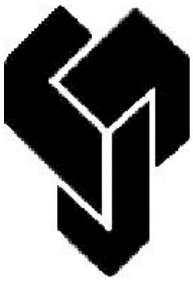

PUBLIC POLICY
RESEARCH CENTER
UNIVERSITY OF MISSOURI-ST. LOUIS

THE ECONOMY OF METROPOLITAN ST. LOUIS

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1.0. Introduction

The Metropolitan St. Louis economy is a dichotomy. The largest portion of the workforce is in the services sector but the output of the manufacturing sector is twice as large. The fastest growing occupation over the next five years will be computer scientists (134.2 percent increase) compared to retail sales persons (15 percent). Yet there will be 100 openings a year for computer scientists and over 2,000 openings a year for retail sales persons. Billions of dollars are planned for infrastructure investment in 'collar' counties, but the economic engine for the region is concentrated in the City of St. Louis and St. Louis County. High profile studies have mapped out a future for life and plant sciences, but there is as much growth potential in manufacturing metal and plastics. The population has grown by a minuscule percentage over the last several decades but the geography has grown exponentially. These contradictory elements of the economy indicate a business climate in metropolitan St. Louis that is complex.

Metropolitan St. Louis is the 60th largest economy in the world. With a gross product of $79.03 billion (1998) it places just ahead of Ireland ($77.22 billion) and just behind Egypt ($81.90 billion). In comparison to other metropolitan areas in the United States, St. Louis falls between Newark, New Jersey ($82.07 billion) and Oakland, California ($76.87 billion).

The business climate in St. Louis might best be described as stable. Stability is, however, both a strength and weakness.

This report includes three topics developed in the first phase of the business climate research project:

1. A description of the structure of the St. Louis economy in 2001.
2. A comparison of changes in the St. Louis economy from 1987 to 1997.
3. A recommendation of comparable and leading metropolitan areas.

1.1. Research Themes

1.1.1 *Old Growth/New Growth*

Newspapers, magazines, and scholarly journals alike have recently begun to divide the economy into "old and new information economy," "network economy," "digital economy," and "knowledge economy," have all been labels applied to what generically is called the "new economy."

However, aside from being a catchy and commonly used phrase, what is the "new economy" and what does it entail?

> The Bureau of Economic Analysis defines the new economy as:
>
> …associated with the impact of technological innovation over the last several decades that appears to have begun to bear fruit by the mid-1990's. These include the impact of sharply lower prices and increased efficiency in computers, cell phones, and the Internet; a host of other new

goods and services, innovation in financial markets, and new methods of payment; and reductions in costs and improvements in quality and efficiency associated with the use of these technologically based changes in other goods and services.

An elementary definition of the economic system can help to define and describe "new economy." The economic system is defined as: the system of production, distribution, and consumption of goods and services. Consequently, a "new" economic system involves new methods of production, distribution, and consumption.

1.1.1.1. *New Production*

Production has taken on new meaning in today's economy. A shift in focus has occurred from the production of tangible goods to investment in intangible services. In today's economy intangibles hold the value. Intellectual capital is in high-demand and firms are hard-pressed to deliver.

Manufacturing production is shifting to meet changing technology and business requirements. As the world becomes more and more high-tech, the types of products needed continue to change. As a result, knowledge jobs are in higher demand than ever and companies must keep abreast and evolve to meet demand, or face the risk of becoming obsolete.

1.1.1.2. *New Distribution*

The theme of today's distribution is speed. The demand for high-tech goods and services are immediate and only the firms that can deliver them the fastest survive. Also, distribution is evolving to accommodate high-tech gadgets and supplies. Change in the products currently manufactured has called for a change in how products are distributed. Firms strive for efficiency in distribution and must evolve to maintain this efficiency when distributing new products.

1.1.1.3. *New Consumption*

Today's consumer demand, as mentioned above, is for intangible services and high-tech products. Consumption can no longer be seen as it was thirty years ago. The traditional view of production and consumption of a good does not apply today. Today's consumer utilizes wireless web service, digital technology, and high-tech devices that can only be produced by knowledgeable and well-trained workers. Distribution does not always require a courier or a truck. And when tangible delivery is required, the consumer expects speed and efficiency.

1.1.1.4. *Globalization*

The "new" economy is also a global one. Global production, global distribution, and global consumption are now the norm. Countries' economies now, more than ever, depend on one another to remain healthy. Firms must not only compete nationally, but also globally. More fierce competition

can also be used to describe how the economy has changed.

In sum, "new economy" refers to the evolution and globalization of production, distribution, and consumption of goods and services that has taken place in the economy. This evolution has led to multiple definitions of the economy in terms of "new" and "old." It is, therefore, important to remember that the "new economy" is not completely different from the old and should be thought of as a constantly evolving phenomenon.

The decline of manufacturing in St. Louis, as well as across the United States, has been thoroughly reported. There are two clarifications that need to be made to this common knowledge. And within the overall shrinkage, there are areas of robust growth in manufacturing.

While in relative terms to the service sector, manufacturing has declined precipitously, in absolute terms, manufacturing still accounts for a significant number of jobs in the local economy.

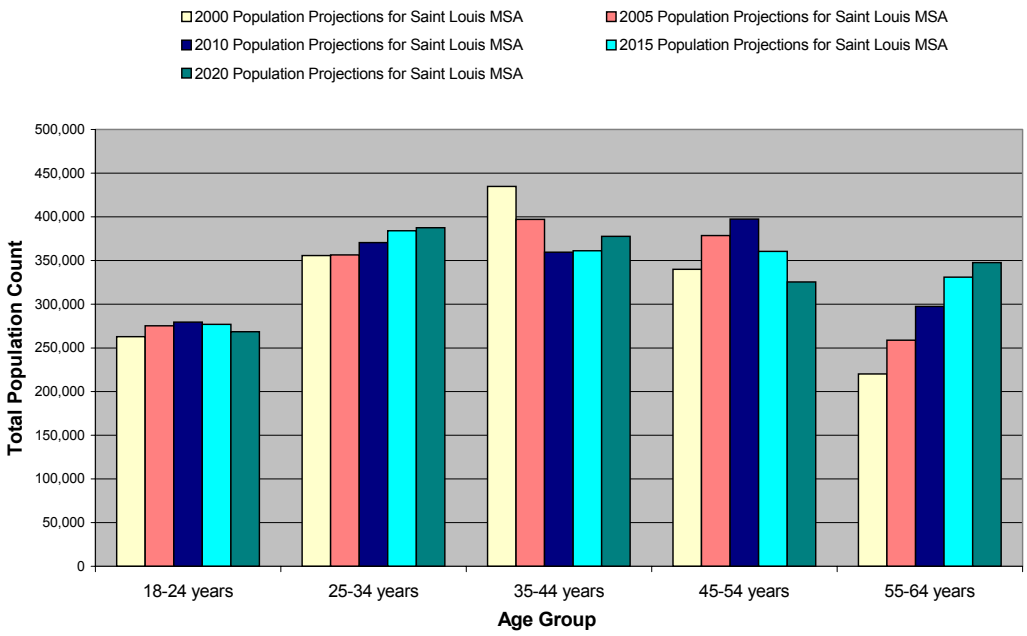
Given the evolving understanding of what is 'new economy,' the challenge becomes determining an appropriate response, for both the public and the private sectors, in terms of efforts to grow a metropolitan economy. One set of recommendations includes:

1. Investment in new economic foundations, specifically education, training, and scientific and technological research.
2. Creation of an open and flexible regulatory and trade regime that supports growth and innovation, including policies that support the IT revolution.
3. Development of policies to enable workers to have the tools they need to navigate, adapt, and prosper in a continually changing economic environment.
4. Reinvention – and digitization – of government to make it fast, responsive, and flexible.

But before a policy or program approach is selected there must be a thorough understanding of the composition of the local economy.

1.1.2. *Workforce: Quality and Quantity*

Chart 1.1
2000-2020 Population Projections for Saint Louis MSA



Source: Missouri and Illinois Departments of Labor

While substantial attention has been given to the need for workforce training because the new economy requires constant retaining as individuals change jobs and even careers periodically, there has been little consideration in metropolitan St. Louis of an approaching crisis of labor supply. Only 35 percent of job openings are the result of employment growth. The majority of job openings (65 percent) come from replacement needs. These replacement openings create labor shortages even in occupations that are not growing. And as Chart 1.1 documents, over the course of the next 10 – 15 years the number of workers retiring and leaving the economy will be increasing significantly, while the number of young workers entering will remain essentially constant. The population demographics impacting the workforce are manifested in three ways:

Business growth is limited by a chronic shortage of labor.

- During the last decade the population of the metropolitan St. Louis area increased by 73,000 people, a growth rate of 2.9 percent. In comparison Minneapolis grew by 324,000 (12.7 percent), Kansas City by 169,000 (10.6 percent), Indianapolis by 151,000 (10.9 percent), Memphis by 95,000 (9.4 percent), and Oklahoma City by 86,000 (9 percent).
- That anemic level of growth is in part a result of an out-migration of about 50,000 people from the area.

- The challenge of attracting geographically mobile, young, new economy workers who frequently choose other metropolitan areas than St. Louis.

1.1.3. *Geography Matters*

A stagnant population base and the perceptual irrelevance of an expanding central sector of the region are two big clouds hanging over the business climate. The perception that most of the City of St. Louis and an expanding large area of north St. Louis County are not strong areas for investment is a drag on regional real estate investment, a cause of disinvestments in infrastructure and education, and a barrier to expanded high-tech business development.

St. Louis suffers the double jeopardy of sprawl on the periphery and abandonment in the core.

As *Plants Sites and Parks Magazine* reports, "Sprawl costs businesses money. It increases the cost of labor, it impairs customer relations and generally degrades the business climate."

Within a given industrial sector, firms are not evenly distributed across the metropolitan area. Any proactive strategy to develop a targeted industrial sector is quite likely to have a differential focus on a sub geography of the metropolitan area.

The Battelle report "Plant and Life Sciences Strategies for St. Louis: The Technology Gateway for the 21st Century," stated one of the lessons learned from comparison benchmark communities was the importance of mechanisms to promote intersectoral and business-to-business networking. Joel Kotkin advises that this type of business climate flourishes best in metropolitan cores: "…the emerging second phase of the digital economy encompasses a whole host of more subjective skills suited to the natural advantages of dense urban areas."

In St. Louis, this points to the most developmentally challenging section of the region. The urban and inner-suburban areas of the region are challenged in part by the acknowledged problem of governmental fragmentation, but equally challenged by the prevalent perception that these areas are not viable business and residential locations.

The burgeoning information economy in metropolitan St. Louis, ranked second in the Midwest after Chicago, does not look to the urban core even for such traditional accoutrements as restaurants, theater or high-end business services.

Dave Steward, President of World Wide Technology, a successful software company in the midopolitan (old suburbs near central core cities) St. Louis County notes:

"The preponderance of our people live in West County or St. Charles. We haven't seen an employee who lives in the city. There's easy access to everything we want here. We have the entertainment, the offices. For technology companies, this is the central core."

2.0. The Metropolitan St. Louis Economy Current Structure

Metropolitan St. Louis has a world-class economy. St. Louis' gross product is $79.03 billion, making it the 60th largest economy in the world. There are 1.37 million workers in the labor force, 205,000 of them technology workers (9th in the United States). The economy is diversified and geographically dispersed. With bank deposits of approximately $30 billion, the area is ranked 16th in the United States. St. Louis ranks high on attracting new firms, is weak on startup business vitality, and has a notable challenge in business retention.

