

# Do State Business Climate Indicators Explain Relative Economic Growth at State Borders?

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Numerous organizations produce rankings of states and localities on relative business climate. State and localities tout the indexes on which they rank highly in their efforts to attract new or expanding businesses. Politicians use them to demonstrate the success of their policies or to denigrate the policies of incumbents. Indexes are widely disseminated in print and electronic media, often treated as accurate measures of actual economic performance. However, few of the indexes are subject to systematic tests of their predictive power.

This study submits eleven indexes to tests of their ability to predict relative economic performance on either side of state borders. On the presumption that an area's comparative advantage is unlikely to differ on either side of a state boundary, it is reasonable to assume that firms would be equally successful in either state, other things equal. This presumption is reinforced by the fact that ease of migration of capital and labor from one side of the border to the other should equalize the marginal products of capital and labor so that productivity shocks in one state would be transmitted quickly to the other. However, states can dampen the forces that would tend to equalize growth to the extent that capital or labor flows respond to state policies. For example, states differ dramatically in the types of taxes imposed, marginal tax rates, training programs, government regulations, support for infrastructure, investments in the arts or education, recreational amenities, or any number of policies that have been alleged to affect business climate. If these differences affect incentives to invest or live in one state relative to another, they can disrupt the free flow of labor and capital across the borders and create gaps in economic performance. As aggregators of the presumed positive and negative effects of these policies, business climate indicators should signal which side of the border should have the more favorable prospects for growth.

The borders are the most logical place to test the performance of these business climate indicators because the differences in state policies will have their largest effects on competitors that are in the same area. Firms located in the interior of the state will have the benefit of distance to moderate the adverse consequences of more favorable policies afforded their competitors in other states. In addition, almost all states have multiple borders which means that the same business climate can be tested against the variety of competing business climates of their neighboring states.

We impose several tests. The first examines the ability of each index to predict relative economic growth at the border over the next five years relative to its ability to explain relative growth over the past five years. This will tell us whether the index is more focused on prediction or simply ranking based on past performance. The second examines whether an index has predictive power in any five year period between 1970 and 2010 regardless of when the index was published. If business climate persists, then we may find that predictive power persists as well. Finally, we allow the various business climate indexes to compete against one another in predicting relative economic growth over the 2005-2010 period regardless of when the index was published. Various measures of growth were employed including changes in aggregate income, per capita income, labor productivity, employment, wages, and population.

Preliminary results show that most business climate indexes have no ability to predict relative economic growth regardless of how that growth is measured. Some are negatively correlated with relative growth. Many are better at reporting past growth than at predicting the future. In the end, the most predictive business climate index is the Grant Thornton Index which was discontinued in 1989.

## **I. Background on Business Climate Indices**

In 1975, the Fantus Corporation prepared a one-time ranking of state business climates for the Illinois Manufacturers Association. The report was based on Fantus' subjective assessment of 33 different indicators that were believed to affect manufacturing locations. That study was followed in 1979 by the first of a series of annual reports by Grant Thornton that used a weighted aggregation of 18 to 22 factors, with the weights determined by a survey of representatives of various manufacturer's associations. Both studies represented attempts to characterize a state's overall environment for business success, including tax policy, regulatory structure, labor force quality, and quality of life.

Since then, hundreds of state rankings have been published based on various criteria such as quality of life, cost of living, school quality, tax competitiveness, labor force quality, entrepreneurship, and green jobs. The ranking business has been extended to the metropolitan level. Both Ames, IA and Lawrence, KS boast numerous accolades from rankings published in *Money Magazine*, *Forbes*, *Inc. Magazine*, *BusinessWeek*, *CareerBuilder.com*, and the *Mother Earth News* 'Great Place You've Never Heard Of'. These rankings are reproduced by local newspapers, Chambers of Commerce, and Economic Development Commissions.

Both of these early business climate indexes received some attention from academics.<sup>1</sup> However, since Grant Thornton discontinued its index in 1989, its successors have rarely been subjected to academic scrutiny. Kolko, Neumark and Cuellar Mejia's (2013) study was the first serious published analysis since 1989. Using aggregate state measures of output, employment and wages, they conclude that indexes that focused on simpler tax structures and smaller welfare states tended to perform better in predicting relative state growth. However, business climate indexes had only modest explanatory power in explaining relative state economic growth

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<sup>1</sup> See Plaut and Pluta (1983) and Lane et al (1989) for generally favorable studies. An unpublished paper by Courant and Fulton (1985) concluded that the Grant Thornton index had weak predictive power except in recessions.

compared to factors beyond policy influence such as weather, proximity to a major waterway, industrial mix, and population density.

Missing from previous studies of business climate indexes is an effort to control for the endogeneity of government policies concerning growth. As was noted by Kolko et al (2013), due to locational, climactic and geological advantages and disadvantages, states will have natural differences in their sectoral comparative advantages and disadvantages. However, governments may alter their tax rates, expenditures and economic development policies to build on these advantages and mitigate disadvantages. Analogously, private investors and financial intermediaries will adjust their strategies in response to perceived local opportunities. Moreover, a state may alter its policies in response to its neighbor's actions. A low marginal income tax rate may have particularly positive impacts when the neighboring state has high marginal rates, but it may have little impact if the neighbor matches the low rate. As a result, cross sectional data on government policies and business will reflect their local environments. The same policy that may prove effective in one location due to geoclimatic conditions and a neighbor's policies and detrimental in another. A simple cross –sectional analysis that relates state-wide economic growth to state policies without considering these local circumstances may yield unreliable inferences.

For that reason, we conduct our analysis of these business climate indexes where they should have the greatest impact -- on opposite sides of state borders. On either side of the border, naturally occurring comparative advantage should be roughly equivalent. Moreover, policy set at the state level may not reflect the particular advantages or disadvantages faced on one border versus another. Finally, this strategy will allow us to gauge the success of a state's policies in the context of each of its neighbor's policies. Because most states will have multiple borders, we

will be able to test its business climate against multiple alternative states, adding to our ability to identify a particularly good business climate measure.

## **II. Business Climate Indexes**

Table 1 contains a listing of the business climate indexes evaluated in this study. The list includes indexes released between 1975-2004 so that we had sufficient time to evaluate each index's predictive power for at least five years after release. All of the included indexes were nationally prominent. To be included in this study also required that the authors of the index provide sufficient detail for us to evaluate how the index was generated. That allowed us to determine that the index was based on structural measures (e.g. tax policies, factor endowments, or environmental amenities) as opposed to performance measures (e.g. the level or growth of production). We view performance measures as reflective of the outcomes of, rather than the inputs to, the business climate. For example, we exclude the *Inc.* magazine ranking of state economies published annually in its October edition through the 1980s. That ranking was heavily based on growth outcomes such as job growth, business starts, and the percent of fast-growing companies, measures that clearly reflect the past rather than predicting future growth.

The indexes are reported in two ways. Some release explicit scores so that one can assess the magnitude of the business climate gap between states. Others just report a ranking. The indexes do not consider the same factors. While all consider various aspects of quality of life, quality of labor or capital inputs, and quality of state or local fiscal and regulatory policies, all also include idiosyncratic factors not considered by other indexes and all place their own explicit or implicit weights on these factors. As information technologies have improved, the indexes have become more complex, both in the number and variety of variables considered and in the statistical mechanisms used to aggregate these variables into a single index.

The indexes clearly viewed themselves as in competition with one another. The Corporation for Enterprise Development (CED, 1987, p. 2) stated that, “the Grant Thornton index does not measure the factors important to business success in today’s economy. The index and the traditional business climate definition it perpetuates are relics from another time, another economy—an economy based on routine mass production where cheap, low skilled labor is the key to success.” In contrast, the CED (1987, p. 3) asserted that its index, “provides a more accurate and more comprehensive picture of how state economies are doing in today’s economy and, thus, how ‘attractive’ they *really* are for business development.” Twelve years later, the Progressive Policy Index justified its creation of the State New Economy Index on similar grounds. “Unlike some other reports which assess state economic performance or state economic policies, this report focuses more narrowly on a simple question: to what degree does the structure of state economies match the ideal structure of the New Economy?” (Atkinson and Stewart, 2012).

