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## AN ASSESSMENT OF ECONOMIC DEVELOPMENT POLICY: NEBRASKA IN THE 1980S

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In the area of state and local economic growth policy there has a tendency, recently noted by Herbert J. Rubin, to "shoot anything that flies, claim anything that falls" (Rubin, 1988). This often entails development agencies pursuing a panoply of programs and actively seeking to implement or at least initiate policies based on the latest developmental buzzwords. At election time the glowing portrait of the recent growth record, usually painted by the incumbent politicians, can only be contrasted to the somber hues in the challengers' view of the economic situation. In such a world of braggadocio, camouflage, and overstatement, it is difficult to isolate the underlying growth trend of the regional economy, let alone the qualitative dimensions and factors effecting that trend.

Considering the increasing importance of state and local generative development policies during the 1980s (and now into the 1990s), it becomes even more imperative that regional scientist cut through the smokescreen of rhetoric in order to provide insightful analysis of "what's really going on" (Riefler, 1990a). Certainly the trend in the literature, as attested to by new journals such as *Economic Development Quarterly* and recent texts such as R. Scott Fosler's *The New Economic Role of American States: Strategies in a Competitive World Economy* (1988) and Peter K. Eisinger's *The Rise of the Entrepreneurial State* (1988) is to do just that. What appears to be emerging is an implicit consensus among scholars that a nascent multidimensional industrial policy is emanating at the state and local policy level; an industrial policy similar in many ways to that discussed and discarded at the national level in the early 1980s (Norton, 1986). As often happens in a federal system of government, a policy that is debated but rejected at one level of government enters the policy arena, often through the back door, at another level.

The purpose of this paper, however, is to go beyond nomenclature, whether it be terms such as *industrial policy* or *generative growth*, to a tentative analysis of the results of state level development policy. It is, therefore, the objective of this paper to further supplement and extend

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the literature, summarized by Fosler and Eisinger, on the effect of state efforts aimed at stimulating growth.<sup>1</sup> Growth is measured in employment terms. Although job growth is only one possible indicator of economic development (capital investment (or increase in assessed value), income growth, or reductions in income inequality being some other candidates), the timely availability and usual importance attached to this variable dictates its use here.<sup>2</sup> Toward that end the paper focuses, utilizing data for Nebraska, on the quantity and quality of employment growth during the 1982-1989 period. Updating the results of an earlier paper, Part I will investigate whether state (and local) development policy in the 1980s has had a favorable impact on the underlying growth trend in Nebraska. It will attempt to investigate whether the state's 1980s' growth represents a departure from previously observed development patterns. Emphasis in Part I will be on the observed quantity of employment growth.

Part II of the paper will turn to an investigation of the more qualitative dimensions of the recorded employment growth. Here attention will focus on the degree to which the observed growth trajectory correlates with possible goals of an industrial policy such as increasing income per worker or value added per employee. Together Parts II and III outline an approach that, while applied for illustrative purposes to Nebraska, can be applied to assess the quantitative and qualitative dimensions of growth policy impact in any state (or local area). Finally, Part III will summarize the findings for Nebraska and, what's more important at this stage of the research agenda, indicate directions for further investigation. Anticipating these concluding remarks, our results suggest some grounds for optimism (e.g., development policy in Nebraska seems to be working in terms of overall employment growth), although the qualitative dimensions of job growth present a more pessimistic view of the efficacy of policy impact.

One caveat to the analysis must be explicitly recognized at this point. The purpose of this paper is to evaluate, at a relatively aggregative level, the effect of overall state and local development efforts in the 1980s (versus the 1970s). No attempt is made to assess the effectiveness or impact of specific policy initiatives. Given the variety of Nebraska programs expanded (e.g., increased emphasis on international marketing efforts), broadened in coverage (e.g., tax incentives

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<sup>1</sup> See Fosler (1988, especially p. 328) and Eisinger (1988, especially p. 338). Also note Rodney A. Erickson's review of Fosler (*Journal of Regional Science*, August 1989, p. 489).

<sup>2</sup> See *The Corporation of Enterprise Development* (1990) for examples of the importance of employment indices as objectives of state development policy and indicators of resulting growth.

for firms locating in or expanding employment), and initiated (e.g., business incubators and venture capital funding), it is impossible without a more microeconomic data base than that available to this study to assess specific program impact. While unfortunate, the increasing number of development programs (e.g., 90 rather generic program areas are listed under the "State Policy Index" section of *The 1990 Development Report Card for the States* (1990)) and increased recognition of the development potential of other existing programs forces us to eschew more detailed analysis at this point in time in favor of an aggregate assessment.

## **Employment Growth in Nebraska**

Table I presents the 1982-1989 growth record for employment, by industry, in Nebraska. These annual data, from the Bureau of Economic Analysis (BEA), trace the recovery of employment from the nadir of the 1981-1982 recession. Although the 15.9 percent growth in jobs is impressive, the depth of the recession and the fact that this increment in employment was below the 20.9 percent increase at the national level must temper any sanguine evaluation. Of more interest to our analysis is the changing industrial structure of Nebraska employment.

