LOCAL ECONOMIC ANALYSIS

DEFINE STUDY AREA AND COMPARISON AREAS
- ⇨ **REFLECTS FOCUS FOR INTERVENTION**
- ⇨ **RELATE TO METROPOLITAN AREA CONTEXT**

DEMOGRAPHIC ANALYSIS
- ⇨ **PROFILES KEY ECONOMIC RESOURCE**
- ⇨ **POPULATION TRENDS & CHARACTERISTICS INFORM ECONOMIC DEVELOPMENT NEEDS AND ISSUES**

ECONOMIC PERFORMANCE ANALYSIS
- ⇨ **BENCHMARKING AND DIAGNOSTIC TOOL**

ECONOMIC BASE ANALYSIS
- ⇨ **IDENTIFY LOCAL ECONOMIC STRUCTURE & TRENDS**
- ⇨ **INFORMS OPPORTUNITIES, NEEDS, AND ASSETS**

RESOURCE ANALYSIS\COMMUNITY INVENTORY
- ⇨ **DEFINE KEY ASSETS AND STRENGTHS**
- ⇨ **IDENTIFY CRITICAL WEAKNESSES AND CONSTRAINTS**

KEY ISSUES EFFECTING DATA SOURCES
- ⇨ Establishment or Household-Based Data
- ⇨ Geographic Area Covered
- ⇨ Level of Industry Aggregation
- ⇨ Type of Information Provided
- ⇨ Frequency and Availability
- ⇨ Coverage and Methods

ECONOMIC DATA SOURCES

HOUSEHOLD-BASED DATA
⇨ COLLECTED AT PLACE OF RESIDENCE
⇨ INFORMATION ON AREA POPULATION AND WORKFORCE NOT EMPLOYERS OR BUSINESSES
⇨ DATA ON POPULATION, INCOME LEVELS, POVERTY RATES, UNEMPLOYMENT RATES, & WORKFORCE CHARACTERISTICS ARE HOUSEHOLD-BASED
⇨ KEY HOUSEHOLD-BASED DATA SOURCES
   ▪ US CENSUS
   ▪ CURRENT POPULATION SURVEY (CPS)
   ▪ POPULATION & POVERTY ESTIMATES
   ▪ LOCAL AREA UNEMPLOYMENT STATISTICS (LAUS)
⇨ CENSUS HAS DETAILED INFORMATION BUT IS QUICKLY OUTDATED
⇨ CPS AND LAUS PROVIDES TIMELY DATA BUT HAVE SAMPLING ERRORS; CPS COVERS LIMITED AREA
⇨ PRIVATE DATA SOURCES CAN FILL DATA GAPS WITH ESTIMATES BETWEEN CENSUS PERIODS & CUSTOMIZED AREA COVERAGE

ESTABLISHMENT-BASED DATA
⇨ COLLECTED AT PLACE OF EMPLOYMENT
⇨ INFORMATION ON AREA EMPLOYERS NOT POPULATION
   ▪ AREA EMPLOYMENT VS. LABOR FORCE
⇨ DATA ON NUMBER OF BUSINESSES, EMPLOYMENT, PAYROLLS, WAGE LEVELS, SALES
⇨ KEY HOUSEHOLD-BASED DATA SOURCES
   ▪ ES-202 DATA SERIES
   ▪ CURRENT EMPLOYMENT STATISTICS (CES)
   ▪ US ECONOMIC CENSUS
   ▪ COUNTY BUSINESS PATTERNS

DEMOGRAPHIC ANALYSIS

POPULATION SIZE, CHARACTERISTICS & GROWTH TRENDS

⇨ WHAT ACCOUNTS FOR POPULATION CHANGE (BIRTHS, DEATHS, MIGRATION, OUT-MIGRATION)

⇨ COMPOSITION BY AGE, RACE, NATIONAL ORIGIN

⇨ STABILITY OF RESIDENCY

⇨ EDUCATION LEVEL AND OCCUPATIONS

⇨ INCOME LEVELS AND SOURCES OF INCOME

⇨ LABOR FORCE PARTICIPATION RATE AND SIZE (VARIATIONS ACROSS AGE, RACE, ETC.)