The business climate indexes break down into three types. The earliest and most common indexes deal with a relatively small number of factors focusing on tax, regulatory and fiscal policies that might affect the cost of doing business. Those include Fantus (FT), Grant Thornton (GT), the Small Business Survival Index (SB), the CED policy index (CEDpi), and the Tax Foundation State Business Tax Climate Index (TF). Another set concentrates on economic freedom, including the Fraser Economic Freedom indexes (FrN, FrS) and the Clemson-Pacific Research Institute Economic Freedom Index (PRI). These also depend on taxes but place greater emphasis on regulatory restrictions on individual decisions. The third are comprehensive measures that generally give positive value to government industrial policies aimed at stimulating business. Those include the New Economy Index (NE), the remaining two CED

indexes on economic development policies (CEDdp) and economic capacity (CEDc), and the Beacon Hill Metro and State Competitiveness Report (BH), which does not reward intervention-related economic policies.

Business climate is not a precise concept: these indexes could diverge considerably from one another at one point in time. In fact, repeated editions of the same index may change over time as well. To examine the extent to which repeated editions of the same index provide new information, we report the extent to which they are correlated in Table 2. For the most part, the indexes show a great deal of persistence. Of five indexes that we observe with a four year gap or more, the smallest inter-temporal correlation is 0.71. Grant Thornton and the Corporation for Enterprise Development indexes show the most variation over time in part because these indexes changed the factors making up the index, and in part because they changed the weights attached to those variables. The other indexes provide little new information over time, consistent with their presumed use of a consistent world view and methodology, we would expect that they would not change dramatically over time.

These indexes are all supposed to measure business climate, and so one might expect that they would be highly correlated one with another. Table 3 reports the cross-correlations between indexes. For indexes with repeated installments, we pick a year in the middle of the sample as the Table 2 results suggest that the midpoint index values would be reasonably highly correlated with index values in earlier and later years. To make the correlations easier to interpret, indexes for which smaller numbers imply better climates were multiplied by -1. Some of the intriguing results:

- 1) The Grant Thornton, Fantus and Pacific Research indexes are clearly measuring similar things. Their correlations are quite high despite almost a quarter century elapsing



between the Fantus and Pacific research indexes. If indexes retain explanatory power for 20 years, then business climate must be extremely persistent.

- 2) A second cluster of indexes includes the New Economy, Beacon Hill and the Center for Enterprise Development: Development Policy indexes.
- 3) The two Fraser Economic Freedom indexes are a third cluster.
- 4) Those clusters aside, almost two-thirds of the correlations are negative and about half of the rest are very small. If business climate were a well-defined statistical measure, we would expect unbiased measures of business climate to be positively correlated. Clearly these indexes are measuring different things.

### **III. Business Climate Indexes and Relative Growth at the Border**

The ultimate test of a business climate index is its ability to explain relative economic performance across states, and if relative business climate matters for business success, it should be most apparent at the states borders.<sup>2</sup> Communities in the center of the state will be somewhat insulated from competition from firms in other states, but firms at the border cannot avoid competition. If state A has a better business climate than state B, state A firms should grow faster in part because of the disadvantage faced by their neighboring competitors in state B.

We begin by identifying all counties in the U.S. that border another state. In total there are 107 borders including all 48 states of the continental United States. Let  $g_{ijt} = \left(\frac{Y_{ijt}}{Y_{ij0}}\right)$  be the ratio of economic outcomes in period  $t$  relative to base period 0 for county  $i$  in state  $j$ . Similarly, let  $g_{ij't} = \left(\frac{Y_{ij't}}{Y_{ij'0}}\right)$  be the corresponding ratio for neighboring county  $i$  in state  $j'$ . Let the

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<sup>2</sup> Previous studies using relative growth at the borders to assess policy effects include Fox (1986) who analyzed retail sales taxes, Holmes (1998) who analyzed of right-to-work laws, and Holcombe and Lacombe (2004) who analyzed state income taxation.

corresponding business climate indexes in the two states be  $b_j$  and  $b_{j'}$ . The test of the predictive power of the business climate index is based on the regression

$$(1) \quad \ln\left(\frac{g_{ijt}}{g_{ij't}}\right) = \beta_0 + \beta_I \ln\left(\frac{b_j}{b_{j'}}\right) + \varepsilon_{ijj't}$$

where  $\varepsilon_{ijj't}$  is a random error. A finding that  $\beta_I > 0$  indicates that the business climate index has power to explain relative growth across states with the magnitude of  $\beta_I$  being the elasticity of relative growth with respect to the relative business climate. The index's power to explain the variance in relative growth across states will be measured by the  $R^2$  statistic.

One might suspect that these business climate indexes do little more than report past growth rather than predicting future growth. We can test that by reversing the specification in 1) to be

$$(2) \quad \ln\left(\frac{g_{ij-t}}{g_{ij'-t}}\right) = \beta_{0'} + \beta_{I'} \ln\left(\frac{b_j}{b_{j'}}\right) + \varepsilon_{ijj'-t}$$

where the left-hand-side is the relative growth from period 0- $t$  to period 0. If the business climate index were truly forward looking, it should have more positive predictive power in (1) than in (2).

A complication is that the borders for county  $i$  state  $j$  will rarely coincide exactly with the borders of county  $i$  in state  $j'$ . More typically portions of county  $i$  in state  $j$  will border two or three counties in state  $j'$ . Furthermore, borders will differ in the number of counties, leading to overweighting of long borders or borders with small counties. To prevent problems of double counting counties with multiple neighbors and of overweighting of borders with more counties, we used the strategy illustrated in Figure 1.

Let the total length of the border between the two states be  $L_{jj'}$ . The total border length can be divided into unique, nonoverlapping border segments. For example, if county  $i$  in state  $j$

borders counties 1, 2, and 3 in state  $j'$ , there will be three corresponding nonoverlapping border segments with respective lengths of  $\ell_{i1j'}$ ,  $\ell_{i2j'}$ , and  $\ell_{i3j'}$ . These three lengths sum to  $\ell_{ij}$ , the total border length of county  $i$  in state  $j$ . Each of the three segments enters regression (1):  $\ln\left(\frac{g_{ijt}}{g_{1j't}}\right)$  with weight  $(\ell_{i1j'}/L_{jj'})$ ;  $\ln\left(\frac{g_{ijt}}{g_{2j't}}\right)$  with weight  $(\ell_{i2j'}/L_{jj'})$ ; and  $\ln\left(\frac{g_{ijt}}{g_{3j't}}\right)$  with weight  $(\ell_{i3j'}/L_{jj'})$ . The weights add up to 1, so each border enters with a cumulative weight of one, whether there is a single county or twenty counties.<sup>3</sup> In practice, we found that the weighted regressions yielded estimates similar to a regression that used a correction for clustering on the border which also has the effect of having each border enter with the same weight in the regression.

We use eight different measures of growth, all available from the Bureau of Economic Analysis' Regional Economic Accounts.<sup>4</sup> The use of multiple growth measures bypasses concerns that different business climate indexes might be focusing on different aspects of economic success. Four measures reflect elements of total output: aggregate income which includes returns to proprietors as well as compensation, aggregate nonfarm income, income per capita and population. If the state's business climate enhances prospects for profit or productivity growth, it should attract more firm entry and expansion. Personal income is the best available measure of aggregate local output. It will miss profits that go to nonresident investors and it will include income derived from other areas. It can be decomposed into population and income per capita. Nonfarm income removes the receipts from farms. Because about one-third of U.S. farmland is rented with rental income and government transfer payments going to nonproprietors, farm income may cloud our estimate of local output. An additional concern is

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<sup>3</sup> We exclude the corner counties that border on more than one state, so the cumulative weights sum up to less than one for borders with one or more multistate corners.

<sup>4</sup> Data descriptions and county-level data can be downloaded from <http://www.bea.gov/bea/regional/data.htm> and are reported in the U.S. Department of Commerce, Bureau of Economic Analysis (2013).

that wage and salary income for residents may be derived from business that are located across the border. The remaining four measures address that concern.

The other four growth indicators are more closely related to the local labor market and worker productivity: average wage per job, output per worker, the county wage bill, and total employment. The county wage bill is the sum of all wages and salaries paid to employees plus the cost of employer provision of benefits such as pensions and insurance, plus the cost of the federally mandated social insurance programs. These are reported by place of work rather than by place of residence, and so these data will include workers commuting from a neighboring state. The wage bill is the largest component of gross state product, representing about 60% of the total state. Consequently, growth in the wage bill is the closest approximation to growth in county output attributable to labor. Wage bill can be decomposed into its two elements, employment and compensation per job. Absent any restrictions on commuting, wages should equalize on either side of a state border with the more productive side having more employees and faster job growth than its less productive neighbors. Therefore, employment should be more responsive than per worker compensation to relative business climate.<sup>5</sup> We also have the option of deriving a measure of output per worker by combining wage and salary earnings with proprietor's income and then dividing by employment plus proprietors. As with wages, mobile labor should equalize labor productivity growth across the state border and so we would not anticipate that the business climate indexes would be able to predict relative productivity growth.

