreneurial state*, although clearly the jury is still undecided.

# References

Ambrosius, Margery M., "The Effectiveness of State Economic Development Policies: A Time Series Analysis," *Western Political Quarterly*, 42, no. 3 (1989).

Andrikopoulos, A., J. Brox, and E. Carvalho, "Shift-Share Analysis and the Potential for Predicting Regional Growth Patterns: Some Evidence for the Region of Quebec, Canada," *Growth and Change*, 21, no. 1 (1990), pp. 1-10.

Arcelus, Francisco, "An Extension of Shift-Share Analysis," *Growth and Change*, 15, no. 1 (1984), pp. 1-8.

Aske, David, "Economic Development and Environmental Regulations: Impact of State Environmental Regulatory Climates on State Manufacturing Employment," *Regional Science Perspectives*, 24, no. 2 (1994), pp. 30-48.

Bartik, Timothy J., *Who Benefits from State and Local Economic Development Policies?* (Kalamazoo, MI: W.E. UpJohn Institute, 1991).

de Bartolome, Charles A.M., and Mark M. Spiegel, "Does State Economic Development Spending Increase Manufacturing Employment?" *Journal of Urban Economics*, 41, no. 2 (1997), pp. 153-175.

Eisinger, Peter K., *The Rise of the Entrepreneurial State* (Madison, WI: The University of Wisconsin Press, 1988).

Estaban-Marquillas, J.M., "A Reinterpretation of Shift-Share Analysis," *Regional Science and Urban Economics*, 2 (1972), pp. 557-581.

Feldman, Maryann P., "The University and Economic Development: The Case of Johns Hopkins University and Baltimore," *Economic Development Quarterly*, 8, no. 1 (1994), pp. 67-76.

Fosler, R. Scott (ed.), *The New Economic Role of American States* (New York: Oxford University Press, 1988).

Gerking, Shelby, and William Morgan, "Measuring Effects of Industrial Location and State Economic Development Policy: A Survey," in Henry W. Herzog, Jr. and Alan M. Schlottman (eds.), *Industry Location and Public Policy* (Knoxville, TN: University of Tennessee Press, 1991).

Goss, Ernest Preston, and Joseph M. Phillips, "State Employment Growth: The Impact of Taxes and Economic Development Agency Spending," *Growth and Change*, 25, no. 3 (1994), pp. 287-300.

---

[28] If we focus on the effects by region, in the earlier period (Table1) eight of the 14 (57 percent) region/policy combinations are negative. For the later period of comparison (Table 2) seven of the nine (77 percent) are positive (and a tenth, the Rocky Mountains for EZ, records a sign reversal). Of course, final determination on this issue entails considering not only the sign but also the magnitude of the relevant coefficients.

Grant, Don Sherman II, Michael Wallace, and William D. Pitney, "Measuring State-Level Economic Development Programs, 1970-1992," *Economic Development Quarterly*, 9, no. 2 (1995), pp. 134-145.

Heaney, Michael T., and Janet M. Rives, "A Multidimensional Index of State Economic Development," paper presented at the annual meeting of the Mid-Continent Regional Science Association (1996).

Kale, Steven R., "U.S. Industrial Development Incentives and Manufacturing Growth During the 1970s," *Growth and Change*, 15, no. 1 (1984), pp. 26-34.

Leicht, Kevin T., and J. Craig Jenkins, "Three Strategies of State Economic Development: Entrepreneurial, Industrial Recruitment, and Deregulation Policies in the American States," *Economic Development Quarterly*, 8, no. 3 (1994), pp. 256-269.

Loh, Eng Seng, "The Effects of Job-Targeted Development Incentive Programs," *Growth and Change*, 24 (1993), pp. 365-383.

Markusen, Ann, "Interaction between Regional and Industrial Policies: Evidence from Four Countries," *International Regional Science Review*, 19, nos. 1 and 2 (1996), pp. 49-77

Marlin, Matthew R., "Industrial Development Bonds: Reviewing the Evidence in the Norfolk-Virginia Beach SMSA," *The Review of Regional Studies*, 14, no. 1 (1984), pp. 45-53.

