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**BUSINESS VOLATILITY AND ECONOMIC GROWTH IN CORE AND
PERIPHERAL AREAS: UPPER MIDWEST REGION (USA) VERSUS
NORDIC COUNTRIES AND BALTIC RIM**

**Wilbur Maki and Paul Reynolds
University of Minnesota and Marquette University**



DEPARTMENT OF AGRICULTURAL AND APPLIED ECONOMICS

UNIVERSITY OF MINNESOTA

COLLEGE OF AGRICULTURE

ST. PAUL, MINNESOTA 55108

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BUSINESS VOLATILITY AND ECONOMIC GROWTH IN CORE AND PERIPHERAL AREAS: UPPER MIDWEST REGION (USA) VERSUS NORDIC COUNTRIES*

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Introduction

Our purpose in addressing the subject is two-fold. We wish to draw some implications of the Upper Midwest labor market experiences since the mid-1970s for the four Nordic countries--Denmark, Finland, Norway and Sweden--as they enter a new period of interregional competition. We also wish to join in sharing some common visions of the future for core and peripheral regions in varying stages of economic development and with varying patterns of internal cooperation and competition. We look forward to comparing our findings with those of other researchers reporting on business volatility and economic growth in the Nordic countries.

Our starting point in this study as in previous ones is the individual decision unit--a business enterprise or government agency--that seeks information about prospective economic conditions in its product and factor markets and their implications for regional growth and change. Our underlying framework for measuring regional growth and change is the economic base model, supplemented by alternate formulations of the determinants of regional exports and exogeneous income flows.

We present findings from an early stage of information preparation based on the historical record of employment, earnings and related variables for individual labor market areas in the US over an 18-year period starting in 1970. We draw some tentative conclusions about these findings for the future of core and peripheral labor market areas.

The Upper Midwest coincides with the Ninth Federal Reserve District, stretching 1300 miles westward from the locks at the international waterway joining Lake Superior and Lake Huron on the US-Canada border, across the Northern Great Plains and over the Continental Divide to the northwest corner of Montana and another international boundary. This is a peripheral region in its own right. A vibrant and vital metropolitan core area--the Twin Cities of Minneapolis and St. Paul--has far-reaching influence on much of this region.

By extending the geographic boundaries of our study, we include all of 12 states from Michigan to Oregon and Washington. We call the 12-state territorial aggregation the Northern Transportation Corridor. This territorial aggregate is heavily dependent on transportation and related energy systems in their various forms. It includes four of the 29 air transportation nodes and, also, a large number of the most peripheral areas in the US. It thus includes parts of the large multi-area regions focused on three of the four metropolitan core areas. All of the Upper Midwest Region is in this territorial aggregation.

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We compare the extended Upper Midwest Region with the Nordic countries because of the similarity of problems in adjusting to changing market conditions and government policies. These include:

1. Loss of government subsidies in farming and the subsequent restructuring of the agricultural economy with subdivision of some farms into smaller "garden" and part-time farms near metropolitan core areas and consolidation of others into large commercial farming operations.
2. Restructuring of milk marketing orders and transfer of much milk production from traditional producing to consuming areas.
3. Removal of marginal lands from agricultural production for preservation and low intensity public uses.
4. Enactment of new environmental legislation for preserving endangered species on forested lands with subsequent closure of millions of acres of forested lands.
5. Federal de-regulation of the transportation industry and the loss of direct air access to metropolitan core areas for many peripheral areas.
6. Shift to "zero maintenance" of low-use rural roads and bridges as a first step in reducing public highway expenditures in rural areas.

These changes--current and prospective--in market conditions and government policies profoundly affect the lives and well-being of residents in the peripheral areas of the extended Upper Midwest Region.

Meanwhile, the changing structure of global competition adds to the loss of control by peripheral area residents. Also important to the loss of control are the reduced energy and material input requirements of advanced manufacturing systems, and the concentration of high-order producer services in the principal metropolitan core areas. However, a growing interdependence between these two types of areas occurs through new contractual arrangements in product marketing, procurement and production scheduling.

The Northern Transportation Corridor forms a territorial aggregation of 34 million people--half again as large as the combined population of the four Nordic countries. The 12 states include the five western states of Oregon, Washington, Idaho, Wyoming and Montana with a combined population of slightly less than 10 million, the five Northern Plains states of Minnesota, Iowa, Nebraska, South Dakota and North Dakota with a combined population of slightly more than 10 million, and the two Great Lakes states of Michigan and Wisconsin with a combined population of slightly more than 14 million.

Overview

We return now to the original intent of this study, namely, to link business volatility to economic growth in core and peripheral regions. We established in an earlier study the quantifiable contribution of business volatility to regional growth (Reynolds and Maki, 1990). Further analysis of the determinants of business volatility followed the earlier study (Reynolds and Maki, 1991). We searched for the attributes of a causal system in which business volatility is a "bridging" concept for introducing firm dynamics in the form of business births and deaths, expansions and contractions into a new economic model of regional growth and change. We continue in this effort in three steps.

Step 1 is to account for the sources of regional growth and change as represented by allocation of total change in specified industry earnings to three change sources--national growth, industry mix and regional share--in each of 77 labor market areas (LMAs) in the Northern Transportation Corridor and 23 elsewhere in the U. S.

Step 2 is to explain, by means of multiple regression analysis, the contribution of a host of area economic and demographic variables, including industry specific business volatility measures, to the corresponding changes in total area employment.

Step 3 is to extend the findings summarized in the first two steps to policies and issues pertaining to the integration of peripheral and core areas of the Northern Transportation Corridor into functional economic communities that form the new regional building blocks of global competition and cooperation.

The working hypothesis for the study is that business volatility is an essential condition of a dynamic regional economy. Changes in the number of establishments and related jobs due to their establishment births and deaths, expansions and contractions define business volatility. This includes four variables--autonomous births and deaths and branch births and deaths--that represent firm volatility. Also, eight variables--the factorial combination of autonomous and branch, births and deaths, and expansions and contractions--represent job volatility. Business volatility is the composite of job volatility and firm volatility.

Our findings show that a unique industry mix and the competitive position of a region's export-producing businesses in national and global markets ameliorate the importance of business volatility as a measure of area growth and change. Stage of the general business cycle and the area's industry composition also qualify the growth-facilitating and growth-inducing effects of business volatility.

Step 2 is essentially a "fine tuning" of the Step 1 findings from the simple shift-share model. In a complete multi-variable, multi-equation economic model of an LMA economy, business volatility variables would represent the contribution of changes in the number and type of business establishments and the related industry-specific employment to total area employment. Total area employment change, in this case, is only one of several measures of area economic vitality and well-being. However, the findings of a comprehensive model of area growth and change is the subject matter of another paper, not this one.¹

In the partial approach of this paper, the regression model of Step 2 offers an alternative explanation of factors affecting area employment change that includes a series of variables in addition to change in industry-specific business volatility. Excess earnings, for example, represents the importance of individual industry groups in the area economic base. Change in excess earnings provides a measure of the importance of change in the area economic base in accounting for total area employment change.

Change Sources for Local Labor Earnings

A recently completed study of business volatility and economic growth summarizes its findings on

¹We reviewed over 200 journal articles and books on regional economic growth in the process of preparing and interpreting the regression model findings presented in this paper. The alternate formulations are summarized under 24 descriptive headings (Reynolds and Maki, 1991).

change sources for local labor earnings in 100 selected labor market areas in the USA, of which 77 are in the Northern Transportation Corridor (Maki and Reynolds, 1991). Figure 1 delineates the 282 labor market areas in the USA. Figure 2 shows the employment change in each of the 382 labor market areas over the 10-year period from 1971 to 1980. Table 1 lists the 100 selected labor market areas.

Selected labor market area attributes

Table 1 also lists two statistics--an income volatility index and an income growth index--for each labor market area (LMA). The income volatility index represents frequency of change in labor earnings while the growth index depicts total change in labor earnings.² These volatility measures (not to be confused with business volatility) are simply summary statistics for describing the economic history of each of the 100 LMAs. National growth, industry mix and regional share represent change sources for labor earnings in the shift-share model.³

Overall national growth affects all regions and all industries in proportion to the size of the industry. A negative change denotes a recession. A positive change denotes recovery in the general business cycle.

Changes in industry mix represent the differential change (i.e., minus the change due to national growth) for a specific industry in the US. Cyclically sensitive industries present a high degree of variability as they shift from above-average to below-average production and earnings. When a product cycle change occurs over a short period it, too, may result in a large industry-mix effect. Thus, the industry-mix effect reveals both short-term and long-term changes in the importance of individual industries in the US economy.