#### **IV. Predictive Performance of Relative Business Climate Indexes**

We summarize the results of our estimation of equations 1) and 2) in Table 4. Our dependent variables are the eight growth measures applied to the five years preceding the release

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<sup>5</sup> We had thought that natural barriers to travel across the border such as a river might moderate the equilibrating forces across state borders, but we found similar effects when we controlled for rivers and bridges.

date of each index and the five years following the release date. These results are reported in the columns labeled “Backcast” and “Forecast” respectively. If the business climate indexes are truly forward looking, they should have more ability to explain the future than the past. The five year time should allow sufficient time for investment to respond to favorable government policies so that our results are not overly clouded by temporary business cycle effects, although the same national business cycle effects should be occurring on both sides of the state border.

For indexes with multiple editions, we report the average across all releases. For example, with 7 Grant Thornton editions released between 1980 and 1986, we report how many times out of the 7 the coefficient on relative business climate was positive ( $\beta_I > 0$ ), how many times it was significantly positive ( $\beta_I \gg 0$ ), how many times it returned a significant negative coefficient ( $\beta_I \ll 0$ ), and the average of the coefficient which we define as the business climate index elasticity  $\bar{\epsilon}_I$ . We also report the average  $R^2$  from the regressions to indicate how much of the variation in relative economic growth at the border can be explained by relative values of the business climate index. We estimated this using our weighted least squares method and by correcting for clustering at the border. Results were similar and so we report just the ones that used the cluster correction.

The relative business climate indexes can explain at most 3% of the variation in relative growth at state borders over the next five years, however we measure outcomes and whether we are looking forward or backward. That suggests that none of these indexes has much to say about economic growth, regardless of how measured. Perhaps growth is primarily driven by fundamentals such as factor endowments and locational comparative advantage and not business climate, or perhaps these measures of business climate are just not that good.

That said, some of the indexes seem better than others. The Grant Thornton index generates the expected positive effect of relative business climate on relative growth over the following five years in 49 of 56 possible cases in the Forecast column including 28 significant positive effects against no significant negative effects. Grant Thornton performs particularly well where an index should be able to predict outcomes, namely growth in aggregate income, wage bill, employment, and population, and it performs less well on relative wages and productivity which should grow similarly on either side of the border. Moreover, the index appears to be truly forward looking in that it performs much better in forecasting than in backcasting. Grant Thornton generated only 12 significant positive effects on growth over the past 5 years against the 28 significant coefficients going forward.

The other index that appeared to perform well is the Corporation for Economic Development Capacity Index which generated 17 significant positive effects on relative growth at the borders against 5 significant negative effects. Like the Grant Thornton, it appears to be genuinely forward looking as it had only 3 significant positive coefficients in its backcasting regressions.

Some indexes seem to have information for a few outcomes but not others. For example, the Tax Foundation index seems to forecast relative population growth on either side of the border. However, it has strangely negative results in projecting per capita income, average wage and productivity, the series that should be equilibrating on either side of the border. That it failed to register positively or negatively for most series suggests that its success in forecasting relative population growth may be a fluke.

Even more perversely, some index consistently predict in the wrong direction. The Small Business Survival Index produces consistently incorrect forecasts of relative growth in nonfarm

income, population, employment and the wage bill. The Corporation for Economic Development-Policy and Fiscal Policy Indexes also explain relatively more of the variation in relative economic growth outcomes than the other indexes, but in the wrong direction. Across the two series, we have 33 significant negative coefficients against only 4 positive effects. They perform even worse going backwards where all 32 significant coefficients on relative business climate are in the wrong direction.

The New Economy Index was the only one that seemed to look backward rather than forward, although it was unable to explain even 1% of the relative growth at state borders. It generated 3 negative and no positive and significant coefficients in its forecasting equations, but 6 positive and no negative and significant coefficients in its backcasting equations. The remaining indexes had almost no predictive power going either forward or backward, suggesting they had no information to offer on why states grow at different rates on either side of their borders.

## **V. Do Business Climate Indexes Explain Growth in any Period?**

Our indexes that were issued on multiple years are highly correlated over time, suggesting that their evaluations of relative business climate are quite stable. It may be that a business climate index will do better in some other five year period, even if it does not distinguish itself in the first five years after its release. On the other hand, we may find that a business climate index that appears to have some forecasting ability over the next five years will have a similar ability to explain relative growth in other five year periods also. We explore these questions in Table 5.

Divide the period between 1975 and 2010 into 8 5 year periods, and we apply equation 1) to each regardless of the publication date of each index. If a state's business climate is

determined by relatively stable government policies regarding taxation, spending and regulation, or if it is fixed by local geoclimatic conditions or naturally occurring geographical advantages, we should find that the index performs similarly across the eight 5-year growth periods spanning 35 years. On the other hand, if business climate evolves over time, then there may be only transitory evidence of success. We use the relative growth in nonfarm income across state borders as our measured economic outcome.

The Grant Thornton index again distinguishes itself, even more impressively because it continues to be able to predict relative growth at state borders 20 years after release. It explained at least 3% of the variation in relative growth for each 5-year period between 1975-2005, but it lost predictive power in the 2005-2010 period. It was most successful in explaining relative growth between 1985-1995.

The Pacific Research Institute, Small Business Survival, and Tax Foundation indexes were also relatively successful across all periods, although those indexes were released after most of the periods had passed. Turning to the out-of-sample forecast of growth over the 2005-2010 period, neither the Small Business nor the Tax Foundation indexes had predictive power. The 2004 Pacific Research Institute actually had a significant coefficient but in the wrong direction for the 2005-2010 period.

The Corporation for Economic Development—Capacity Index failed to generate a strong relationship with growth in any of the periods between 1975-2005. However, it was the only index that had positive power to predict relative growth at the state borders in the 2005-2010 period. As that period includes the most protracted post-war recession, it may be that the CED-Capacity index measures economic resilience and flexibility in its elements. For the most part, the other indexes had the most success in explaining relative growth during expansionary periods



of the business cycle with 32/39 having their best performance in the 5-year periods between 1985-2000.

The rest of the indexes failed to demonstrate a significant relationship with growth in any of the 8 5-year growth periods. Moreover, none of the indexes save the CED-Capacity had any success in predicting relative growth in the 2005-2010 period.

## **VI. Composite Business Climate**

The rather poor performance of these indexes in predicting relative economic growth in the 2005-2010 period leads to another question: How much of the variance in relative economic performance should we expect a business climate index to could a business climate index possibly explain? To address this question, we stacked all the business climate indexes together into a single regression explaining relative growth of counties at the state borders between 2005-2010. With the possible exception of the CED-Capcity, none of the indexes had much power to explain growth in this period individually, but they might have power collectively. For indexes with multiple editions, we picked just one as representative, given the high correlation between the various editions of these indexes. The results for sveral growth indicators are reported in Table 6.

Even when we combine 11 business climate indexes together, we can only explain 3-7% of the variation in relative growth at state borders. All but one of the indexes switches signs across the four growth measures. The sole consistent performar is the 2000 Small Business Survival index which has a positive effect on relative growth in all four regressions. Even so, it is difficult to say that the Small Business Index is somehow superior, given its more mediocre performance when placed in isolation. Similarly, the New Economy Index finally regosters some positive predictive power, but only when paired with its more successful competitors. In

isolation, it had nothing to say about relative growth. One could use the coefficients in Table 6 to generate a weighted combination of these forecasts to generate a single superior forecast. However, the broader lesson from Table 6 is that even when we combine the collective wisdom of all the main business climate indexes developed between 1975-2005, we cannot explain even 10% of the variation in relative economic performance across states.