Thirty-seven of the 64 industries in Table 1 recorded growth rates below average for the state; 14 industries exhibited decreases in employment. While the 62 percent decline in petroleum and coal products stands out, the industry's miniscule 0.03 percent share of 1982 employment tempers the importance of this figure. More significant are the 15 percent and 11 percent declines, respectively, in the railroad and communications industries—sectors that account for 1.9 percent and 1.6 percent of 1982 state employment. At the other end of the spectrum, the more than doubling of employment in the business service sector (accounting for 3.3 percent of the 1982 economy), the 56 percent increase in personal services, and the 50 percent increase in social services are notable.

A more comprehensive measure of the changing structure of Nebraska's employment is possible. Using the 1982 distribution of jobs (see column 2 in Table 1) as a proxy for Nebraska's historical comparative advantage and the 1982-1989 growth rates (column 5) as a measure of current advantage, we can gauge the change that has taken place in the state's economy. A Spearman rank correlation coefficient between the 1982 share and 1982-1989 growth rate of nongovernment employment is +0.0562 ( $n = 60$ ); for manufacturing the correlation coefficient was -0.059. Neither coefficient, of course, is significantly different from zero at any normally acceptable confidence interval. This lack of correlation between 1982 shares and 1982-1989 growth indi-

cates, from a locational perspective, that Nebraska in the 1980s was marching to the tune of a different drummer.

To what extent, however, do the changes in the 1980s represent a change from, say, the decade immediately preceding? And to what extent does the lack of correlation referred to in the previous paragraph simply reflect overall differential national trends? Alternatively, to focus on the issue of interest to this paper, to what extent can the experience of the 1980s be attributed to changes amenable to local policy manipulation? Utilization of the Mead/Ramsay (MR) model facilitates answering these questions (Mead and Ramsay, 1982, and Riefler, 1986).

The MR model is a version of the shift/share technique. Its forte is that it allows the analyst to directly compare economic behavior of a region in two different time periods without obscuring net shift, industrial mix, and regional competitive factors with the shifting employment base of the region. The basic equation of the MR model is:

$$dChE = [(E_1 - E_0) (N_0 + I_0 + R_0)] + [E_0\{(N_1 - N_0) + (I_1 - I_0) + (R_1 - R_0)\}]$$

where:

- $dChE$  = The differential change in employment between two time periods;
- $E_0(E_1)$  = A vector, over  $i$  industries, indicating employment at the beginning of the first (second) period;
- $N_0(N_1)$  = A vector, over  $i$  industries, of the net shift effect in the first (second) period;
- $I_0(I_1), R_0(R_1)$  = The analogously defined industrial mix and regional competitive effects for the two periods.

The model basically

- Compares the differential effect of overall national growth on Nebraska in two time periods  $[E_0(N_1 - N_0)]$ ;
- Compares the differential effect of individual industry growth, again at the national level, on Nebraska  $[E_0(I_1 - I_0)]$ ; and
- Compares the differential shift in regional competitiveness of Nebraska's industries between two time periods  $[E_0(R_1 - R_0)]$ .

All this is accomplished after adjusting for changes in the economic base of the state entering the two time periods  $[(E_1 - E_0) (N_0 + I_0 + R_0)]$ .<sup>3</sup>

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<sup>3</sup>For a comparison to traditional shift-share using Nebraska in the 1970s versus the 1980s, see Roger F. Riefler (1990b).

The MR model is used to compare Nebraska's growth record during the 1980s with that of a similarly prosperous period in the 1970s. To oversimplify somewhat, the former time frame (the 1980s) encompasses the period of evolving industrial policy or, in more comprehensive terms, emphasis on generative growth, while the latter (the 1970s) could be characterized by its stress on more traditional smokestack chasing and competitive growth initiatives. Table 2 shows the results obtained when the MR model is applied, utilizing in this case monthly data from the state and federal Departments of Labor, to a comparison of the March 1975-January 1980 and February 1984-December 1989 periods in Nebraska.<sup>4</sup>

After adjusting for changes in the state's economic base between the mid-1970s and early 1980s (e.g.,  $E_1 - E_0$ ), the differential behavior of total national employment growth (e.g.,  $N_1 - N_0$ ), and differences in national growth by industry (e.g.,  $I_1 - I_0$ ), the regional comparative growth effect,  $E_0 (R_1 - R_0)$ , is positive, indicating an improvement in Nebraska's competitive position in the latter time period.<sup>5</sup> While this improvement in competitive position could be due to many factors (such as the depreciation of the dollar in international trade), it is the working hypothesis of this paper that the shift reflects the favorable (direct and/or indirect) impact of state and local development policies. Table 3 contains the industrial breakdown of the (crucial for policy evaluation) regional comparative growth effect.