Both the national-growth effect and the industry-mix effect pertain to US industry changes. Because of the general availability of US industry forecasts, any area can have its own forecast, given access to a forecast of the regional share effect.

Changes in regional share--the proportion of total US labor earnings in a specified industry originating in the given region--reveal changes in the competitive position of the region's share of the US industry.

The 77 LMAs in the Northern Transportation Corridor split into two parts. Forty LMAs are in Mid-continent West and 37 LMAs are in Mid-continent East. The West accounted for about one-third of the total earnings in 1970. By 1986 the West accounted for 39 percent of this total. Thus, the Northern Transportation Corridor tilts sharply and symbolically to the West over the 1970-86 period. The automobile-based Michigan economy, for example, was out-performed by the air transportation-based economy of Washington. Moreover, the development of the energy resources of the West during this period added to its already rapid growth.

Historically, the two parts of the Northwest Transportation Corridor experienced much income volatility due to the natural resource dependency of the interior states and the cyclically sensitive durable goods manufacturing elsewhere in the region. Historically, also, the individual states in this territorial aggregate trade

²The income volatility index is the ratio of the normalized value of the absolute annual change in total area earnings to total earnings. The income growth index is the normalized value of the ratio of total earnings change over the 1970-86 period to total earnings.

³The shift-share model is an identity represented by the partitioning of the dependent into three parts, of which two are given to the regional analyst from the reference area data base and projection series.

much with Canada, particularly Ontario in the East and British Columbia in the West. Recent enactment of the US-Canada Free Trade Agreement further strengthens the already strong economic linkages between these long-time trading partners.

The remaining 23 comparison LMAs include both rapidly growing and generally declining base economies that vary in income volatility and overall growth from the lowest to among the highest. They provide comparison with a wide range of regional basic industries and growth histories.

Shift-share analysis of selected labor market areas

Shift-share analysis identifies sources of income volatility--that is, period-to-period shifts in labor earnings. This analysis includes the two long periods of economic recovery--1970 to 1980 and 1982 to 1986--separated by two recessions occurring in the 1980-82 period. Both the income volatility index and the income growth index refer to change over the entire 1970 to 1986 period.

The summary results of the shift-share analyses show vastly different growth patterns for the four territorial groupings. Over the 16-year period, total labor earnings--the principal source of personal income--increased by more than \$782 billion (in 1982 dollars). It increased from \$1,426 billion in 1970 to \$2,208 billion in 1986. The comparison LMAs increased in importance from 10.6 percent of total US labor earnings in 1970 to 12.8 percent in 1986. Mid-continent East dropped from 9.5 percent of the total to 8.4 percent.

The principal reasons for the contrasting growth patterns rest with the base economies in the Northwest Transportation Corridor. The competitive position of the Corridor's principal exports is worsening. An overall above-average industry-mix effect and an overall above-average regional-share effect distinguish the base economies of the comparison region.

The direction of relative change is a distinguishing difference between the high income volatility and low income volatility LMAs in Table 3. It is strongly negative for high volatility areas and strongly positive for low volatility areas. For most high income volatility LMAs, a positive regional-share effect for the 1970s turned negative in the 1980s, thus contributing to the strongly negative relative change in the 1980s.

The ranking of total change in labor earnings in the 1970-86 period confirms the unique role of the local base economy in accounting for regional job and income growth. For the 30 fastest-growing LMAs, total labor earnings increased from \$182.6 billion in 1970 to \$345 billion in 1986. This is an increase of 89 percent. During the same period, total labor earnings increased for the 30 slowest-growing LMAs from \$96.1 billion in 1970 to \$116.9 billion in 1986. This is an increase of only 22 percent.

High local labor income growth correlates with high as well as low labor income volatility--nine in both cases. In comparison, the low income LMAs include 13 of the highest and five of the lowest volatility LMAs. Thus the mid-range LMAs in labor income growth include 12 high and 12 low income volatility LMAs. The findings show a lack of strong correlation between income growth and income volatility when local base economies lack differentiation.

A two-digit county-level wage and salary earnings series is the source of the excess earnings change variable. The two-digit series is compiled and reported by the US Department of Commerce. The excess earnings

variable represents the difference between the area and the US total labor earnings, by industry. The US Department of Commerce statistical series provides this series for the following years: 1970, 1975, 1980, 1982, 1985 and 1986. Straight-line data interpolation of intervening year estimates completed the two-year even-year change series.

High levels of industry specialization in farming, mining or manufacturing distinguish the base economies of the high volatility LMAs. In these areas, the high income volatility correlates with a high degree of vulnerability to cyclically sensitive export markets. Moreover, the extreme specialization of industry in the base economies of the high income volatility LMAs persisted through the 1970s and part of the 1980s. Where high income volatility accompanied slow income growth, the local base economies also faced shrinking export markets.

High income growth areas differ from high income volatility areas and low income growth areas in the diversity of their base economy. Even specialized base economies support high income growth when the export-producing sectors remain competitive in their export markets and maintain their market shares. Generally, however, the specialized fast-growing economies lost their earlier momentum by the mid 1980s and faced, instead, much reduced income growth.

Business Volatility and Regional Growth and Change

Our earlier findings show the importance of business volatility in a region's economic growth (Reynolds and Maki, 1990, p.90). The authors note that, "The process of economic change requires a substantial transfer of resources (capital, facilities, employees, entrepreneurial and managerial talent) from one firm to another, from one industry sector to another."

Excess labor earnings, when used as a measure of the geographic concentration and specialization of industry, describe the area-to-area linkages. Export market conditions affect business and income volatility in the exporting areas, especially for cyclically sensitive base economies, like mining and durable goods manufacturing.

Access variables, like distance to nearest airport node or proximity to nearest metropolitan core area, provide additional measures of rural-to-metropolitan area linkages. They serve as a surrogate measure of access to information and markets for high value added products and to growth-facilitating business distribution services in the metropolitan core areas.

Each measure of regional growth varies in relative values from one period to the next. For some areas, the volatility in rates of regional growth is due to the cyclical sensitivity of the local economy. For other areas, the period-to-period changes in jobs and earnings relate to long-term changes in industry product cycles.

Multiple regression models, estimated for each two-year period and three area orientations--rural, manufacturing (rural transitional) and metropolitan, provide the empirical bases for this section of the report. Only estimates significant at 95 percent confidence level are presented. Total employment change is the dependent variable in each model. Figure 2 illustrates the total employment change in each LMA. The presentations of results start with the 1978-80 period for the composite area orientation (Reynolds and Maki, 1991).

Employment effects of business volatility

Business volatility variables correlate positively with employment change, except for branch births and branch deaths in the 1982-84 period and job growth associated with branch births in the 1986-88 period. Autonomous firm births have the largest effect on total area employment.

Business volatility affects labor market areas with a rural emphasis more than LMAs with an urban metropolitan emphasis. LMAs with a rural emphasis experience more income volatility than LMAs with an urban metropolitan orientation. They also are more susceptible to the positive influences of increased business activity. One result of a concurrence of firm births and job expansions as well as firm deaths and job contractions is an economic dynamism that shifts local resources into more productive enterprises.

Thus, the business volatility effect is significant in most cases addressed in this study (Reynolds and Maki, 1991) It has the largest effect in rural areas that are defined as transitional, i.e., areas of above-average manufacturing industry growth. It is also significant in urban metropolitan areas with less income volatility than the transitional rural areas.

The study findings have important policy implications that stem directly from economic principles, namely, that competitive markets allocate resources to their "best" uses, but only because entrepreneurial capital exists to accomplish a shift of local resources to more profitable uses.

Most regional growth models fail to include such measures of firm structure when fitted to available data simply because of the lack of data. In this study, access to the firm-level Duns Marketing Indicators for a two-digit classification of industry groups covering 3124 counties in the US over six two-year periods provided a unique opportunity for testing a series of hypotheses relating to the contribution of firm structure and change to regional economic growth.

The findings on the importance of business volatility in accounting for regional growth complement the findings based on the shift-share model. They provide additional geographical attributes of regional change not included in a set of partitioned change variables, as in the shift-share model. In this paper, they confirm the impressions of many observers of rural economies that "all rural areas are not same". Each rural area has its unique "index of peripherality", represented in part by its business volatility measures.