## **VII. Conclusions**

TO BE WRITTEN

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Table 1: Overview of Business Climate Indexes Used in this Study

| Index  | Comments  |
|--|---|
| <p>Fantus Company (1975)</p> <p>Symbol: FT</p>                                   | <ul style="list-style-type: none"> <li>• Commissioned by the Illinois Manufacturers' Association.</li> <li>• 15 measures that primarily related to the cost of doing business.</li> <li>• Measures appeared to be equally weighted.</li> <li>• To the authors' knowledge, there are no surviving copies of the original report, only cursory discussions in secondary sources.</li> </ul>   |
| <p>Grant Thornton (1979-1989)</p> <p>Symbol: GT</p>                              | <ul style="list-style-type: none"> <li>• 1979 study commissioned by the Council of State Manufacturers' Associations (COSMA). Thereafter, COSMA members participated, but COSMA did not financially sponsor the annual study.</li> <li>• 18-22 measures primarily associated with the cost of doing business, with a few demographic and performance measures.</li> <li>• Measures are weighted based on survey responses regarding measures' importance to COSMA membership.</li> <li>• Only the 48 contiguous states</li> </ul>                         |
| <p>Small Business Survival Index (2000-2004)</p> <p>Symbol: SB</p>               | <ul style="list-style-type: none"> <li>• Product of the Small Business and Entrepreneurship Council (formerly known as the Small Business Survival Council). <a href="http://www.sbsc.org/">http://www.sbsc.org/</a></li> <li>• 15-21 measures primarily associated with the costs of doing business. Heavily weighted toward tax policy measures. Small index values indicate a "better" business climate.</li> <li>• All measures equally weighted.</li> <li>• The index dates back to the mid-1990s, but earlier versions were unavailable.</li> </ul> |
| <p>Metro Area and State Competitiveness Report (2001-2004)</p> <p>Symbol: BH</p> | <ul style="list-style-type: none"> <li>• Product of the Beacon Hill Institute at Suffolk University. <a href="http://www.beaconhill.org/">http://www.beaconhill.org/</a></li> <li>• Approximately 40 measures categorized into 5 subindexes: Policy, Security, Infrastructure, Human Resources, Technology, and Finance.</li> <li>• Each measure is equally weighted within each subindex. Each subindex is equally weighted in the aggregate index.</li> </ul>   |
| <p>The State New Economy Index (1999 &amp; 2002)</p> <p>Symbol: NE</p>           | <ul style="list-style-type: none"> <li>• Product of the Progressive Policy Institute. <a href="http://www.neweconomyindex.org/states/2002/">http://www.neweconomyindex.org/states/2002/</a></li> <li>• 23 measures categorized into 5 categories: Knowledge Jobs, Globalization, Economic Dynamism, Digital Economy, and Innovation Capacity. Measures focus on technology-related areas.</li> <li>• Weights applied to each measure to mitigate the influence of closely correlated measures.</li> </ul>   |

| Index  | Comments  |
|--|---|
| <p>Economic Freedom Index 2004</p> <p>Symbol: FrN (All gov't)</p> <p>Symbol: FrS (S&amp;L gov't)</p>                   | <ul style="list-style-type: none"> <li>• Product of the Fraser Institute and the National Center for Policy Analysis. <a href="http://www.fraserinstitute.ca/">http://www.fraserinstitute.ca/</a> <a href="http://www.ncpa.org/">http://www.ncpa.org/</a></li> <li>• The methodology was applied to both U.S. and Canadian data at both the national and subnational levels of government. The index is reported at both levels of aggregation.</li> <li>• 10 measures related to the size of government and the regulation of markets in three categories: Size of Government, Takings and Discriminatory Taxation, and Labor Market Freedom.</li> <li>• Each measure is equally weighted within each subindex. Each subindex is equally weighted in the aggregate index.</li> </ul>   |
| <p>The U.S. Economic Freedom Index (2004)</p> <p>Economic Freedom in America's 50 States (1999)</p> <p>Symbol: PRI</p> | <ul style="list-style-type: none"> <li>• The 2004 index is a product of the Pacific Research Institute (in association with Forbes Magazine). The 1999 index is a product of the work of three Clemson University economics professors. <a href="http://www.pacificresearch.org/">http://www.pacificresearch.org/</a> <a href="http://freedom.clemson.edu/">http://freedom.clemson.edu/</a></li> <li>• The 1999 Clemson index (used in the present analysis) is the intellectual forerunner of the 2004 PRI report.</li> <li>• Dozens of metrics categorized into five categories: Fiscal Sector, Regulatory Sector, Judicial Sector, Size of Government, and Welfare Spending.</li> <li>• Lower index scores means greater economic freedom.</li> <li>• The 1999 Index has a two-part weighting procedure. Individual measures within each category are given decile-based scores, and the decile score of the various measures within each category are averaged to produce a category score. In 1999, the category scores were aggregated into a single index using weights from principle components analysis. In 2004, the aggregation used weights from regression coefficients relating the categories to interstate migration between 1995-2000.</li> </ul> |
| <p>Development Report Card of the States—Policy Index (1987-1992)</p> <p>Symbol: CEDdp</p>                             | <ul style="list-style-type: none"> <li>• Product of the Corporation for Enterprise Development <a href="http://drc.cfed.org/">http://drc.cfed.org/</a></li> <li>• Dozens of measures separated in to eight subindexes.</li> <li>• Each measure equally weighted in each subindex. Each subindex equally weighted in the aggregate Policy index.</li> <li>• Measures focus on the existence of government-based economic development programs.</li> </ul>  |

| Index   | Comments   |
|---|--|
| <p>Development Report Card of the States—Capacity Index (1987-2004)</p> <p>Symbol: CEDc</p>       | <ul style="list-style-type: none"> <li>• Product of the Corporation for Enterprise Development <a href="http://drc.cfed.org/">http://drc.cfed.org/</a></li> <li>• 26-30 measures separated into five subindexes: Human Resources, Technology, Finance, Infrastructure, and Amenities.</li> <li>• Each measure equally weighted in each subindex. Each subindex equally weighted in aggregate Capacity index.</li> </ul>  |
| <p>Development Report Card of the States—Fiscal Policy Index (1988-1998)</p> <p>Symbol: CEDpi</p> | <ul style="list-style-type: none"> <li>• Product of the Corporation for Enterprise Development <a href="http://drc.cfed.org/">http://drc.cfed.org/</a></li> <li>• 16-18 measures separated into three subindexes: Fiscal Stability and Balance, Tax Fairness, and Fiscal Equalization.</li> <li>• Separate reporting of this index began with the 1988 report (but was part of the 1987 Policy Index).</li> <li>• Each measure equally weighted in each subindex. Each subindex equally weighted in aggregate Capacity index.</li> </ul>   |
| <p>State Business Tax Climate Index (2003-2004)</p> <p>Symbol: TF</p>                             | <ul style="list-style-type: none"> <li>• Product of the Tax Foundation <a href="http://www.taxfoundation.org/">http://www.taxfoundation.org/</a></li> <li>• The 2003 index was comprised of 5 major indexes: Corporate Income Tax, Individual Income Tax, Sales and Gross Receipts Tax, Fiscal Balance, Tax Base Conformity. The major indexes contain 18 subindexes and 32 measures.</li> <li>• Each major index is weighted equally to form the aggregate index. Each sub-index is weighted equally within the major indexes. In many instances, a measure equals a sub-index (e.g., tax rates)</li> <li>• The 2004 index replaces adds the Conformity index variables into the other major indexes and adds an Unemployment Tax index. It also expands the number of sub-indexes and measures, and alters the weighting scheme to diminish the weights of “yes-or-no” variables.</li> </ul> |

Table 2: Intertemporal correlations for repeated business climate indexes, various years

|          | <i>GT80</i> | <i>SB00</i> | <i>NE99</i> | <i>BH01</i> | <i>PRI99</i> | <i>CEDdp87</i> | <i>CEDc87</i> | <i>CEDpi88</i> | <i>TF03</i> |
|----------|-------------|-------------|-------------|-------------|--------------|----------------|---------------|----------------|-------------|
| $X(T+1)$ | 0.81        | 0.97        |             | 0.97        |              | 0.84           | 0.85          | 0.75           | 0.99        |
| $X(T+2)$ | 0.81        | 0.96        |             | 0.96        |              | 0.84           | 0.83          | 0.74           |             |
| $X(T+3)$ | 0.81        | 0.92        | 0.96        | 0.84        |              | 0.68           | 0.79          | 0.74           |             |
| $X(T+4)$ | 0.76        |             |             |             |              | 0.71           | 0.72          | 0.71           |             |
| $X(T+5)$ | 0.72        |             |             |             | 0.86         |                | 0.73          | 0.61           |             |
| $X(T+6)$ | 0.62        |             |             |             |              |                | 0.73          | 0.61           |             |
| $X(T+7)$ |             |             |             |             |              |                | 0.74          | 0.61           |             |
| $X(T+8)$ |             |             |             |             |              |                | 0.73          | 0.58           |             |
| $X(T+9)$ |             |             |             |             |              |                | 0.68          |                |             |

Correlations represent the earliest available index  $X$  at time  $T$  with values of the same index taken at time  $T+t$ ,  $t=1, 2, 9$ .



