A Game of Incentives: Competition among States

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Undergraduate Honors Thesis
Spring Term 2001

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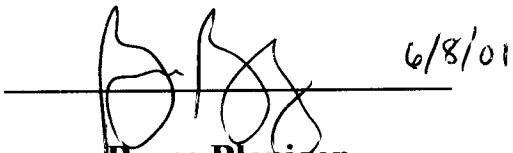

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Spring 2001

A Game of Incentives: Competition among States

By Robert Reineke

Abstract: This paper examines the relationship/correlation between states concerning the incentives that local government and city officials offer businesses who are choosing to locate in their regions. The question that is attempting to be answered is do states copy each other when coming up with the incentives that they choose to offer. More specifically, and perhaps more interestingly, do "neighboring" states copy each other in order to remain competitive. The conclusion of this paper will show that neighboring states tend to be correlated higher than states located some distance away. Also, correlations tend to run higher when unemployment rates are comparatively higher, although this relationship isn't as strong as the previous.

Introduction:

Over the past few decades our state governors and city mayors have assumed the responsibility of bringing in jobs for the region in which they govern. It has been there responsibility to create a positive business environment. According to some this is absolutely necessary or else they will face the inevitable. "Watch helplessly while neighboring states win the battle for new corporate facility investments and the jobs and economic growth that accompany them (Venable 1996, "Tax Cuts"). This has been no easy task in the past. Hundreds of committees, both private and public, have attempted to assist them with this never-ending job. Their goal, among other things has been to put together the right mix of policies that will entice firms to locate in their region. They understand that in order to thrive, and for some areas it's just a matter of surviving, they

must bring jobs to their region or city. They also understand (whether true or not) that many firms use tax incentives as the "tie-breaker" (Lyne, 1992). This sometimes means doing whatever it takes to lure big businesses into their region. In the past these committees and government officials have offered huge incentive packages in trying to entice large firms to locate in their area. Many experts have criticized these state officials for being too generous with their offers, while the state officials contend that these offers are necessary in order to bring in the jobs that are needed for the region in which they govern. Some experts claim that "incentives are defining attitudes in the local areas". ("Management Strategy") According to site selection veteran Richard Sheehy, the manager of Advanced Planning Services group, "If there are no incentives available for an industry to go to an area, that tells me that either the community doesn't value this type of industry or they haven't thought about it, or they very well might not support it if there is trouble." ("Management Strategy"). Critics have gone as far to say that states are "racing to the bottom", where the state that outbids another state for the location choice of a firm, actually loses the contest instead of winning. Although this argument is one of genuine interest, my focus will not be to prove whether the governing bodies (will now be referred to as states) are being too generous or not enough. The goal of this paper is to examine the correlation between states (concerning the many incentives that they offer), as well as whether or not these states are copying each other.

In reviewing literature for this task, it was important to gain a broader understanding of how firms go about making their location decisions. Perhaps even more important was learning why states feel they are the ones who benefit when a firm chooses to locate in their region in spite of the huge incentives offered. Two books that helped in

my gaining this broader understanding were from Timothy J. Bartik, "Who Benefits From State and Local Economic Development Policies?" and Roger Schmenner, "Making Business Location Decisions". In my search for information I located a list of incentives that each state has to offer different firms who choose to locate in their regions. This list was located in an ongoing publication of the Site Selection Handbook. ("U.S. State Incentive Programs 1980 –2000") In order to get a feel for any trends that may or may not be taking place; I felt it was important to look back several years. The data presented goes from 1980 to 2000. The incentives are broken down into categories, which include financial assistance for industry, tax incentives for industry, special services for industrial development, state incentives for pollution control and a small number of other laws, which play an important role in the location decisions of firms. It is also important to note that the data presented over the years changed over a period of time. For example, bond financing was offered in the early 80's but not in the 90's, due to changing government laws. Also for the years 1996-2000, the amount of data listed in the handbook was not as extensive, although a large number of policies and laws still existed and are included. These factors were and should be taken into consideration when looking at the data and drawing conclusions. All the incentives/laws listed in the Site Selection Handbook are meant to be an exhaustive list of policies, revealing the advantages and disadvantages for a firm to consider when choosing their site location. Originally the reason for looking at this data was to see how states are competing with each other, especially neighboring states that are only separated by an imaginary line. For example, it would seem that any two states that neighbor each other, such as North Carolina and South Carolina, would be in a fierce competition for firms to locate in their

region. Both states have similar climates and both have access to the same water transportation. They would seem to both have similar comparative advantages, therefore it seems reasonable that some firms would be indifferent between the two states in choosing its site. Because of this competition it would seem logical that if one state offered a particular incentive, then the other one would also have to offer it if the state wanted to remain competitive. It would also seem logical that when different policies and incentives are considered, one of the things that policy makers look at is what their competition is doing. It would seem a necessity to either offer the same incentives or lose out.

Hypothesis:

One official said it best by saying, "We're seeing lots of incentives wars between the states. One state will come up with a new program, and before you know it all the other states in the region have the same thing. Even states that hardly had anything four years ago have lots of programs now" (Venable, 1996 "Tax Cuts"). Unfortunately this is a belief that many experts share but little has been done, providing proof for this excerption. In addition to examining, and attempting to quantify this idea, I will also examine whether states suffering from high unemployment are more likely to compete with neighboring states for the location choice of firms. According to research from the Upjohn Institute, "State and local development incentives are adopted for a variety of reasons, high unemployment perhaps being one, but slow growth and simple imitation of others being more important reasons," (Fisher and Peters).

After extensive reading on the subject which helped formulate my opinion, it is my hypothesis that neighboring states do in fact copy each other when coming up with

the incentives they choose to offer. It is also my contention that states are more aggressive with their competition when times are bad. If this theory is true then the correlation coefficient between states should be higher when the economy is not doing well and lower when the economy is booming. There are several ways one can determine the overall well being of the economy. Since these policy makers are most concerned with levels of unemployment in their regions, it is my contention that correlations will fluctuate with unemployment rates. It is also important to consider that there may have been special dynamics taking place that is not being held constant. For example, as states become more competitive, they may actually try and outdo each other rather than settling for equal incentives. This can only go so far before the losses outweigh the gains and states can simply do no more. This back and forth competition has the ability to changes as times go from good to bad. It is also my opinion, from examining the data that once a firm chooses to add an incentive program, that program seems to stay in effect for some time. I don't think a one-year drop or rise in unemployment would change this although several years might. These are some of the factors that should be taken into consideration when considering why correlation between states aren't higher than they are.

Methodology: The correlation test compared with unemployment rates.

One of the difficulties in looking at this raw data and running a correlation was having to treat different policies simply as, yes they have it or no they don't. Many of these policies or incentives were very complex in and of themselves and didn't look identical, though it was necessary in order to do a correlation test to either mark yes or no. This simple correlation test produces a range of value of -1 to +1. Values of -1 indicate perfect

negative correlation, that is, the strongest possible tendency for the two states to vary inversely with each other. Values of +1 indicate perfect positive correlation; that is, the two states have identical incentives being offered. Correlations of zero indicate that the two states being compared have no relationship with one another. When considering the results it is also important to remember that the correlation coefficient does not explain the cause or effect, and the results should be used to only support or refute ones initial theory.

Also included in the data are the unemployment rates for the last 20 years, both nationally and state by state. This data is laid out in each table with other data in the corresponding year. This is done in order to better examine trends of neighboring state correlations and the relationship unemployment might play into states copying each other. Also states were broken up into regions in order to better analyze the neighboring state theory that states located near each other have a tendency to copy each other.

Looking at the data:

For purposes of simplicity for the reader, I have separated the states into regions. These regions were not chosen arbitrarily but were the simplest, since data on unemployment rates was broken down into these same regions. Each region has between 3 and 8 states listed for comparison. Also for simplicity, data is shown for every four years, starting with 1980 and ending with year 2000.

The first promising sign of this "copycat" effect comes when the average correlation between states is compared with the national unemployment rate. Each of the years when the unemployment rate dropped so did the average correlation between states.

Also when unemployment rose, the average correlation rose with it. The only exception to this was year 1984, when the unemployment rate rose only slightly from 1980, and the correlation dropped only slightly. This trend gave interest as well as reason to look at individual state unemployment rates and compare them with how neighboring states correlate with each other.

Is the correlation higher with neighboring states?