Other variables in the regression model also complement the shift-share findings. These include two measures of excess earnings change as measures of an area's economic base change and four measures of spatial structure.

Employment effects of excess earnings change

Most excess earnings variables correlate positively with employment change. Exceptions occur in the 1980-82 period and in construction, durable goods manufacturing and other services (health care, education and social services) that relate to their role in the 1980-82 recessions. In the preceding two-year period many LMAs peaked in total employment because of high levels of durable goods manufacturing in their local base economies. Large employment losses in the 1980-82 period followed peak employment levels in the 1978-80 period.

Agriculture sector earnings show the largest percentage change in total employment. On the other hand, the mining earnings-to-employment multiplier is large because of high earnings per worker in mining.

Employment effects of excess earnings changes in construction and other private services, like health care, education and social services, were largest in the urban metropolitan areas. Employment effects of excess earnings changes in the manufacturing sector and the transportation, communications and public utilities sector were large in LMAs with a manufacturing orientation. For the remaining industry groups the employment effects were largest in LMAs with a rural emphasis.

Employment effects of industry scale

Current year values of excess earnings account for the differential effects of sector size on total employment in the regression model. Again, this measure of the base economy proved statistically significant in explaining model variance.

Sector size relates positively to employment change in agriculture, construction, nondurables manufacturing, retail trade and other services. It relates negatively to employment change in mining, durable goods manufacturing, the transportation, communications and public utilities sector, and business services.

Employment effects of sector size vary with economic emphasis. They are the largest in (1) the urban metropolitan emphasis for retail trade and business services, (2) the rural emphasis for agriculture, construction, wholesale trade and other services, and (3) the manufacturing emphasis for mining, manufacturing, the transportation, communications and public utilities sector, and consumer services.

Employment effects of spatial structure

Three dummy variables represent market access differences in the spatial structure of rural and metropolitan areas. Market access, as represented by proximity to one or two of the 29 US airline nodes, is a statistically significant locational attribute for differentiating among LMAs with reference to employment change. It helps articulate the role and dimensions of location, particularly about metropolitan core areas, in regional economic growth and change.

Each of the three economic orientations cited earlier has a different response to the market access variables. Proximity to a primary and secondary airline node correlates positively with employment change, especially for the LMAs with a rural orientation. Proximity to two airline nodes is most important to LMAs with a metropolitan orientation.

A Sunbelt location was a positive factor in employment growth in the 1978-80 and 1980-82 periods, but a negative factor in the 1984-86 and 1986-88 periods. The LMAs with a metropolitan orientation were slightly more influenced by these factors than the combined LMAs.

Population density was a negative factor for LMAs with a manufacturing orientation during the 1980-82 period, but a positive factor in the 1984-86 period. It was a positive factor for LMAs with a rural orientation in the 1978-80 period when rural prosperity was approaching its peak period in the Northern Transportation Corridor Region.

Finally, total personal income change correlates positively with employment change in the 1984-86

and 1986-88 periods and negatively in the 1978-80 period. Its largest effect was in the LMAs with a manufacturing orientation.

Integrating Core and Peripheral Areas into Globally Competitive Regional Economies

One interpretation of the study findings is that a particular region's location in the national and global regional settlement and trading systems imposes severe constraints on regional development options. A rural LMA located well beyond the outer commuting limits of any metropolitan LMA has diminished prospects for long-term economic viability beyond the lifetimes of its principal product cycles. These are some tentative conclusions from comparisons of the contrasting labor earnings and employment experience of selected core versus selected peripheral labor market areas in the US.

Contrasting core and peripheral labor market areas

A series of statements contrasting the two types of areas--core and periphery--summarizes the principal findings of the two studies cited earlier. The study findings (Maki and Reynolds, 1991) show for the five two-year periods from 1978-80 to 1986-88 that:

1. Slow-growing labor market areas (LMAs) are not consistently slow-growing and fast growing LMAs are not consistently fast growing. However, slow-growing areas in total are consistently slow growing and the fast-growing areas in total are consistently fast growing in each of three time periods.
2. Slow-growing areas experience both a negative industry effect and a negative regional share effect during each of the three time periods. Fast-growing areas experience both negative and positive industry mix effects and generally positive regional share effects.
3. Slow-growing areas are concentrated in the sparsely populated parts of the study region while fast-growing areas are concentrated in and around metropolitan core areas.
4. Exceptional shifts in the commodity-producing sectors accounts for high income volatility among LMAs while low volatility areas generally maintain their diverse base economy.
5. Rural areas with some exceptions retain high levels of industry specialization, while metropolitan areas generally sustain their diversified base economies.
6. High business (not income) volatility is associated with high growth and low business volatility is associated with low growth.
7. Access to, and choice of, airline node is associated with high growth.
8. Sunbelt location is associated with high growth much of the time but low growth when the product cycles of dominant basic industries a strongly negative industry-mix effect.

In summary, the peripheral LMAs are most vulnerable to cyclically induced income volatility while metropolitan core areas benefit most from business volatility. Transitional rural areas experience high income and business volatility and, also, high income growth.

Attributes of local economic environment

The study findings presented earlier show a high degree of industry specialization in most LMAs, especially among those with the highest income volatility. The incidence of specialization has not changed

among individual LMAs with the highest income volatility.

Overall, reduced dependence on agricultural specialization among the 100 selected LMAs balances increased dependence on manufacturing specialization. Until the 1982-84 period, mining specialization also was important. For most LMAs with a rural or manufacturing orientation, replacement of extreme dependence on industry specialization with a more diverse base economy seems unlikely, given the factual evidence presented earlier.

Thus, the recent history shows that:

1. Peripheral rural LMAs are overwhelmingly dependent on the utilization of local natural resources. Efficiency in the conversion of primary resources into finished products reduces the demand for primary products and places many peripheral areas at risk. Often cited, also, but less evident, is the decoupling of advanced manufacturing from primary production. In any event, advanced manufacturing clearly is skill-dependent, which favors industry location in core metropolitan areas and adjoining rural areas and in new industrial spaces in formerly peripheral areas now anchored to cities that serve as small scale metropolitan core areas.
2. Transitional LMAs are exceptions to the overall pattern of continuing industry specialization. They are close enough to the metropolitan core area to gain new industry, particularly new businesses of industries branching from the metropolitan core area to low cost sites in nearby rural areas. Also, a new, diverse base economy is emerging in the transitional LMAs because of metropolitan core area businesses subcontracting with transitional area businesses. Thus, transitional rural areas experience high income growth and high income volatility and, also, high business volatility.
3. Metropolitan LMAs, with the exception of areas marked by negative industry mix and regional share values in a highly specialized base economy, generally are the fastest growing in labor earnings. At the same time, income volatility may range from the lowest to among the highest LMAs. A high degree of dependency on a specialized base economy would still sustain high income growth as shown by the strongly positive industry mix and regional share effects. Business volatility is generally high in metropolitan areas.

The promoting of regional growth is a regional issue, therefore, severely constrained in its successful implementation. The realities of business location, industry product cycles and access to new product and process technologies are constraining influences on regional growth.

The peripheral LMAs dominate the standardized and readily tradeable products cluster. The metropolitan LMAs dominate the non-standardized less readily tradable products cluster. Successful strategies for maintaining and improving on existing business locations, products and technologies thus differ for the two types of industry clusters.

An important attribute of an optimal location for a business enterprise is the local infrastructure--the physical facilities and economic resources shared, in varying degree, by all local businesses (Aschauer, 1991; Porter, 1990).

For the most part, the local infrastructure is in the public sector, although it includes important quasi-private and private enterprise. The local infrastructure includes the regulated industries--transportation, communications and public utilities--and banking, finance and insurance companies, management consulting agencies, and research and development laboratories (Moss and Brion, 1991; Noyelle and Stanbeck, 1984).

Each industry cluster in a local community shares the total local infrastructure, which represents the macro-economic entity that relates to the individual export-producing businesses in the local economy. By definition, the export-producing businesses are part of the local base economy. Typically, the largest employers in this category are branch plants or headquarters offices of multi-national companies trading in global markets (Daly, 1991). Corporate decisions based on national and global rather than local considerations particularly affect branch plants. The quality and availability of local training and education in public schools and post-secondary educational institutions also affect the productivity of the local work force.

The location attribute for strengthening a region's economic base includes support industries serving the region's residential sector and the local transportation and telecommunications infrastructure. Local governmental efforts and the local macro-economic environment directly affect both supporting industries and local infrastructure.