Table 3: Correlations across Business Climate Indexes, Various Years

|                | <i>GT81</i>   | <i>FT75</i> | <i>SB00</i> | <i>BH01</i> | <i>NE99</i> | <i>FrNG04</i> | <i>FrSG04</i> | <i>PRI99</i> | <i>CEDdp89</i> | <i>CEDc92</i> | <i>CEDpi92</i> | <i>TF03</i> |
|----------------|---|-------------|-------------|-------------|-------------|---------------|---------------|--------------|----------------|---------------|----------------|-------------|
| <i>GT81</i>    | 1   |             |             |             |             |               |               |              |                |               |                |             |
| <i>FT75</i>    | <b>0.71</b>   | 1           |             |             |             |               |               |              |                |               |                |             |
| <i>SB00</i>    | 0.39  | 0.36        | 1           |             |             |               |               |              |                |               |                |             |
| <i>BH01</i>    | -0.12   | -0.35       | -0.05       | 1           |             |               |               |              |                |               |                |             |
| <i>NE99</i>    | -0.12   | -0.45       | -0.12       | <b>0.63</b> | 1           |               |               |              |                |               |                |             |
| <i>FrNG04</i>  | -0.36   | -0.12       | -0.45       | -0.20       | -0.24       | 1             |               |              |                |               |                |             |
| <i>FrSG04</i>  | -0.46   | -0.28       | -0.58       | -0.12       | -0.17       | <b>0.90</b>   | 1             |              |                |               |                |             |
| <i>PRI99</i>   | <b>0.69</b>   | <b>0.71</b> | 0.47        | -0.05       | -0.34       | -0.35         | -0.42         | 1            |                |               |                |             |
| <i>CEDdp89</i> | -0.60   | -0.58       | -0.51       | 0.19        | 0.35        | 0.41          | 0.46          | -0.67        | 1              |               |                |             |
| <i>CEDc92</i>  | -0.31   | -0.48       | -0.19       | <b>0.62</b> | <b>0.81</b> | -0.11         | -0.04         | -0.39        | 0.51           | 1             |                |             |
| <i>CEDpi92</i> | -0.23   | -0.27       | -0.54       | 0.07        | 0.07        | 0.34          | 0.50          | -0.21        | -0.46          | -0.12         | 1              |             |
| <i>TF03</i>    | 0.50  | 0.35        | 0.75        | 0.10        | 0.07        | -0.52         | -0.61         | 0.44         | -0.52          | -0.04         | -0.63          | 1           |
| <i>GT81</i>    | Grant Thornton 1981 index   |             |             |             |             |               |               |              |                |               |                |             |
| <i>FT75</i>    | (-1)* Fantus 1975 index   |             |             |             |             |               |               |              |                |               |                |             |
| <i>SB00</i>    | (-1)*Small Business Survival Index 2000 index   |             |             |             |             |               |               |              |                |               |                |             |
| <i>BH01</i>    | Beacon Hill 2001 index  |             |             |             |             |               |               |              |                |               |                |             |
| <i>NE99</i>    | New Economy Index 1999 index  |             |             |             |             |               |               |              |                |               |                |             |
| <i>FrNG04</i>  | Fraser Institute/NCPA Economic Freedom Index: All government 2004 index                     |             |             |             |             |               |               |              |                |               |                |             |
| <i>FrSG04</i>  | Fraser Institute/NCPA Economic Freedom Index: State and Local government 2004 index         |             |             |             |             |               |               |              |                |               |                |             |
| <i>PRI99</i>   | (-1)*Clemson/Pacific Research Institute 1999 index  |             |             |             |             |               |               |              |                |               |                |             |
| <i>CEDdp89</i> | (-1) Corporation for Enterprise Development: economic development policy ranking 1989 index |             |             |             |             |               |               |              |                |               |                |             |
| <i>CEDc92</i>  | (-1) Corporation for Enterprise Development: capacity ranking 1992 index                    |             |             |             |             |               |               |              |                |               |                |             |
| <i>CEDpi92</i> | Corporation for Enterprise Development: fiscal policy index 1992 index                      |             |             |             |             |               |               |              |                |               |                |             |
| <i>TF03</i>    | Tax Foundation 2003 index   |             |             |             |             |               |               |              |                |               |                |             |

Table 4: Performance of Business Climate Indexes in Predicting Relative Income or Population Growth at State Borders  
Over the Next 5 Years