2.1. Structure

2.1.1. *By Industry*

Identifying the dominant economic activity in the metropolitan St. Louis area depends upon one's perspective. The ascendancy of the service economy has received extensive coverage, locally and nationally. But based on economic activity (the value of sales, receipts or shipments), metropolitan St. Louis is a manufacturing and wholesale trade economy. Those two sectors account for over $100 billion in activity ($57 billion wholesale and $51.5 billion manufacturing), compared to $26.5 billion for the service sector. And manufacturing and wholesale trade are responsible for $9.5 billion in annual payroll, just 2 percent less than the $9.9 billion for services. If, however, one asks, what do most people in the metropolitan St. Louis economy do, the response is that it is a service dominated sector. There are about 450,000 people working in the service sector (the majority being 150,000 in health care and 100,000 in accommodations and foodservices), compared to about 237,000 in manufacturing and wholesale (171,000 manufacturing and 66,000 wholesale).

One of the reasons for continued strength in the metropolitan St. Louis manufacturing base is foreign direct investment. In a Department of Commerce study, St. Louis ranked 17th overall nationally for foreign-owned establishments. The foreign direct investment was disproportionately for Greenfield development. Metropolitan St. Louis ranked 12th in new Greenfield establishments but 20th in foreign-owned acquired establishments. The metropolitan area was in the top five for Canadian-and German-owned and in the top 10 for French-owned Greenfield establishments. For foreign-owned acquired establishments, St. Louis was ranked in the top 10 for Canadian ownership and in the top twenty for French ownership.

St. Louis is not alone in having economic output that is predominately manufacturing and wholesale. As Table 2.1 shows, Cleveland's manufacturing sector has both a larger sales volume and more employees. Milwaukee and Minneapolis have more manufacturing employees than St. Louis, but not as large an industry by sales volume. Denver and Minneapolis have more employees in the wholesale

sector, but Minneapolis' sales volume is considerably larger than both Denver and St. Louis. For all of these metropolitan areas, the manufacturing/wholesale sectors are larger by sales volume than services, although the service sector has more employees.

Table 2.1
St. Louis Compared to Other Central U.S. Metropolitan Areas
in Manufacturing, Wholesale and Services Sectors
(Sales data in $1,000)

	Manufacturing		Wholesale		Services	
	Sales	Employees	Sales	Employees	Sales	Employees
St. Louis	51,488,137	170,766	57,134,255	66,406	26,412,376	448,812
Cincinnati	35,239,117	139,924	D	D	14,099,430	338,533
Cleveland	53,188,994	255,158	45,381,353	80,340	27,894,776	489,130
Denver	26,465,891	115,133	54,606,933	69,748	32,099,826	447,352
Indianapolis	26,773,226	106,283	28,933,918	42,968	15,680,470	276,200
Kansas City	31,014,921	95,231	46,070,822	53,535	19,085,981	307,338
Milwaukee	36,323,066	184,012	30,083,310	47,661	16,849,919	300,368
Minneapolis	44,599,702	234,192	81,848,998	98,760	34,152,490	562,140

Source: US Census Bureau, 1997 Economic Census
D = withheld to avoid disclosure

In the wholesale sector, as shown in Table 2.2, the greater portion of activity in nondurable goods (other than groceries) is attributable to transshipment of farm and petroleum products. The largest segment of the employment in the wholesale sector is in durable goods, especially those handled by merchant wholesalers.

Table 2.2
The Wholesale Sector in Metropolitan St. Louis
(Sales data in $1,000)

	Establishments	Sales	Employees
Merchant Wholesalers			
Durable goods	2,457	12,211,767	31,276
Nondurable goods	1,188	15,838,660	17,832
Manufacturers' sales			
Durable goods	250	10,590,569	6,070
Nondurable goods	150	11,882,164	7,348
Agents/brokers			
Durable goods	548	3,272,209	2,474
Nondurable goods	212	3,338,886	1,406

Source: US Census Bureau, 1997 Economic Census

The services sector of the metropolitan St. Louis economy provides $26 billion in sales activity and 448,000 jobs. The largest services sub sector is health care and social assistance ($9 billion sales; 150,000 employees) followed by professional, scientific, and technical services ($6.7 billion sales; 60,000 employees). The retail sector is a little smaller than the services sector in sales ($24 billion) but has only 32 percent of the number of employees (142,000).

The Milkin Institute, a California-based economic research corporation, conducted a study of the structure of high-tech economic activity. The study examined the impact of high technology on the growth of metropolitan areas. Their report ranked metropolitan St. Louis 34th of the top 50 high-tech metropolitan areas on a composite index equivalent to the percent of national high-tech real output multiplied by the high-tech real output location quotient. While this ranking classifies St. Louis as a Tech-Pole (metropolitan areas that attract high-tech), using a measure of high-tech real output growth for the period 1990-1998, St. Louis did not make the top fifty metropolitan areas. The only Missouri or Illinois metropolitan area to rank in the top fifty for growth was Springfield, Missouri (39th).

The Milkin study definition of high-tech ("industries that spend an above-average amount of revenue on research and development and that employ an above industry-average number of technology-using occupations") includes nine manufacturing and five service industries. County Business Pattern 1998 data for these 14 industries for the metropolitan St. Louis area are recorded in Tables 2.3 and 2.4.

There are 195 high-tech manufacturing firms in metropolitan St. Louis, using Milkin's definition.

Nearly half (45 percent) of the high-tech firm manufactures are either surgical, medical, & dental instruments and supplies or drugs. There also are concentrations in electronic components & accessories and laboratory apparatus and analytical, optical, measuring & controlling instruments. Not including Boeing workers, about 80 percent of metropolitan St. Louis high-tech manufacturing workers are employed in these four industries. There are 19,500 workers at the other 194 high-tech firms and 16,400 at Boeing.

There are 2,320 high-tech service firms in metropolitan St. Louis, using Milkin's definition. Over three quarters (77 percent) of these firms are either computer programming, data processing & other computer related services or engineering, architectural, & surveying services. There are 45,000 high-tech service industry employees in metropolitan St. Louis. Telephone communications services represent a disproportionately large percentage of the workers. Eleven percent of the high-tech service firms are telephone communications services, but they employ over one-third (33 percent) of all high-tech service workers.

Table 2.3
High Tech Manufacturing Industries

SIC CODES	283		357		366		367		372		376		381		382		384	
	workers	Firms	workers	firms	workers	firms	workers	Firms	workers	Firms	workers	firms	workers	firms	workers	firms	workers	firms
St. Louis	958	19	100-249	15	0-19	9	381	11	25,000-49,999	1	20-99	1	500-999	2	1,220	17	2,561	34
City	3,094	10	100-249	1	100-249	4	20-99	4	20-99	2	1,000-2,499	1	0-19	1	250-499	8	4,098	5
St. Charles	0-19	2	20-99	2	-	-	1,000-2,499	8	250-499	2	100-249	1	-	-	-	-	100-249	5
Franklin	20-99	1	-	-	-	-	100-249	2	0-19	1	-	-	-	-	-	-	0-19	1
Jefferson	-	-	-	-	-	-	-	-	100-249	2	-	-	-	-	0-19	2	100-249	5
Madison	0-19	3	-	-	-	-	20-99	3	100-249	2	-	-	-	-	0-19	1	-	-
Monroe	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
St. Clair	-	-	0-19	1	0-19	1	100-249	1	0-19	1	-	-	-	-	-	-	0-19	3

Source: County Business Patterns, 1998

Table 2.4
High-Tech Service Industries

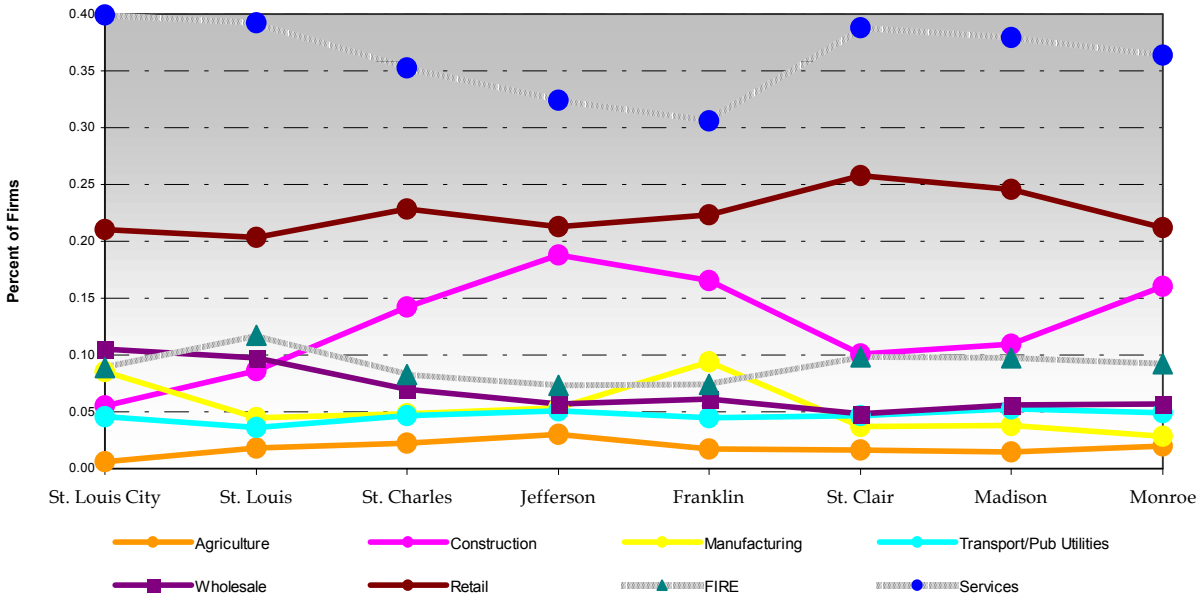
SIC CODES	481		737		781		871		873	
	workers	firms	workers	firms	workers	firms	workers	firms	workers	Firms
St. Louis	6,374	115	13,143	685	369	52	5,767	419	1,799	110
City	5,694	48	2,066	122	326	22	2,439	132	492	41
St. Charles	1,000-2,499	23	991	105	0-19	2	540	64	91	8
Franklin	147	10	0-19	12	0-19	1	131	14	20-99	2
Jefferson	100-249	14	97	29	0-19	1	114	19	0-19	2
Madison	228	28	147	47	0-19	1	239	37	141	10
Monroe	20-99	1	3	5	-	-	-	-	-	-
St. Clair	250-499	20	728	63	0-19	3	590	42	131	11

Source: County Business Patterns, 1998

2.1.2. *By Geography*

Within the metropolitan St. Louis economy, there is variation in the distribution of economic activities across the multi-county area. As shown in the Figure 2.1, some sectors have less than 5 percent variation (agriculture and transportation/public utilities) while others have as much as 10 percent (services) to 15 percent (construction).

Figure 2.1
County Industry Groups in Metropolitan St. Louis



Source: County Business Patterns, 1997

Specifically comparing the manufacturing and service sectors, manufacturing is the dominant economic activity by sales volume in all eight counties (see Table 2.5). In Franklin, Jefferson, and Madison Counties the largest portion of payroll also comes from manufacturing. Manufacturing is particularly important in Franklin County. Payroll for the manufacturing sector is almost three times the payroll for the service industry and by the measure of sales volume manufacturing is six times the activity level of services. In Madison County the manufacturing payroll is a little less than twice the services payroll, but by sales volume manufacturing is seven times the activity level of services.