⇨ UNEMPLOYMENT RATES

⇨ EXTENT OF SELF-EMPLOYMENT

⇨ STUDY TREND OVER TIME AND COMPARE WITH REGION, STATE AND OTHER COMMUNITIES

DEMOGRAPHIC ANALYSIS:

DATA SOURCES

CENSUS BUREAU IS CRITICAL DATA SOURCE
- ⇨ **DECENNIAL CENSUS OF POPULATION & HOUSING**
- ⇨ **CURRENT POPULATION SURVEY**
- ⇨ **POPULATION ESTIMATES**
- ⇨ **SMALL AREA (COUNTY) INCOME & POVERTY ESTIMATES**

BUREAU OF LABOR STATISTICS
- ⇨ **LOCAL AREA UNEMPLOYMENT STATISTICS**
- ⇨ **AVAILABLE THROUGH STATE LABOR MARKET AGENCY**

STATE AND LOCAL DATA SOURCES
- ⇨ **POPULATION CENSUS**
- ⇨ **SCHOOL DEPARTMENT STATISTICS**
- ⇨ **WELFARE CASELOADS**
- ⇨ **LOCAL PLANS AND STUDIES**

STATE DATA CENTERS

ECONOMIC PERFORMANCE ANALYSIS

IDENTIFY KEY ISSUES FROM ECONOMIC RESULTS

ANSWERS SEVERAL QUESTIONS:
⇨ HOW IS YOUR AREA ECONOMY PERFORMING RELATIVE TO THE REGION?

⇨ IS THE AREA PARTICIPATING IN REGIONALGROWTH AND BENEFITS?

⇨ IS THE AREA AND ITS POPULATION BENEFITING FROM KEY GROWTH SECTORS AND HIGHER WAGE INDUSTRIES

PERFORMANCE MEASURES
⇨ POPULATION GROWTH
⇨ EMPLOYMENT GROWTH
⇨ UNEMPLOYMENT RATE
⇨ INCOME LEVELS
⇨ EARNINGS AND WAGE LEVELS
⇨ POVERTY RATE
⇨ LABOR FORCE PARTICIPATION
⇨ FIRM BIRTHS, DEATHS, AND RELOCATIONS
⇨ NEW DEVELOPMENT AND INVESTMENT
⇨ PROPERTY VALUES AND TAX REVENUES

ANALYZE THESE MEASURES IN SEVERAL WAYS:
⇨ TRENDS OVER TIME
⇨ COMPARE LOCAL PERFORMANCE TO OTHER AREAS (STATE, METRO AREA, NEARBY CITIES)
⇨ COMPARE OVERALL PERFORMANCE TO THAT FOR DEMOGRAPHIC SUBGROUPS AND GEOGRAPHIC SUB-AREAS

ECONOMIC PERFORMANCE ANALYSIS DATA SOURCES

PLACE OF RESIDENCY-BASED DATA ON POPULATION, INCOME, POVERTY RATES, EDUCATIONAL ATTAINMENT
- ⇨ **CENSUS BUREAU: DICENNIAL CENUS, POPULATION ESTIMATES, CURRENT POPULATION SURVEY, SMALL AREA INCOME AND POVERTY ESTIMATES**
- ⇨ **REGIONAL ECONOMIC INFORMATION SYSTEM**

PLACE OF RESIDENCY-BASED UNEMPLOYMENT AND LABOR FORCE PARTICIPATION DATA:
- ⇨ **CENSUS DATA AND BUREAU OF LABOR STATISTICS LOCAL AREA UNEMPLOYMENT STATATISTICS**

PLACE OF WORK-BASED EMPLOYMENT AND EARNINGS DATA :
- ⇨ **REIS AND CES FOR STATES, MSA, COUNTIES**
- ⇨ **ES-202 DATA SERIES**
- ⇨ **COUNTY BUSINESS PATTERNS**
- ⇨ **US ECONOMIC CENSUS**