Support industries produce goods and services for local intermediate and final markets. Local industries purchasing semi-finished products are the intermediate markets while households, businesses and governments purchasing finished products are the final markets.

The location attributes of support industries are simple and straightforward in their implications for new business formation: all markets are local. Import from outside the LMA fulfills the excess product demand. Therefore, economies of scale in production and production knowledge are the critical limiting factors facing entrepreneurial efforts in establishing strongly competitive new business ventures tapping into existing local markets.

Improving access to decision information by the residents of a region is of over-riding importance in building local infrastructure or supporting the base economy. However, available local resources limit access to information by local community leaders and resident small business managers. The decision centers of the large corporations with branch plants and offices in the local community have the information access advantage.

Small export-producing businesses in peripheral areas may access to markets through various contractual arrangements with core area businesses. These include outsourcing by core area producers during peak production periods and promotion of training sessions sponsored by core area producers for input-supplying businesses. New public-private partnerships address the advantages of cooperation between rural and metropolitan area businesses and institutions in strengthening local and regional infrastructure and support industries for interregional and global competition.

Key sectors for improving local access to information include state and local educational institutions and related community functions, such as city and neighborhood libraries and social centers. Moreover, various information partnerships that involve local businesses and community leaders, as well as state and local governments, can become active participants in improving access to decision information. For example, local and regional post-secondary educational institutions with curricula and programs that address periphery-to-core area linkages and information access may thus contribute directly to improving the quality of life and

the economic well-being of local and regional residents. For many of these institutions, however, a radical change in the attitudes and values of its members and providers may be necessary to thus redefine the "business" of "higher" education to include these sorts of local missions.

Summary and Conclusions

The working hypothesis for the study is that business volatility, as measured by changes in business births, deaths, expansions, and contractions, is an essential condition of a dynamic regional economy. The unique industry mix in the region and the competitive position of the region's export-producing, income-generating businesses in national and global markets ameliorates the importance of business volatility. Stage of the general business cycle and the region's industry composition qualifies the growth-facilitating and growth-inducing effects of business volatility for a region.

Economic base is basic

Peripheral areas--the sparsely populated labor market areas producing largely standardized, tradable agricultural, mineral and timber products--benefit from export growth. However, the economic and political importance of these products and their areas of production has declined in recent years because of reduced requirement for energy and other material inputs.

Earnings per worker are high in metropolitan core regions. Investment per worker is also high in the metropolitan core areas. Yet, the two contrasting types of regions are interdependent local economies. Business volatility is positively, rather than negatively, associated with economic growth.

Business volatility correlates with employment change

Changes in the number of firms and related jobs due to establishment births and deaths and job expansions and contractions define business volatility. Four variables--autonomous births and deaths and branch births and deaths--represent firm volatility. Eight variables--the factorial combination of autonomous and branch, births and deaths, and expansions and contractions--represent job volatility.

Business volatility variables correlate positively with employment change in the studies addressed in this report, except for branch births and branch deaths in the 1982-84 period and job growth associated with branch births in the 1986-88 period. Autonomous firm births consistently have the largest effect on total area employment.

Business volatility affects labor market areas with a rural emphasis more strongly than LMAs with an urban metropolitan emphasis, particularly about autonomous births and autonomous expansions. While LMAs with a rural emphasis may experience more income volatility than LMAs with an urban metropolitan orientation, they also are more susceptible to the positive influences of increased business activity. One result of a concurrence in firm births and job expansions as well as firm deaths and job contractions is an economic dynamism that shifts local resources into more productive enterprises.

Market access makes a difference

Market access as represented by proximity to one or two of the 29 US airline nodes is a statistically significant locational attribute for differentiating among LMAs. It helps articulate the role and dimensions of

location in regional economic growth and change.

Each of the three economic orientations cited earlier has a different response to the market access variables. Proximity to primary and secondary airline nodes correlates positively with employment change, especially for the LMAs with a rural orientation. Proximity to two airline nodes is most important to LMAs with a metropolitan orientation.

Location affects long-term economic viability

One interpretation of the study findings addressed in this report is that a particular region's location in the national and global regional settlement and trading systems imposes severe constraints on regional development options. A rural LMA located well beyond the outer limits of any metropolitan LMA has diminished prospects for long-term economic viability because of reduced access to vital business and market information. Such an area lacks the economic and political power to seriously affect the decision options of the largest export-producing businesses.

At best peripheral areas face a gradual decline in economic and social well-being. If fortunate, some new sense of fairness in the implementation of contractionary public policies affecting natural resource-based local economies would allow those left behind to live their remaining years with dignity and grace. More likely than not, however, the decoupling of primary production from advanced manufacturing systems will lead to radical change in the spatial-economic organization of regional activity systems. Peripheral areas of metropolitan-focused regions thus sooner, rather than later, become the parks, playgrounds and ecological preserves for an environmentally conscious, dominantly urban population. The Northern Plains, for example, are the future "buffalo commons" according to some regional analysts.

New industrial spaces link peripheral to core areas

An alternative interpretation of the study findings is that peripheral areas of metropolitan-focused regions are, in large numbers, transitory. Those close to metropolitan core areas experience the overspill effects of rapid population growth in the core area. A new locational equilibrium for manufacturing enterprise, driven by lower site and production costs, transforms many rural communities into the expanding urban frontier of the metropolitan core area (Scott, 1988).

The new industrial spaces emerge initially in rural areas adjoining the metropolitan core area. They expand gradually into the more distant areas within 100 miles or so of the core area borders.

For distances beyond 100 miles in the rural periphery, cities of 100 thousand or more attract new industries seeking low cost sites and access to the "knowledge workers" and information sources at local post-secondary education institutions and libraries. Such a city is Fargo, North Dakota, together with the adjoining city of Moorhead, Minnesota. Trondheim, the home of the Technological University of Trondheim, Norway, is another city that provides periphery-to-core area linkages for sustaining viable communities in formerly peripheral areas.

The metropolitan core area of a radically transforming economic region remains an integral link in the global transportation and communication network (Irwin and Kasarda, 1991). However, it, too, faces

internal change. Its downtown district is rapidly becoming the "nerve center" of the extended economic region with a concentration of strategic management services (Daly, 1991; Daniels, 1991; Moss and Brion, 1991). Air transportation and telecommunications systems connect the downtown with clients and customers on virtually a real time basis, globally as well as locally and regionally.

Yet, one-on-one relationships among information providers and users are even more important in the downtown district than ever before because of the uniqueness of information--its principal product--and its inherently differentiated content (Hutton and Ley, 1987; Ley and Hutton, 1987). The downtown district thus transforms into a locally-connected global information center by its strategic management functions and supporting infrastructure and services (Daly, 1991; Daniels, 1991; Leo and Philippe, 1991; Noyelle and Peace, 1991).

New rural service centers link rural residents to core area information sources

Even declining rural labor market areas include individual counties experiencing job growth. These are counties marked by the existence of a growing area service center in each county that provides the high order services for the entire labor market area. The area centers typically have one or more post-secondary education institutions and a municipal or county public library system. They also have numerous public and private linkages with government agencies and businesses in the metropolitan core area.

Key players in the new "connectivity" games that link metropolitan and peripheral areas are the "knowledge workers." Although primarily metropolitan "downtown" residents, they reside throughout the peripheral areas of the metropolitan-focused economic region. "Knowledge workers" reside in every rural and urban population center with public libraries and post-secondary educational institutions. They serve as information specialists and managers of information resource offices and systems.

University extension offices and post-secondary education institutions, particularly, could cater to the information needs of local residents--households, businesses and government agencies--if this were part of their mission. However, additional training and experience are essential (like the three year apprenticeships now offered by one "high-tech" management consulting firm in the Minneapolis-St. Paul Metropolitan Area) for "knowledge workers" generally to become fully contributing members of this new profession.

New regional partnerships build bridges for global competition

An example of new directions in public-private partnerships for facilitating the emergence of intra-regional linkages, particularly that between periphery and core areas, is the "One Minnesota" Project. The Blandin Foundation of Grand Rapids, Minnesota funds this project. The Blandin Foundation has a strong commitment to the funding of studies on revitalizing rural communities in Minnesota and the Upper Midwest. It is in a rural community about 50 miles from a metropolitan area of nearly 100 thousand population and 150 miles from the Minneapolis-St. Paul metropolitan core area. The Blandin Company is a long-established manufacturing enterprise engaged in converting nearby forests in Northeast Minnesota into wood pulp and paper.