Table 2.5
County-Level Comparison of Manufacturing and Services in Metropolitan St. Louis
(Data in $1,000)

	Manufacturing		Services	
	Sales/Shipments	Payroll	Sales/Shipments	Payroll
City of St. Louis	8,605,466	1,243,627	4,385,105	1,704,172
St. Louis County	25,347,905	3,359,780	10,974,121	4,097,664
St. Charles County	4,432,880	431,886	1,317,612	475,432
Jefferson County	1,199,342	168,185	424,097	145,355
Franklin County	1,836,298	284,438	308,737	99,480
St. Clair County	1,763,491	249,320	1,344,480	480,376
Madison County	7,676,517	743,827	1,120,654	393,430
Monroe County	N	N	57,956[1]	24,254[1]

Source: US Census Bureau, 1997 Economic Census

Note: For Monroe County manufacturing data was not available and the services data did not include educational services and accommodation and food services.

The Research and Planning Division of the Missouri Department of Economic Development prepared a report on manufacturing diversity in Missouri counties, comparing 1990 to 1999. Manufacturing diversity measures the distribution of various industries in a particular area – measured by the proportionate distribution of the labor force. The City of St. Louis has a fully diversified index. While St. Louis County was fully dependent and St. Charles County significantly dependent on aerospace at the start of the last decade, they both moved to significantly diversified in the last ten years. Franklin and Jefferson Counties were consistently significantly diversified.

The type of manufacturing activity varies across the counties. As shown in Table 2.6, the leading sub sector in the City of St. Louis is chemical, in St. Louis and St. Charles Counties it is transportation equipment, in Jefferson, St. Clair, and Madison Counties it is primary metals, and in Franklin County it is fabricated metal products.

Table 2.6
County-Level Comparison of Manufacturing Sub sector Activity

	Sub sector	Percent of Manufacturing
City of St. Louis	Chemical	34 %
St. Louis County	Transportation Equipment	70 %
St. Charles County	Transportation Equipment	D
Jefferson County	Primary metal	20%
Franklin County	Fabricated metal product	16%
St. Clair County	Primary metal	27%
Madison County	Primary metal	30%
Monroe County	N	

Source: US Census Bureau, 1997 Economic Census

Note: For Monroe County manufacturing data was not available.

The largest subregional economy in metropolitan St. Louis is St. Louis County: in manufacturing, it has 38 percent of all establishments and 46 percent of all employees; in wholesale it has 55 percent of all establishments and 58 percent of all employees; in retail it has 43 percent of all establishments and 51 percent of employers; in services it has 44 percent of all establishments and 40 percent of all employees; in professional and technical services it has 56 percent of all establishments and 59 percent of all employees.

The Milkin Institute study documents the concentration of high-tech industry in St. Louis County. The data in Tables 2.3 and 2.4 above show 56 percent of high-tech manufacturing firms and 59 percent of high-tech service firms in St. Louis County. For both manufacturing and service high-tech firms, 75 percent are located in the City of St. Louis – St. Louis County part of the metropolitan area. The only exceptions are aircraft & parts manufacturing, with 8 of the 11 firms in this industry outside of the City/County, and telephone communications services, with just less than 40 percent of the firms in this industry located outside of the City/County (although over 80 percent of the workers are inside the City/County).

2.1.3. *A Challenge Responding to Structure*

The economy of metropolitan St. Louis has sufficient high-tech output to be nationally ranked as a Tech-Pole and the services sector provides the largest percentage of jobs, but the largest portion of economic activity is manufacturing and wholesale sales. The metropolitan St. Louis economy is diversified but it grows slowly.

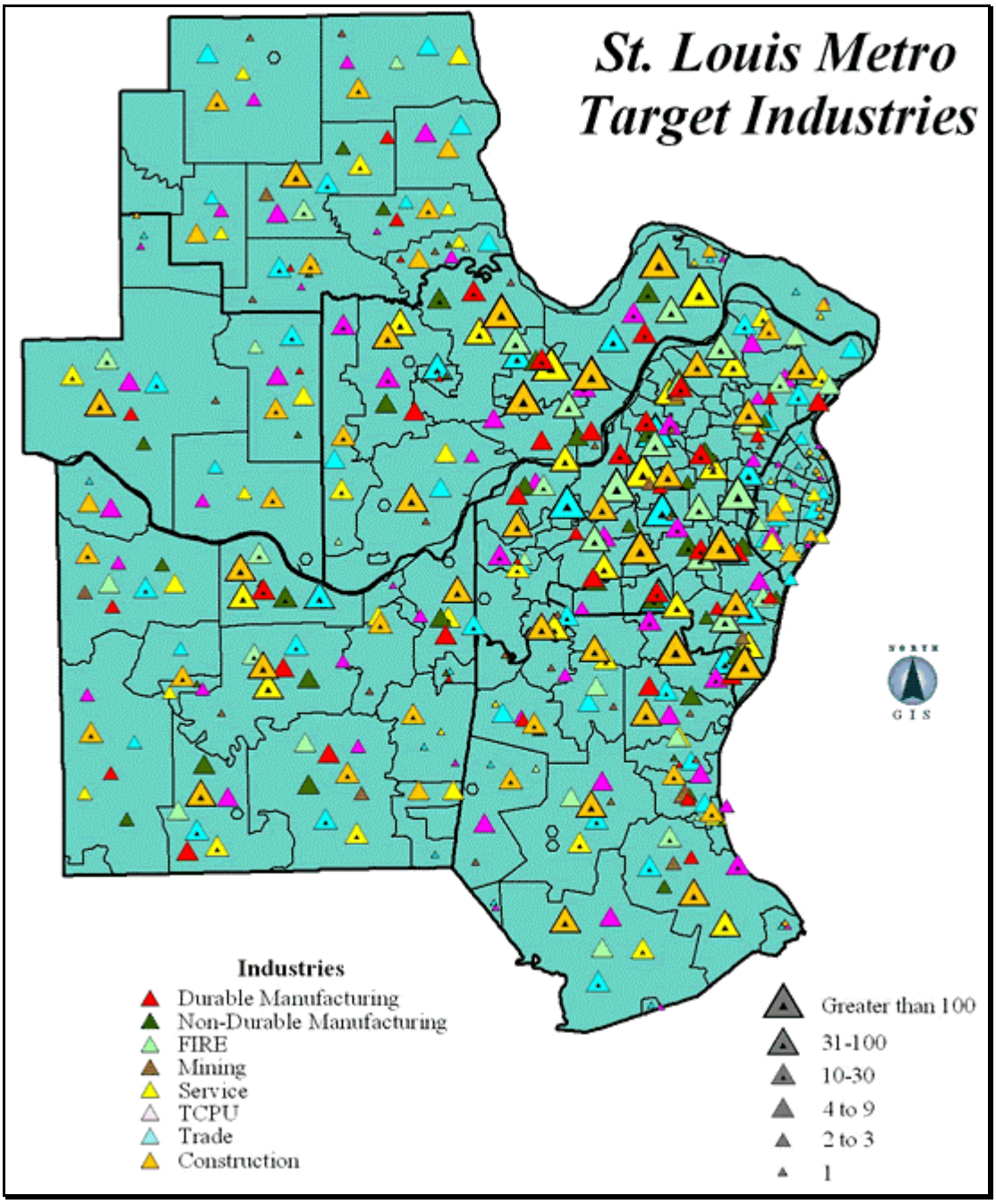
One of the challenges to developing a proactive approach to expanding the metropolitan St. Louis economy is economic geography.

The relative impact of the different economic sectors is important because they reflect different needs in and from the community. For example, while workforce is an important issue for all sectors, the greatest demand comes from the services sector. The manufacturing sector has been declining in relative importance, particularly measured by its employment base, but it is dominant as an economic activity in the inner core of the metropolitan St. Louis region (see Map 2.1). The same is true of wholesale sales. The volume and impact of these economic sectors would indicate a need to examine whether metropolitan transportation investments have properly supported manufacturing needs.

The East-West Gateway 20-year transportation plan *Transportation Redefined II* (TRII) includes a rather heavy investment in peripheral highway improvements in the collar counties. The planning process for TRII included a Transportation and Economy committee of volunteer community representatives. TRII made population and employment projections using a basic spatial analysis of computer run holding capacity algorithms followed by a manual small-area validation process. This may reflect projections for development in the residential construction sector of the economy (for only 17 percent of the population). The TRII report acknowledged the need to "develop stronger analysis tools to better describe and quantify the relationships between the transportation system, land use, and economic performance."

The infrastructure investment needs of the core economic activities of manufacturing and wholesale may require reallocation of some of the projected road funds.

Map 2.1



Source: Target II, Missouri Department of Economic Development

2.2. Large and Small Employers

The metropolitan St. Louis economy is influenced across all industrial sectors by the presence of large employers. The impact of operational decisions by large employers can pose challenges as well as provide benefits. For example, there are about 3,265 Union Pacific employees in the metropolitan St. Louis area. There are 500 jobs currently under consideration for transfer out of state in the customer service department. These employees earn an estimated $30,000 per employee annually. The multiplier effect of the loss of 500 Union Pacific jobs will mean an immediate loss of 806 jobs in the City of St. Louis, with increasing job losses in future years. This loss in employment will lead to the loss of $27 million in wages in the first year. The metropolitan St. Louis area can expect to lose 1,131 jobs due to the job movement. The resulting loss in wages will be $43 milion in the first year. Of the 160,000 jobs created in St. Louis during the 1990's, approximately 80 percent came from firms with fewer than 100 employees. Over half (51 percent) of all metropolitan St. Louis businesses employ one to four people; 84 percent employ less than 20 people. Opportunities to attract a large employer occur several times a year in St. Louis, but over time attracting large firms is not the significant source of growing the local economy. Large employers can just as quickly become a loss from the economy. And as the data in Tables 2.3 and 2.4 indicate, particularly for high-tech services firms, the industries are composed of many small firms. A business development strategy must have the capacity to reach a large number of individual business owners/entrepreneurs if it is going to be successful.

The majority of recent job growth is from smaller employers.

2.3. Nonemployers

While their impact is not typically examined, the nonemployer firms in the metropolitan St. Louis economy provide jobs for approximately the same number of people as the area's seven largest corporations. There are about 90,000 nonemployer firms. Nonemployers typically are self-employed individuals or partnerships operating businesses that they have not chosen to incorporate. (Self-employed owners of incorporated businesses typically pay themselves wages or salary, so that the business is an employer.)

Nonemployer firms can be a significant portion of the total employment in a particular economic sub sector. As shown in Table 2.7, there are five sub sectors where nonemployer

firms add substantially to the total employment in metropolitan St. Louis. For example, there are about 60,000 employees working for professional, scientific, and technical services firms, and another 21,000 in nonemployer firms. There are about half as many people working in nonemployer firms in the other services sub sector as there are for employer firms.