This is difficult to answer with a simple yes or no, although there does seem to be evidence that this certainly is true in some regions. In order to better answer this, each region should be looked at separately. For example, in the Pacific Region the correlation between Washington and Oregon is much higher than either of their state averages in the early 80's and goes to zero as you move into the 90's. Although the correlation between Oregon and California continues to get higher over time, moving from .144 in 1980 to .62 in the year 2000. Because these trends go in opposite directions it is difficult to determine if states are copying each other over time, or if states tend to imitate each other during economically challenged times of higher unemployment. It could also be possible that Oregon chose to go after firms that California was attracting. If they viewed their competition as switching from Washington to California, this could explain the change over time.

1980 Paired State Correlations for the Pacific Region

	OREGON	CALIFORNIA	ALASKA	HAWAII
WASHINGTON	0.574498	0.109473	0.342574	0.138086
OREGON		0.144281	0.371061	0.1895
CALIFORNIA			0.376337	0.356548
ALASKA				0.448842

1980 Average Correlation between all states = .37896

1980 National Unemployment Rate % = 7.1

1980 Average Correlation	
WASHINGTON	0.355314
OREGON	0.336136
CALIFORNIA	0.267167
ALASKA	0.389054
HAWAII	0.217878

1980 Unemployment Rate (%)	
WASHINGTON	7.9
OREGON	8.3
CALIFORNIA	6.8
ALASKA	9.7
HAWAII	4.9

1984 Paired State Correlations for the Pacific Region

	OREGON	CALIFORNIA	ALASKA	HAWAII
WASHINGTON	0.464839	0.351243	0.506752	0.491262
OREGON		0.445173	0.495802	0.436413
CALIFORNIA			0.306382	0.455847
ALASKA				0.563194

1984 Average Correlation between all states = .366692

1984 National Unemployment Rate % = 7.5

1984 Average Correlation	
WASHINGTON	0.414064
OREGON	0.36038
CALIFORNIA	0.30233
ALASKA	0.363602
HAWAII	0.350312

1984 Unemployment Rate (%)	
WASHINGTON	9.5
OREGON	9.4
CALIFORNIA	7.8
ALASKA	10
HAWAII	5.6

1988 Paired Stated Correlations for the Pacific Region

	OREGON	CALIFORNIA	ALASKA	HAWAII
WASHINGTON	0.104563	0.235702	0.353553	0.389736
OREGON		0.509201	0.231455	0.26881
CALIFORNIA			0.333333	0.348418
ALASKA				0.561012

1988 Average Correlation between all states = .331717 1988 National Unemployment Rate % = 5.5

1988 Average Correlation	
WASHINGTON	0.283437
OREGON	0.301459
CALIFORNIA	0.326945
ALASKA	0.263635
HAWAII	0.295087

1988 Unemployment Rate (%)	
WASHINGTON	6.2
OREGON	5.8
CALIFORNIA	5.3
ALASKA	9.3
HAWAII	3.2

1992 Paired State Correlations for the Pacific Region

	OREGON	CALIFORNIA	ALASKA	HAWAII
WASHINGTON	0.088315	0.29309	0.449117	0.397706
OREGON		0.354003	0.265167	0.091691
CALIFORNIA			0.249473	0.308658
ALASKA				0.24296

1992 Average Correlation between all states = .350165 1992 National Unemployment Rate % = 7.5

1992 Average Correlation	
WASHINGTON	0.325276
OREGON	0.267544
CALIFORNIA	0.35523
ALASKA	0.256216
HAWAII	0.259247

1992 Unemployment Rate (%)	
WASHINGTON	7.5
OREGON	7.5
CALIFORNIA	9.1
ALASKA	9.1
HAWAII	4.5

1996 Paired State Correlations for the Pacific Region				
	OREGON	CALIFORNIA	ALASKA	HAWAII
WASHINGTON	-0.046291	0.05164	-0.232379	0.258199
OREGON		0.352592	0.352592	-0.119523
CALIFORNIA			0.01	0.2
ALASKA				-0.25

1996 Average Correlation between all states = .28372 1996 National Unemployment Rate % = 5.4

1996 Average Correlation		1996 Unemployment Rate (%)	
WASHINGTON	0.205516	WASHINGTON	6.5
OREGON	0.209405	OREGON	5.9
CALIFORNIA	0.34808	CALIFORNIA	7.2
ALASKA	-0.04541	ALASKA	7.8
HAWAII	0.192512	HAWAII	6.4

2000 Paired State Correlations for the Pacific Region				
	OREGON	CALIFORNIA	ALASKA	HAWAII
WASHINGTON	-0.046291	0.033903	-0.232379	0.258199
OREGON		0.619918	0.352592	-0.119523
CALIFORNIA			0.223221	0.131306
ALASKA				-0.25

2000 Average Correlation between all states = .269282 2000 National Unemployment Rate % = 4.2

2000 Average Correlation		2000 Unemployment Rate (%)	
WASHINGTON	0.204244	WASHINGTON	4.5
OREGON	0.219238	OREGON	4.7
CALIFORNIA	0.287313	CALIFORNIA	4.8
ALASKA	-0.04404	ALASKA	5.9
HAWAII	0.183023	HAWAII	4.9

As you move to other regions of the United States the data tends to show a stronger trend. In the Mountain Region, there is a strong relationship between neighboring states and higher than average correlations. Throughout the 20 year period the correlation between Utah and Idaho remained very strong and well above both their individual state averages as well as the national average correlation. The correlation between Idaho and Montana seemed to also be relatively strong in comparison to states that didn't share a border between them. The same can be said for Nevada and Utah.

Overall, for the Mountain region, the correlations seemed to get stronger as unemployment rates rose and got weaker when unemployment rates dropped (although there are individual states that went against this trend).

1980 Paired State Correlations for the Mountain Region

	IDAHO	WYOMING	COLORADO	NEW MEXICO	ARIZONA	UTAH	NEVADA
MONTANA	0.243367	0.434634	0.474136	0.452754	0.361372	0.492823	0.388217
IDAHO		0.347519	0.255678	0.374833	0.374833	0.412868	0.184851
WYOMING			0.545464	0.471142	0.424869	0.467379	0.529915
COLORADO				0.384556	0.612594	0.558108	0.452798
NEW MEXICO					0.453416	0.623481	0.378596
ARIZONA						0.623481	0.471142
UTAH							0.513905

1980 Average Correlation between all states = .37896 1980 National Unemployment Rate % = 7.1

1980 Average Correlation	
MONTANA	0.385555
IDAHO	0.298578
WYOMING	0.362709
COLORADO	0.385401
NEWMEXICO	0.416514
ARIZONA	0.426135
UTAH	0.452452
NEVADA	0.366531

1980 Unemployment Rate (%)	
MONTANA	6.1
IDAHO	7.9
WYOMING	4
COLORADO	5.9
NEWMEXICO	7.5
ARIZONA	6.7
UTAH	6.3
NEVADA	6.2

1984 Paired State Correlations for the Mountain Region

	IDAHO	WYOMING	COLORADO	NEW MEXICO	ARIZONA	UTAH	NEVADA
MONTANA	0.45	0.420833	0.471941	0.377124	0.385995	0.498445	0.477306
IDAHO		0.375	0.517882	0.471405	0.522961	0.726899	0.385995
WYOMING			0.309059	0.377124	0.435801	0.461061	0.481456
COLORADO				0.348479	0.638078	0.521475	0.455027
NEW MEXICO					0.322832	0.481687	0.369789
ARIZONA						0.567882	0.499742
UTAH							0.522369

1984 Average Correlation between all states = .366692

1984 National Unemployment Rate % = 7.5

1984 Average Correlation	
MONTANA	0.387472
IDAHO	0.447405
WYOMING	0.300214
COLORADO	0.410399
NEWMEXICO	0.401973
ARIZONA	0.43087
UTAH	0.448195
NEVADA	0.359692

1984 Unemployment Rate (%)	
MONTANA	7.4
IDAHO	7.2
WYOMING	6.3
COLORADO	5.6
NEWMEXICO	7.5
ARIZONA	5
UTAH	6.5
NEVADA	7.8

1988 Paired State Correlations for the Mountain Region

	IDAHO	WYOMING	COLORADO	NEW MEXICO	ARIZONA	UTAH	NEVADA
MONTANA	0.510796	0.285272	0.11025	0.322749	0.43305	0.535615	0.239317
IDAHO		0.15311	0.1594	0.265742	0.416162	0.765426	0.357083
WYOMING			0.352254	0.294628	0.263546	0.208063	0.381448
COLORADO				0.091499	0.435258	0.297052	0.25218
NEW MEXICO					0.26482	0.323669	0.205971
ARIZONA						0.471861	0.234632
UTAH							0.471861