The first phase of the "One Minnesota" study focuses on business linkages backward to suppliers and forward to markets between the seven-county Minneapolis-St. Paul Metropolitan Area and the largely rural counties in the rest of Minnesota. It focuses on the "endogenous factor"--the factor inputs and factor markets--that account for differences in area economic performance.

The analytical framework for the study of factor inputs and factor markets is simply an extension of the current economic base model that focuses primarily on product markets and related income flows (Maki, 1991). The local labor market already delineates the outer boundaries of the residentiary sector and the inner boundaries of the export-producing sector. The additional dimensions introduced in the One Minnesota Project is the further differentiation of factor inputs, particularly entrepreneurial and venture capital, and the inclusion of education and training institutions. The education and training institutions in this framework address directly the task of improving factor productivity and product quality and thus the bottom line of successful business enterprise engaged in global competition--low unit cost and high product quality.

The Center for Corporate Responsibility directs the second phase of this project. It focuses on the social structures and learning environments for facilitating inter-area business cooperation and enterprise. The Center is on the Minneapolis downtown campus of St. Thomas University--a private educational institution that maintains an MBA program with more than five thousand students as well as a seminary. Its recognized accomplishments in higher education are expanding into new disciplines and curricula that serve many different constituencies of post-secondary education.

This second phase involves the cooperation and active participation of businesses, post-secondary educational institutions, both public and private, and government agencies in a rural labor market area. Participants first establish ownership in the second phase activities by working together toward a common plan of action. Sponsoring and supporting joint conferences, seminars, one-on-one consulting arrangements and other learning opportunities for new business enterprise are among the options in such a plan.

A third or fourth phase of the One Minnesota Project lies ahead. Agreement among three colleges in the University of Minnesota and the 16 Regional Colleges of Norway sets the stage. Cross-country studies are underway already between the two research groups. One such study focuses on sustainable economic development in two peripheral areas--one in Northeast Minnesota, the other in Central Norway (Maki and Westeren, 1992). Measures for improving information access and the productivity of human and natural resources use in peripheral areas, among other concerns, are in the study objectives.

The Norway-Minnesota cross-country studies are joint ventures in sharing a common vision of the global community--a vision that acknowledges the role of both cooperation and competition in regional economic development. In this vision, economic units of all kinds cooperate within regions to successfully compete in global markets. Economic regions that enhance internal cooperation and linkages between their periphery and metropolitan core areas thus have a good chance of becoming the success stories of this new global community.

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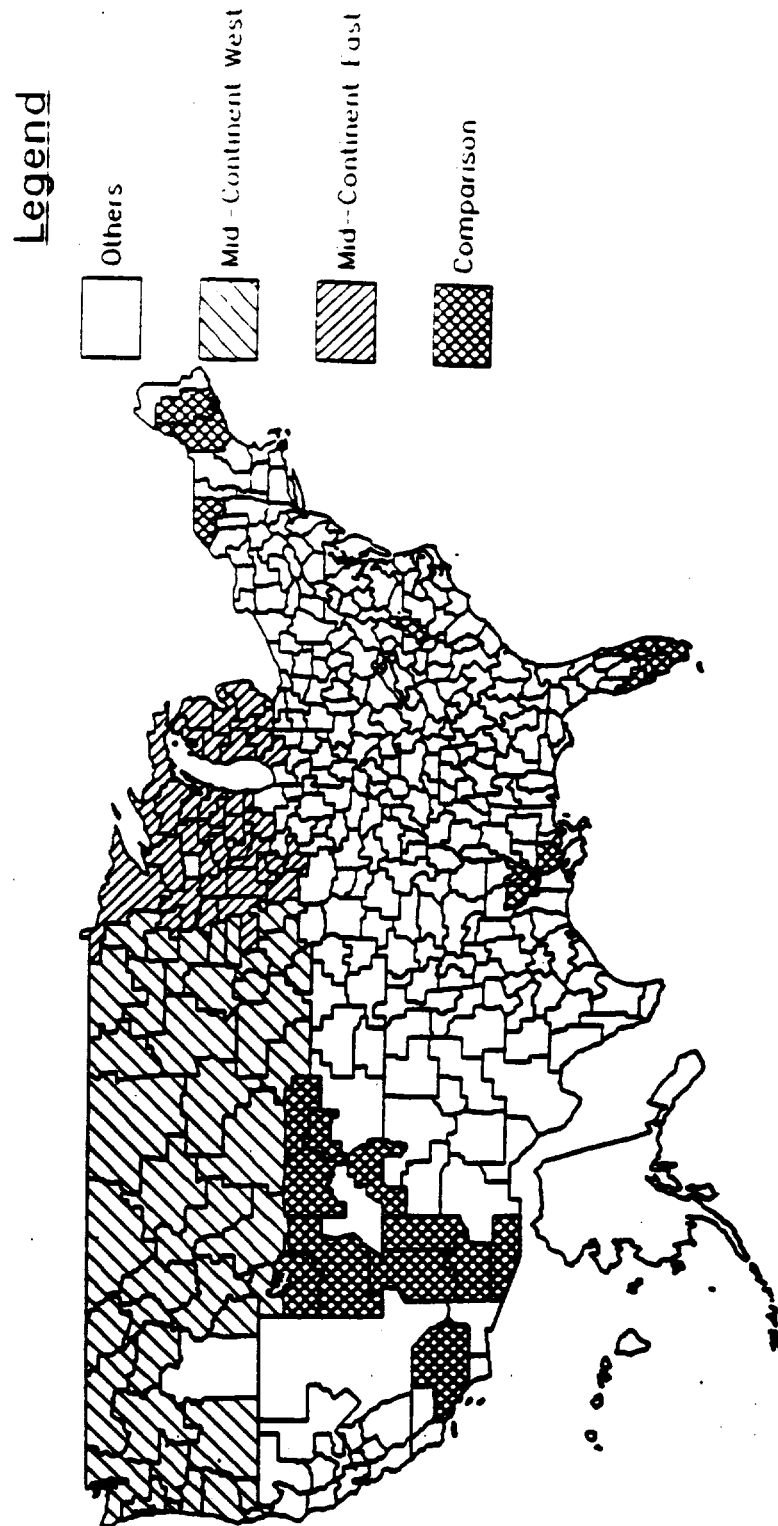
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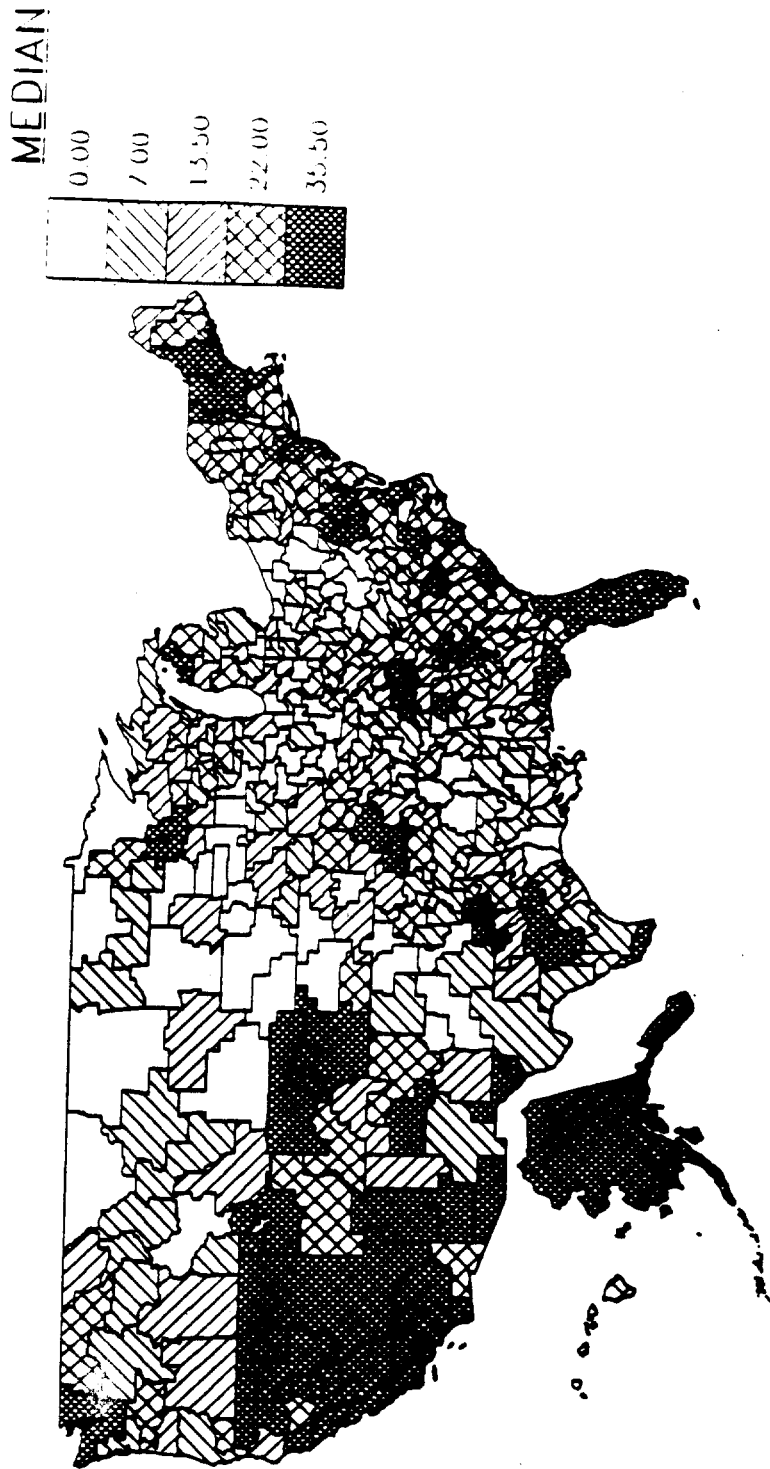
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Figure 1. Labor Market Areas Selected for Shift-Share Analysis