Table 2.7
Ten Largest Sub sectors of Nonemployer Firms
in Metropolitan St. Louis

ECONOMIC SUB SECTOR	EMPLOYEES	NON EMPLOYERS
Professional, scientific and technical services	59,511	20,966
Other services	33,822	15,441
Real estate and rental and leasing	17,872	13,324
Arts, entertainment, and recreation	25,132	5,798
Educational services	3,124	2,029

Source: US Census Bureau, 1997 Economic Census

2.4. Real Estate Climate

Geographic expansion has stimulated commercial and residential development throughout the multi-county metropolitan area. (The metropolitan St. Louis area is spread out over 6,400 square miles.) Over the past half century, the economic geography of metropolitan St. Louis has evolved into a polycentric structure. Interest by both investors and developers in Greenfield and floodplain development expanded office, retail, and warehouse projects into the outer reaches of the metropolitan St. Louis real estate market. Languorous growth in population has, however, kept commercial real estate markets in equilibrium during the economic boom of the 1990's. Residential construction is the only exception.

Since population growth in metropolitan St. Louis is attributed to the fact that births exceed population loss both through deaths and outmigration, residential real estate development from that perspective could be seen to be out of bal-

Comparing population change to building permits indicates a new single-family unit was built for every baby born during the last decade.

ance. There are two concentrations of office development, downtown and Clayton. Historic tax credits and Brownfield incentives encouraged office and hotel development downtown. Hotel development will support the ability to attract larger conventions to the downtown where the largest (but only one of several) convention facility in the area is located. Downtown office space recently has increased through renovation projects, whereas there has been new construction in Clayton. The downtown space has proven attractive to smaller new technology businesses needing to attract a younger employee base. New office development in St. Charles County is developing as a focus for decentralized technology functions of larger corporations such as MCI WorldCom Inc. and MasterCard International Inc. Build-to-suit projects have increased office space in the various sub markets. There is investor activity, but nationally metropolitan St. Louis is not seen as a strong market.

A notable development in industrial space is expansion into Illinois through projects including Gateway Commerce Center in Edwardsville and the Lewis & Clark Enviro-Tech Business Park in Wood River. In retail, three big-box power centers have been completed in recent years with new major chains entering the market or chains already in the market expanding.

Consolidations and evolving business practices in the health care sector have produced a unique real estate challenge. St. Louis leads the nation in hospital closings and lags behind in putting vacant hospital buildings to new uses.

Infrastructure investments currently being made, or planned over the next twenty years, will provide support to the continued combination of new development on the outer edges of the metropolitan St. Louis area and infill, redevelopment in the City of St. Louis, St. Louis County interior of region's the economic geography.

2.5 How To Grow?

Several recent studies have recommended actions for both the public and private sectors to expand the metropolitan St. Louis economy. These studies have examined the existing business structure, either generally or in specific sectors or sub sectors, and recommended an approach to capitalize on existing clusters of activity to grow more business. The direction charted by these studies varies significantly.

The Missouri Department of Economic Development prepared "Target Missouri: Creating a Foundation for the 21st Century Economy," a business development strategy for the State. The Target Missouri strategy has separate analyses for the metropolitan St. Louis re-

gion and for the City of St. Louis. The strategy included a second targeted industry report for metropolitan St. Louis (see Attachment A for report and methodology). Both reports target the more traditional sub sectors of the metropolitan St. Louis economy. The highest rated industrial sectors for targeting are:

Industry
Motor vehicles and equipment
Aerospace
Hydraulic cement
Primary nonferrous smelting and refining
Railroad
Communications
Water and sanitation
Wholesale trade
Refrigeration and service industry machinery
Medical equipment, instruments and supplies
Drugs
Soap, cleaners, and toilet goods
Miscellaneous plastics products

Source: Missouri Department of Economic Development

The purpose for developing the strategy is to guide the State in using incentives for economic development projects.

This is one of a number of recent studies of the St. Louis economy. The Initiative for a Competitive Inner City developed the St. Louis Inner City Competitive Assessment and Strategy Project with funding from the Danforth Foundation and other corporate sponsors. The project is pursuing an agenda to enhance workforce readiness and the City government's business outreach capacity. It also targets four traditional strengths of the local economy industrial sub sectors for development: metal manufacturing, transportation and logistics, construction services, and commercial services.

RCGA commissioned the Battelle Memorial Institute to prepare a strategy for plant and life sciences. The goal of the strategy Battelle prepared is "…to position St. Louis as the international center for plant sciences and a major international center in life sciences." The Battelle report identifies five strategies to establish an international reputation, build an entrepreneurial culture, tap intellectual capital resources, improve the business climate, and strengthen the workforce.

Development in new economy sectors have, however, a differential impact on other sectors. An economic sector analysis of health science biotechnology by the research and planning division of the Missouri Department of Economic Development reports that the most significant impact of expansion of the employment base in health science would be on the manufacturing sector. The Department projects that for each 100 jobs created in biotechnology, there immediately will be 150 additional manufacturing jobs and 132 service jobs. By 2010, the impact is 190 manufacturing jobs but only 90 service jobs.

2.5.1. *The Challenge of Business Development Studies*

Metropolitan St. Louis must have a master plan for business development that includes consideration of all geographies and industries.

There are multiple strategies pursuing development of different industries in metropolitan St. Louis. Promoting the continued growth and diversity of the economy is a good thing, but an uncoordinated plethora of plans can result in duplication of effort or even conflicting priorities for use of public incentives, workforce training programs, and infrastructure investments.

2.6. Strengths

St. Louis compares favorably to other metropolitan areas on cost of living. As shown in Table 2.8, not only is the price of housing lower in St. Louis than in competing metropolitan regions, but also groceries, transportation and utilities.

Table 2.8

Cost of Living Index in Six Metropolitan Regions

Location	All Items	Grocery	Housing	Utilities	Trans-portation	Health	Misc	Average Rent	Average Home
St. Louis	97.2	94.9	90.8	98.2	100.4	103.8	101.5	$ 666	$179,368
Baltimore	96.8	96.0	90.5	114.4	102.4	94.6	96.9	$ 574	$182,000
Cleveland	109.8	104.4	108.0	140.5	108.8	115.0	106.1	$ 834	$209,633
Minneapolis	108.0	103.0	108.0	102.0	114.0	132.0	105.0	$ 722	$202,880
Pittsburgh	107.7	101.2	115.1	128.6	102.7	89.6	103.8	$ 876	$228,525
San Diego	120.8	119.9	142.6	122.0	117.5	123.6	103.0	$ 1,149	$281,809

Source: ACCRA Cost of Living Index, Third Quarter 2000 (The national average cost for each index area is 100, and the indexes for each place are then calculated based upon their relation to that average.)

Of $74.5 billion in personal income over 21 percent ($15.8 billion) is from investment sources (dividends, interest, and rent), a level that compares to retirement communities in Arizona and Florida. Net earnings did, however, grow at a slightly faster rate than investment income in the 1990's, 22.5 percent compared to 19.6 percent. This level of investment capital should be a strong resource for business development in metropolitan St. Louis.

2.7. Weaknesses

Metropolitan St. Louis does not compare well on many fundamental growth measures. As Table 2.9 indicates, the relation between low population growth and an available workforce is an issue putting metropolitan St. Louis at a comparative disadvantage in attracting and retaining business, both 'old' and 'new' economy.

Table 2.9
Comparison Growth Indices
(Average Annual Growth, 1990-98)

	U.S.	Region[1]	Metro St. Louis
Population	1.0	.7	.4
Employment	2.0	2.1	1.2
Real personal income	2.7	2.6	2.1

Source: Economic Information Systems, 1999
[1]Region is defined as the states of Missouri, Illinois, Iowa, Indiana, Kansas, and Minnesota

The level of education in the St. Louis workforce is comparatively low.

For the population 25 years and over, in St. Louis 22.3 percent have a bachelor's or higher degree. For other metropolitan areas the same level of education is:

Denver – 40.4; Minneapolis – 36.6; Cincinnati – 30.5; and Indianapolis – 28.6.

2.8 Conclusion

As the metropolitan St. Louis has elements of the 'old' and the 'new' economy, it must be looked at in old and in new ways. There are great opportunities for development of high technology industries, but there also are great opportunities to not only maintain, but also expand, the manufacturing and wholesale trade base that are the economic strength of metropolitan St. Louis. There are business development plans that have looked at select business sector opportunities, but there is no metropolitan business development strategy. Metropolitan St. Louis covers an ever expanding geography but companies in almost every industrial sector benefit from locating in relative proximity to companies in the same, or supporting, sectors.

3.0. The Metropolitan St. Louis Economy Trends

In academic terms, the metropolitan St. Louis economy is a B student. POLICOM Corporation annually measures and ranks the "economic strength" of U.S. metropolitan areas for the purpose of studying the characteristics of strong and weak economies. They measure economic strength as a combination of both the rate of growth and the consistency of the growth (over a 25-year period). Simplistically, the formula is "growth - instability = strength" (See methodology section 3.8 for detail). POLICOM for the last six years has given St. Louis a "B" although it has improved from a B- to a B+.

2000	1999	1998	1997	1996	1995
B+	B	B	B-	B-	B-

The following section takes a more comprehensive look at how the metropolitan St. Louis economy has grown in recent years. Using U.S. Bureau of Census' County Business Patterns data, the structure of economic activity is compared at three dates: 1987, 1992, and 1997. (See Section 3.9 for a description of the methodology.) While there are various increases and decreases within SIC codes over the ten-year period, the total in absolute numbers has increased. In March 1987, the metropolitan St. Louis area employed approximately 993,000 individuals working for 57,000 companies. In March 1997, those numbers increased to 1,164,000 workers and 64,000 companies. This is an increase of 17.2 percent employed and an 11.3 percent increase in companies over the ten-year period.

3.1. Growth in Services

For the metropolitan St. Louis area, the industrial sector with the largest percentage of employees, as well as the largest number of establishments over the period are those in the service industry (SIC 70). The percentage of employees working in the service industry grew from 29.67 percent in 1987, to 34.09 percent in 1992, to 37.08 percent in 1997. The number of service establishments as a percentage of total establishments in the metro area increased from 34.65 percent in 1987 to 36.21 percent in 1992, and to 38.09 percent in 1997. There were several notable changes within the services industrial classification.

3.1.1. *Health Services*

Health Services has been the largest service industry over the ten-year period.

The Health Services industry (SIC 8000) in metropolitan St. Louis had the largest percentage of employees and establishments over the ten-year period. In 1987 there were 90,891 employees and 4,230 establishments, in 1992 there were 115,869 and 4,575, and in 1997 there were 130,869 and 4,843, respectively. This represents an increase of 43.8 percent in the number of employees and a 14.5 percent in the number of establishments over the period.

The total number of establishments did not increase at the same rate as the number of employees because of mergers of health service organizations over the last several years.

In fact, according to the February 2–8, 2001 St. Louis Business Journal listing of the 50 largest employers, BJC Health is the largest employer in metropolitan St. Louis with 19,033 employees.

As of March 1997, the health services field employed 11.22 percent of all workers in metropolitan St. Louis and included 7.59 percent of all establishments.

The counties with the largest percentage of employees in the health field in 1997 were St. Clair (10,881 of 73,753 employees) at 14.8 percent, Madison (10,782 of 81,652) at 13.2 percent, and Jefferson (4,234 of 34,841) at 12.2 percent. St. Louis County had the largest absolute number of employees and establishments, 57,501 and 2,599 respectively. Within the health services industry in every county, the largest percentages of employees were working in hospitals (SIC 8060), followed by nursing and personal care facilities (SIC 8050), and offices and clinics of medical doctors (SIC 8010).