| Metrics               | Beacon Hill |          | CED Policy |          | CED Capacity |          | CED Fiscal Policy |          |
|-----------------------|-------------|----------|------------|----------|--------------|----------|-------------------|----------|
|                       | Backcast    | Forecast | Backcast   | Forecast | Backcast     | Forecast | Backcast          | Forecast |
| Aggregate Income      |             |          |            |          |              |          |                   |          |
| $\beta_I > 0$         | 4/4         | 2/4      | 0/5        | 0/5      | 2/10         | 5/10     | 0/9               | 2/9      |
| $\beta_I \gg 0$       | 1/4         | 0/4      | 0/5        | 0/5      | 0/10         | 4/10     | 0/9               | 1/9      |
| $\beta_I < 0$         | 0/4         | 0/4      | 3/5        | 3/5      | 0/10         | 1/10     | 4/9               | 1/9      |
| $\bar{\varepsilon}_I$ | 0.05        | 0.00     | -0.02      | -0.02    | -0.01        | 0.00     | -0.07             | -0.03    |
| R <sup>2</sup>        | 0.005       | 0.001    | 0.01       | 0.026    | 0.007        | 0.017    | 0.018             | 0.010    |
| Nonfarm Income        |             |          |            |          |              |          |                   |          |
| $\beta_I > 0$         | 3/4         | 1/4      | 0/5        | 0/5      | 5/10         | 8/10     | 0/9               | 1/9      |
| $\beta_I \gg 0$       | 1/4         | 0/4      | 0/5        | 0/5      | 1/10         | 1/10     | 0/9               | 0/9      |
| $\beta_I < 0$         | 0/4         | 0/4      | 3/5        | 4/5      | 0/10         | 0/10     | 5/9               | 3/9      |
| $\bar{\varepsilon}_I$ | 0.03        | 0.00     | -0.01      | -0.01    | 0.00         | 0.00     | -0.05             | -0.02    |
| R <sup>2</sup>        | 0.012       | 0.001    | 0.014      | 0.022    | 0.003        | 0.005    | 0.024             | 0.008    |
| Per capita Income     |             |          |            |          |              |          |                   |          |
| $\beta_I > 0$         | 3/4         | 2/4      | 1/5        | 0/5      | 2/10         | 6/10     | 0/9               | 6/9      |
| $\beta_I \gg 0$       | 1/4         | 1/4      | 0/5        | 0/5      | 1/10         | 3/10     | 0/9               | 1/9      |
| $\beta_I < 0$         | 0/4         | 0/4      | 3/5        | 3/5      | 2/10         | 2/10     | 2/9               | 1/9      |
| $\bar{\varepsilon}_I$ | 0.03        | 0.01     | -0.01      | -0.01    | 0.00         | 0.00     | -0.03             | 0.00     |
| R <sup>2</sup>        | 0.005       | 0.003    | 0.016      | 0.018    | 0.010        | 0.014    | 0.013             | 0.008    |
| Population            |             |          |            |          |              |          |                   |          |
| $\beta_I > 0$         | 4/4         | 0/4      | 4/4        | 0/4      | 5/10         | 9/10     | 0/9               | 0/9      |
| $\beta_I \gg 0$       | 0/4         | 0/4      | 0/4        | 0/4      | 0/10         | 4/10     | 0/9               | 0/9      |
| $\beta_I < 0$         | 0/4         | 0/4      | 0/4        | 0/4      | 0/10         | 0/10     | 7/9               | 5/9      |
| $\bar{\varepsilon}_I$ | 0.01        | -0.01    | 0.01       | -0.01    | 0.00         | 0.00     | -0.03             | -0.03    |
| R <sup>2</sup>        | 0.002       | 0.002    | 0.006      | 0.019    | 0.002        | 0.001    | 0.017             | 0.012    |
| Average Wage          |             |          |            |          |              |          |                   |          |
| $\beta_I > 0$         | 1/4         | 0/4      | 1/5        | 2/5      | 10/10        | 6/10     | 2/9               | 0/9      |
| $\beta_I \gg 0$       | 1/4         | 0/4      | 0/5        | 1/5      | 0/10         | 0/10     | 0/9               | 0/9      |
| $\beta_I < 0$         | 0/4         | 0/4      | 0/5        | 3/5      | 0/10         | 0/10     | 0/9               | 2/9      |
| $\bar{\varepsilon}_I$ | 0.02        | -0.01    | -0.01      | 0.00     | 0.00         | 0.00     | -0.01             | -0.02    |
| R <sup>2</sup>        | 0.005       | 0.001    | 0.002      | 0.008    | 0.002        | 0.001    | 0.001             | 0.007    |
| Productivity          |             |          |            |          |              |          |                   |          |
| $\beta_I > 0$         | 2/4         | 2/4      | 1/5        | 2/5      | 7/10         | 4/10     | 2/9               | 1/9      |
| $\beta_I \gg 0$       | 1/4         | 0/4      | 0/5        | 1/5      | 0/10         | 0/10     | 0/9               | 0/9      |
| $\beta_I < 0$         | 0/4         | 0/4      | 2/5        | 3/5      | 0/10         | 0/10     | 1/9               | 2/9      |
| $\bar{\varepsilon}_I$ | 0.01        | 0.00     | 0.00       | 0.00     | 0.00         | 0.00     | -0.01             | -0.02    |
| R <sup>2</sup>        | 0.004       | 0.001    | 0.004      | 0.013    | 0.001        | 0.001    | 0.002             | 0.007    |
| Wage Bill             |             |          |            |          |              |          |                   |          |
| $\beta_I > 0$         | 4/4         | 4/4      | 1/5        | 0/5      | 6/10         | 8/10     | 3/9               | 1/9      |
| $\beta_I \gg 0$       | 0/4         | 1/4      | 0/5        | 0/5      | 0/10         | 2/10     | 0/9               | 0/9      |
| $\beta_I < 0$         | 0/4         | 0/4      | 0/5        | 0/5      | 0/10         | 0/10     | 0/9               | 1/9      |
| $\bar{\varepsilon}_I$ | 0.03        | 0.05     | -0.01      | -0.01    | 0.00         | 0.01     | -0.01             | -0.03    |
| R <sup>2</sup>        | 0.001       | 0.004    | 0.001      | 0.003    | <0.001       | 0.003    | 0.006             | 0.005    |
| Employment            |             |          |            |          |              |          |                   |          |
| $\beta_I > 0$         | 4/4         | 4/4      | 2/5        | 0/5      | 6/10         | 10/10    | 3/9               | 2/9      |
| $\beta_I \gg 0$       | 0/4         | 0/4      | 0/5        | 0/5      | 1/10         | 3/10     | 0/9               | 0/9      |
| $\beta_I < 0$         | 0/4         | 0/4      | 0/5        | 1/5      | 2/10         | 2/10     | 2/9               | 2/9      |
| $\bar{\varepsilon}_I$ | 0.04        | 0.03     | 0.00       | -0.01    | 0.00         | 0.00     | -0.01             | -0.02    |
| R <sup>2</sup>        | 0.003       | 0.002    | 0.001      | 0.003    | 0.001        | 0.005    | 0.008             | 0.005    |

Table 4: Performance of Business Climate Indexes in Predicting Relative Income or Population Growth at State Borders Over the Next 5 Years (continued)

| Metrics               | Fantus   |          | Fraser   |          | Grant Thornton |          | New Economy |          |
|-----------------------|----------|----------|----------|----------|----------------|----------|-------------|----------|
|                       | Backcast | Forecast | Backcast | Forecast | Backcast       | Forecast | Backcast    | Forecast |
| Aggregate Income      |          |          |          |          |                |          |             |          |
| $\beta_I > 0$         | 0/1      | 1/1      | 0/2      | 2/2      | 6/7            | 7/7      | 2/2         | 1/2      |
| $\beta_I \gg 0$       | 0/1      | 0/1      | 0/2      | 0/2      | 3/7            | 4/7      | 2/2         | 0/2      |
| $\beta_I < 0$         | 1/1      | 0/1      | 0/2      | 0/2      | 0/7            | 0/7      | 0/2         | 1/2      |
| $\bar{\varepsilon}_I$ | -0.03    | 0.02     | -0.01    | 0.02     | 0.03           | 0.07     | 0.07        | -0.02    |
| R <sup>2</sup>        | 0.019    | 0.005    | 0        | 0.002    | 0.006          | 0.014    | 0.017       | 0.004    |
| Nonfarm Income        |          |          |          |          |                |          |             |          |
| $\beta_I > 0$         | 0/1      | 0/1      | 0/2      | 2/2      | 4/7            | 7/7      | 2/2         | 0/2      |
| $\beta_I \gg 0$       | 0/1      | 0/1      | 0/2      | 0/2      | 3/7            | 6/7      | 1/2         | 0/2      |
| $\beta_I < 0$         | 1/1      | 0/1      | 1/2      | 0/2      | 0/7            | 0/7      | 0/2         | 1/2      |
| $\bar{\varepsilon}_I$ | -0.01    | 0.00     | -0.04    | 0.01     | 0.03           | 0.05     | 0.05        | -0.02    |
| R <sup>2</sup>        | 0.01     | 0.001    | 0.01     | 0.002    | 0.009          | 0.03     | 0.004       | 0.005    |
| Per capita Income     |          |          |          |          |                |          |             |          |
| $\beta_I > 0$         | 0/1      | 1/1      | 2/2      | 2/2      | 2/7            | 5/7      | 2/2         | 1/2      |
| $\beta_I \gg 0$       | 0/1      | 1/1      | 0/2      | 2/2      | 1/7            | 2/7      | 1/2         | 0/2      |
| $\beta_I < 0$         | 1/1      | 0/1      | 0/2      | 0/2      | 0/7            | 0/7      | 0/2         | 1/2      |
| $\bar{\varepsilon}_I$ | -0.02    | 0.02     | 0.02     | 0.07     | 0.00           | 0.03     | 0.03        | -0.02    |
| R <sup>2</sup>        | 0.029    | 0.013    | 0.003    | 0.025    | 0.004          | 0.008    | 0.013       | 0.005    |
| Population            |          |          |          |          |                |          |             |          |
| $\beta_I > 0$         | 0/1      | 0/1      | 0/2      | 0/2      | 7/7            | 7/7      | 2/2         | 1/2      |
| $\beta_I \gg 0$       | 0/1      | 0/1      | 0/2      | 0/2      | 3/7            | 7/7      | 0/2         | 0/2      |
| $\beta_I < 0$         | 0/1      | 0/1      | 2/2      | 2/2      | 0/7            | 0/7      | 0/2         | 0/2      |
| $\bar{\varepsilon}_I$ | 0.00     | 0.00     | -0.05    | -0.04    | 0.02           | 0.03     | 0.01        | 0.00     |
| R <sup>2</sup>        | 0.001    | 0.002    | 0.021    | 0.023    | 0.008          | 0.025    | 0.002       | 0.002    |
| Average Wage          |          |          |          |          |                |          |             |          |
| $\beta_I > 0$         | 0/1      | 0/1      | 2/2      | 2/2      | 2/7            | 7/7      | 2/2         | 1/2      |
| $\beta_I \gg 0$       | 0/1      | 0/1      | 0/2      | 1/2      | 0/7            | 3/7      | 0/2         | 0/2      |
| $\beta_I < 0$         | 0/1      | 0/1      | 0/2      | 0/2      | 1/7            | 0/7      | 0/2         | 0/2      |
| $\bar{\varepsilon}_I$ | -0.01    | 0.00     | 0.02     | 0.03     | -0.01          | 0.02     | 0.01        | -0.01    |
| R <sup>2</sup>        | 0.005    | 0.003    | 0.004    | 0.009    | 0.002          | 0.006    | 0.001       | 0.002    |
| Productivity          |          |          |          |          |                |          |             |          |
| $\beta_I > 0$         | 0/1      | 0/1      | 2/2      | 2/2      | 1/7            | 4/7      | 1/2         | 0/2      |
| $\beta_I \gg 0$       | 0/1      | 0/1      | 0/2      | 2/2      | 0/7            | 2/7      | 0/2         | 0/2      |
| $\beta_I < 0$         | 0/1      | 0/1      | 0/2      | 0/2      | 1/7            | 0/7      | 0/2         | 0/2      |
| $\bar{\varepsilon}_I$ | -0.01    | 0.00     | 0.03     | 0.04     | -0.01          | 0.01     | 0.00        | -0.02    |
| R <sup>2</sup>        | 0.006    | 0.003    | 0.006    | 0.008    | 0.002          | 0.006    | 0.002       | 0.003    |
| Wage Bill             |          |          |          |          |                |          |             |          |
| $\beta_I > 0$         | 0/1      | 0/1      | 1/2      | 0/2      | 6/7            | 7/7      | 2/2         | 2/2      |
| $\beta_I \gg 0$       | 0/1      | 0/1      | 0/2      | 0/2      | 1/7            | 1/7      | 1/2         | 0/2      |
| $\beta_I < 0$         | 0/1      | 0/1      | 0/2      | 1/2      | 0/7            | 0/7      | 0/2         | 0/2      |
| $\bar{\varepsilon}_I$ | 0.00     | 0.00     | -0.01    | -0.05    | 0.01           | 0.04     | 0.05        | 0.03     |
| R <sup>2</sup>        | <0.001   | <0.001   | <0.001   | 0.003    | 0.003          | 0.008    | 0.007       | 0.002    |
| Employment            |          |          |          |          |                |          |             |          |
| $\beta_I > 0$         | 1/1      | 1/1      | 1/2      | 0/2      | 5/7            | 5/7      | 2/2         | 2/2      |
| $\beta_I \gg 0$       | 0/1      | 0/1      | 0/2      | 0/2      | 1/7            | 3/7      | 1/2         | 0/2      |
| $\beta_I < 0$         | 0/1      | 0/1      | 0/2      | 2/2      | 0/7            | 0/7      | 0/2         | 0/2      |
| $\bar{\varepsilon}_I$ | 0.00     | 0.01     | 0.00     | -0.04    | 0.00           | 0.02     | 0.05        | 0.02     |
| R <sup>2</sup>        | <0.001   | 0.005    | <0.001   | 0.005    | 0.002          | 0.008    | 0.009       | 0.002    |