Source: Reynolds, Paul D. and Wilbur Maki. 1991. "U.S. Regional Characteristics that Promote Regional Growth". Final project report submitted to Aspen Institute in fulfillment of Ford Foundation Grant No. 8900-013, University of Minnesota Grant No. 0610-5764, Minneapolis, MN.

Figure 2. - Percentage Job Growth by U.S. Labor Market Area: 1978-88



Source: Reynolds, Paul D. and Wilbur Maki. 1991. "U.S. Regional Characteristics that Promote Regional Growth". Final project report submitted to Aspen Institute in fulfillment of Ford Foundation Grant No. 8900-013, University of Minnesota Grant No. 0610-5764, Minneapolis, MN.

Table 1. Total labor earnings (1982 \$) for all industry and volatility and growth indexes of specified labor market areas: "Mid-Continent West, Mid-Continent East and Comparison Labor Market Areas, US, 1970-1986"

No.	Labor Market Area	Labor Earnings		Volat		Growth		No.	Labor Market Area	Labor Earnings		Volat		Growth	
		LMA	1970	1986	Index	Index	LMA			1970	1986	Index	Index		
		(mil.\$)	(mil.\$)	(Rank)	(Rank)					(mil.\$)	(mil.\$)	(Rank)	(Rank)		
1	WA-OR:WALLA WALLA AREA	2	2664	4379	25	37		52	MN:ST CLOUD AREA	157	783	1390	76	20	
2	WA-ID:SPOKANE AREA	3	2887	4570	73	40		53	MN:MANKATO AREA	158	1323	1788	80	67	
3	ID-WA:LEWISTON AREA	4	833	1061	53	78		54	MN:ROCHESTER AREA	159	1476	2136	75	54	
4	OR-CA:EUGENE AREA	5	2253	3203	23	62		55	WI:NORTHWEST AREA	160	629	1041	77	29	
5	OR-BEND (CENTRAL)	6	773	1186	19	51		56	WI-MN:LA CROSSE AREA	161	952	1466	78	44	
6	OR:MEDFORD (SW)	7	669	1221	26	23		57	WI-MN:WINONA MN AREA	162	506	698	62	65	
7	OR:SALEM AREA	8	1998	3243	47	33		58	IN-MI:SOUTH BEND AREA	261	4996	6595	13	61	
8	OR-WA:PORTLAND AREA	9	8270	13467	54	38		59	MI:KALAMAZOO AREA	262	3491	4564	86	72	
9	OR-WA:LONGVIEW-COAST	10	1282	1690	24	58		60	MI:GRAND RAPID AREA	263	5843	9094	49	39	
10	WA:SEATTLE-TACOMA MET	11	17344	30708	81	18		61	MI:LANSING AREA	264	2915	4491	88	43	
11	ID:SOUTH CENTRAL	40	635	904	31	69		62	MI:MIDLAND AREA	265	3473	4509	55	77	
12	ID:POCATELLO AREA	41	1131	1784	67	42		63	MI:DETROIT METRO	266	42911	55904	17	74	
13	WY-ID-UT:ROCK SPRINGS	42	420	1130	4	2		64	MI:JACKSON AREA	267	1774	1819	79	99	
14	UT-ID:LOGAN AREA	43	376	774	92	11		65	MI:HURON FOREST AREA	268	607	801	32	81	
15	MT-ID:KALISPELL AREA	46	460	661	63	52		66	MI:TRAVERSE CITY (NW)	269	709	1236	51	27	
16	MT:MISSOULA AREA	47	441	728	36	35		67	MI:CADILLAC AREA	270	566	752	44	75	
17	MT:BUTTE-HELENA AREA	48	702	855	70	79		68	IL-WI:ROCKFORD AREA	271	4413	5612	45	61	
18	MT-WY:BILLINGS AREA	49	980	1521	18	32		69	WI:STEVENS POINT AREA	272	735	1274	83	22	
19	WY-MT:YELLOWSTONE N P	50	539	847	7	45		70	WI:WAUSAU AREA	273	909	1380	68	50	
20	MT:GREAT FALLS AREA	51	1124	1141	35	100		71	WI:GREEN BAY AREA	274	1447	2499	85	21	
21	NE-CO:NORTH PLATTE AR	66	822	1140	30	47		72	WI:OSHKOSH AREA	275	3202	4703	97	49	
22	NE-GRAND ISLAND AREA	67	1720	2389	2	36		73	WI:FOND DU LAC AREA	276	751	992	91	68	
23	NE-IA-MO:OMAHA METRO	68	5668	7716	43	59		74	WI:MILWAUKEE METRO	277	12088	15504	93	76	
24	NE-LINCOLN METRO	69	1942	2811	21	46		75	WI:KENOSHA AREA	278	2153	2676	29	80	
25	IA-NE-SD:SIOUX CITY	70	1258	1506	66	82		76	MI-WI:UPPER PENNSULIA	279	1236	1424	65	90	
26	NE-SD:NORFOLK AREA	71	557	805	6	41		77	WI-MI:IRON MOUNTAIN	280	725	1062	72	57	
27	SD:SOUIS FALLS AREA	72	1642	2351	89	56			Total Mid-continent East	135197	185176				
28	WY-NE:CHEYENNE AREA	73	1592	2486	1	60		78	AZ:HOLBROOK (NE)	12	3190	672	38	87	
29	SD-NE-WY:RAPID CITY A	74	976	1720	11	17		79	AZ:PHOENIX METRO	13	7442	19696	98	4	
30	SD-ND:ABERDEEN-WEST	75	896	1019	28	86		80	AZ:TUSCON METRO	14	2527	5429	96	9	
31	IA-MO:DES MOINES METR	76	4004	5590	94	66		81	AZ-UT:FLAGSTAFF-CANYO	15	463	1068	82	7	
32	IA-SPENCER (NW) AREA	77	903	1017	27	97		82	NM:DURANGO-TAOS	16	555	1202	5	10	
33	MN:WORTHINGTON (SE)	78	788	844	60	98		83	CO:DENVER METRO	19	9760	22467	46	8	
34	MN:BEMIDJI-N CENTRAL	79	507	811	56	30		84	CO:GRAND JUNCTION-NW	21	765	1884	3	6	
35	MN:ALEXANDRIA AREA	80	622	847	58	63		85	CA:LOS ANGELES METRO	25	82481	147132	52	19	
36	MN-SD:MORRIS-SISSETON	81	1113	1362	34	88		86	UT:SALT LAKE CITY MET	44	5408	10363	61	15	
37	ND-MN:FARGO-MOOREHEAD	82	1324	1934	69	48		87	UT:CEDAR CITY-PRICE	45	512	1090	8	12	
38	ND-MN:GRAND FORKS ARE	83	1297	1754	33	64		88	CO:FT COLLINS-NE AREA	65	1340	2648	59	13	
39	ND-MINOT-BISMARCK AREA	84	1033	1633	20	24		89	NY:NORTHEAST AREA	195	1361	1700	16	71	
40	ND-MT-SD:DICKINSON AR	85	989	1206	9	73		90	ME:PORTLAND METRO	196	3487	5680	22	25	
	Total Mid-continent West		75431	116013				91	ME:BANGOR METRO	197	1048	1609	48	34	
41	IA-IL:DUBUQUE AREA	146	1529	1669	64	96		92	WV-VA:BLUEFIELD	207	844	948	14	89	
42	WI:MADISON AREA	147	3049	4447	84	53		93	FL:WEST PALM BEACH	318	4700	11839	95	5	
43	WI:PLATTEVILLE AREA	148	686	801	39	92		94	FL:MIAMI METRO	319	14037	26961	87	14	
44	IA-IL-MO:BURLINGTON	149	1442	1606	90	91		95	FL:SARASOTA AREA	320	1274	3414	99	3	
45	IA:OTTUMWA AREA	150	1263	1495	57	85		96	FL:FT MYERS AREA	321	982	2973	100	1	
46	IA:CEDAR RAPIDS AREA	151	1654	2049	71	83		97	NC-VA:GREENBOROUGH AR	333	4574	7045	15	31	
47	IA:IOWA CITY AREA	152	982	1557	42	28		98	LA:BATON ROUGE METRO	373	3004	5483	10	16	
48	IA:WATERLOO AREA	153	2275	2520	40	94		99	LA:ALEXANDRIA AREA	374	933	1326	74	55	
49	IA-MN:MASON CITY AREA	154	2229	2456	41	95		100	LA-MS:NATCHEZ MS AREA	375	456	542	12	84	
50	MN-WI:DULUTH AREA	155	2243	2474	37	93			Total Comparison LMAs	151140	283169				
51	MN-WI:MPLS-ST PAUL ME	156	17234	28092	50	26			Total US	1425767	2288097				