3.1.2. *Business Services*

The next largest area of growth and total percentage of employment in metropolitan St. Louis, also in the services industry, is business services (SIC 7300). In 1987, there were 58,158 employees at 3,554 establishments. In 1992 there were 63,035 employees at 3,345 establishments, and in 1997 88,604 employees at 4,203 establishments. This is an increase of 52.3 percent in employees over the ten-year period, with an increase of 18.2 percent total businesses, although there was a 6 percent decline from 1987 to 1992. In 1987, 5.85 percent of metropolitan workers were employed in this industry. By March 1997 that percentage increased to 6.59 percent.

Employment in business services increased over 50 percent from 1987 to 1997.

Because of data withheld due to disclosure in several of the counties, total metropolitan percentages were not computed at the 3-digit level for business services. However, examining St. Louis City and County only shows that in business services, the 3-digit SIC codes indicated the largest percentage of employment in 1997 were services to buildings (SIC 7340), personnel supply services (SIC 7360) and computer and data processing services (SIC 7370). They all grew as percentages of total employment and establishments from 1987 to 1997 as well as within their fields.

The computer and data processing field in 1987 for St. Louis City and County combined consisted of 8,738 employees working in 342 establishments. By 1997 there was a growth to

15,209 employees working in 897 establishments. *This is an increase of 74 percent in the number of employees, but 162 percent in the number of establishments.*

There is a high and growing demand for telecommunications and information technology related jobs, but the supply is not growing at the same rate.

As stated by Greg Sullivan, founder of a local fast-growing software company, "St. Louis should be a good place to build a cluster of information-technology companies based upon its physical location as a hub for data traffic. However, most out-of-town recruits are more likely to choose to work in the Nashville or San Antonio offices." According to a Post-Dispatch article dated 7/12/2000, "High-tech employers' complaints about a lack of workers are among the loudest. Ed Whitacre, chief executive of SBC said that the company has about 500 technical jobs going begging in Missouri." There appears to be more growth opportunity for technology companies, but the supply of employees is restricting the actual rate of growth.

The labor shortage has contributed to the increase in Personnel Supply Services (SIC 7360). Not only does this SIC include employment agencies, but also temporary services. Personnel Supply Services in 1987 for St. Louis City and County combined consisted of 10,270 employees working in 229 establishments. By 1997 there was a growth to 22,776 employees working in 388 establishments. *This is an increase of 122 percent in the number of employees and 69 percent in the number of establishments.* This is also an increase from 19.7 percent of total percentage of business service employees employed in this SIC code to 30.2 percent of total percentage of business service employees from 1987 to 1997. This growth is likely due to the increase in the number of temporary workers that many companies are forced to turn to because they cannot find qualified workers on their own.

The third area in business services that has a large percentage of employees and establishments is Services to Buildings (SIC 7340). For the City of St. Louis this is the largest sub code for employees (third in number of establishments). The concentration of large office buildings in downtown accounts for the demand for this service category. These services include those affiliated with building maintenance. For the City of St. Louis, the number of employees in 1987 was 3,917, which was 25 percent of all business service employees. By 1997 the number of employees in this area increased to 6,787 (an increase of 73 percent), which was 32 percent of all business service employees.

3.1.3. *Engineering and Management Services*

Engineering and management services (SIC 8700) is the final service industry that showed significant change. In 1987, these businesses were listed in the miscellaneous services SIC (8910 and 8930). There were 1,208 companies employing 13,551 individuals. In 1992 there were 2,243 such businesses employing 25,145 workers and in 1997 there were 2,719 with 27,612 employees. There is an increase of 104 percent in employers and 125 percent in the number of firms. Over 60 percent of these businesses were located in St. Louis County in 1997 (1,648). Broken down even further, in 1997 in St. Louis County, approximately 25 percent of this SIC consisted of engineering and architectural services, 29 percent accounting, auditing and bookkeeping, seven percent research and testing services and 39 percent management and public relations firms.

In 1996, a leading national high-technology publication, Technology Transfer Business ranked metropolitan St. Louis among the top ten metro areas in the nation in the fields of aerospace engineering, chemistry, chemical engineering, and biological/life sciences. According to this article, there were more than 1,200 high-tech companies employing 150,000 people in the St. Louis region, including professionals in the fields of engineering, computer science, and health. Although seven percent for research and testing may seem an inconsequential number of businesses, in 1987 there were no businesses in the region listed in this category. This may be an industry to watch in the future. According to a September, 1999 article in the St. Louis Post-Dispatch, "St. Louis has several building blocks for a life-sciences cluster. The Danforth Plant Science Center will bring in 200 scientists when it opens in 2001, adding to a biotechnology base in place at Monsanto and medical schools at Washington University and St. Louis University."

Research and testing may be an industry to watch in the future.

3.2. Retail Trade

Second to service industries in the percentage of employees as well as number of establishments is Retail Trade. In 1997, 19.39 percent of employees in the metropolitan St. Louis worked in retail occupations and 21.67 percent of establishments were retail. *This level has stayed fairly consistent over the ten-year period as far as number of employees, but has decreased in total percentage of establishments from 23.73 percent in 1987.* The only retail establishment subcategory that showed an increase is Eating and Drinking Places (SIC 5800). This is a function of lifestyle changes and the economy. People have less time to cook and more money to spend

since many families have two incomes. As a result they are eating out more because they can afford to and because it saves time. As in several other industries, the overall decline in the number of retail establishments coupled with the consistent number of employees, most likely is the result of the trend in the nineties of merging organizations.

3.3. *F.I.R.E.*

A total of 6.98 percent of metropolitan St. Louis employees work in the area of Finance, Insurance and Real Estate. This sector includes 10.19 percent of business establishments. *In this particular industry the total number of establishments has shown a sharp increase from 1992 to 1997 after experiencing a decline from 1987 to 1992.* In 1987 there were 74,198 employees in 5,013 establishments. This decreased in 1992 to 60,118 employees (18.9 percent decrease) and 4,861 establishments (3 percent decrease). However, by 1997 these numbers increased to 81,237 employees and 6,498 establishments, an increase of 35 percent and 33.6 percent percentage respectively since 1992. The two SIC codes that caused this pattern were in the Insurance Agents, Brokers and Service (SIC 6400) and Real Estate (SIC 6500).

The trend in the insurance agent numbers can be attributed to the change in the way the insurance industry has operated nationally over the last ten to fifteen years. According to Paige Proctor, a financial and planning consultant for the insurance industry, increased competition within the insurance industry had led to consolidation among independent agencies. After years of consolidation among independent insurance agencies, the number of independent agents has leveled off. The number was at a high of 53,000 nationally in 1987. It declined to 46,500 in 1992. This would explain the decrease shown in the St. Louis area from 1987 to 1992. The industry now consists of insurance agents who no longer represent one company, but independent agents who compare several insurance companies and find their clients the best overall coverage package.

Due to the many merger and acquisitions of other industries, which causes them to want more insurance coverage for unforeseen circumstances as well as the overall trend to offering insurance that was not available to high-risk individuals, more policies have been underwritten in recent years. Joseph Lehrer, an attorney with Greensfelder, Hemker & Gale who specializes in mergers and acquisitions states, "Insurance companies are more flexible in what they'll write. Insurance can be a tool that assists mergers and acquisitions with issues such as potential environmental liability. A company can buy a policy to cap any losses that might occur as a result of mandated environmental cleanups. Insurance also is often used in

securities transactions as protection against litigation and patent insurance against lawsuits also is used frequently."

Real estate is the largest industry in the Finance, Insurance, and Real Estate SIC code. The real estate industry also showed a recovery from a decline in establishments from 1987 to 1992 to an increase from 1992 to 1997. This trend is probably the result of the several years it took for the real estate bust of the late 1980s to level out. By the middle of the nineties, with the economy picking up, several sectors in the real estate industry began rebounding, including retail real estate and new construction.

The real estate industry in metropolitan St. Louis, especially commercial real estate, is a growing and changing industry.

The core of St. Louis commercial real estate firms has changed dramatically over the last several years as they've shifted their emphasis from just brokering real estate deals and managing multi-tenant office buildings to carrying out complex real estate responsibilities for corporations as many corporations have started to reduce and eliminate their in-house departments. Mark Burkhart, president of Colliers Turley Martin Tucker, one of St. Louis' largest commercial real estate companies stated in 1997, "Sixty percent of our revenue comes from services we weren't performing five years ago." These include such services as establishing branch offices for large companies, handling legal environmental issues, interior design, and many other aspects of corporate services that used to be performed in-house.

3.4. *Construction*

The construction industry stayed relatively constant between 1987 and 1997. In 1987, construction businesses accounted for 9.43 percent of businesses in the metro area and by 1997 the percentage was 9.88. This translates into an increase from 5,403 establishments to 5,977 establishments (a 10.6 percent increase). Although the number of employees increased from 60,386 to 63,449 (a 5 percent increase), the growth in construction employment was outpaced by growth in total employment in the metropolitan St. Louis area (or total construction establishments), which is why the total percentage number from 1987 to 1997 showed a decrease (from 6.08 percent to 5.45 percent). The construction industry has remained strong due to the strong housing markets in the outlying counties of

The major concern with the construction industry is the age of the workers.

metropolitan St. Louis, major highway projects, MetroLink and the Lambert Field expansion. All of these construction activities will be continuing into the immediate future. The major concern with the construction industry is the age of the workers. The average construction worker in the St. Louis area is 52 years old, and many in this industry take early retirement. It is also not as prevalent as it has been in the past for fathers to pass construction jobs down to their sons. As a result, according to Dave Rosenberg, director of the St. Louis Works Partnership, *it is estimated that the construction industry faces a shortage of 8,000 to 10,000 workers in the next seven or eight years.* As mentioned, this trend is already having an effect, as the number of construction employees cannot keep pace with the number of establishments over the ten year period studied.

3.5. Wholesale

Wholesale Trade accounts for 8.43 percent of all establishments in metropolitan St. Louis and 6.58 percent of all employees. This industrial category has declined in percentage over the ten-year period, although the total number of businesses and employees has increased (from 67,645 and 4,963 to 76,598 and 5,380 respectively).

The City of St. Louis has the largest percentage of wholesale trade firms as a percentage of total businesses, 10.5 percent, followed by St. Louis County at 9.7 percent. For both the City and County the largest group within this code is Professional and Commercial Equipment (SIC 5040). This category includes photographic equipment, office equipment, computer equipment, and medical equipment. In 1987 this same SIC code was identified as Sporting Goods, toys and hobby goods, and Professional and Commercial Equipment was SIC 5086, part of Machinery, Equipment and Supplies. By 1992 Sporting Goods had moved to the Miscellaneous Category and Professional and Commercial Equipment had this 3-digit code. During this time frame the number of establishments increased from 164 to 461 (a 181 percent increase) and the number of employees increased from 2,477 to 8,117 (a 227 percent increase) for St. Louis City and County combined. Professional and Commercial Equipment establishments as a percentage of total wholesale establishments increased from 4.2 percent to 11.5 percent during this time frame.

3.6. *Manufacturing*

The total number of manufacturers increased from 1987 to 1997.