1988 Average Correlation between all states = .331717

1988 National Unemployment Rate % = 5.5

1988 Average Correlation	
MONTANA	0.373984
IDAHO	0.309369
WYOMING	0.272672
COLORADO	0.21314
NEWMEXICO	0.326412
ARIZONA	0.370946
UTAH	0.352714
NEVADA	0.295765

1988 Unemployment Rate (%)	
MONTANA	6.8
IDAHO	5.8
WYOMING	6.3
COLORADO	6.4
NEWMEXICO	7.8
ARIZONA	6.3
UTAH	4.9
NEVADA	5.2

1992 Paired State Correlations for the Mountain Region

	IDAHO	WYOMING	COLORADO	NEW MEXICO	ARIZONA	UTAH	NEVADA
MONTANA	0.395437	0.079637	-0.105414	0.138718	0.046684	0.18642	0.230089
IDAHO		0.242399	0.26638	0.267932	0.223818	0.680439	0.420389
WYOMING			0.447764	0.326809	0.282095	0.273188	0.362259
COLORADO				0.21335	0.398694	0.42514	0.282314
NEW MEXICO					0.320836	0.360332	0.100434
ARIZONA						0.36678	0.21904
UTAH							0.507149

1992 Average Correlation between all states = .350165

1992 National Unemployment Rate % = 7.5

1992 Average Correlation	
MONTANA	0.21009
IDAHO	0.328359
WYOMING	0.317465
COLORADO	0.307384
NEWMEXICO	0.312309
ARIZONA	0.321844
UTAH	0.357678
NEVADA	0.306163

1992 Unemployment Rate (%)	
MONTANA	6.7
IDAHO	6.5
WYOMING	5.6
COLORADO	5.9
NEWMEXICO	6.8
ARIZONA	7.4
UTAH	4.9
NEVADA	6.6

1996 Paired State Correlations for the Mountain Region

	IDAHO	WYOMING	COLORADO	NEW MEXICO	ARIZONA	UTAH	NEVADA
MONTANA	0.473665	-0.145437	0.317744	0.386526	0.036776	0.145437	-0.08989
IDAHO		0.044777	0.149071	0.276755	0.237778	0.694049	0.210334
WYOMING			0.300376	0.148708	0.06084	0.116541	0.219344
COLORADO				-0.049507	0.063296	0.250313	0.185653
NEW MEXICO					0.21058	0.342029	-0.029412
ARIZONA						0.190126	-0.086488
UTAH							0.394077

1996 Average Correlation between all states = .28372

1996 National Unemployment Rate % = 5.4

1996 Average Correlation	
MONTANA	0.068858
IDAHO	0.294331
WYOMING	0.200792
COLORADO	0.190874
NEWMEXICO	0.284026
ARIZONA	0.274921
UTAH	0.310495
NEVADA	0.18533

1996 Unemployment Rate (%)	
MONTANA	5.3
IDAHO	5.2
WYOMING	5
COLORADO	4.2
NEWMEXICO	8.1
ARIZONA	5.5
UTAH	3.5
NEVADA	5.4

2000 Paired State Correlations for the Mountain Region

	IDAHO	WYOMING	COLORADO	NEW MEXICO	ARIZONA	UTAH	NEVADA
MONTANA	0.362738	-0.020728	-0.258775	0.239046	0.207635	0.020728	-0.240852
IDAHO		0.116541	0.112641	0.47691	0.266507	0.62782	0.116541
WYOMING			0.300376	0.043355	-0.011587	0.116541	0.271392
COLORADO				0	0.102869	0.250313	0.222783
NEW MEXICO					0.267261	0.606977	0.214373
ARIZONA						0.139047	-0.103129
UTAH							0.464713

2000 Average Correlation between all states = .269282

2000 National Unemployment Rate % = 4.2

2000 Average Correlation	
MONTANA	0.030529
IDAHO	0.271804
WYOMING	0.193214
COLORADO	0.174022
NEWMEXICO	0.387507
ARIZONA	0.286748
UTAH	0.292108
NEVADA	0.205537

2000 Unemployment Rate (%)	
MONTANA	4.9
IDAHO	4.4
WYOMING	4.1
COLORADO	2.6
NEWMEXICO	5.3
ARIZONA	4.1
UTAH	2.8
NEVADA	4.1

In the West North Central Region there seems to be some strong evidence supporting the neighboring state theory. The correlation between states was especially high when individual states were compared with states with the same boundary line. Although not all state correlations remained high, neighboring states seemed to have a higher correlation with each other when compared with other states in its region that did not share a boundary line. One interesting comparison is between Missouri and Iowa. The correlation between these neighboring states started out at .432825 and grew to a whopping .896421. Although this goes against my theory that correlations change with state unemployment rates.

1980 Paired State Correlations for the West North Central Region

	IOWA	MISSOURI	N. DAKOTA	S. DAKOTA	NEBRASKA	KANSAS
MINNESOTA	0.439087	0.399893	0.513939	0.387254	0.260829	0.359201
IOWA		0.432825	0.493624	0.496619	0.518644	0.45076
MISSOURI			0.348695	0.391348	0.48343	0.388883
N. DAKOTA				0.508002	0.400209	0.425036
S. DAKOTA					0.538951	0.491321
NEBRASKA						0.32357

1980 Average Correlation between all states = .37896

1980 National Unemployment Rate % = 7.1

1980 Average Correlation	
MINNESOTA	0.32265
IOWA	0.442032
MISSOURI	0.404962
N. DAKOTA	0.362433
S. DAKOTA	0.431973
NEBRASKA	0.464701
KANSAS	0.347664

1980 Unemployment Rate	
MINNESOTA	5.9
IOWA	5.8
MISSOURI	7.5
N. DAKOTA	5
S. DAKOTA	4.9
NEBRASKA	4.1
KANSAS	4.5

1984 Paired State Correlations for the West North Central Region

	IOWA	MISSOURI	N. DAKOTA	S. DAKOTA	NEBRASKA	KANSAS
MINNESOTA	0.360404	0.274272	0.451552	0.360404	0.325599	0.287314
IOWA		0.424043	0.500847	0.576923	0.560432	0.555471
MISSOURI			0.43525	0.374421	0.47104	0.406629
N. DAKOTA				0.552097	0.45248	0.484351
S. DAKOTA					0.700011	0.50865
NEBRASKA						0.491321

1984 Average Correlation between all states = .366692

1984 National Unemployment Rate % = 7.5

1984 Average Correlation	
MINNESOTA	0.30871
IOWA	0.441726
MISSOURI	0.417833
N. DAKOTA	0.380515
S. DAKOTA	0.428661
NEBRASKA	0.486816
KANSAS	0.378137

1984 Unemployment Rate (%)	
MINNESOTA	6.3
IOWA	7
MISSOURI	7.2
N. DAKOTA	5.1
S. DAKOTA	4.3
NEBRASKA	4.4
KANSAS	5.2

1988 Paired State Correlations for the West North Central Region

	IOWA	MISSOURI	N. DAKOTA	S. DAKOTA	NEBRASKA	KANSAS
MINNESOTA	0.461186	0.294963	0.410032	0.324517	0.332168	0.266507
IOWA		0.490578	0.312482	0.422266	0.361345	0.232021
MISSOURI			0.155078	0.358803	0.436049	0.302485
N. DAKOTA				0.484182	0.292665	0.4816
S. DAKOTA					0.497612	0.378465
NEBRASKA						0.46875

1988 Average Correlation between all states = .331717

1988 National Unemployment Rate % = 5.5

1988 Average Correlation	
MINNESOTA	0.351518
IOWA	0.369311
MISSOURI	0.393991
N. DAKOTA	0.278499
S. DAKOTA	0.367345
NEBRASKA	0.394157
KANSAS	0.30088