Table 4: Performance of Business Climate Indexes in Predicting Relative Income or Population  
Growth at State Borders Over the Next 5 Years (continued)

| Metrics               | Pacific Institute |          | Small Business |          | Tax Foundation |          |
|-----------------------|-------------------|----------|----------------|----------|----------------|----------|
|                       | Backcast          | Forecast | Backcast       | Forecast | Backcast       | Forecast |
| Aggregate Income      |                   |          |                |          |                |          |
| $\beta_I > 0$         | 1/2               | 0/2      | 4/5            | 2/5      | 0/2            | 0/2      |
| $\beta_I \gg 0$       | 0/2               | 0/2      | 0/5            | 1/5      | 0/2            | 0/2      |
| $\beta_I < 0$         | 0/2               | 0/2      | 0/5            | 0/5      | 0/2            | 0/2      |
| $\bar{\varepsilon}_I$ | 0.02              | -0.04    | 0.03           | 0.02     | -0.04          | -0.05    |
| R <sup>2</sup>        | 0.006             | 0.003    | 0.005          | 0.005    | 0.003          | 0.007    |
| Nonfarm Income        |                   |          |                |          |                |          |
| $\beta_I > 0$         | 2/2               | 1/2      | 0/5            | 0/5      | 2/2            | 1/2      |
| $\beta_I \gg 0$       | 1/2               | 0/2      | 0/5            | 0/5      | 0/2            | 0/2      |
| $\beta_I < 0$         | 0/2               | 0/2      | 1/5            | 4/5      | 0/2            | 0/2      |
| $\bar{\varepsilon}_I$ | 0.06              | 0.00     | -0.02          | -0.05    | 0.04           | 0.00     |
| R <sup>2</sup>        | 0.012             | 0.003    | 0.005          | 0.027    | 0.011          | 0.004    |
| Per capita Income     |                   |          |                |          |                |          |
| $\beta_I > 0$         | 0/2               | 0/2      | 5/5            | 4/5      | 0/2            | 0/2      |
| $\beta_I \gg 0$       | 0/2               | 0/2      | 1/5            | 2/5      | 0/2            | 0/2      |
| $\beta_I < 0$         | 0/2               | 1/2      | 0/5            | 0/5      | 0/2            | 2/2      |
| $\bar{\varepsilon}_I$ | -0.01             | -0.04    | 0.02           | 0.02     | -0.02          | -0.08    |
| R <sup>2</sup>        | 0.001             | 0.006    | 0.004          | 0.007    | 0.0025         | 0.032    |
| Population            |                   |          |                |          |                |          |
| $\beta_I > 0$         | 2/2               | 2/2      | 0/5            | 0/5      | 2/2            | 2/2      |
| $\beta_I \gg 0$       | 1/2               | 1/2      | 0/5            | 0/5      | 1/2            | 2/2      |
| $\beta_I < 0$         | 0/2               | 0/2      | 1/5            | 5/5      | 0/2            | 0/2      |
| $\bar{\varepsilon}_I$ | 0.05              | 0.03     | -0.02          | -0.04    | 0.03           | 0.05     |
| R <sup>2</sup>        | 0.017             | 0.005    | 0.005          | 0        | 0.008          | 0.022    |
| Average Wage          |                   |          |                |          |                |          |
| $\beta_I > 0$         | 1/2               | 0/2      | 4/5            | 4/5      | 0/2            | 0/2      |
| $\beta_I \gg 0$       | 1/2               | 0/2      | 2/5            | 1/5      | 0/2            | 0/2      |
| $\beta_I < 0$         | 0/2               | 1/2      | 0/5            | 0/5      | 0/2            | 2/2      |
| $\bar{\varepsilon}_I$ | 0.03              | -0.04    | 0.02           | 0.01     | -0.02          | -0.05    |
| R <sup>2</sup>        | 0.012             | 0.009    | 0.008          | 0.003    | 0.005          | 0.019    |
| Productivity          |                   |          |                |          |                |          |
| $\beta_I > 0$         | 1/2               | 0/2      | 4/5            | 2/5      | 1/2            | 0/2      |
| $\beta_I \gg 0$       | 1/2               | 0/2      | 0/5            | 0/5      | 0/2            | 0/2      |
| $\beta_I < 0$         | 0/2               | 0/2      | 0/5            | 0/5      | 0/2            | 2/2      |
| $\bar{\varepsilon}_I$ | 0.00              | -0.02    | 0.01           | 0.00     | -0.01          | -0.05    |
| R <sup>2</sup>        | 0.002             | 0.004    | 0.005          | 0.001    | 0.001          | 0.013    |
| Wage Bill             |                   |          |                |          |                |          |
| $\beta_I > 0$         | 1/2               | 0/2      | 2/5            | 0/5      | 1/2            | 2/2      |
| $\beta_I \gg 0$       | 0/2               | 0/2      | 0/5            | 0/5      | 0/2            | 1/2      |
| $\beta_I < 0$         | 0/2               | 0/2      | 0/5            | 3/5      | 0/2            | 0/2      |
| $\bar{\varepsilon}_I$ | 0.00              | -0.04    | -0.01          | -0.05    | 0.00           | 0.08     |
| R <sup>2</sup>        | 0.004             | 0.003    | <0.001         | 0.008    | <0.001         | 0.01     |
| Employment            |                   |          |                |          |                |          |
| $\beta_I > 0$         | 0/2               | 1/2      | 1/5            | 0/5      | 1/2            | 2/2      |
| $\beta_I \gg 0$       | 0/2               | 0/2      | 0/5            | 0/5      | 1/2            | 2/2      |
| $\beta_I < 0$         | 1/2               | 1/2      | 0/5            | 3/5      | 0/2            | 0/2      |
| $\bar{\varepsilon}_I$ | -0.04             | -0.04    | -0.01          | -0.03    | 0.00           | 0.06     |
| R <sup>2</sup>        | 0.006             | 0.004    | <0.001         | 0.006    | <0.001         | 0.01     |