The manufacturing industry has shown the highest relative decrease in percentage of regional employees over the ten-year period. However, it is still in absolute terms the third largest in percentage of individuals employed in the industry (17.15 percent). The total number of businesses actually increased from 3,154 to 3,341 (although as a percentage of total establishments it decreased from 5.51 percent in 1987 to 5.24 percent in 1997). In part, the growth in the number of manufacturers is the result of individuals laid off from larger manufacturing companies, especially the former McDonnell Douglas (Boeing) and starting their own smaller businesses. From 1987 to 1997 the number of individuals employed in manufacturing decreased from 203,692 to 199,668. Although it is only a 2 percent decrease it is a decrease in percentage of total employed in the region from 20.5 percent to 17.1 percent. As stated, many of these were employed by McDonnell Douglas, which had 40,000 employees at the start of the decade and as of February 2001, employed only 16,400. In 1999, it was estimated that only 15 percent of the workers in the metropolitan St. Louis region are employed in manufacturing.

Boeing and automobile manufacturers (Chrysler, Ford and General Motors) and many of their suppliers are all included in the 3700 SIC Code for Transportation Equipment. In 1987 and 1992 County Business Patterns did not disclose how many employees they had at their various locations so an overall trend cannot be established. However, numbers are available for 1997. During this year 45,121 workers were employed in this SIC Code which accounts for 22.6 percent of all those employed in the manufacturing industry, with 37,027 of these workers employed in St. Louis County (where Boeing and 2 automobile plants are located).

The manufacturing industries that increased in number of establishments from 1987 to 1997 are: apparel and other textile products; lumber and wood products; furniture and fixtures; printing and publishing; petroleum and coal products; rubber and miscellaneous plastics products (an increase of 36 percent in the number of firms); transportation equipment; and miscellaneous manufacturing industries. As explained by Russell Roberts, director of the management center at the John M. Olin School of Business at Washington University, "In today's world, we keep only the manufacturing jobs that pay well and are interesting, the rest competition forces overseas." According to Russ Signorino, a workforce development

consultant with the United Way of Greater St. Louis, "*manufacturing continues to play an important role in the St. Louis economy, but manufacturers are able to produce more with fewer people.*"

3.7. *Transportation and Public Utilities*

The Transportation and Public Utilities industries (SIC 4000) are grouped together. Overall there was a decrease in percentage of individuals employed and an increase in percentage of establishments over the ten-year period, from 7.28 percent to 6.71 percent and from 4.02 percent to 4.22 percent respectively. The total number of employees did increase from 72,296 to 78,152 (8.1 percent) and the total number of establishments from 2,303 to 2,694 (17 percent).

The largest percentage of employees and businesses was in the trucking and warehousing field (SIC 4200).

The number of employees increased from 20,859 in 1987 to 23,615 in 1997 which was a 13.2 percent increase and in 1997 this SIC represented 30.2 percent of all those employed in the Transportation and Public Utilities industry. In Madison and Monroe counties, trucking and warehousing account for 50 percent and 40 percent of employees and 50 percent and 69 percent of number of establishments respectively in this industry.

In St. Louis County in 1997 the Transportation by Air category employed 9,789 individuals, over 25 percent of the total industry. Some employers did not disclose this number in 1987 but in 1992 there were 8,098 employees in this classification (also 25 percent of the industry). St. Louis County dominates this SIC code as the location of the regional passenger airport.

The Communication SIC Code 4800 is broken down further into telephone communication; telegraph communication, radio and television broadcasting, and cable services. This category is probably one of the most outdated using 1997 data as a stopping point. So much has happened in this industry in the last 5 years that it has become one of the fasted growing in metropolitan St. Louis. In 1987 cable services was not listed as a category and even in 1997 there is no specific listing for companies developing fiber optic networks. Also, in 1987 only St. Louis County and St. Clair County disclosed the number of telephone communication employees. Therefore, using St. Louis County data only, it is obvious that SIC 4810 (telephone communication) is fast growing. In 1987 there were 72 telephone communication establishments employing 3,660 and by 1997 there were 115 employing 6,374, a 60 percent growth in businesses with a 74 percent growth in employees.

The growth in this area and the whole communications industry was initiated by the deregulation of telecommunication services. Several developments in the region led to the recent emergence of this industry locally. Southwestern Bell invested considerable capital in developing a fiber-optic network and other advanced technologies. When it moved its headquarters to San Antonio, several key people stayed behind to seek other opportunities, starting their own companies. Also, the late Robert Brooks became one of the telecom industry's most successful entrepreneurs, setting up and selling four large cable and fiber optics companies in the past several years. Locally based Charter Communications is now one of the largest cable television companies in the nation. In just one year, Charter's total employment in the St. Louis area grew from 775 workers in March 1999 to 1,134 in March 2000.

3.8. Conclusion

As suggested previously in this report, metropolitan St. Louis, as is typical of the rest of the country, has moved from a manufacturing employment base to preponderance in service. This requires individuals with more skilled labor than in the past, which in many industries is becoming difficult to find, specifically the high tech business service areas. The construction industry is also experiencing a problem in finding skilled workers. Most individuals that follow the business environment in the region and country seem to agree as to the direction the area economy is headed. For example, Tom White, regional director of the Mid-America Manufacturing Technology Center, states, "We are predominantly a service economy today. The future will be heavily dependent on information technology, telecommunications and biotechnology, where St. Louis is strong." The information and telecommunications growth is due in part to St. Louis' central location. As in rail traffic in the past, data moving over the Internet goes over landlines, and St. Louis is in a great physical location as a hub for data traffic.

At the same time, it is vital to understand the role of manufacturing and other sectors such as wholesale trade to understand the business climate in metropolitan St. Louis.

3.9. Methodology

3.9.1. *POLICOM Grading Criteria*

The US Department of Commerce, Bureau of Economic Analysis maintains the database used for the analysis. It is considered "source" data. The last year for which source data is available is 1998, which was released June 17, 2000. POLICOM's formulas reward the areas that have had the fastest, most consistent growth over an extended period of time. Communities that have a history of "boom and bust" are typically ranked lower than area that had a slower, but much more consistence growth pattern.

The eighteen categories include the following:

Per Capita Personal Income
Earnings - All Workers
Employment - All Workers
Annual Earnings Per Worker
Wage & Salaried Workers - Earnings
Wage & Salaried Workers - Employment
Wage & Salaried Workers - Annual Earnings Per
Nonfarm Proprietors - Earnings
Nonfarm Proprietors - Number of
Nonfarm Proprietors - Annual earnings per
Retail Trade - Earnings
Retail Trade - Employment
Retail Trade - Annual Earnings Per Worker
Construction - Earnings
Construction - Employment
Construction - Annual Earnings Per
Medical Transfers to the Poor (Medicaid)
Income Maintenance (welfare)

These categories are chosen as they reflect how the economy is behaving, not what is causing it to behave in a particular manner. Additionally, related categories were used to create redundancy to compensate for anomalous data.

The average deviation from previous year (DEV) and the average annual increase (AAI) were calculated for each category for each time period. The DEV was subtracted from the

AAI to create a strength factor for each category. Each category was adjusted to give each equal weight. The data for both the 15-year and 10-year terms were totaled for each of the categories.

The total for the 10-year term was doubled (giving the last ten years twice the emphasis of the previous fifteen years) and added to the total for the 15-year term. From the totals, the metropolitan areas were given an "Economic Strength Ranking." The rankings area based upon a 25-year data history. The following are the data periods for the years in which the rankings have been provided:

2000 = 1998 - 1974
(based upon data released June 17, 2000 by the Bureau of Economic Analysis)

1999 = 1997 - 1973

1998 = 1996 - 1972

1997 = 1995 - 1971

1996 = 1994 - 1970

1995 = 1993 – 1969

3.9.2. *County Business Pattern Data*

In order to determine the trend of the St. Louis area business economy, past data needed to be gathered indicating statistics such as number of businesses and employees for the various industries. Data is available from two sources. The Economic Census is published every 5 years, most recently in 1997. County Business Patterns (CBP) offers similar data, but is published annually. While both sources contain similar information, there was a significant difference as a source for historical comparison. The Economic Census switched from the SIC (U.S. Standard Industrial Classification) to NAICS (North American Industry Classification System) method in 1997 and County Business Patterns in 1998. The Census Bureau offered a note of caution that stated:

> "While many of the individual SIC industries correspond directly to industries as defined under the NAICS system, most of the higher level groupings do not. Particular care should be taken in comparing data for retail trade, wholesale trade, and manufacturing. . . . Where changes are significant, it will not be able to construct time series that include data for points before 1997."

Taking this into consideration, the decision was made to use County Business Patterns for comparison purposes since the 1997 data was in the same format as prior years. The

Economic Census would not be able to offer an accurate correlation to past data. The years 1997, 1992 and 1987 were chosen as measurement years since 1997 was the last available SIC year and so that a comparison could be made to the Economic Census if necessary.

The sources of the CBP data are: the Business Register; the Census Bureau's file of all known single and multi-establishment companies; the Annual Company Organization Survey; the Economic Census; the Annual Survey of Manufactures; Current Business Surveys; as well as from administrative records of the Internal Revenue Service, the Social Security Administration, and the Bureau of Labor Statistics. Data are excluded for self-employed persons, employees of private households, railroad employees, agricultural production workers, and government employees (except those working in wholesale liquor establishments, retail liquor stores, Federally-chartered savings institutions, Federally-chartered credit unions, and hospitals.)

Although the CBP data includes number of employees as well as total number of establishments, in many of the 3-digit SICs ranges were used to indicate number of employees rather than absolute numbers. This is done by CBP to prevent disclosure of an individual employer. However, at the 2-digit level, total number of employees is available. There were several SIC codes in which only 1 county indicated ranges rather than absolute numbers. Typically these were small range categories (A, B, or C). In any case where it was felt that the totals for these SIC codes were relevant in the analysis, the range was replaced with an average number in order to tabulate the total for more accurate comparison purposes.

County Business Pattern data was studied at the 3-digit SIC level for the 3 mentioned years. From this data, those codes that were determined to include a high percentage of businesses were broken out into the 4 and in some cases 5-digit level for 1997. Data was collected from the seven counties used to represent the St. Louis Metropolitan area: St. Louis City, St. Louis County, St. Charles County, Jefferson County, and Franklin County of Missouri, and St. Clair County, Madison County and Monroe County of Illinois. A summary of the total area was then compiled.

4.0. Comparable Metropolitan Areas

All 318 metropolitan areas in the United States were compared to assess similarity with the metropolitan St. Louis area. The criteria for similarity covered measures of income, industrial mix, and population distribution. The 82 metropolitan areas in the Plains and Great Lakes (Midwest) regions were compared to determine the regional metropolitan areas most similar to metropolitan St. Louis. Finally, individual judgment was used to determine the list of the most similar places across all measures.

The top five places most similar to the metropolitan St. Louis area (Table 4.1), comparing income, industrial mix, and population distribution are: Baltimore, MD; Newark, NJ; Oakland, CA; Pittsburgh, PA; and, Cleveland, OH. Across all of the sets of variables used to measure similarity, the metropolitan areas in the Midwest region that are most similar (Table 4.2): Minneapolis-St. Paul MN-WI; Cleveland-Lorain-Elyria OH; Grand Rapids-Muskegon-Holland MI; Cincinnati-OH; Kansas City MO-KS; Indianapolis, IN; Columbus, OH; and Milwaukee-Waukesha, WI.