1988 Unemployment Rate (%)	
MINNESOTA	4
IOWA	4.5
MISSOURI	5.7
N. DAKOTA	4.8
S. DAKOTA	3.9
NEBRASKA	3.6
KANSAS	4.8

1992 Paired State Correlations for the West North Central Region

	IOWA	MISSOURI	N. DAKOTA	S. DAKOTA	NEBRASKA	KANSAS
MINNESOTA	0.536053	0.429844	0.304417	0.552778	0.271194	0.335794
IOWA		0.562477	0.456645	0.536053	0.405874	0.371707
MISSOURI			0.337861	0.359227	0.450168	0.408679
N. DAKOTA				0.304417	0.281433	0.374873
S. DAKOTA					0.204124	0.52571
NEBRASKA						0.315911

1992 Average Correlation between all states = .350165

1992 National Unemployment Rate % = 7.5

1992 Average Correlation	
MINNESOTA	0.382351
IOWA	0.432501
MISSOURI	0.411552
N. DAKOTA	0.28588
S. DAKOTA	0.368585
NEBRASKA	0.388298
KANSAS	0.375305

1992 Unemployment Rate (%)	
MINNESOTA	5.1
IOWA	4.6
MISSOURI	5.7
N. DAKOTA	4.9
S. DAKOTA	3.1
NEBRASKA	3
KANSAS	4.2

1996 Paired State Correlations for the West North Central Region

	IOWA	MISSOURI	N. DAKOTA	S. DAKOTA	NEBRASKA	KANSAS
MINNESOTA	0.348006	0.240563	0.120761	0.433013	-0.028868	0.144338
IOWA		0.716328	0.194206	0.419314	0.225381	0.262071
MISSOURI			0.239046	0.333333	0.466667	0.5
N. DAKOTA				0.059761	0.15538	0.239046
S. DAKOTA					-0.1	0.318182
NEBRASKA						0.2

1996 Average Correlation between all states = .28372

1996 National Unemployment Rate % = 5.4

1996 Average Correlation	
MINNESOTA	0.251078
IOWA	0.358564
MISSOURI	0.447154
N. DAKOTA	0.204405
S. DAKOTA	0.250925
NEBRASKA	0.299952
KANSAS	0.3088

1996 Unemployment Rate (%)	
MINNESOTA	4
IOWA	3.8
MISSOURI	4.6
N. DAKOTA	3.1
S. DAKOTA	3.2
NEBRASKA	2.9
KANSAS	4.5

2000 Paired State Correlations for the West North Central Region

	IOWA	MISSOURI	N. DAKOTA	S. DAKOTA	NEBRASKA	KANSAS
MINNESOTA	0.31053	0.240563	0.120761	0.433013	0.06415	0.188434
IOWA		0.896421	0.292857	0.41833	0.239046	0.456968
MISSOURI			0.239046	0.333333	0.185185	0.373002
N. DAKOTA				0.059761	0.239046	0.273066
S. DAKOTA					0	0.373002
NEBRASKA						0.202043

2000 Average Correlation between all states = .269282

2000 National Unemployment Rate % = 4.2

2000 Average Correlation	
MINNESOTA	0.242484
IOWA	0.435747
MISSOURI	0.432619
N. DAKOTA	0.213562
S. DAKOTA	0.257214
NEBRASKA	0.201238
KANSAS	0.300157

2000 Unemployment Rate (%)	
MINNESOTA	2.5
IOWA	2.4
MISSOURI	2.3
N. DAKOTA	3.2
S. DAKOTA	2.4
NEBRASKA	2.4
KANSAS	3.1

In the East North Central Region, correlation between states started out much higher than both their state averages as well as the national average. Over time the correlations varied somewhat and generally seemed to move in the same trend as

unemployment rates. However the general trend was that each of the states ended with extremely high correlations with each other, even though unemployment was down.

1980 Paired State Correlations for the East North Central Region				
	INDIANA	ILLINOIS	MICHIGAN	WISCONSIN
OHIO	0.411539	0.545787	0.509877	0.347738
INDIANA		0.555545	0.527046	0.490233
ILLINOIS			0.602045	0.591184
MICHIGAN				0.635043
1980 Average Correlation between all states = .37896			1980 National Unemployment Rate % = 7.1	

1980 Average Correlation		**1980 Unemployment Rate**	
OHIO	0.375473	OHIO	8.4
INDIANA	0.403593	INDIANA	9.6
ILLINOIS	0.497411	ILLINOIS	8.3
MICHIGAN	0.443347	MICHIGAN	12.4
WISCONSIN	0.478596	WISCONSIN	7.2

1984 Paired State Correlations for the East North Central Region				
	INDIANA	ILLINOIS	MICHIGAN	WISCONSIN
OHIO	0.523349	0.489682	0.349776	0.328976
INDIANA		0.510683	0.371429	0.407634
ILLINOIS			0.39273	0.440825
MICHIGAN				0.407634
1984 Average Correlation between all states = .366692			1984 National Unemployment Rate % = 7.5	

1984 Average Correlation		**1984 Unemployment Rate (%)**	
OHIO	0.329982	OHIO	9.4
INDIANA	0.362715	INDIANA	8.6
ILLINOIS	0.442103	ILLINOIS	9.1
MICHIGAN	0.319607	MICHIGAN	11.2
WISCONSIN	0.438404	WISCONSIN	7.3

1988 Paired State Correlations for the East North Central Region

	INDIANA	ILLINOIS	MICHIGAN	WISCONSIN
OHIO	0.440086	0.450461	0.47593	0.334832
INDIANA		0.490578	0.603148	0.417828
ILLINOIS			0.401249	0.296683
MICHIGAN				0.51431

1988 Average Correlation between all states = .331717 1988 National Unemployment Rate % = 5.5

1988 Average Correlation	
OHIO	0.326115
INDIANA	0.411426
ILLINOIS	0.372625
MICHIGAN	0.379796
WISCONSIN	0.332257

1988 Unemployment Rate (%)	
OHIO	6
INDIANA	5.3
ILLINOIS	6.8
MICHIGAN	7.6
WISCONSIN	4.3

1992 Paired State Correlations for the East North Central Region

	INDIANA	ILLINOIS	MICHIGAN	WISCONSIN
OHIO	0.713738	0.47269	0.608709	0.506549
INDIANA		0.482783	0.618596	0.547035
ILLINOIS			0.514591	0.287273
MICHIGAN				0.519461

1992 Average Correlation between all states = .350165 1992 National Unemployment Rate % = 7.5

1992 Average Correlation	
OHIO	0.38084
INDIANA	0.42193
ILLINOIS	0.407162
MICHIGAN	0.429024
WISCONSIN	0.339674

1992 Unemployment Rate (%)	
OHIO	7.2
INDIANA	6.5
ILLINOIS	7.5
MICHIGAN	8.8
WISCONSIN	5.1

1996 Paired State Correlations for the East North Central Region

	INDIANA	ILLINOIS	MICHIGAN	WISCONSIN
OHIO	0.606478	0.680881	0.780654	0.484544
INDIANA		0.488645	0.563242	0.563242
ILLINOIS			0.464327	0.303035
MICHIGAN				0.426087

1996 Average Correlation between all states = .28372 1996 National Unemployment Rate % = 5.4

1996 Average Correlation	
OHIO	0.430027
INDIANA	0.366372
ILLINOIS	0.419904
MICHIGAN	0.392094
WISCONSIN	0.303459

1996 Unemployment Rate (%)	
OHIO	4.9
INDIANA	4.1
ILLINOIS	5.3
MICHIGAN	4.9
WISCONSIN	3.5

2000 Paired State Correlations for the East North Central Region				
	INDIANA	ILLINOIS	MICHIGAN	WISCONSIN
OHIO	0.606478	0.847222	0.92376	0.484544
INDIANA		0.398001	0.656532	0.563242
ILLINOIS			0.764989	0.484544
MICHIGAN				0.550178

2000 Average Correlation between all states = .269282 2000 National Unemployment Rate % = 4.2

2000 Average Correlation		2000 Unemployment Rate (%)	
OHIO	0.411482	OHIO	4
INDIANA	0.361076	INDIANA	3
ILLINOIS	0.400116	ILLINOIS	4.1
MICHIGAN	0.436148	MICHIGAN	3.2
WISCONSIN	0.302198	WISCONSIN	2.8

In the West South Central Region correlations seemed to remain higher than the national averages, with the exception of the latter years when unemployment was lower. Overall the states seemed to follow the same trend as unemployment, by decreasing over the years as times got better for many of these states. Interestingly, Oklahoma went from being fairly highly correlated with each state in its region to having a negative correlation with each of its neighbors.