Source: Reynolds, Paul D. and Wilbur Maki. 1991. "U.S. Regional Characteristics that Promote Regional Growth". Final project report submitted to Aspen Institute Washington, DC in fulfillment of Ford Foundation Grant No. 8900-013, University of Minnesota Grant No. 0610-5764, Minneapolis, MN.

Table 2. Total and relative labor earnings (in 1982\$) and period-to-period change sources:* by regional groupings of US labor market areas, 1970-86"

No.	Year and Change Source	Total Labor Earnings (1982\$)					Proportion of Total					
		Mid-Continent West	East	Comparis LMAAs	Other LMAAs	All LMAAs	Mid-Continent West	East	Comparis LMAAs	Other LMAAs	All LMAAs	
		(mil.\$)	(mil.\$)	(mil.\$)	(mil.\$)	(mil.\$)	(pct.)	(pct.)	(pct.)	(pct.)	(pct.)	
1	*1970, Totals*	75431	135197	151140	1063999	1425767	5.3	9.5	10.6	74.6	100.0	
2	US Growth	25388	45504	50870	358114	479875	33.7	33.7	33.7	33.7	33.7	
3	Industry Mix	-2452	-1462	-258	4172	0	-3.3	-1.1	-0.2	0.4	0.0	
4	Regional Share	12756	-6483	30157	-36430	0	16.9	-4.8	20.0	-3.4	0.0	
5	Relative Change	10304	-7945	29899	-32258	0	13.7	-5.9	19.8	-3.0	0.0	
6	*1980, Totals*	111123	160930	227790	1405800	1905643	5.8	8.4	12.0	73.8	100.0	
7	US Growth	-1364	-1975	-2796	-17257	-23393	-1.2	-1.2	-1.2	-1.2	-1.2	
8	Industry Mix	-2426	-7870	4813	5482	0	-2.2	-4.9	2.1	0.4	0.0	
9	Regional Share	-3790	-9845	4969	8667	0	-3.4	-6.1	2.2	0.6	0.0	
10	Relative Change	-6216	-17715	9782	14149	0	-5.6	-11.0	4.3	1.0	0.0	
11	*1982, Totals*	104743	157678	231738	1388091	1882250	5.6	8.4	12.3	73.7	100.0	
12	US Growth	13514	20343	29898	179088	242844	12.9	12.9	12.9	12.9	12.9	
13	Industry Mix	-307	-705	3361	-2350	0	-0.3	-0.4	1.5	-0.2	0.0	
14	Regional Share	-6244	340	4888	1016	0	-6.0	0.2	2.1	0.1	0.0	
15	Relative Change	-6550	-365	8249	-1333	0	-6.3	-0.2	3.6	-0.1	0.0	
16	*1985, Totals*	111707	177657	269885	1565845	2125094	5.3	8.4	12.7	73.7	100.0	
17	US Growth	4363	6939	10541	61160	83004	3.9	3.9	3.9	3.9	3.9	
18	Industry Mix	188	-916	1107	-380	0	0.2	-0.5	0.4	0.0	0.0	
19	Regional Share	-245	1496	1636	-2887	0	-0.2	0.8	0.6	-0.2	0.0	
20	Relative Change	-57	581	2743	-3266	0	-0.1	0.3	1.0	-0.2	0.0	
21	*1986, Totals*	116013	185176	283169	1623739	2208097	5.3	8.4	12.8	73.5	100.0	
22	*Change Sources Summary, 1970-86:*											
23	US Growth	41901	70811	88513	581104.9618	782330	35.5	52.4	58.6	54.6	54.9	
24	Industry Mix	-4996	-10953	9024	6925	0	-6.6	-8.1	6.0	0.7	0.0	
25	Regional Share	2477	-14492	41649	-29634	0	3.3	-10.7	27.6	-2.8	0.0	
26	Relative Change	-2519	-25444	50673	-22709	0	-3.3	-18.8	33.5	-2.1	0.0	
27	Total Change	39381	45366	139186	558396	782330	52.2	33.6	92.1	52.5	54.9	

Source: Reynolds, Paul D. and Wilbur Maki. 1991. "U.S. Regional Characteristics that Promote Regional Growth". Final project report submitted to Aspen Institute Washington, DC in fulfillment of Ford Foundation Grant No. 8900-013, University of Minnesota Grant No. 0610-5764, Minneapolis, MN.

Table 3. Total change in labor earnings (1982 \$) from all industry due to relative change effect in 30 highest volatility and 30 lowest volatility areas: Mid-Continent West, Mid-Continent East and Comparison Labor Market Areas, US, 1970-1986