LOCAL INVESTMENT AND TAXES FROM LOCAL GOVERNMENT DATA

FIRM BIRTHS, DEATH, RELOCATIONS FROM PRIVATE DATA BASES

ECONOMIC BASE/STRUCTURE ANALYSIS

TWO KEY GOALS:
⇨ UNDERSTAND LOCAL ECONOMIC STRUCTURE
⇨ ASSESS OPPORTUNITIES, NEEDS, & ASSETS

KEY QUESTIONS TO ADDRESS
⇨ COMPOSITION OF EMPLOYMENT BY SECTOR
⇨ LARGEST JOB SOURCES AND THEIR WAGES
⇨ GROWING AND DECLINING SECTORS
⇨ HOW DOES COMPOSITION AND GROWTH COMPARE TO REGION AND OTHER AREAS
⇨ OCCUPATIONAL COMPOSITION OF LARGEST AND GROWING SECTORS
⇨ INDUSTRY CONCENTRATIONS AND CLUSTERS
⇨ INTER-INDUSTRY RELATIONSHIPS

DATA SOURCES:

EMPLOYMENT GROWTH AND WAGE LEVELS:
⇨ ES-202 DATA SERIES
⇨ US ECONOMIC CENSUS
⇨ COUNTY BUSINESS PATTERNS
⇨ BUREAU OF LABOR STATISTICS OCCUPATIONAL DATA

FOCUS GROUPS & INTERVIEWS TO HELP DEFINE CLUSTERS, INTER-INDUSTRY RELATIONSHIPS AND OCCUPATIONAL STRUCTURE

DATA SOURCES: THE SIC & NAICS

ESTABLISHMENT BASES DATA IS ORGANIZED DATA INTO INDUSTRY CATEGORIES WITH ASSIGNED NUMERICAL CODES

ECONOMIC DATA IS AGGREGATED AND REPORTED BY THESE CODES

NESTED SYSTEM WHERE INDUSTRY SPECIALTY INCREASES WITH NUMBER OF DIGITS IN CODE

STANDARD INDUSTRIAL CLASSIFICATION (SIC) SYSTEM DEVELOPED IN 1930S AND USED THROUGH 1990S

⇨ ONE-DIGIT DENOTES BROAD SECTOR:
   2 AND 3 ARE MANUFACTURING SECTORS

⇨ TWO DIGIT INDICATES INDUSTRY WITHIN THE BROAD SECTOR REPRESENTED BY THE FIRST DIGIT CATEGORY:
   30 IS RUBBER AND PLASTIC PRODUCTS MANUFACTURING

⇨ THREE DIGIT INDICATES NARROWER SEGMENT WITHIN TWO DIGIT INDUSTRY:
   302 IS RUBBER AND PLASTIC FOOTWEAR

NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) REPLACED SIC CODES IN LATE 1990S TO REFLECT SECTORS & DETAILED INDUSTRIES CURRENT ECONOMY

⇨ TWO-DIGIT DENOTES BROAD SECTOR:
   31 to 33 ARE MANUFACTURING SECTORS

⇨ THREE-DIGIT DENOTES INDUSTRIES WITHIN BROAD SECTOR: 316 IS LEATHER AND ALLIED PRODUCTS

⇨ FOUR TO SIX-DIGIT DENOTES NARROWER SEGMENT WITHIN INDUSTRY: 3162 IF FOOTWEAR MFG, 316211IS RUBBER AND PLASTIC FOOTWEAR MFG