It should be noted that if annual data from the U.S. Department of Commerce, Bureau of Economic Analysis is substituted for that used to compute Table 2 (and Table 3 below), results are qualitatively similar. (See appendix.) In Table 2 the regional comparative advantage effect is 39 percent of the total differential change in employment (1980s versus 1970s); in Table 2a of the appendix the analogous percent is 31 percent.

Table 1 indicates both a significant increase in Nebraska employment in the 1980s and a change in the source of growth in that decade. Table 2 indicates that, in comparison to the 1970s, part of that increase is due to an improvement in the region's economic base (e.g., a total

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<sup>4</sup>The February 1984 date was used due to

- The likely policy lags in instituting a generative development policy; and
- The lingering effects of the 1981-1982 recession in agricultural regions such as Nebraska.

See Riefler (1990a) for a further discussion of these points.

<sup>5</sup>See Riefler (1990b) for an analysis of the stability of the regional competitive effect.

base effect of +11,879), but that an equally large factor is an improvement in the competitive situation in Nebraska (e.g.,  $E_0 [R_1 - R_0] = +10,263$ ). While the former effect is exogenous from the purview of state policy makers operating in the 1980s, the latter is clearly potentially endogenous and, given the working hypothesis outlined above, amenable to policy manipulation.

If favorable shifts in regional comparative advantage were limited to industries specializing in production for national (and international) markets such as manufacturing, one might suspect that demand factors largely outside the influence of indigenous state policy makers were largely responsible for observed developments. Or, alternatively, such results would suggest that state policy effectively was attracting business expansion through traditional supply side programs (e.g., tax breaks). Although manufacturing and federal government sectors in Table 3 do record favorable competitive effects, so do the largely local service, construction, and trade sectors. Only two of the nine major sectors in the table show a negative regional competitive advantage effect; the pervasive nature of favorable shifts in regional comparative advantage suggest that truly local indigenous factors on both the demand and supply side are at work (likely in conjunction with national factors) rather than merely local manifestations of national or international demand side phenomena.<sup>6</sup> At this point the evidence is suggestive, but not conclusive, in imputing a positive role to state (and local) development policy.

## Evaluation of Job Growth

It is useful to go behind the numerical aggregate record of state economic growth, reported and analyzed in Tables 1 to 3, and look at the quality of the recorded economic development in the 1980s. Give our tentative conclusion concerning the efficacy of state policy in generating employment growth, has that policy been effective in increasing the quality of employment in the state? One of the more interesting ways to answer this question (and in so doing further test the working hypothesis) is to imagine ourselves back in 1982 and posit the following question: given the 1982 structure of the Nebraska economy (see the

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<sup>6</sup>Table 3a in the appendix, constructed using Bureau of Economic Analysis employment data, shows an overall positive regional competitive effect in manufacturing (and 10 of 17 individual manufacturing sectors), retail trade, services, and government (as well as in the relatively minor mining and agricultural services industries), with negative effects for construction, transportation, communication, and public utilities, wholesale trade, and finance, insurance, and real estate. See Eisinger (1988, p. 10) for a discussion of supply side versus demand factors in policy formulation.

first two columns of Table 1), what industries would we like to see expand their relative position during the 1982-1989 period?

Answering this question is more difficult than one might first imagine. What is a good industry for a region's economy? What are (or should be) our growth objectives? Several possible criteria suggest themselves. Other things equal, we would like to see those industries that generate the highest earnings per worker expand rapidly. Further, it would be advantageous if income per production worker and income per nonproduction employee (e.g., supervisory, management, research jobs, etc.) were high. Alternatively, given the mix of available (or desired?) labor supply, more weight might be placed on either the production or nonproduction components of overall earnings per worker.

Priority might be given to industries with high wages per hour and a significant fraction of available jobs full-time in nature. Or, again alternatively, consideration might be given to a proper mix of full- and part-time employment opportunities considering the available (or desired) labor force (e.g., primary versus secondary earners, males/females, percent teenage and elderly labor, et cetera). Emphasis might be placed on industries with significant linkages to other sectors in the Nebraska economy. These linkages might be backward in nature, thereby providing a market for industries currently in Nebraska, or forward in the sense of supplying inputs to indigenous sectors.

At a slightly more esoteric level attention might be given, again other things equal, to industry value added per worker or per dollar of sales or shipments. As value added is defined as the value of sales minus the cost of material purchases it measures, roughly, the piece of the production pie available for local owners of the capital, land, and labor devoted to the production process (as well as the proportion of total output available for taxation and hence government revenue and expenditures). (See SRI International, 1988.) Finally, we might prefer, other things equal, expansion in large (or small) firms in industries containing a high percentage of production (nonproduction) workers characterized by branch (single) plant facilities and producing durables (nondurable, service, et cetera) goods or output. These dimensions of industrial composition may measure various aspects of growth potential, cyclical sensitivity, and indigenous control.