1980 Paired State Correlations for the West South Central Region			
	LOUISIANA	OKLAHOMA	TEXAS
ARKANSAS	0.470693	0.470693	0.306908
LOUISIANA		0.42381	0.433587
OKLAHOMA			0.384163

1980 Average Correlation between all states = .37896 1980 National Unemployment Rate % = 7.1

1980 Average Correlation		1980 Unemployment Rate (%)	
ARKANSAS	0.395953	ARKANSAS	7.6
LOUISIANA	0.3634	LOUISIANA	6.7
OKLAHOMA	0.427232	OKLAHOMA	4.8
TEXAS	0.376561	TEXAS	5.2

1984 Paired State Correlations for the West South Central Region			
	LOUISIANA	OKLAHOMA	TEXAS
ARKANSAS	0.470045	0.335849	0.423181
LOUISIANA		0.421439	0.307656
OKLAHOMA			0.375741

1984 Average Correlation between all states = .366692 1984 National Unemployment Rate % = 7.5

1984 Average Correlation		1984 Unemployment Rate (%)	
ARKANSAS	0.362638	ARKANSAS	8.9
LOUISIANA	0.366677	LOUISIANA	10
OKLAHOMA	0.372525	OKLAHOMA	7
TEXAS	0.352572	TEXAS	5.9

1988 Paired State Correlations for the West South Central Region			
	LOUISIANA	OKLAHOMA	TEXAS
ARKANSAS	0.444591	0.431531	0.447418
LOUISIANA		0.394853	0.269191
OKLAHOMA			0.365086

1988 Average Correlation between all states = .331717 1988 National Unemployment Rate % = 5.5

1988 Average Correlation		1988 Unemployment Rate (%)	
ARKANSAS	0.336805	ARKANSAS	7.7
LOUISIANA	0.300956	LOUISIANA	10.9
OKLAHOMA	0.362219	OKLAHOMA	6.7
TEXAS	0.312027	TEXAS	7.3

1992 Paired State Correlations for the West South Central Region			
	LOUISIANA	OKLAHOMA	TEXAS
ARKANSAS	0.448824	0.325367	0.569448
LOUISIANA		0.316896	0.469554
OKLAHOMA			0.534702

1992 Average Correlation between all states = .350165 1992 National Unemployment Rate % = 7.5

1992 Average Correlation		1992 Unemployment Rate (%)	
ARKANSAS	0.366188	ARKANSAS	7.2
LOUISIANA	0.336116	LOUISIANA	8.1
OKLAHOMA	0.330722	OKLAHOMA	5.7
TEXAS	0.396516	TEXAS	7.5

1996 Paired State Correlations for the West South Central Region			
	LOUISIANA	OKLAHOMA	TEXAS
ARKANSAS	0.283333	0.223221	0.283333
LOUISIANA		0.306382	0.185185
OKLAHOMA			0.065653
1996 Average Correlation between all states = .28372			1996 National Unemployment Rate % = 5.4

1996 Average Correlation		1996 Unemployment Rate (%)	
ARKANSAS	0.296112	ARKANSAS	5.4
LOUISIANA	0.241511	LOUISIANA	6.7
OKLAHOMA	0.22322	OKLAHOMA	4.1
TEXAS	0.203899	TEXAS	5.6

2000 Paired State Correlations for the West South Central Region			
	LOUISIANA	OKLAHOMA	TEXAS
ARKANSAS	0.139771	-0.091725	0.194206
LOUISIANA		-0.083333	0.239046
OKLAHOMA			-0.074702
2000 Average Correlation between all states = .269282			2000 National Unemployment Rate % = 4.2

2000 Average Correlation		2000 Unemployment Rate (%)	
ARKANSAS	0.217003	ARKANSAS	4.4
LOUISIANA	0.241874	LOUISIANA	4.7
OKLAHOMA	-0.00865	OKLAHOMA	2.8
TEXAS	0.226101	TEXAS	4.3

In the East South Central Region, the correlations seemed to get stronger over time. This goes against my theory that the correlation moves with the unemployment rates. Although the neighboring state theory still remains fairly strong here, as most correlations between states ended much stronger than their state averages. (Although this was a region that had generally high averages. This might be due to the many other neighboring states that are not listed in the region, yet are still neighboring states.

1980 Paired State Correlations for the East South Central Region			
	TENNESSEE	ALABAMA	MISSISSIPPI
KENTUCKY	0.407283	0.407283	0.358174
TENNESSEE		0.443678	0.57779
ALABAMA			0.529732
1980 Average Correlation between all states = .37896		1980 National Unemployment Rate % = 7.1	

1980 Average Correlation		**1980 Unemployment Rate**	
KENTUCKY	0.442602	KENTUCKY	8
TENNESSEE	0.376359	TENNESSEE	7.3
ALABAMA	0.370276	ALABAMA	8.8
MISSISSIPPI	0.38197	MISSISSIPPI	7.2

1984 Paired State Correlations for the East South Central Region			
	TENNESSEE	ALABAMA	MISSISSIPPI
KENTUCKY	0.39036	0.253708	0.30276
TENNESSEE		0.38377	0.473598
ALABAMA			0.395195
1984 Average Correlation between all states = .366692		1984 National Unemployment Rate % = 7.5	

1984 Average Correlation		**1984 Unemployment Rate (%)**	
KENTUCKY	0.423107	KENTUCKY	9.3
TENNESSEE	0.373256	TENNESSEE	8.6
ALABAMA	0.293063	ALABAMA	11.1
MISSISSIPPI	0.355467	MISSISSIPPI	10.8

1988 Paired State Correlations for the East South Central Region			
	TENNESSEE	ALABAMA	MISSISSIPPI
KENTUCKY	0.414771	0.303268	0.333694
TENNESSEE		0.306266	0.277304
ALABAMA			0.267103
1988 Average Correlation between all states = .331717		1988 National Unemployment Rate % = 5.5	

1988 Average Correlation		**1988 Unemployment Rate (%)**	
KENTUCKY	0.359869	KENTUCKY	7.9
TENNESSEE	0.343107	TENNESSEE	5.8
ALABAMA	0.277642	ALABAMA	7.2
MISSISSIPPI	0.394477	MISSISSIPPI	8.4

1992 Paired State Correlation for the East South Central Region			
	TENNESSEE	ALABAMA	MISSISSIPPI
KENTUCKY	0.498182	0.51349	0.448824
TENNESSEE		0.444826	0.382368
ALABAMA			0.493414
1992 Average Correlation between all states = .350165		1992 National Unemployment Rate % = 7.5	

1992 Average Correlation		1992 Unemployment Rate (%)	
KENTUCKY	0.430187	KENTUCKY	6.9
TENNESSEE	0.325725	TENNESSEE	6.4
ALABAMA	0.393023	ALABAMA	7.3
MISSISSIPPI	0.447556	MISSISSIPPI	8.1

1996 Paired State Correlations for the East South Central Region			
	TENNESSEE	ALABAMA	MISSISSIPPI
KENTUCKY	0.300376	0.659004	0.54917
TENNESSEE		0.447446	0.416975
ALABAMA			0.466667
1996 Average Correlation between all states = .28372		1996 National Unemployment Rate % = 5.4	

1996 Average Correlation		1996 Unemployment Rate (%)	
KENTUCKY	0.407678	KENTUCKY	5.6
TENNESSEE	0.301889	TENNESSEE	5.2
ALABAMA	0.408403	ALABAMA	5.1
MISSISSIPPI	0.437035	MISSISSIPPI	6.1

2000 Paired State Correlations for the East South Central Region			
	TENNESSEE	ALABAMA	MISSISSIPPI
KENTUCKY	0.505	0.67	0.65
TENNESSEE		0.34	0.466667
ALABAMA			0.466667
2000 Average Correlation between all states = .269282		2000 National Unemployment Rate % = 4.2	

2000 Average Correlation		2000 Unemployment Rate (%)	
KENTUCKY	0.391248	KENTUCKY	3.8
TENNESSEE	0.284247	TENNESSEE	3.5
ALABAMA	0.388297	ALABAMA	4.9
MISSISSIPPI	0.427241	MISSISSIPPI	5.1

As we move towards the Atlantic correlations do not remain as constant with neighboring states. In the South Atlantic Region Florida is highly correlated with Georgia, yet that correlation fluctuates over time. Conversely, Florida is somewhat

correlated with South Carolina in 1980 and over time the correlation got stronger until it reached .744. Another interesting note is that West Virginia was plagued with one of the highest unemployment rates in the nation and at the same time lower correlation averages when compared with other states. In fact in year 2000 there is almost no correlation at all between West Virginia and its neighboring states.