ECONOMIC BASE ANALYSIS-KEY STEPS

DETERMINE CROSSECTIONAL COMPOSITION OF ECONOMY BY BROAD SECTORS AND COMPARE TO REGION, STATE AND NATION

⇨ IDENTIFIES MAJOR ECONOMIC SECTORS AND HOW THEY COMPARE WITH OTHER AREAS

COMPARE LOCAL GROWTH IN BROAD SECTORS TO REGION, STATE AND NATION

⇨ IDENTIFIES WHICH LOCAL SECTORS ARE GROWING FASTER AND SLOWER THAN OTHER AREAS

NEXT, LOOK AT CROSSECTION COMPOSITION AND WAGE LEVELS OF LARGEST SECTORS SERVICES AT TWO-DIGIT LEVEL

⇨ IDENTIFIES MOST IMPORTANT INDUSTRIES WITHIN KEY SECTORS

⇨ SHOWS HOW INDUSTRY MIX VARIES WITH THAT OF REGION

⇨ DETERMINES RELATIVE WAGES OF LOCALITY'S MAJOR INDUSTRIES

LOOK AT RECENT TRENDS FOR KEY TWO-DIGIT INDUSTRIES AT LOCAL AND REGIONAL LEVEL

⇨ DETERMINES WHICH INDUSTRIES ARE FASTEST GROWING

⇨ IDENTIFIES DECLINNING AND "AT-RISK" INDUSTRIES

⇨ COMPARES LOCAL AND REGIONAL INDUSTRY GROWTH TRENDS

ECONOMIC BASE ANALYSIS-FURTHER STEPS

EXPAND UPON THIS ANALYSIS IN SEVERAL WAYS:
- ⇨ ANALYZE THREE DIGIT INDUSTRIES TO BETTER UNDERSTAND INDUSTRY COMPOSITION
- ⇨ CALCULATE LOCATION QUOTIENTS TO ASSESS INDUSTRY CONCENTRATION
- ⇨ USE SHIFT-SHARE ANALYSIS TO DISSECT GROWTH INDUSTRIES
- ⇨ RESEARCH ON CRITICAL INDUSTRIES TO ASSESS KEY TRENDS, SOURCES OF COMPETITIVE ADVANTAGE, SPECIALIZED NEEDS AND LOCATION FACTORS

STRATEGY IMPLICATIONS FROM ECONOMIC BASE ANALYSIS
- ⇨ KEY INDUSTRIES TO RETAIN AND SUPPORT
- ⇨ EMERGING AND FAST-GROWING INDUSTRIES TO FOSTER AND ATTRACT
- ⇨ STRUCTURAL CHANGES SHAPING ECONOMY
- ⇨ DETERMINE CITY'S ROLE IN REGIONAL ECONOMY

ECONOMIC BASE ANALYSIS: LOCATION QUOTIENTS

LOCATION QUOTIENT: RATIO OF THE SHARE OF AN INDUSTRY'S EMPLOYMENT (OR OTHER MEASURE) FOR A REGION TO THE SHARE OF THAT SAME INDUSTRY'S NATIONAL EMPLOYMENT

$$LQ_I = (e_{i,r}/e_r)/(E_{I,N}/E_N)$$

$(e_{i,r}/e_r)$ = SHARE OF REGION'S EMPLOYMENT IN INDUSTRY I

$(E_{I,N}/E_N)$ = SHARE OF NATIONAL EMPLOYMENTIN INDUSTRY I

ALTERNATIVE FORMULA: $LQ_I = (e_{i,r}/E_{I,N})/(e_r/E_N)$

LQ INDICATES INDUSTRY CONCENTRATIONS IN A REGION AND EXPORT INDUSTRIES.

LOCATION QUOTIENTS MEANINGS

INTERPRETATION 1:

WHEN LQ > 1, THE INDUSTRY IS CONSIDERED AN EXPORT OR BASE INDUSTRY

INTERPRETATION 2:

VERY HIGH LQ INDICATES INDUSTRY CONCENTRATION. A REGIONAL COMPARATIVE ADVANTAGE MAY EXIST FOR THAT INDUSTRY.

INTERPRETATION 3:
WHEN LQ<1, MAY INDICATE OPPORTUNITY FOR EXPANSION IN LOCAL-ORIENTED RETAIL AND SERVICE INDUSTRIES WHERE YOU'D EXPECT LQ = 1. LQ < 1, SUGGESTS LOCAL POPULATION IS BUYING THESE SERVICES OUTSIDE THE COMMUNITY. A POTENTIAL OPPORTUNITY FOR GROWTH IN THIS SECTOR MAY EXIST.

LQ CAN BE ADAPTED TO MEASURES DIFFERENT TYPES OF RELATIVE CONCENTRATION, SUCH OUTPUT, INCOME, OR EXPORTS.

CALCULATING LOCATION QUOTIENTS

1. **COLLECT AND ORGANIZE DATA FOR LOCAL AREA AND NATION BY INDUSTRY CODE**

2. **CALCULATE PERCENTAGE OF TOTAL EMPLOYMENT FOR EACH LOCAL INDUSTRY AND FOR THE INDUSTRY NATIONALLY**

3. **DIVIDE LOCAL INDUSTRY PERCENTAGE BY NATIONAL PERCENTAGE**

SECTOR	LAWR. EMPLOY-MENT 1996	LAWR. % OF TOTAL	US 1996 EMPLOY-MENT	US % OF TOTAL	LQ
MANUF	**6,678**	**31.60**	**18,460,469**	**15.65**	**2.02**
TRADE	**3,005**	**14.22**	**28,027,093**	**23.76**	**0.60**
SERVICES	**7,541**	**35.70**	**32,256,990**	**27.34**	**1.31**

SHIFT-SHARE ANALYSIS

A DESCRIPTIVE TOOL TO ANALYZE THE COMPONENTS OF EMPLOYMENT CHANGE IN A REGION.