Unfortunately, on the basis of some preliminary work in the manufacturing sector, other things are seldom equal and these possible goals and objectives often conflict. Utilizing information from the 1982 *Census of Manufactures*, it is possible to compute some of these indicators of growth desirability for Nebraska (U.S. Department of Commerce, 1986). Table 4 contains Nebraska data for 16 major manufacturing industries in Nebraska (accounting for over 99 percent of total state secondary employment) on the number of establishments, income



per production worker, income per nonproduction worker, value added per dollar of shipments, value added per worker, percent of total employment accounted for by production workers, and percent of firms employing more than 20 workers. While the conflict between possible growth objectives is difficult to discern from this mass of information, some indication is given by the following: the (rank) correlation between income per production worker and income per nonproduction worker, while positive, is only significant at the 90 percent confidence interval; the correlation between value added per worker and value added per dollar of shipments is not significant; the correlation between value added per dollar of shipments and income per worker is negative (and significant at the 90 percent level), and there is no significant correlation between size of firm and percent of total employment accounted for by production workers.

Obviously our difficulty in identifying a single development objective or goal makes the evaluation of policy challenging (to say the least). Further, the lack of correlation between alternatives, even if only tested within the manufacturing sector, makes the evaluation of the actual 1982-1989 growth pattern reported in Table 1 or the possible policy effect identified in Tables 2 and 3 a formidable task. Rather than evaluate performance versus a single criterion, we must compare actual growth rates (Table 1) or improvement in regional comparative advantage (Table 3) with alternative measures of the quality of development.

Because the *1982 Census of Manufactures* offers us the most comprehensive menu of job quality indicators, initial evaluation of Nebraska's growth was restricted to the secondary sector. This analysis utilized the quality indicators summarized in Table 4 and employment growth data reported by the Bureau of Economic Analysis and contained in Table 1. The (Spearman rank) correlation coefficients between 1982 and 1989 manufacturing growth and value added per dollar of shipments by industry (+0.247) and 1982 income per nonproduction worker (+0.082), while positive, are not significantly different from zero. The correlation (-0.306) between employment growth and production worker salaries is negative, but also is not significantly different from zero. Thus, we can conclude that observed 1982-1989 growth patterns do not match the patterns indicated by the objectives or goals of maximizing income per (production or nonproduction) worker or garnering growth in high value added industries. Nonsignificant results also were obtained when correlating growth rank with:

- Value added per worker (-0.035);
- Percent of industry employment accounted for by production workers (+0.412); and
- Percent of firms employing more than 20 workers (+0.235).

The results consistently suggest a lack of correlation between qualitative goals and quantitative results.

Given the export nature of most of the manufacturing industries included in these preliminary tests and the nature of the data contained in Table 1, these results are disappointing but not surprising. The actual overall growth of Nebraska manufacturing industries is undoubtedly significantly dictated by occurrences beyond the state's borders. A more sophisticated test of the efficiency with which state development policy is achieving possible qualitative goals would correlate qualitative indices, such as those suggested above, with the differential regional competitive effects reported in Table 3. By adjusting observed growth patterns for developments at the national level and directly comparing the period (the 1980s) of active generative (or industrial) state policy with a period of competitive policy (the 1970s), this approach would represent a more even-handed evaluation of the qualitative dimension of recent Nebraska growth. The results of such a test are summarized in Table 5.

The first column in Table 5 identifies the job quality indicator being (rank) correlated with manufacturing regional competitive effects calculated from BEA data (e.g., Table 3a).<sup>7</sup> The second column utilizes the absolute size of the regional competitive effect while the third column divides that quantity by 1982 sector employment levels to normalize the change in regional competitiveness. Note that none of the rank correlation coefficients reported in Table 5 are significant at conventionally acceptable levels. Utilization of a superior measure of the impact of regional development policy, therefore, does not change our tentative conclusion advanced above; there appears to be no consistency between quantitative results that indicate a favorable policy impact and qualitative assessment that indicates no targeting in the manufacturing sector.

In the tertiary area, the *1982 Census of Service Industries*, the *1982 Census of Wholesale Trade*, and the *1982 Census of Retail Trade* offer less in the way of possible indicators of the quality of job growth (U.S. Department of Commerce, 1982, 1982, and 1982). Three mea-

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<sup>7</sup>BEA data were utilized in the construction of Table 5 due to the degree of industrial disaggregation provided ( $n = 16$ ). Similar calculations were performed using Nebraska Department of Labor statistics ( $n = 11$ ) with similar results overall; all rank correlation coefficients (save one) between change in regional comparative advantage and job quality indices were not significant. The one exception was that between relative regional competitive effect and value added per dollar of shipments. That coefficient, which was significant at the 90 percent confidence interval, was negative (-0.591), indicating that policy was effective in attracting low value added industries!

asures can be used: compensation per worker, sales per worker, and sales per establishment. The former two reflect labor productivity, while the latter can be taken as a (rather imperfect) indicator of capital productivity. Table 6 illustrates for each of these possible indicators of the quality of observed job growth the (rank) correlation between the quantitative dimension of growth, measured as 1982-1989 growth rate (column 2) or regional differential competitiveness (1980s versus 1970s—column 3) and the indicated qualitative dimension in column 1. The results mirror those reported above for manufacturing. In none of the six cases itemized in Table 6 is a significant rank correlation found.<sup>8</sup>