Table 4.1

U.S. Metropolitan Areas Most Similar to St. Louis

Baltimore MD PMSA

Newark NJ PMSA

Oakland CA PMSA

Pittsburgh PA PMSA

Cleveland-Lorain-Elyria OH PMSA

Table 4.2

Midwest Metropolitan Areas Most Similar to St. Louis
Cleveland-Lorain-Elyria OH PMSA
Minneapolis-St. Paul MN-WI MSA
Grand Rapids-Muskegon-Holland MI MSA
Kansas City MO-KS MSA
Columbus OH MSA
Cincinnati OH-KY-IN PMSA
Indianapolis IN MSA
Milwaukee-Waukesha WI PMSA

4.1. *Criteria for Establishing Similarity*

The criteria for establishing similarity with the metropolitan St. Louis area include similarity across sets variables measuring income, industrial mix, population distribution, unemployment, and median home price. The specific variables were chosen based upon the stated purpose of the research conducted: to study the business climate of the St. Louis area. According to Isserman (1994) "no widely held precise theory leads to a specific list of variables and a specific functional form . . . industrial mix, export base, market area and size, spatial context, and the wage level are among the factors most commonly accepted as underlying regional growth." To measure the business climate, it is important to also include characteristics of the population distribution and of unemployment.

Some individual variables were used in more than one set. Analysis was conducted across thirty variables in the three sets of criteria. The sets of variables are detailed in Table 4.3.

Table 4.3

Variables Used as Criteria For Similarity Across Metropolitan Areas

Income of Metropolitan Area

Average Annual Earnings

Income

Per Capita Income

Percent of Income from Dividends, Interest, and Rent

Percent of Income from Transfers

Industrial Mix of Metropolitan Area

Agriculture (income %)
Construction (income %]
Finance, Insurance, and Real Estate [income %]
Government (income %]
Manufacturing— total [income %]
Manufacturing— durable goods [income %]
Manufacturing— nondurable goods [income %]
Military [income %]
Mining [income %]
Retail Trade [income %]
Services [income %]
Transportation and Utilities [income %]
Wholesale Trade [income %]

Population of Metropolitan Area

Population
Percent over 64
Percent 45 to 64
Percent 20 to 45
Percent 15 to 19
Percent under 15
Percent Change in Population (last 10 years)
Percent Change in Population Aged 20 to 45 [last 10 years]
Population Density
Net Migration [last 10 years]

Other

Unemployment Rate
Percent Change in the Median Home Price [last year]
Region (New England, Mid-Atlantic, Great Lakes, Plains, Southeast, Southwest, Rocky Mountain, Pacific)

4.2. Results and Analysis

Analysis was performed across all variables together and across subsets of the variables in order to compare metropolitan St. Louis to other metropolitan areas in the United States and in the Midwest region. A procedure that hierarchically "clusters" observations (the metropolitan areas) was used to determine groups of metropolitan areas based on similarity according to the criteria defined.

The fact that the algorithm *hierarchically* clusters metropolitan areas suggests that metropolitan areas can be grouped *at different levels of similarity*. For instance, metropolitan St. Louis begins in a cluster all by itself and then it is grouped with the one most similar metropolitan area (or a cluster of metropolitan areas) that is most similar to it. The cluster that includes metropolitan St. Louis is then joined with other clusters, for increasingly broad groupings of metropolitan areas, until the "cluster" includes all 318 metropolitan areas. Thus, the cluster levels will NOT be of uniform size in the results.

Analysis was performed across all variables, and across two subsets of the variables: (1) population distribution and unemployment; and (2) income, industrial mix and unemployment.

4.2.1. <u>All Variables</u>

Table 4.4 summarizes four levels of clusters across all variables and all metropolitan areas. Begin at the bottom of the table for those closest in similarity according to the algorithm. Metropolitan St. Louis begins in a cluster by itself in Level 1. Level 2 is then added and this includes St. Louis and the two most similar areas across all variables — Baltimore and Newark. Level 3 is next, with seven metropolitan areas, and it includes Levels 1 and 2 (St. Louis, Baltimore, Newark) as well as Oakland, Phoenix, San Diego, and San Francisco. Level 4 is comprised of fourteen metropolitan areas, including the previous three levels (St. Louis, Baltimore, Newark, Oakland, Phoenix, San Diego, and San Francisco) and Cleveland, Pittsburgh, Tampa, New Haven, San Jose, and Riverside.

Notice in Table 4.4 that the high incidence of California metropolitan areas appears a bit peculiar, and this is where informed judgment becomes important in the final groups identified above. As will become clearer, metropolitan St. Louis does appear to be similar to the Oakland area based on the variables analyzed. The nature of cluster analysis is to "bring along" areas that were already clustered with Oakland— San Diego, and San Francisco— into Level 3. Then as the algorithm is applied in subsequent levels, it brings in areas that are

similar to these California areas now clustered with St. Louis. Thus, the results that follow, and good sense, suggest that while Pittsburgh and Cleveland are quite similar to St. Louis, San Diego and San Jose are not.

Table 4.4

Cluster Analysis Results for All Variables Across U.S.

Level 4 (14 Metros) **Tampa-St Petersburg-Clearwater FL MSA** **New Haven CT NECMA** **San Jose CA PMSA** **Riverside-San Bernardino CA PMSA** **Cleveland-Lorain-Elyria OH PMSA** **Pittsburgh PA PMSA** **Denver CO PMSA**
Level 3 (7 Metros) **Oakland CA PMSA** **Phoenix-Mesa AZ MSA** **San Diego CA MSA** **San Francisco CA PMSA**
Level 2 (3 Metros) **Baltimore MD PMSA** **Newark NJ PMSA**
Level 1 (1 Metro) **Saint Louis MO-IL MSA**

4.2.2. *Income and Industrial Distribution Variables*

Table 4.5 identifies the results of analysis over the income and industrial mix variables listed above (the analysis also includes the measure of unemployment). Metropolitan St. Louis begins in a cluster by itself at Level 1. Again, Level 2 adds Baltimore and Newark to St. Louis, forming a cluster with three metropolitan areas. Level 3 adds Oakland, Phoenix, San Diego, and San Francisco to Level 2, forming a cluster with seven metropolitan areas.

Table 4.5

Cluster Analysis Results for Income and Industrial Mix Variables Across the U.S.

Level 3 (7 metros) Oakland CA PMSA Phoenix-Mesa AZ MSA San Diego CA MSA San Francisco CA PMSA
Level 2 (3 metros) Baltimore MD PMSA Newark NJ PMSA
Level 1 (1 metro) Saint Louis MO-IL MSA

4.2.3. *Population Variables*

Table 4.6 displays the results of analysis of just the population distribution variables described above, again including unemployment. Metropolitan St. Louis begins in its own cluster at Level 1. At Level 2, St. Louis and Baltimore are grouped together. Level 3 adds Miami, Pittsburgh, Seattle, Oakland, Cleveland, and Tampa to Level 2. In this case, Oakland is clustered with St. Louis, but is not clustered with the other California areas. This helps to sort out the seemingly anomalous results in the previous two analyses. Oakland is similar to St. Louis in population and in income and industry mix. When Oakland is already clustered with the California areas (San Francisco, San Diego, etc.), these are "brought along" with Oakland into a cluster with St. Louis. The appearance of Miami and Tampa Bay are probably due their similarity with St. Louis in terms of relatively high percentages of their populations in the upper end of the age distribution.

Table 4.6

Cluster Analysis Results for Income and Industrial Mix Variables Across the U.S.

Level 3 (8 Metros) Pittsburgh PA PMSA Cleveland-Lorain-Elyria OH PMSA Oakland CA PMSA Miami FL PMSA Tampa-St Petersburg-Clearwater FL MSA Seattle-Bellevue-Everett WA PMSA
Level 2 (2 Metros) Baltimore MD PMSA
Level 1 (1 Metro) Saint Louis MO-IL MSA

4.3. Summary of Analysis Across All U.S. Metropolitan Areas

Given the difference in results across the different subsets of variables, informed judgment is required for a final list of U.S. metropolitan areas that are similar to metropolitan St. Louis. In each of the three analyses, Baltimore is included in the first cluster of other metropolitan areas with St. Louis, and so is considered the most similar metropolitan area. Newark ranks in Level 2 in two of the three analyses. Cleveland appears in the final rankings in two of the three analyses, and ranks extremely highly in similarity in the regional analysis described below. Oakland is considered similar at some level in each analysis. Pittsburgh makes the final rankings in two of the three analyses.

Some other areas are included in two of the three analyses: Phoenix, San Diego, San Francisco, and Tampa. However, as discussed above, these are not conventionally considered similar to the St. Louis area and are likely showing up because they share some similarities with other metropolitan areas that are "more similar" to St. Louis.

Therefore, the five areas most similar to St. Louis are considered to be: Baltimore, Newark, Cleveland, Pittsburgh, and Oakland.

4.4. Results of Analysis on All 82 Plains and Great Lakes Metropolitan Areas

Table 4.7 displays the other areas in the region (the combined Plains and Great Lakes regions) that are most similar when all variables are included in the analysis. St. Louis alone makes up Level 1. Then, Cleveland and St. Louis make up Level 2. Level 3 adds Minneapolis-St. Paul to Level 2. Level 4 has nine metropolitan areas, including all the areas in Level 3 plus Grand Rapids, Kansas City, Columbus, Cincinnati, Indianapolis and Milwaukee.

As illustrated in Table 4.8 and Table 4.9, these results are extremely consistent when analysis is broken down into the subcategories of Income and Industrial Mix Variables, and Population Variables. While the metropolitan areas in Levels 2 and 3 "change places" across the analyses, all analyses result in the same nine metropolitan areas in Level 4: St. Louis, Cleveland, Minneapolis-St. Paul, Grand Rapids, Kansas City, Columbus, Cincinnati, Indianapolis, and Milwaukee. Thus, as stated at the beginning of this section of the report, all eight areas that join St. Louis in Level 4 are included in the final "most similar" list.

Table 4.7

Cluster Analysis Results for All Variables Across the Region

Level 4 (9 metros) Kansas City MO-KS MSA Columbus OH MSA Cincinnati OH-KY-IN PMSA Indianapolis IN MSA Milwaukee-Waukesha WI PMSA Grand Rapids-Muskegon-Holland MI MSA
Level 3 (3 metros) Minneapolis-St. Paul MN-WI MSA
Level 2 (2 metros) Cleveland-Lorain-Elyria OH PMSA
Level 1 (1 metro) Saint Louis MO-IL MSA

Table 4.8

Cluster Analysis Results for Income and Industrial Mix Variables Across the Region

Level 4 (9 metros) Kansas City MO-KS MSA Columbus OH MSA Cincinnati OH-KY-IN PMSA Indianapolis IN MSA Minneapolis-St. Paul MN-WI MSA Milwaukee-Waukesha WI PMSA
Level 3 (3 metros) Grand Rapids-Muskegon-Holland MI MSA
Level 2 (2 metros) Cleveland-Lorain-Elyria OH PMSA
Level 1 (1 metro) Saint Louis MO-IL MSA

Table 4.9

Cluster Analysis Results for Population Variables Across the Region

Level 4 (9 metros) Kansas City MO-KS MSA Columbus OH MSA Cincinnati OH-KY-IN PMSA Indianapolis IN MSA Milwaukee-Waukesha WI PMSA Grand Rapids-Muskegon-Holland MI MSA
Level 3 (3 metros) Cleveland-Lorain-Elyria OH PMSA
Level 2 (2 metros) Minneapolis-St. Paul MN-WI MSA
Level 1 (1 metro) Saint Louis MO-IL MSA

4.5. Analysis

To formally compare all 318 metropolitan areas across the criteria described above, a mathematical clustering algorithm was applied. The procedure hierarchically "clusters" observations (the metropolitan areas). The method is based on the usual agglomerative hierarchical clustering procedure applied in urban and regional analysis (typically applied for purposes of clustering across industries in a given state or metropolitan area). Each metropolitan area begins in a cluster by itself. The two "closest" metropolitan areas (across the variables identifying the metropolitan areas) are merged to form a new cluster that replaces the two old clusters. Merging of the two closest clusters is repeated until only one cluster is left. There are various clustering methods available. This analysis applies the *Centroid Method*, which is described in Appendix B.