Rnk	Labor Market Area	LMA No.	Change, 1970-80				Change, 1980-82				Change, 1982-85				Change, 1985-86				
			US Growth	Ind Mix	Reg Share	1980 (mil\$)	US Growth	Ind Mix	Reg Share	1982 (mil\$)	US Growth	Ind Mix	Reg Share	1985 (mil\$)	US Growth	Ind Mix	Reg Share	1986 (mil\$)	
1	WY-NE-CHEYENNE AREA	73	1592	536	91	1100	3319	-41	-331	-372	2905	375	-149	-533	2598	101	-50	-163	2486
2	NE:GRAND ISLAND AREA	67	1720	579	-208	-140	1951	-24	293	269	2175	281	-31	-86	2339	91	25	-66	2389
3	CO:GRAND JUNCTION-NW	21	765	257	78	878	1978	-24	-66	281	2169	280	-47	-487	1915	75	-2	-103	1884
4	WY-ID-UT:ROCK SPRINGS	42	420	141	8	582	1152	-14	71	57	1179	152	-88	-68	1175	46	-42	-49	1130
5	NM:DURANGO-TAOS	16	555	187	36	490	1267	-16	0	-1	1250	161	-45	-140	1226	48	-22	-50	1202
6	NE-SD:NORFOLK AREA	71	557	187	-54	-3	687	-8	46	38	712	92	-11	-32	761	30	5	9	805
7	WY-MT:YELLOWSTONE N P	50	539	181	39	236	995	-12	-53	-65	902	116	-42	-97	879	34	-10	-57	847
8	UT:CEDAR CITY-PRICE	45	512	172	27	330	1042	-13	-10	108	1127	145	-107	-25	1140	45	-22	-73	1090
9	ND-MT-SD:DICKINSON AR	85	989	333	-96	142	1368	-17	69	52	1437	185	-74	-410	1139	44	-26	49	1206
10	LA:BATON ROUGE METRO	373	3004	1011	60	1598	5673	-70	196	126	5735	740	-70	-605	5800	227	-12	-532	5483
11	SD-NE-WY:RAPID CITY A	74	976	328	-36	382	1650	-20	108	88	1711	221	-106	-122	1704	67	-41	-9	1720
12	LA-MS:NATCHEZ MS AREA	375	456	154	49	-24	635	8	-1	-8	627	81	-23	-89	595	23	-13	-64	542
13	IN-MI:SOUTH BEND AREA	261	4996	1681	-31	-912	5734	-70	-37	-107	5413	698	-40	166	6238	244	-63	177	6595
14	WV-VA:BLUEFIELD	207	844	284	253	-212	1168	-14	-48	-63	1066	138	-118	-122	963	38	-31	-22	948
15	NC-VA:GREENBOROUGH AR	333	4574	1540	-488	224	5850	-72	160	88	5744	741	-77	316	6725	263	-18	76	7045
16	NY:NORTHEAST AREA	195	1361	458	-81	-241	1497	-18	14	-5	1459	188	-62	70	1655	65	-19	-1	1700
17	MI:DETROIT METRO	266	42911	14443	-117	-5082	40329	-495	-4148	-4643	45071	5815	570	2223	53679	2097	-321	450	55904
18	MT-WY:BILLINGS AREA	49	980	330	0	307	1617	-20	44	24	1617	209	-44	-263	1518	59	-21	-36	1521
19	OR:BEND (CENTRAL)	6	773	260	-9	202	1227	-15	-125	-140	1009	130	8	19	1166	46	6	-32	1186
20	ND:MINOT-BISMARK AREA	84	1033	348	-114	233	1499	-18	127	108	1602	207	-25	-118	1666	65	0	-99	1633
21	NE:LINCOLN METRO	69	1942	654	-63	-110	2422	-30	87	58	2455	317	-25	-4	2742	107	12	-50	2811
22	ME:PORTLAND METRO	196	3487	1174	-191	119	4589	-56	133	77	4568	589	-65	140	5232	204	-14	257	5680
23	OR-CA:EUGENE AREA	5	2253	758	119	349	3481	-43	-371	-414	2846	367	47	-146	3115	122	13	-47	3203
24	OR-WA:LONGVIEW-COAST	10	1282	431	34	247	1994	-24	-59	-83	1764	228	-1	-326	1665	65	-1	-39	1690
25	WA-OR:WALLA WALLA AREA	2	2664	897	-131	1126	4555	-56	-230	-286	4203	542	-38	-550	4158	162	28	31	4379
26	OR:MEDFORD (SW)	7	669	225	27	284	1205	-15	-123	-138	1014	131	15	11	1171	46	5	-1	1221
27	IA:SPENCER (NW) AREA	77	903	304	-144	-2	1061	-13	-141	-154	885	114	-5	-38	956	37	12	11	1017
28	SD-ND:ABERDEEN-WEST	75	896	302	-144	-143	911	-11	-26	-37	864	111	-5	-86	885	35	10	89	1019
29	WI:KENOSHA AREA	278	2153	725	2	118	2998	-37	-192	-229	2648	342	-41	-271	2678	105	-35	-72	2676
30	NE-CO:NORTH PLATTE AREA	66	822	277	-101	47	1044	-13	49	36	1045	135	-29	-22	1129	44	5	-38	1140
30 Highest-volatility LMAs			86427	29156	-1187	2127	104898	-1288	-4564	-5335	107284	13831	-727	-1696	118612	4633	-642	-455	122148
71	IA:CEDAR RAPIDS AREA	151	1654	557	-81	-36	2094	-26	-140	-165	1878	242	-31	-133	1956	76	-12	28	2049
72	WI-MI:IRON MOUNTAIN	280	725	244	-5	71	1035	-13	-68	-81	928	120	-14	-7	1027	40	-7	2	1062
73	WA-ID:SPOKANE AREA	3	2887	972	-23	646	4482	-35	-237	-292	4029	520	-77	-73	4309	172	4	-5	4570
74	LA-ALEXANDRIA AREA	374	933	314	-34	83	1297	-16	9	-7	1283	166	-7	-98	1344	52	2	-73	1326
75	MN:ROCHESTER AREA	159	1476	497	-69	-8	1897	-23	-24	-48	1835	237	-44	-12	2016	79	-6	47	2136
76	MN-ST CLOUD AREA	157	783	264	-62	180	1165	-14	-4	-19	1123	145	-13	19	1274	50	3	64	1390
77	WI-NORTHWEST AREA	160	629	212	-30	120	931	-11	-38	-49	857	111	-9	5	963	38	2	38	1041
78	WI-MN:LA CROSSE AREA	161	952	320	-40	189	1421	-17	-50	-68	1322	171	-24	-69	1400	35	-6	18	1466
79	MI:JACKSON AREA	267	1774	597	29	-459	1941	-24	-142	-166	1716	221	6	-158	1784	70	-22	-13	1819
80	MN:MANKATO AREA	158	1323	445	-121	36	1683	-21	-59	-80	1567	202	-25	-59	1685	66	-2	39	1788
81	WA-SEATTLE-TACOMA MET	11	17344	5837	-56	4050	27175	-334	269	-65	26364	3401	526	-1446	28845	1127	84	652	30708
82	AZ-UT:FLAGSTAFF-CANYO	15	463	156	-2	259	875	-11	-10	-20	829	107	-13	69	992	39	0	37	1068
83	WI:STEVENS POINT AREA	272	735	247	-18	176	1140	-14	-8	-22	1098	142	-20	3	1223	48	3	0	1274
84	WI:MADISON AREA	147	3049	1026	-54	-70	3951	-49	-53	-101	3842	496	9	-161	4186	164	31	66	4447
85	WI:GREEN BAY AREA	274	1447	487	-44	283	2173	-27	-14	-41	2082	269	-27	40	2364	92	-10	53	2499
86	MI:KALAMAZOO AREA	262	3491	1175	-74	-209	4383	-54	-191	-244	4034	521	-113	-72	4369	171	-48	72	4564
87	FL:MIAMI METRO	319	14037	4724	491	2866	22118	-272	564	293	22245	2870	612	-127	25600	1000	339	21	26961
88	MI:LANSING AREA	264	2915	981	23	182	4101	-50	-117	-168	3848	496	39	-36	4367	171	-2	-44	4491
89	SD:SOUIS FALLS AREA	72	1642	532	-146	124	2172	-27	-63	-90	2056	265	-23	-3	2266	90	20	-54	2351
90	IA-IL-MO:BURLINGTON	149	1442	485	-69	-163	1696	-21	-90	-111	1534	198	-42	-116	1573	61	-10	-18	1606
91	WI:FOND DU LAC AREA	276	751	253	-33	-16	954	-12	-27	-38	886	114	-27	-26	948	37	-9	16	992
92	UT-ID:LOGAN AREA	43	376	126	-41	157	618	-8	20	12	608	78	-16	47	718	28	-10	39	774
93	WI:MILWAUKEE METRO	277	12088	4068	75	-1080	15151	-186	-522	-708	14185	1830	-132	-874	15010	586	-88	-4	15504
94	IA-MO:DES MOINES METR	76	4004	1348	-115	91	5327	-65	-236	-302	4999	645	21	-294	5371	210	43	-35	5590
95	FL-WEST PALM BEACH	318	4700	1582	131	1958	8370	-103	582	479	8646	1115	242	1035	11039	431	83	286	11839
96	AZ-TUSCON METRO	14	2527	851	-29	926	4276	-52	188	135	4316	537	-33	313	5133	200	0	96	5429
97	WI:OSHKOSH AREA	275	3202	1078	-114	214	4380	-54	-96	-150	4082	527	-84	-41	4485	175	-39	82	4703
98	AZ:PHOENIX METRO	13	7442	2505	150	4093	14190	-174	462	288	14233	1836	204	2027	18300	715	205	476	19696
99	FL-SARASOTA AREA	320	1274	429	5	843	2530	-31	86	53	2537	327	86	219	3170	124	37	83	3414
100	FL-FT MYERS AREA	321	982	330	-27	850	2135	-26	124	98	2152	278	77	220	2727	107	44	95	2973
30 Lowest-volatility LMAs			97846	32643	-382	16356	145682	-1788	113	-1675	141115	18286	1047	195	168563	6271	629	2863	169526

Source: Reynolds, Paul D. and Wilbur Maki. 1991. "U.S. Regional Characteristics that Promote Regional Growth". Final project report submitted to Aspen Institute Washington DC in fulfillment of Ford Foundation Grant No. 8900-013, University of Minnesota Grant No. 0610-5764, Minneapolis, MN.