## Conclusions and Extensions

Nebraska's economy, while lagging behind the growth rate exhibited by the United States as a whole, has exhibited a relatively robust recovery from the depths of the 1981-1982 recession. Although recovery was delayed somewhat by a lagging agricultural sector, recent employment growth has been healthy. Further, a comparison of state growth in the 1980s with that in the 1970s indicates that the more recent period was characterized by an improvement in the region's competitive effect. This advancement was relatively pervasive across most major industrial groups. It seems reasonable, therefore, to suggest that the evolution of a more comprehensive state industrial policy based on the premise of generative growth was at least partially responsible for the improvement in competitive environment.

Accepting for the moment that the hypothesis that state industrial policy in the 1980s had a role in the improvement in Nebraska's competitive position, the major thrust of this paper was to evaluate the qualitative results of these initiatives. As is often the case when shifting gears from quantitative to qualitative analysis, there are difficulties in specifying qualitative goals or objectives. Despite this caveat, however, the available evidence is much less sanguine concerning the impact of development policy initiatives on the qualitative dimensions of

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<sup>8</sup>Using BEA data one qualitative assessment of overall job quality can be made. These data allow one to compare sector growth (Table 1) and regional competitive effect (Table 3a) with earnings per worker for 60 nongovernmental sectors of the state's economy. These 60 sectors encompass the totality of Nebraska's nonfarm private economy. The rank correlation coefficient between earnings per worker and 1982-1989 growth was -0.120. The coefficient for earnings per worker and differential regional competitiveness was -0.242. The former coefficient is not significantly different from zero, but the latter is significant at the 90 percent confidence interval. The negative coefficient suggests that Nebraska's regional competitiveness increased most rapidly in those industries with low earnings per worker in 1982. If attributable to development policies, this result certainly implies rather perverse targeting!

employment growth. It appears that although policy makers may be justified in claiming a significant role for economic development initiatives, especially if they claim "everything that falls," they continue overall to "shoot anything that flies." Evidence presented in this paper shows little if any overall targeting effect of development assistance package offered by the State of Nebraska.

The analysis presented in this paper, while suggestive, is far from definitive. Given the indirect linkages, for the most part, between development policy initiatives and employment growth and the multiple possible causes of the latter phenomenon, this situation is likely to exist for some time. (It will continue, therefore, to provide grist for the mills of both incumbent and challenging politicians.) Further research into the issues raised by this paper likely will continue to build a circumstantial case for the hypotheses raised. A first step in this direction will be to compare the employment growth record of other similarly situated states in the Midwest and, especially, their differential region competitive effect in the 1980s. Such a comparative exercise, when supplemented by a state-by-state analysis of development policy measures, should prove instructive in identifying the effectiveness of such initiatives.

A second avenue for further analysis would be to focus on factors likely to impinge on differential regional competitiveness. In addition to the changing nature of state policy, the focus of this paper, it is likely that the changing value of the dollar in international trade might help explain the comprehensive changes in regional competitiveness reported in Table 3. Certainly research by Carlino, Cody, and Voith (1990) suggests that the Nebraska economy is one of the few nationwide where, to date, we have been able to identify a discernable impact of exchange rate fluctuations. Simultaneous consideration of state level development policy, fluctuations in the value of the dollar, and, possibly, the trend in energy prices during the 1980s, all in the context of a model capable of assessing the impact of multiple causation, should help clarify the role of policy in the favorable shifts in Nebraska's comparative advantage.

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Table 1  
Nebraska Employment  
1982 and 1989

Sector/Industry	1982	Percent	1989	Percent	Growth 1982-1989
Total Employment	850,772		958,729		0.158848
Wage & Salary Employment	674,421		769,388		0.420879
Nonfarm Employment	765,246		886,804		-0.13359
Ag Service, Forestry, Fisheries	6,686	0.008737	9,500	0.010712	0.086346
Mining	2,777	0.003628	2,406	0.002713	0.131957
Construction	38,299	0.050047	41,606	0.046916	0.149394
Manufacturing	89,021	0.116329	100,768	0.113630	0.124692
Nondurable Goods	45,671	0.059681	52,494	0.059194	-0.06306
Food & Kindred	26,032	0.034017	29,278	0.033015	0.178636
Textile Milling	222	0.000290	208	0.000234	0.245152
Apparel & Other Textiles	2,200	0.002874	2,593	0.002923	0.184102
Paper & Allied	1,444	0.001886	1,798	0.002027	-0.07427
Printing & Publishing	8,756	0.011442	10,368	0.011691	-0.61574
Chemicals & Allied	2,585	0.003377	2,393	0.002698	0.334759
Petroleum & Coal Products	216	0.000282	83	0.000093	0.933884
Rubber & Miscellaneous Plastics	3,973	0.005191	5,303	0.005979	0.093408
Leather & Leather Products	242	0.000316	468	0.000527	0.085168
Durable Goods	44,150	0.057693	48,274	0.054435	0.776323
Lumber & Wood	2,043	0.002669	2,217	0.002499	0.199491
Furniture & Fixtures	1,605	0.002097	2,851	0.003214	-0.08245
Primary Metals	1,574	0.002056	1,888	0.002128	0.102342
Fabricated Metals	6,234	0.008146	5,720	0.006450	0.053317
Machinery Except Electric	11,354	0.014837	12,516	0.014113	-0.17076
Electric & Electronic Equipment	8,515	0.011127	8,969	0.010113	0.413821
Transportation Equipment Except Autos	2,196	0.002869	1,821	0.002053	0.107028
Motor Vehicles & Equipment	2,431	0.003176	3,437	0.003875	0.277039
Stone, Clay, & Glass	2,803	0.003662	3,103	0.003499	-0.38980
Instruments & Related	3,689	0.004820	4,711	0.005312	
Miscellaneous Manufacturing Equipment	1,706	0.002229	1,041	0.001173	