Marvel, Mary K., and William J. Shkurti, "The Economic Impact of Development: Honda in Ohio," *Economic Development Quarterly*, no. 1 (1993), pp. 50-62.

McHone, W. Warren, "State Industrial Development Incentives and Employment Growth in Multistate SMSAs," *Growth and Change*, 15, no. 4 (1984), pp. 8-15.

Newman, Robert J., and Dennis H. Sullivan, "Econometric Analysis of Business Tax Impacts on Industrial Location: What Do We Know, and How Do We Know It?" *Journal of Urban Economics*, 23, no. 2 (1988), pp. 215-234.

Polzin, Paul, "Barro Growth Models Vs. Economic Base: Which Works Best?" paper presented at the Western Regional Science Association meetings (1997).

Porter, Michael E., "Reply [to Ann Markusen]," *International Regional Science Review*, 19, nos. 1 and 2 (1996), pp. 93-94.

Riefler, Roger F., "Comparative State Economic Growth: An Exploratory Investigation," *The Review of Regional Studies*, 25, no. 2 (1995), pp. 187-205.

Rubin, Herbert J., "Shoot Anything That Flies; Claim Anything That Falls: Conversations with Economic Development Practitioners," *Economic Development Quarterly*, 2, no. 3 (1988), pp. 236-251.

Smith, Tim R., and Deron Ferguson, "Targets of State and Local Economic Development Policy," *Regional Economic Digest of the Federal Reserve Bank of Kansas City*, 6, no. 3 (1995), pp. 4-11.

White, Halbert, "A Heteroskedasticity-Consistent Covariance Estimator and a Direct Test for Heteroskedasticity," *Econometrica*, 48 (1980), pp. 817-838.

Yanarella, Ernest J., and William C. Green, "Community, Labor, and Environmental Participation in Industrial Recruitment: East Asian Automobile Investment in Canada in Comparative Perspective," *Economic Development Quarterly*, 7, no. 1 (1993), pp. 50-62.

# Appendix A
# Factors loading on specific development policies

1975 to 1985
  REGRESSIVE TAX POLICIES (TAX)
        Corporate income tax exemption
        Personal income tax exemption
        Sales/use tax exemption on new equipment
        Accelerated depreciation of industrial equipment
  DEBT FINANCING (DEBT)
        State financing aid for existing plant expansion
        State loans for building, construction
        State/county loans for equipment, machinery
        State authority or agency bond revenue financing
        State loan guarantees for building construction and/or equipment/machinery
  LABOR MARKET DEREGULATION (LMD)
        Fair Employment Code (reverse coded)
        Minimum wage law (reverse coded)
        Right-to-work law
  GEOGRAPHICALLY TARGETED POLICIES (GT)
        State funds for city and/or county public works projects
        State funds for city and/or county master plans
        State funds for city and/or county recreational projects
  POLLUTION CONTROL INCENTIVES (PC1)
        Real property tax exemption
        Personal property tax exemption
        Sales/use tax exemption on purchase of pollution control facilities
        Sales/use tax exemption applicable to lease of pollution control facilities
        Credit against corporate income tax

1988 to 1992
  ENTREPRENEURIAL POLICIES (EI)
        State funds committed to venture capital program
        Research and development grants available to industry
        State funds committed to setting up incubators
        State funds committed to setting up research parks
  ENTERPRISE ZONES (EZ)
        Sales/sales and use tax credit
        Employer income tax credit

Job-creation/wage credit
Credit for selective hiring
POLLUTION CONTROL INCENTIVES (PC2)
Real property tax exemption
Personal property tax exemption
Sales/use tax exemption on purchase of pollution control facilities
Sales/use tax exemption applicable to lease of pollution control facilities
Credit against corporate income tax

Source: Don Sherman Grant II, Michael Wallace, and William D. Pitney (1995, Tables 1 and 3).