Table 5: Summary of regressions of relative nonfarm income growth at state borders on state relative business climate indexes, 5 year periods between 1975 and 2005

| Index           | Year | Positive $\beta_I$ | significant $\beta_I$ | Best fit, best period, and largest estimate of $\beta_I$ |             |                     | 2005-2010 |
|-----------------|------|--------------------|-----------------------|--|-------------|---------------------|-----------|
|                 |      |                    |                       | highest $R^2$  | Best Period | largest $ \beta_I $ |           |
| Beacon Hill     | 2001 | 4/7                | 1/7                   | 0.023  | 95-00       | 0.068**             | 0.01      |
|                 | 2002 | 4/7                | 1/7                   | 0.012  | 95-00       | 0.049*              | 0.012     |
|                 | 2003 | 4/7                | 0/7                   | 0.02   | 85-90       | -0.083              | 0.021     |
|                 | 2004 | 4/7                | 1/7                   | 0.019  | 95-00       | 0.064**             | 0.015     |
| CED-Development | 1989 | 1/7                | 0/7                   | 0.035  | 90-95       | -0.020***           | 0.006     |
|                 | 1990 | 1/7                | 0/7                   | 0.04   | 90-95       | -0.021***           | 0.002     |
|                 | 1991 | 0/7                | 0/7                   | 0.037  | 90-95       | -0.018***           | -0.003    |
| CED-Capacity    | 1990 | 4/7                | 0/7                   | 0.007  | 00-05       | -0.007              | 0.006     |
|                 | 1991 | 5/7                | 2/7                   | 0.008  | 05-10       | 0.007*              | 0.007*    |
|                 | 1992 | 4/7                | 2/7                   | 0.011  | 05-10       | 0.008*              | 0.008*    |
|                 | 1993 | 4/7                | 2/7                   | 0.009  | 05-10       | 0.007*              | 0.007*    |
|                 | 1994 | 4/7                | 0/7                   | 0.012  | 00-05       | -0.009*             | 0.004     |
|                 | 1995 | 4/7                | 0/7                   | 0.008  | 00-05       | -0.007              | 0.003     |
|                 | 1996 | 4/7                | 1/7                   | 0.011  | 95-00       | 0.009*              | 0.003     |
| CED-Fiscal      | 1990 | 1/7                | 0/7                   | 0.039  | 85-90       | -0.062***           | -0.0001   |
|                 | 1991 | 1/7                | 0/7                   | 0.039  | 85-90       | -0.062***           | -0.0004   |
|                 | 1992 | 2/7                | 0/7                   | 0.037  | 85-90       | -0.061***           | -0.003    |
|                 | 1993 | 2/7                | 0/7                   | 0.039  | 85-90       | -0.090**            | 0.006     |
|                 | 1994 | 1/7                | 0/7                   | 0.047  | 85-90       | -0.096**            | 0.003     |
|                 | 1995 | 2/7                | 0/7                   | 0.044  | 85-90       | -0.091**            | 0.006     |
|                 | 1996 | 2/7                | 0/7                   | 0.034  | 85-90       | -0.080**            | 0.0005    |
| Fantus          | 1975 | 5/7                | 0/7                   | 0.007  | 95-00       | 0.007               | 0.006     |
| Fraser          | 2004 | 1/7                | 0/7                   | 0.05   | 90-95       | -0.103***           | 0.031     |
|                 | 2004 | 1/7                | 0/7                   | 0.075  | 85-90       | -0.158***           | 0.03      |
| Grant Thornton  | 1980 | 6/7                | 4/7                   | 0.039  | 95-00       | 0.128***            | -0.017    |
|                 | 1981 | 6/7                | 6/7                   | 0.036  | 95-00       | 0.042***            | -0.013    |
|                 | 1982 | 6/7                | 6/7                   | 0.033  | 95-00       | 0.055***            | -0.011    |
|                 | 1983 | 7/7                | 5/7                   | 0.032  | 90-95       | 0.049***            | 0.006     |
|                 | 1984 | 7/7                | 3/7                   | 0.035  | 90-95       | 0.042**             | 0.003     |
|                 | 1985 | 7/7                | 4/7                   | 0.035  | 90-95       | 0.041**             | 0.005     |
|                 | 1986 | 6/7                | 3/7                   | 0.03   | 85-90       | 0.051**             | -0.007    |
| New Economy     | 1999 | 4/7                | 0/7                   | 0.005  | 95-00       | 0.021               | 0.019     |
|                 | 2002 | 4/7                | 0/7                   | 0.007  | 75-80       | -0.044              | 0.015     |
| PRI             | 1999 | 5/7                | 3/7                   | 0.024  | 90-95       | 0.109***            | -0.04     |
|                 | 2004 | 5/7                | 4/7                   | 0.021  | 90-95       | 0.070**             | -0.055**  |
| Small Business  | 2000 | 6/7                | 2/7                   | 0.066  | 85-90       | 0.120***            | 0.011     |
|                 | 2001 | 7/7                | 2/7                   | 0.067  | 85-90       | 0.126***            | 0.004     |
|                 | 2002 | 6/7                | 3/7                   | 0.072  | 85-90       | 0.107***            | 0.003     |
|                 | 2003 | 7/7                | 3/7                   | 0.07   | 85-90       | 0.109***            | 0.004     |
|                 | 2004 | 5/7                | 3/7                   | 0.072  | 85-90       | 0.124***            | -0.001    |
| Tax Foundation  | 2003 | 6/7                | 2/7                   | 0.057  | 85-90       | 0.135***            | -0.036    |
|                 | 2004 | 6/7                | 3/7                   | 0.049  | 85-90       | 0.129***            | -0.034    |

Table 6: Regressions Explaining Relative Growth Across Counties at State Borders by Relative State Business Climate Indexes, 2005-2010

| Index and Year                | Nonfarm Income     | Output Per Worker  | Population         | Employment        |
|-------------------------------|--------------------|--------------------|--------------------|-------------------|
| Beacon Hill 2004              | -0.0163<br>(0.51)  | 0.028<br>(0.79)    | 0.002<br>(0.10)    | 0.004<br>(0.10)   |
| CED-Policy 1990               | 0.0002<br>(0.04)   | 0.009*<br>(1.86)   | -0.0009<br>(0.36)  | -0.006<br>(0.87)  |
| CED-Economic Development 1989 | -0.005<br>(0.73)   | -0.012<br>(1.51)   | -0.004<br>(1.09)   | -0.012*<br>(1.77) |
| CED-Policy Institute 1995     | -0.012<br>(-0.34)  | -0.014<br>(-0.36)  | 0.049**<br>(2.48)  | -0.062<br>(1.65)  |
| Fantus 1975                   | 0.010*<br>(1.91)   | -0.010*<br>(1.90)  | 0.001<br>(0.40)    | -0.010*<br>(1.91) |
| Fraser 2004                   | 0.039<br>(0.96)    | 0.064<br>(1.57)    | -0.039*<br>(1.69)  | 0.093**<br>(2.09) |
| Grant Thornton 1986           | -0.007<br>(0.45)   | 0.021<br>(1.38)    | -0.007<br>(0.81)   | 0.037**<br>(2.02) |
| New Economy 1999              | 0.062**<br>(2.19)  | 0.002<br>(0.07)    | -0.005<br>(0.33)   | 0.047*<br>(1.79)  |
| Pacific Research Inst 2004    | -0.043<br>(1.26)   | -0.0143<br>(0.41)  | -0.0204<br>(1.00)  | -0.0431<br>(1.14) |
| Small Business 2000           | 0.084**<br>(2.95)  | 0.130***<br>(3.63) | 0.051**<br>(3.06)  | 0.006<br>(0.15)   |
| Tax Foundation 2003           | -0.119**<br>(2.12) | -0.115*<br>(1.80)  | 0.018<br>(0.67)    | 0.058<br>(1.01)   |
| Constant                      | -0.008*<br>(1.72)  | 0.004<br>(0.67)    | -0.006**<br>(2.47) | 0.006<br>(0.96)   |
| N                             | 1222               | 1222               | 1222               | 1222              |
| R <sup>2</sup>                | 0.073              | 0.060              | 0.045              | 0.037             |

t-statistics are in parentheses: \* significance at the 10th percentile; \*\* significance at the 5th percentile

Dependent variable is the natural logarithm of the relative growth rate of counties at either side of the border.

Standard errors corrected for clustering by border

Figure 1: Example of the creation of county pairs based on border segment lengths