SHIFT SHARE DECOMPOSES EMPLOYMENT GROWTH IN A REGION INTO THREE PARTS:

$$(e_{I,T} - e_{I,T-1}) = N + I + R$$

(1) **NATIONAL GROWTH EFFECT (N) - GROWTH ATTRIBUTABLE TO THE NATIONAL GROWTH RATE, I.E., HOW MUCH GROWTH WOULD OCCUR IF EVERY INDUSTRY IN THE REGION GREW AT THE NATIONAL GROWTH RATE.**

(2) **INDUSTRY MIX EFFECT (I) - GROWTH ATTRIBUTABLE TO THE REGION'S INDUSTRY MIX, I.E., TO HAVING A LARGER SHARE OR FAST GROWING OR SLOW GROWING INDUSTRIES**

(3) **REGIONAL SHIFT EFFECT (R) - GROWTH ATTRIBUTABLE TO SHIFT IN INDUSTRY JOBS FROM ONE REGION TO ANOTHER, I.E., ARE GROWTH RATES IN THE REGION'S INDUSTRIES ABOVE THE NATIONAL INDUSTRY GROWTH RATES**

SHIFT-SHARE CALCULATIONS

CALCULATED ON A SECTORAL AND INDUSTRY-Y-NDUSTRY BASIS AND THEN AGGREGATED TO DETERMINE RELATIVE CONTRIBUTION OF EAH SECTOR AND INDUSTRY TO OVERALL EMPLOYMENT GROWTH.

CALCULATE EACH COMPONENT SEPARATELY:

NATIONAL SHARE EFFECT: $N_{I,T} = e_{I, T-1}(E_T/E_{T-1}-1)$

$N_{I,T}$ - EMPLOYMENT GROWTH IN INDUSTRY I DURING PERIOD T-1 TO T EXPLAINED BY NATIONAL GROWTH

$e_{I, T-1}$ - REGION'S EMPLOYMENT IN INDUSTRY I AT BEGINNING OF PERIOD

$(E_T/E_{T-1}-1)$- OVERALL NATIONAL GROWTH RATE FOR ALL INDUSTRIES DURING PERIOD

Sector	Beginning employment	national growth rate	N
agriculture	150	.50	75
manufacturing	50	.50	25
services	50	.50	25
government	10	.50	5
Total	260	.50	130

SHIFT-SHARE CALCULATIONS

INDUSTRY MIX EFFECT:

$$I_I = e_{I. T-1} [(E_{I,T}/E_{I,T-1} -1)-(E_T/E_{T-1}-1)]$$

= **BEGINNING EMPLOYMENT FOR INDUSTRY I**
TIMES THE DIFFERENCE BETWEEN INDUSTRY I NATIONAL
GROWTH RATE AND NATIONAL OVERALL GROWTH RATE

BRACKETED FIGURE IS THE DIFFERENCE IN INDUSTRY I'S
***NATIONAL* GROWTH RATE AND THE OVERALL NATIONAL**
GROWTH RATE, I.E., IS INDUSTRY I A HIGH OR LOW
GROWTH INDUSTRY FOR THE NATION

Sector	Beg Emp.	Nat Ind Rate	Nat Gr. Rate	Dif in Rate	I
Agriculture	150	0	.5	-.50	-75
Manufacturing	50	1.00	.5	.50	25
Services	50	.50	.5	0	0
Government	10	1.33	.5	.83	8
Total	260				- 42

Nationally, agriculture had a 0% growth rate, 50% *below* the national growth rate. With initial agricultural employment of 150, the industry mix effect was -75. Adding I for all sectors, you see how region's mix of high growth or low growth industries effected jobs growth--producing a net loss of 42,000 jobs.