1980 Paired State Correlations for the South Atlantic Region

	MARYLAND	VIRGINI	W. VIRGINIA	N. CAROLINA	S. CAROLINA	GEORGIA	FLORIDA
DELAWARE	0.126335	0.22471	0.069376	0.400019	0.328015	0.383571	0.207255
MARYLAND		0.373	0.510172	0.357183	0.275177	0.341565	0.261989
VIRGINIA			0.269727	0.567882	0.685679	0.682524	0.412008
W. VIRGINIA				0.391543	0.194184	0.326732	0.477862
N. CAROLINA					0.573759	0.704727	0.569951
S. CAROLINA						0.693375	0.471142
GEORGIA							0.500517

1980 Average Correlation between all states = .37896 1980 National Unemployment Rate % = 7.1

1980 Average Correlation	
DELAWARE	0.292638
MARYLAND	0.357181
VIRGINIA	0.449214
W. VIRGINIA	0.32388
N. CAROLINA	0.433126
S. CAROLINA	0.411094
GEORGIA	0.449806
FLORIDA	0.366235

1980 Unemployment Rate	
DELAWARE	7.3
MARYLAND	6.5
VIRGINIA	5
W. VIRGINIA	9.4
N. CAROLINA	6.6
S. CAROLINA	6.9
GEORGIA	6.4
FLORIDA	5.9

1984 Paired State Correlations for the South Atlantic Region

	MARYLAND	VIRGINI	W. VIRGINIA	N. CAROLINA	S. CAROLINA	GEORGIA	FLORIDA
DELAWARE	0.422819	0.5122	0.294628	0.451051	0.34963	0.445477	0.189383
MARYLAND		0.39228	0.334855	0.285007	0.30683	0.236701	0.30683
VIRGINIA			0.252527	0.542767	0.576666	0.556297	0.383896
W. VIRGINIA				0.249892	0.178552	0.144275	0.343369
N. CAROLINA					0.455761	0.685139	0.312692
S. CAROLINA						0.53053	0.302773
GEORGIA							0.292576

1984 Average Correlation between all states = .366692 1984 National Unemployment Rate % = 7.5

1984 Average Correlation	
DELAWARE	0.383072
MARYLAND	0.340897
VIRGINIA	0.401002
W. VIRGINIA	0.273404
N. CAROLINA	0.415783
S. CAROLINA	0.346651
GEORGIA	0.393217
FLORIDA	0.33231

1984 Unemployment Rate (%)	
DELAWARE	6.2
MARYLAND	5.4
VIRGINIA	5
W. VIRGINIA	1.5
N. CAROLINA	6.7
S. CAROLINA	7.1
GEORGIA	6
FLORIDA	6.3

1988 Paired State Correlations for the South Atlantic Region

	MARYLAND	VIRGINI	W. VIRGINIA	N. CAROLINA	S. CAROLINA	GEORGIA	FLORIDA
DELAWARE	0.505951	0.43338	0.490283	0.311353	0.456571	0.36046	0.572035
MARYLAND		0.36545	0.410032	0.258782	0.386793	0.254152	0.431655
VIRGINIA			0.209744	0.464014	0.598468	0.473548	0.406955
W. VIRGINIA				0.211163	0.232107	0.181859	0.278593
N. CAROLINA					0.317404	0.598392	0.264743
S. CAROLINA						0.45444	0.43209
GEORGIA							0.287879

1988 Average Correlation between all states = .331717 1988 National Unemployment Rate % = 5.5

1988 Average Correlation	
DELAWARE	0.440408
MARYLAND	0.378241
VIRGINIA	0.359199
W. VIRGINIA	0.273147
N. CAROLINA	0.306614
S. CAROLINA	0.353914
GEORGIA	0.312588
FLORIDA	0.392557

1988 Unemployment Rate (%)	
DELAWARE	3.2
MARYLAND	4.5
VIRGINIA	3.9
W. VIRGINIA	9.9
N. CAROLINA	3.6
S. CAROLINA	4.5
GEORGIA	5.8
FLORIDA	5

1992 Paired State Correlations for the South Atlantic Region

	MARYLAND	VIRGINI	W. VIRGINIA	N. CAROLINA	S. CAROLINA	GEORGIA	FLORIDA
DELAWARE	0.532692	0.57942	0.369967	0.329599	0.392794	0.37728	0.503497
MARYLAND		0.24515	0.297161	0.115348	0.264014	0.171737	0.504115
VIRGINIA			0.308658	0.585389	0.54935	0.546608	0.508923
W. VIRGINIA				0.219718	0.076836	0.178794	0.16265
N. CAROLINA					0.2326	0.524271	0.241225
S. CAROLINA						0.527964	0.539471
GEORGIA							0.355641

1992 Average Correlation between all states = .350165 1992 National Unemployment Rate % = 7.5

1992 Average Correlation	
DELAWARE	0.423965
MARYLAND	0.376165
VIRGINIA	0.44456
W. VIRGINIA	0.279132
N. CAROLINA	0.297803
S. CAROLINA	0.33439
GEORGIA	0.327015
FLORIDA	0.410932

1992 Unemployment Rate (%)	
DELAWARE	5.3
MARYLAND	6.6
VIRGINIA	6.4
W. VIRGINIA	11.3
N. CAROLINA	5.9
S. CAROLINA	6.2
GEORGIA	6.9
FLORIDA	8.2

1996 Paired State Correlations for the South Atlantic Region

	MARYLAND	VIRGINI	W. VIRGINIA	N. CAROLINA	S. CAROLINA	GEORGIA	FLORIDA
DELAWARE	0.449013	0.70404	0.35	0.342508	0.505	0.477668	0.571315
MARYLAND		0.38521	0.089803	0.218033	0.449013	0.278243	0.489522
VIRGINIA			0.233126	0.566009	0.857904	0.722315	0.62562
W. VIRGINIA				0.216777	0.05	0	-0.052414
N. CAROLINA					0.485582	0.660466	0.295418
S. CAROLINA						0.619677	0.744282
GEORGIA							0.419532

1996 Average Correlation between all states = .28372 1996 National Unemployment Rate % = 5.4

1996 Average Correlation	
DELAWARE	0.408995
MARYLAND	0.348633
VIRGINIA	0.456187
W. VIRGINIA	0.207845
N. CAROLINA	0.296635
S. CAROLINA	0.357281
GEORGIA	0.351663
FLORIDA	0.30389

1996 Unemployment Rate (%)	
DELAWARE	5.2
MARYLAND	4.9
VIRGINIA	4.4
W. VIRGINIA	7.5
N. CAROLINA	4.3
S. CAROLINA	6
GEORGIA	4.6
FLORIDA	5.1

2000 Paired State Correlations for the South Atlantic Region							
	MARYLAND	VIRGINI	W. VIRGINIA	N. CAROLINA	S. CAROLINA	GEORGIA	FLORIDA
DELAWARE	0.449013	0.57132	0.288675	0.342508	0.505	0.51593	0.571315
MARYLAND		0.17886	-0.155543	0.218033	0.449013	0.295901	0.489522
VIRGINIA			0.348006	0.295418	0.394348	0.454489	0.274725
W. VIRGINIA				0.112641	-0.028868	0.025031	-151307
N. CAROLINA					0.485582	0.736842	0.295418
S. CAROLINA						0.659004	0.744282
GEORGIA							0.454489

2000 Average Correlation between all states = .269282 2000 National Unemployment Rate % = 4.2

2000 Average Correlation		2000 Unemployment Rate (%)	
DELAWARE	0.391027	DELAWARE	3.1
MARYLAND	0.353735	MARYLAND	3.1
VIRGINIA	0.332996	VIRGINIA	2.6
W. VIRGINIA	0.120142	W. VIRGINIA	5.6
N. CAROLINA	0.298845	N. CAROLINA	3.2
S. CAROLINA	0.344413	S. CAROLINA	2.4
GEORGIA	0.347987	GEORGIA	3.6
FLORIDA	0.296625	FLORIDA	3.7

In the Middle Atlantic Region, the correlation between New York and New Jersey remained very strong. Pennsylvania however started out being fairly highly correlated with both New Jersey and New York, but over time had its correlation reduced significantly. Each Both New York and New Jersey's shared correlation grew higher than there averages, while Pennsylvania's dropped somewhat below. Although this study doesn't include other neighboring states that aren't included in the listed region, it would be interesting to see how the other neighboring states compared with these.