Table 1 (continued)  
Nebraska Employment  
1982 and 1989

Sector/Industry	1982	Percent	1989	Percent	Growth 1982-1989
Transportation & Utilities					
Railroad	51,669	0.067519	53,749	0.060609	0.040256
Truck & Warehouse	14,352	0.018754	12,232	0.013793	-0.14771
Water	16,116	0.021059	21,593	0.024349	0.339848
Other Transportation	120	0.000156	99	0.000111	-0.175
Communications	3,979	0.005199	5,728	0.006459	0.439557
Electricity, Gas, Sanitary	12,453	0.016273	11,131	0.012551	-0.10615
Wholesale Trade	4,649	0.006075	2,966	0.003344	-0.36201
Retail Trade	50,092	0.065458	54,612	0.061582	0.090233
Building & Garden Supply	140,693	0.183853	159,829	0.180230	0.136012
General Merchandise	7,022	0.009176	6,344	0.007153	-0.09655
Food Stores	15,429	0.020162	17,044	0.019219	0.104673
Auto Dealers & Service Stations	17,757	0.023204	22,580	0.025462	0.271611
Apparel & Accessories	16,923	0.022114	19,952	0.022498	0.178987
Furniture & Home Furnishings	7,685	0.010042	7,951	0.008965	0.034612
Eating & Drinking Establishments	5,654	0.007388	6,835	0.007707	0.208878
Miscellaneous Retail	42,052	0.054952	50,598	0.057056	0.203224
Finance, Insurance, & Real Estate	28,171	0.036812	28,525	0.032166	0.012566
Banking & Credit	60,472	0.079022	72,202	0.081418	0.193974
Other F.I.R.E.	15,738	0.020565	17,094	0.019275	0.086160
Securities & Commodities Brokers	44,734	0.058457	55,108	0.062142	0.231904
Insurance Carriers	1,590	0.002077	2,121	0.002391	0.333962
Insurance Agents	15,826	0.020680	16,913	0.019071	0.088684
Real Estate	8,349	0.010910	12,740	0.014366	0.525931
Combined Real Estate & Insurance	17,132	0.022387	21,012	0.023694	0.226476
Holding & Other Investment Companies	659	0.000861	430	0.000484	-0.34749
	1,178	0.001539	1,892	0.002133	0.606112



Table 1 (continued)  
Nebraska Employment  
1982 and 1989

Sector/Industry	1982	Percent	1989	Percent	Growth 1982-1989
Services	177,192	0.231549	234,013	0.263883	0.320674
Hotel & Other Lodging	8,140	0.010637	8,518	0.009605	0.046437
Personal Services	15,751	0.020582	24,543	0.027675	0.558186
Private Household	9,664	0.012628	7,953	0.008968	-0.17704
Business Services	25,448	0.033254	54,382	0.061323	1.13685
Auto Repair, Services	7,420	0.009696	10,302	0.011616	0.388409
Miscellaneous Repair Services	5,436	0.007103	6,268	0.007068	0.153053
Amusement & Recreation	8,292	0.010835	10,130	0.011423	0.221659
Motion Pictures	1,235	0.001613	1,229	0.001385	-0.00485
Health Services	50,372	0.065824	57,443	0.064775	0.140375
Legal Services	5,477	0.007157	6,210	0.007002	0.133832
Educational Services	9,125	0.011924	10,546	0.011892	0.155726
Social Services	6,855	0.008957	10,257	0.011566	0.496280
Museums, Botanical Gardens	218	0.000284	381	0.000429	0.747706
Membership Organizations	11,459	0.014974	12,185	0.013740	0.063356
Miscellaneous Services	12,300	0.016073	14,466	0.016312	0.176097
Government and Government Enterprises	147,545	0.192807	157,319	0.177399	0.066244
Federal, Civilian	16,335	0.021346	17,692	0.019950	0.083073
Military	18,127	0.023687	20,654	0.023290	0.139405
State & Local	113,083	0.147773	118,973	0.134159	0.052085