REGIONAL SHARE EFFECT

R IS THE RESIDUAL FROM THE **N** AND **M.**

⇨ $(e_{I,T} - e_{I,T-1}) = N + I + R$

⇨ $R = (e_{I,T} - e_{I,T-1}) - N - I;$

⇨ $R = 55 - 130 - (-42) = -33$

R CAN ALSO BE CALCULATED DIRECTLY:

$$R_I = e_{I,T-1} * [(e_{I,T}/e_{I,T-1} - 1) - (E_I T/EI_{,T-1} - 1)]$$

BEGINNING EMPLOYMENT FOR INDUSTRY I TIMES THE DIFFERENCE BETWEEN INDUSTRY I *REGIONAL* GROWTH RATE AND INDUSTRY I NATIONAL GROWTH RATE.

BRACKETED FIGURE IS THE DIFFERENCE IN THE INDUSTRY GROWTH RATE BETWEEN THE REGION AND NATION, I.E., IS THE INDUSTRY GROWING FASTER OR SLOWER IN THE REGION THAN FOR THE NATION. WHEN $R > 1$, INDUSTRY EMPLOYMENT IS SHIFTING TO THE REGION, I.E. THE REGION IS GAINING EMPLOYMENT SHARE IN THAT INDUSTRY. THE REGION MAY HAVE A COMPETITIVE ADVANTAGE IN THAT INDUSTRY.

Sector	Beg Employ	Reg ind Rate	Nat ind. Rate	Dif	R
AGRICULTURE	150	-.20	0	-.20	-30
Manufact.	50	.60	1.00	-.40	-20
Services	50	.90	50	.40	20
Government	10	1.00	1.33	-.33	-3
Total	260				- 33

FOR SERVICES: R $= (50)*(.90-.50) = +20$

INTERPRETATION OF SHIFT-SHARE DATA

HELPS ASSESS THE BASIS FOR A REGION'S PERFORMANCE BY PROVIDINGS A WAY TO LOOK AT THE COMPONENTS OF GROWTH: SEPARATE OUT CYCLICAL, INDUSTRY AND POSSIBLE LOCAL COMPETITIVE FACTORS.

FLAGS INDUSTRIES WHERE PERFORMANCE IS PARTICULARLY GOOD OR BAD, I.E., WHERE LARGE REGIONAL SHIFTS ARE OCRUING. INDUSTRIES WITH A LARGE POSITIVE R ARE PERFORMING BETTER THAN THE NATIONAL INDUSTRY WHILE A NEGATIVB R INDICATES REGIONAL INDUSTRIES THAT DOING WORSE. STUDY THESE INDUSTRIES IN MORE DETAIL TO UNDERSTAND THE FACTORS SHAPING THEIR PERFORMANCE.

USE SHIFT-SHARE ANALYSIS TO TARGET "AT-RISK" INDUSTRIES FOR POTENTIAL HELP AND INDUSTRIES TO RECRUIT BASED ON REGIONAL COMPETITIVE ADVANTAGES

Identifying Growth Industries and Opportunities

Screening Criteria for Target Industries:

- Size of industry\importance to area
- Growth rate nationally and locally
- LQ > 1 (agglomeration or specialization)
- Positive regional shift
- Type and quality of jobs
- Relationship to existing industries (suppliers, key support services, customers, synergies)
- Ability to utilize specialized factors and competitive advantages in region

Customize these criteria for local goals and strategy

A. Attracting Regional Growth to Local Community

1. Major industries in the region

2. INDUSTRIES WITH THE FASTEST GROWTH RATES AND LARGEST ABSOLUTE GROWTH IN JOBS.

3. Key location needs and factor requirements of these industries and their fit with local resources and advantages. How do the attributes of the community match these needs? How can community attributes be enhanced to address regional industry needs?

4. Capacity to train and place local labor force to benefit from job opportunities in growth sectors

5. Build supplier\service opportunities for local firms

<u>B. Growing Existing Local Industries</u>

1. What are the largest sectors in the local economy? What is their performance and future outlook?
- Niche growth opportunities for growth (Polartec at Malden Mills)
- Opportunities to gain competitive advantages and increase market share (Fast turnaround for Fall River apparel firms)

2. Existence of smaller emerging industries? (Food industry in Northern Tier)

3. INDUSTRY SPECIALIZATIONS THAT FORM THE BASIS FOR EXPANDING SUPPLIER OR SERVICE RELATIONSHIPS

4. Under-served local demand and import substitution opportunities

5. Advanced or key factors that can form basis for creating new industries
- Research and technology
- Labor force skills
- Special infrastructure