1980 Paired State Correlations for the Middle Atlantic Region		
	NEW JERSEY	PENNSYLVANIA
NEW YORK	0.316938	0.636715
NEW JERSEY		0.444867

1980 Average Correlation between all states = .37896 1980 National Unemployment Rate % = 7.1

1980 Average Correlation		1980 Unemployment Rate	
NEW YORK	0.354741	NEW YORK	7.5
NEW JERSEY	0.381403	NEW JERSEY	7.2
PENNSYLVANIA	0.427801	PENNSYLVANIA	7.8

1984 Paired State Correlations for the Middle Atlantic Region

	NEW JERSEY	PENNSYLVANIA
NEW YORK	0.316433	0.271073
NEW JERSEY		0.433029

1984 Average Correlation between all states = .366692 1984 National Unemployment Rate % = 7.5

1984 Average Correlation		**1984 Unemployment Rate (%)**	
NEW YORK	0.325029	NEW YORK	7.2
NEW JERSEY	0.401546	NEW JERSEY	6.2
PENNSYLVANIA	0.365839	PENNSYLVANIA	9.1

1988 Paired State Correlations for the Middle Atlantic Region

	NEW JERSEY	PENNSYLVANIA
NEW YORK	0.451664	0.374423
NEW JERSEY		0.378489

1988 Average Correlation between all states = .331717 1988 National Unemployment Rate % = 5.5

1988 Average Correlation		**1988 Unemployment Rate (%)**	
NEW YORK	0.364282	NEW YORK	4.2
NEW JERSEY	0.386679	NEW JERSEY	3.8
PENNSYLVANIA	0.363346	PENNSYLVANIA	5.1

1992 Paired State Correlations for the Middle Atlantic Region

	NEW JERSEY	PENNSYLVANIA
NEW YORK	0.574143	0.304374
NEW JERSEY		0.299136

1992 Average Correlation between all states = .350165 1992 National Unemployment Rate % = 7.5

1992 Average Correlation		**1992 Unemployment Rate (%)**	
NEW YORK	0.349322	NEW YORK	8.5
NEW JERSEY	0.436194	NEW JERSEY	8.4
PENNSYLVANIA	0.391002	PENNSYLVANIA	7.5

1996 Paired State Correlations for the Middle Atlantic Region		
	NEW JERSEY	PENNSYLVANIA
NEW YORK	0.680881	0.261528
NEW JERSEY		0.189525

1996 Average Correlation between all states = .28372

1996 National Unemployment Rate % = 5.4

1996 Average Correlation	
NEW YORK	0.354181
NEW JERSEY	0.398434
PENNSYLVANIA	0.251811

1996 Unemployment Rate (%)	
NEW YORK	6.2
NEW JERSEY	6.2
PENNSYLVANIA	5.3

2000 Paired State Correlations for the Middle Atlantic Region		
	NEW JERSEY	PENNSYLVANIA
NEW YORK	0.680881	0.178864
NEW JERSEY		0.129619

2000 Average Correlation between all states = .269282

2000 National Unemployment Rate % = 4.2

2000 Average Correlation	
NEW YORK	0.342425
NEW JERSEY	0.394282
PENNSYLVANIA	0.1868

2000 Unemployment Rate (%)	
NEW YORK	4.9
NEW JERSEY	3.9
PENNSYLVANIA	4

Finally, we move to the New England Region. In 1980 Maine is most correlated with New Hampshire, its neighboring state while Vermont is also most highly correlated with New Hampshire. (Although New Hampshire is most correlated with Rhode Island in 1980, which isn't quite a neighboring state but close). Overall it is difficult to find a general trend in the New England Region, but something to consider is that most of these states had much lower unemployment rates when compared to the national average.

1980 Paired State Correlations for the New England Region

	NEW HAMPSHIRE	VERMONT	MASSACHUSETTS	RHODE ISLAND	CONNECTICU
MAINE	0.50128	0.374421	0.28391	0.405798	0.241495
NEW HAMPSHIRE		0.52915	0.39036	0.612121	0.287146
VERMONT			0.295084	0.478755	0.148914
MASSACHUSETTS				0.341565	0.24927
RHODE ISLAND					0.233723

1980 Average Correlation between all states = .37896

1980 National Unemployment Rate % = 7.1

1980 Average Correlation	
MAINE	0.327446
NEW HAMPSHIRE	0.399071
VERMONT	0.417456
MASSACHUSETTS	0.332054
RHODE ISLAND	0.369678
CONNECTICUT	0.167536

1980 Unemployment Rate	
MAINE	7.8
NEW HAMPSHIRE	4.7
VERMONT	6.4
MASSACHUSSETS	5.6
RHODE ISLAND	7.2
CONNECTICUT	5.9

1984 Paired State Correlations for the New England Region

1984 NEW HAMPSHIRE	VERMONT	MASSACHUSETTS	RHODE ISLAND	CONNECTICU
MAINE	0.315497	0.316843	0.303035	0.281488	0.188975
NEW HAMPSHIRE		0.389563	0.447237	0.332215	0.373786
VERMONT			0.199435	0.29259	0.064889
MASSACHUSETTS				0.303544	0.439867
RHODE ISLAND					0.344682

1984 Average Correlation between all states = .366692

1984 National Unemployment Rate % = 7.5

1984 Average Correlation	
MAINE	0.31763
NEW HAMPSHIRE	0.328635
VERMONT	0.315409
MASSACHUSETTS	0.32304
RHODE ISLAND	0.319297
CONNECTICUT	0.232898

1984 Unemployment Rate (%)	
MAINE	6.1
NEW HAMPSHIRE	4.3
VERMONT	5.2
MASSACHUSSETS	4.8
RHODE ISLAND	5.3
CONNECTICUT	4.6

1988 Paired State Correlations for the New England Region

1988	NEW HAMPSHIRE	VERMONT	MASSACHUSETTS	RHODE ISLAND	CONNECTICU
MAINE	0.332983	0.222911	0.416519	0.152489	0.205755
NEW HAMPSHIRE		0.448499	0.28244	0.222683	0.387045
VERMONT			0.310759	0.312464	0.201146
MASSACHUSETTS					0.386445
RHODE ISLAND					0.506945

1988 Average Correlation between all states = .331717 1988 National Unemployment Rate % = 5.5

1988 Average Correlation	
MAINE	0.30972
NEW HAMPSHIRE	0.271427
VERMONT	0.317338
MASSACHUSETTS	0.361859
RHODE ISLAND	0.229329
CONNECTICUT	0.28155

1988 Unemployment Rate (%)	
MAINE	3.8
NEW HAMPSHIRE	2.4
VERMONT	2.8
MASSACHUSSETS	3.3
RHODE ISLAND	3.1
CONNECTICUT	3

1992 Paired State Correlations for the New England Region

1992	NEW HAMPSHIRE	VERMONT	MASSACHUSETTS	RHODE ISLAND	CONNECTICU
MAINE	0.299632	0.21243	0.376036	0.196483	0.243702
NEW HAMPSHIRE		0.42595	0.338648	0.199941	0.403823
VERMONT			0.382774	0.382825	0.245271
MASSACHUSETTS				0.493414	0.330184
RHODE ISLAND					0.612033

1992 Average Correlation between all states = .350165 1992 National Unemployment Rate % = 7.5

1992 Average Correlation	
MAINE	0.309683
NEW HAMPSHIRE	0.281133
VERMONT	0.320353
MASSACHUSETTS	0.367786
RHODE ISLAND	0.342035
CONNECTICUT	0.346388