Source: Bureau of Economic Analysis, Regional Economic Information System

**Table 2\***  
**Nebraska Nonagricultural Employment Change**  
**March 1975-January 1980 versus**  
**February 1984-December 1989**

$N_0 (E_1 - E_0)$	+	11,724	
$I_0 (E_1 - E_0)$	+	2,184	
$R_0 (E_1 - E_0)$	-	2,030	
Total Base Effect			+ 11,879
$E_0 (N_1 - N_0)$	-	658	
$E_0 (I_1 - I_0)$	+	4,533	
$E_0 (R_1 - R_0)$	+	10,263	
Total Comparative Growth Effect			+ 14,714
Differential Employment Change			+ 26,593

\*Figures may not add due to rounding. See text for interpretation

Source: Nebraska Department of Labor and MR model

**Table 3\***  
**Industrial Composition of the**  
**Regional Comparative Advantage Effect**  
**March 1975-January 1980 versus**  
**February 1984-December 1989**

Sector		$E_0 (R_1 - R_0)$
Mining	+	371
Construction	+	3,535
Manufacturing	+	8,641
Durables	+	1,318
Construction Material	+	800
Furniture & Fixtures	+	1,125
Primary & Fabricated Metals	-	27
Machinery	-	604
Electrical Equipment	+	2,085
Other Durables	-	4,747
Nondurables	+	6,769
Food & Kindred Products	+	4,004
Textiles & Apparel**	+	542
Printing & Publishing	+	605
Chemicals & Allied Products	-	547
Other Nondurables	+	233
Transportation, Communication, & Public Utilities	-	4,634
Trade	+	3,613
Wholesale Trade	+	3,305
Retail Trade	+	1,179
Finance, Insurance, & Real Estate	-	3,079
Services	+	4,471
Government	+	2,056
Federal	+	1,744
State & Local	+	477

\* Figures may not add due to level of aggregation of MR application

\*\* In 1989 textile & apparel employment was added to the other nondurables category. Bureau of Economic Analysis data were used to disaggregate this figure. The result probably slightly overestimates the favorable regional comparative advantage in textiles & apparel and underestimates it for other nondurables

Source: Nebraska Department of Labor and MR methodology

Table 4  
1982 Job Quality Indices  
Nebraska

	Number of Establishments	Income Per Production Worker	Income per Nonproduction Worker	Value Added per \$1 Shipment	Value Added per Worker	% Total Employment Production Workers	% With More Than 20 Workers
Food & Kindred SIC 20	342	16,614	20,614	0.165	60,100	0.780	0.518
Apparel SIC 23	51	9,000	10,666	0.539	26,053	0.842	0.275
Lumber & Wood SIC 24	82	13,462	21,500	0.398	29,529	0.765	0.183
Furniture & Fixtures SIC 25	40	11,385	39,250	0.524	36,764	0.765	0.275
Paper & Allied SIC 26	22	15,000	28,000	0.401	37,154	0.769	0.682
Printing & Publishing SIC 27	407	12,771	16,862	0.612	31,740	0.623	0.204
Chemicals & Allied SIC 28	61	16,267	27,333	0.529	137,500	0.625	0.328
Rubber & Miscellaneous Plastics SIC 30	59	15,581	24,556	0.552	38,775	0.775	0.373
Stone, Clay, & Glass SIC 32	161	17,333	25,800	0.511	46,231	0.808	0.168
Primary Metals SIC 33	26	24,000	28,000	0.293	69,500	0.808	0.423
Fabricated Metals SIC 34	134	15,354	25,905	0.437	41,725	0.696	0.410
Machinery, Except Electric SIC 35	285	17,267	22,870	0.518	42,280	0.652	0.305
Electric & Electronic SIC 36	57	15,021	21,792	0.662	43,431	0.667	0.474
Transportation Equipment SIC 37	44	15,633	23,875	0.507	54,711	0.789	0.409
Instruments & Related SIC 38	24	14,833	21,167	0.701	66,250	0.833	0.583
Miscellaneous Manufacturing SIC 39	72	10,600	18,000	0.567	24,000	0.769	0.153

Source: 1982 Census of Manufacturers

**Table 5**  
**Rank Correlation Results\***  
**Manufacturing**  
**Change in Regional Competitive Effect**  
**Versus**  
**Job Quality Indices**

Job Quality Indicator	Absolute Competitive Effect**	Relative Competitive Effect**
Income per Production Worker	-0.338	-0.315
Income per Nonproduction Worker	-0.309	-0.174
Value Added per Dollar Shipments	+0.162	+0.132
Value Added per Worker	-0.115	-0.079
Percent Production Workers	+0.206	+0.188
Percent of Firms Employing Over 20	+0.156	+0.241

\* With  $n = 16$ , a rank correlation coefficient of 0.423 (absolute value) would be needed for significance at the 90 percent confidence interval

\*\* See text for definition

**Table 6**  
**Rank Correlation Results\***  
**Tertiary Sector**  
**Growth Rate and Change in Regional Competitive Effects**  
**Versus**  
**Job Quality Indices**

Job Quality Index	Growth Rate**	Relative Competitive Effect***
Payroll per Worker	+0.045	-0.153
Sales per Worker	-0.220	-0.217
Sales per Establishment	-0.192	-0.156

\*  $n = 20$ . Industries include wholesale trade, retail trade (eight sectors) and selected services (SRI, 1988)

\*\* 1982-1989 growth rate. See Table 1

\*\*\* See Table 3a

## Appendix

Data used to construct Tables 2 and 3 are from the Labor Market Information Section, Nebraska Department of Labor, *Nebraska Labor Market Information Quarterly*, various annual summary reports, Lincoln, Nebraska. These statistics are available on a monthly basis and therefore are useful in tracking employment behavior over the business cycle. (See Riefler, 1990a and 1990b.) The Bureau of Economic Analysis, U.S. Department of Commerce, as part of its *Regional Economic Information System*, also tabulates state employment data. These data were used in constructing Table 1. This appendix presents tables analogous to Tables 2 and 3 using this data source. Because BEA data are yearly versus monthly, more disaggregate, and compiled in a manner more consistent with top down modeling (e.g., agreeing with a national control total) than those generated by the Nebraska Department of Labor, significant differences in absolute change were anticipated (and found). Tables reveal similar qualitative conclusions, as observed in the text.

**Table 2a**  
**Nebraska Nonfarm Employment Change**  
**1975-1980 Versus 1984-1989**

$N_0 (E_1 - E_0)$	+	16,805		
$I_0 (E_1 - E_0)$	+	5,024		
$R_0 (E_1 - E_0)$	-	5,168		
Total Base Effect			+	16,661
$E_0 (N_1 - N_0)$	-	11,464		
$E_0 (I_1 - I_0)$	-	38		
$E_0 (R_1 - R_0)$	+	2,314		
Total Comparative Growth Effect			+	9,187
Differential Employment Change			+	7,474

Source: Bureau of Economic Analysis, *Regional Economic Information System* and MR methodology

**Table 3a**  
**Regional Competitive Effect:**  
**Industrial Composition**

Major* Sector/Industry	$E_0 (R_1 - R_0)$
Agricultural Services, Forestry, Fishing	+ 1,182
Mining	+ 426
Construction	- 651
Manufacturing	+ 3,427
Durables	- 680
Lumber & Wood Products	+ 28
Furniture & Fixtures	+ 1,157
Primary Metals	- 30
Fabricated Metals	- 835
Machinery, Except Electrical	- 679
Electrical & Electronic Equipment	+ 1,406
Transportation Equipment Except Auto	- 936
Motor Vehicles & Equipment	+ 349
Stone, Clay, & Glass	+ 64
Instruments & Related	+ 323
Miscellaneous Manufacturing Industries	- 506
Nondurables	+ 3,377
Food & Kindred Products	+ 2,322
Apparel & Other Textile	+ 164
Paper & Allied	+ 56
Printing & Publishing	+ 602
Chemicals & Allied Products	- 910
Rubber & Miscellaneous Plastics	- 434
Transportation, Communication, & Public Utilities	- 5,662
Railroad Transportation	- 3,167
Trucking & Warehousing	+ 2,840
Other Transportation	- 252
Communications	- 904
Electric, Sanitary, Gas Utilities	- 1,783
Wholesale Trade	- 950
Retail Trade	+ 3,753
Building & Garden Supplies	- 1,100
General Merchandise	- 217
Food Stores	+ 1,012
Auto Dealers & Service Stations	+ 1,087
Apparel & Accessories	- 581
Furniture & Home Furnishings	+ 89
Eating & Drinking Establishments	+ 3,761
Miscellaneous Retail	- 571
Finance, Insurance, & Real Estate	- 95
Banking & Credit Agencies	- 135
Other F.I.R.E.	+ 6
Securities & Commodities Brokers	- 49
Insurance Carriers	- 1,988
Insurance Agents	+ 880
Real Estate	+ 18
Holding & Other Investment Companies	+ 627



**Table 3a (continued)**  
**Regional Competitive Effect:**  
**Industrial Composition**

Major* Sector/Industry	$E_0 (R_1 - R_0)$	
Services	+	5,972
Hotels & Other Lodging	-	295
Personal Services	+	268
Private Household Services	+	377
Business Services	+	4,012
Auto Repair Services	+	207
Miscellaneous Repair Services	+	76
Amusement & Recreation	+	43
Motion Pictures	-	19
Health Services	-	1,745
Legal Services	-	155
Educational Services	+	166
Social Services	+	498
Membership Organizations	-	403
Miscellaneous Services	-	320
Government & Government Enterprises	-	5,089
Federal Civilian	+	1,440
Military	+	589
State & Local	-	6,965

\* Regional competitive effect for major sectors employing more than 1,000 in 1982. Figures may not add due to rounding, level of aggregation of MR application, and deletion of minor sectors