1992 Unemployment Rate (%)	
MAINE	7.1
NEW HAMPSHIRE	7.5
VERMONT	6.6
MASSACHUSSETS	8.5
RHODE ISLAND	8.9
CONNECTICUT	7.5

1996 Paired State Correlations for the New England Region

1996	NEW HAMPSHIRE	VERMONT	MASSACHUSETTS	RHODE ISLAND	CONNECTICU
MAINE	0.323989	0.143126	0.479583	0.273066	0.361209
NEW HAMPSHIRE		0.293005	0.199205	-0.143747	0.298292
VERMONT			0.176505	0.351175	0.080614
MASSACHUSETTS				0.160357	0.205527
RHODE ISLAND					0.102012

1996 Average Correlation between all states = .28372 1996 National Unemployment Rate % = 5.4

1996 Average Correlation	
MAINE	0.392602
NEW HAMPSHIRE	0.202749
VERMONT	0.171985
MASSACHUSETTS	0.367786
RHODE ISLAND	0.342035
CONNECTICUT	0.346388

1996 Unemployment Rate (%)	
MAINE	5.1
NEW HAMPSHIRE	4.2
VERMONT	4.6
MASSACHUSSETS	4.3
RHODE ISLAND	5.1
CONNECTICUT	5.7

2000 Paired State Correlations for the New England Region

2000	NEW HAMPSHIRE	VERMONT	MASSACHUSETTS	RHODE ISLAND	CONNECTICU
MAINE	0.300376	0.202548	0.279715	0.120761	0.398001
NEW HAMPSHIRE		0.437291	0.155113	-0.191733	0.244793
VERMONT			0.176505	0.351175	0.080614
MASSACHUSETTS				0.160357	0.205527
RHODE ISLAND					0.102012

2000 Average Correlation between all states = .269282 2000 National Unemployment Rate % = 4.2

2000 Average Correlation	
MAINE	0.399574
NEW HAMPSHIRE	0.154022
VERMONT	0.158283
MASSACHUSETTS	0.202026
RHODE ISLAND	0.148682
CONNECTICUT	0.319352

2000 Unemployment Rate (%)	
MAINE	3.5
NEW HAMPSHIRE	2.6
VERMONT	2.7
MASSACHUSSETS	3
RHODE ISLAND	3.8
CONNECTICUT	2.2

Conclusions:

Overall it is difficult to draw definite conclusions from looking at the data. In general there does seem to be evidence that suggests that neighboring states are in fact more highly correlated with each other and some copying is taking place. Although the cause of these higher correlations with neighboring states is difficult to determine, it does seem to suggest that states imitate what their competition is doing at least to some degree. What was interesting about separating the states into regions is that the central regions seemed much more correlated with each other than the coastal regions. This was especially true when the average correlations of the states on the Atlantic Ocean are compared with most other states as you move west. This might be explained by the types of businesses that states are trying to attract. The central regions may be more open to new plants being opened while the Atlantic regions may prefer more service types of industries. On the same note there doesn't seem to be as strong of a relationship with unemployment rates and the correlation between states as I had assumed there would be. Although there is some evidence from other studies that show incentives do modestly favor places with higher unemployment (Fisher and Peters). It was difficult to show that these conditions definitely caused states to copy each other. This could be explained by the fact that many times when a state is faced with high unemployment, during these difficult times the particular incentives that are offered tend to be offset by the higher taxes and possible other incentives taken away from pre-existing businesses. (Fisher and Peters). There are several factors that could be effecting these results. Below I have listed some of the salient reasons as to why some of the correlations were lower than expected.

One factor is that when a state is faced with high unemployment, government officials feel the pressure to do something. In fact it is conceivable they may try and outdo a neighboring state and offer even more incentives, rather than simply offering equal incentives. It is possible that one state may feel it has to give everything they can to lure business into their region while the other state isn't faced with the same pressure because of lower unemployment rates. This could be looked at more closely by examining the comparative rates. Although it is also important to not discount the fact that overall correlation averages changed with national unemployment rates.

One way state officials are fighting unemployment is through enterprise zones. This provides a way for states to target areas that suffer from high unemployment. In 1992, 36 states had enterprise zone programs and that number continues to grow (Hoyt and Venable). Most enterprise zones consist of a grab-bag mix of incentives that not only look different from state to state but even from city to city within the state. No single standard for enterprise zones exists, making it difficult to prove the copycat theory. Although it is hard to argue that states didn't copy each other with this idea, because each state offers a different package for potential businesses it is difficult to show from the data that they are imitating each other.

Another factor is the complexity of all the incentives being offered. A survey was done and the highlights published in Site Selection (O'Conner, 1988 "Infrastructure") where the consensus was that competition among jurisdictions was becoming more vigorous. The only exception was that most of New England respondents (70%), thought that "competition for new facilities was either about the same or somewhat weaker than it was three years ago". (This is interesting since New England, as mentioned earlier, seems

to have a different trend than the central region.) The rest of the country felt that either competition was much stronger or at least stayed the same over the past 3 years, (again this was in 1992). Most though didn't necessarily feel that the value of the incentive packages were going up nearly as much as competition was increasing. Some felt that the stiffer competition was in the form of more sophisticated and professional development programs, rather than higher incentive packages. Even others offer the explanation that areas or communities are restricted from offering to great of an incentive package due to state laws limiting the amount of incentives that they can offer (O'Conner 1998, "Infrastructure").

Still another explanation is that there is more to worry about than just unemployment. In fact many policy makers realize that all the incentives in the world won't bring businesses to their jurisdiction if other factors such as their infrastructure isn't taken care of. It becomes increasingly difficult to attract new businesses if the state isn't prepared to meet the other needs of a business. After all, incentives are only one piece of the equation, and many times it's only a small piece. Over time it is becoming more evident that firms are looking for a state that not only has a very helpful attitude in meeting their company needs, but they are also looking for a state that has the ability to meet their growing demands in the future. This means more than just incentives, but a strong commitment to growth concerning the state's infrastructure. And frankly, not all states are as equally committed to growth. There are a lot of low unemployment areas out there that have a high quality of life, and they are somewhat tired of growth. They basically don't have incentives ("Management Strategy"). But even states that are committed to growth have had to take a road less traveled. One trend has been for city's

to focus on making their jurisdictions more livable. Some of them are drawing, literally, an infrastructure and growth line in the sand (Venable 1996, "Infrastructures"). This has meant focusing on development within the city and not spreading out and getting too big too fast. This has meant a different package of incentives being offered that may not look the same as their neighbors, although the dollar value may be competitive.

Becoming increasingly important is the quality of life factors that firms are looking for when making a location decision. This coincides closely with a states infrastructure, which includes things such as airports, and the quality of schools and universities. Most businesses today are looking for a skilled workforce, which is becoming increasingly difficult to find with today's unemployment rates being so low. If a state is serious about attracting new businesses it must take into consideration the other needs that the locating business has other than just tax incentives. This supports the notion that many states are offering complex packages that consist of more than just incentives but also of promises to help train the workforce the company will need in the future. This has been a problem for some time now. Almost every year over the past decade you will find one report after another featuring firms in desperate need for a skilled workforce. "It is absolutely the single most important location factor today, and every year it gains in importance. Regardless of livability or anything else, the first thing in the corporate executive's mind is, 'Where can I find a workforce that has the necessary skills for my new facility to be successful? (Venable, 1992)

One interesting avenue worth pursuing is to compare quality of life factors between neighboring states and see if the correlation is stronger when the quality of life is essentially the same. Some experts claim that it is actually quality of life factors that act

as the "tie-breaker" rather than incentives offered by states. A trend lately has been that the white-collar workers are moving where they prefer to live rather than where the jobs might be already located. This creates a different set of dynamics when coupled with the labor shortage for an educated and skilled workforce. If firms are now shopping around for the right mix of workers, states may find themselves competing with other states that share the same quality of life factors. One way this correlation could be tested is to look at the GDP per capita in each of the states. States that share similar GDP per capita might also be more closely correlated especially if other factors remain constant, such as geographic location.

There are many factors to consider when comparing why different states offer different (or the same) incentives. Past empirical data hasn't shown any conclusive results as to whether incentives actually make a difference when a firm is choosing between two locations. It is possible that state officials realize that incentives don't always make the difference and reserve special deals for special situations. We may find that deals being made behind closed doors might be quite similar. This would mean that copying may in fact be taking place more so than we can put our finger on or quantify. Although it does seem to be the case that states which neighbor each other, tend to be more correlated than those located some distance away. Whether or not this is truly necessary or wise is another question and frankly for someone else to decide.

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