5.0. Leading Metropolitan Areas

5.1 Selecting the Leading Cities

The selection of leading cities for this report is based upon their quality of life, business environment, and economic growth. The final five leading cities/areas – Chicago, IL, Portland, OR, Raleigh-Durham/Chapel Hill, NC, Salt Lake City, UT and San Jose, CA represent diverse regions of the country, and illustrate the potential for urban prosperity in various settings across the nation. Three sources inform the selection of the final five: *Fortune* Magazine's selection and report of the best five cities for business; *Money* Magazine's selection and Report of the best places to live, and POLICOM'S ranking of the economic Performance of over 300 metropolitan areas.

Leading Metros -

Chicago, IL
Portland, OR
Raleigh-Durham/Chapel Hill, NC
Salt Lake City, UT
San Jose, CA

The selected leading cities are not ranked, but presented in alphabetical order because they represent selections from among several rankings that reflect various criteria. Detailed discussion of the leading cities and their selection follows the summary of the rankings by set of criteria.

Table 5.1

Cities/Metro Areas Ranked by Business, Quality of Life, and Growth

Rankings Across Different Sources			
Rank	**Business**	**Quality of Life**	**Economic Strength**
1	New York	Portland, OR	Austin, TX
2	San Francisco	Providence, RI	Seattle, WA
3	Chicago	Chicago, IL	Salt Lake City UT
4	Washington DC Area	Raleigh-Durham/Chapel Hill, NC	Fort Collins, CO
5	San Jose	Salt Lake City, UT	Denver, CO

Sources: *Fortune* Magazine; *Money* Magazine, POLICOM

Based upon research and analysis conducted by Arthur Anderson Accounting, *Fortune* Magazine (2000) lists the tip five cities for business as: New York, San Francisco, Chicago, Washington DC area, and San Jose. Like stock portfolios that performed relatively well over the last twelve to eighteen months, the year's list of cities is notable for being a "solid collec-

tion" of "veteran all-stars" rather than an assortment of emerging cities driven heavily by a few emerging industries. *Fortune* selected the leading cities on the basis broad-ranging criteria, such as business growth, number of Fortune 500 headquarters, real estate prices, education level of workers, worker retention, quality of schools, length of commutes, and business leader testimonies about the nuances of doing business in the different locations and their expectations for the future.

However, while *Fortune's* all-stars represent the business big league, leading cities can also distinguish themselves as desirable places, ripe with current and future possibilities for people to live and work. *Money* Magazine (2000) provides a ranking of the best places to live. Chicago ranks highly in both magazines' lists, which can be viewed as a positive signal for its warmer neighbor, St. Louis. However, *Money* considers Portland to offer the best daily grind of the country based upon its strong job market, stellar urban planning, and the recreational opportunities surrounding it. Given Money's emphasis upon ranking cities based upon quality of life, choices were based on criteria such as success of limiting urban sprawl, the provision of green space, and availability of cultural activities, as well as economic prosperity, school quality, low crime rates and high job growth.

POLICOM, a private firm, annually ranks metropolitan areas on the basis of evidence of economic strength – defined by stable growth – over the most recent twenty-five years. Evidence of growth is based upon measures of earnings, employment, and government transfers. Growth is a useful measure that complements the other two rankings. However, it can require careful interpretation. Note that none of the business city all-stars appear on the top five in steady growth list. The growth lists reflects just that – growth at the margin – but not absolute levels of economic performance. The consequence of this caveat is that metropolitan areas that had a "lot of growing to do" can be more prominent than the veterans in this particular ranking. However, the practice of controlling for stable (rather than overall) growth helps to generate meaningful statistics on economic strength of the metropolitan areas. Furthermore, measures of growth can also help to identify cities that are up and coming and, thus, leading cities in an important alternative dimension. Consistent with population trends, the steady growth winners are concentrated in the mountain states and westward.

5.2. The Leading Cities

5.2.1. *Chicago*

Chicago not only ranked third in *Fortune's* and *Money's* lists, but was also in the top fourteen percent (43 of 318) of metropolitan areas ranked by POLICOM. *Money* emphasizes Chicago's recent beautification developments, cultural opportunities, and nightlife; as well as the improvements in "once notorious" city schools. *Fortune*, on the other hand, lauds Chicago's industrial diversity and its central location and stature as a worldwide transportation hub.

Figure 5.1

Chicago, IL
1988-98

Chicago is one of the 318 metropolitan areas in the United States.
Its 1998 population of 7,949,134-ranked 3rd in the nation.

PER CAPITA PERSONAL INCOME
In 1998, Chicago had a per capita personal income (PCPI) of $33,181. This PCPI ranked 21st in the United States and was 122 percent of the national average, $27,203. In 1988, the PCPI of Chicago was $20,476 and ranked 26th in the United States. The average annual growth rate of PCPI over the past 10 years was 4.9 percent. The average annual growth rate for the nation was 4.6 percent.

TOTAL PERSONAL INCOME
In 1998, Chicago had a total personal income (TPI) of $263,762,597*. This TPI ranked 2nd in the United States. In 1988, the TPI of Chicago was $150,655,031* and ranked 3rd in the United States. The average annual growth rate of TPI over the past 10 years was 5.8 percent. The average annual growth rate for the nation was 5.6 percent.

EARNINGS BY INDUSTRY
Earnings of persons employed in Chicago increased from $116,013,045* in 1988 to $201,672,626* in 1998, an average annual growth rate of 5.7 percent. The largest industries in 1998 were services; finance, insurance, and real estate, 11.6 percent; and durable goods manufacturing, 9.8 percent. In 1988, the largest industries were services; durable goods manufacturing; and finance, insurance, and real estate, 9.5 percent. Of the industries that accounted for at least 5 percent of earnings in 1998, the slowest growing from 1988 to 1998 was durable goods manufacturing; the fastest was finance, insurance, and real estate, which increased at an average annual rate of 7.7 percent.

*All income estimates with the exception of PCPI are in thousands of dollars.

Source: Bureau of Economic Analysis

5.2.2. *Portland*

Portland ranks in the top four percent (12 of 318) in terms of steady economic growth as measured by POLICOM. The report in Money Magazine highlights the draw that Portland has even for transplants from the business big leagues due to its relatively affordable housing and other amenities combines with its status as a "high-tech hub."

Figure 5.2

Portland-Vancouver, OR-WA
1988-98

Portland Vancouver is one of the 318 metropolitan areas in the United States. Its 1998 population of 1,820,007-ranked 27th in the nation.

PER CAPITA PERSONAL INCOME
In 1998, Portland-Vancouver had a per capita personal income (PCPI) of $29,430. This PCPI ranked 47th in the United States and was 108 percent of the national average, $27,203. In 1988, the PCPI of Portland-Vancouver was $17,747 and ranked 71st in the United States. The average annual growth rate of PCPI over the past 10 years was 5.2 percent. The average annual growth rate for the nation was 4.6 percent.

TOTAL PERSONAL INCOME
In 1998, Portland-Vancouver had a total person income (TPI) of $53,562,978*. This TPI ranked 29th in the United States. In 1988, the TPI of Portland-Vancouver was $25,666,783* and ranked 34th in the United States. The average annual growth rate of TPI over the past 10 years was 7.6 percent. The average annual growth rate for the nation was 5.6 percent.

EARNINGS BY INDUSTRY
Earnings of persons employed in Portland-Vancouver increased from $18,650,421* in 1988 to $39,814,293* in 1998, an average annual growth rate of 7.9 percent. The largest industries in 1998 were services, 25.8 percent of earnings; durable goods manufacturing, 14.9 percent; and state and local government, 10.3 percent. Of the industries that accounted for at least 5 percent of earnings in 1998, the slowest growing from 1988 to 1998 was transportation and public utilities (6.7 percent of earnings in 1998), which increased at an average annual rate of 6.0 percent; the fastest was construction (7.8 percent of earnings in 1998), which increased at an average annual rate of 10.7 percent.

*All income estimates with the exception of PCPI are in thousands of dollars.

Source: Bureau of Economic Analysis

5.2.3. *Raleigh-Durham-Chapel Hill, NC*

Raleigh-Durham-Chapel Hill (RDCH) is featured in *Money* Magazine as a desirable place to live due to the abundance of high-quality education in and around Research Triangle Park and its relatively affordable and low-stress lifestyle for a community supported by technology-heavy industries. Furthermore, it ranks in the top two and one-half percent (7 out of 318) in terms of POLICOM's index of economic growth.

Figure 5.3

Raleigh-Durham-Chapel Hill, NC
1988-98

Raleigh-Durham-Chapel Hill is one of the 318 metropolitan areas in the United States.
Its 1998 population of 1,079,286-ranked 56th in the nation.

PER CAPITA PERSONAL INCOME
In 1998, Raleigh-Durham-Chapel Hill had a per capita personal income (PCPI) of $30,394. This PCPI ranked 38th in the United States and was 112 percent of the national average, $27,203. In 1988, the PCPI of Raleigh-Durham-Chapel Hill was $18,604 and ranked 52nd in the United States. The average annual growth rate of PCPI over the past 10 years was 5.0 percent. The average annual growth rate for the nation was 4.6 percent.

TOTAL PERSONAL INCOME
In 1998, Raleigh-Durham-Chapel Hill had a total personal income (TPI) of $32,803,772*. This TPI ranked 51st in the United States. In 1988, the TPI of Raleigh-Durham-Chapel Hill was $15,149,787* and ranked 60th in the United States. The average annual growth rate of TPI over the past 10 years was 8.0 percent. The average annual growth rate for the nation was 5.6 percent.

EARNINGS BY INDUSTRY
Earnings of persons employed in Raleigh-Durham-Chapel Hill increased from $12,158,019* in 1988 to $26,475,153* in 1998, an average annual growth rate of 8.1 percent. The largest industries in 1998 were services; 29.5 percent of earnings; state and local government, 14.9 percent; and durable goods manufacturing, 12.6 percent. In 1988, the largest industries were services, 23.8 percent of earnings; state and local government, 17.9 percent; and durable goods manufacturing, 12.7 percent. Of the industries that accounted for at least 5 percent of earnings in 1998, the slowest growing from 1988 to 1998 was state and local government, which increased at an average annual rate 6.2 percent; the fastest was finance, insurance, and real estate.

*All income estimates with the exception of PCPI are in thousands of dollars.

Source: Bureau of Economic Analysis

5.2.4. *Salt Lake City*

Salt Lake City is featured as one of *Money's* best places to live and POLICOM'S top five in metropolitan areas in terms of steady economic growth. *Money* emphasizes that, like Portland (and to a lesser extent RDCH) it is full of recreational opportunities and is noted for safety and quality of education.

Figure 5.4.

Salt Lake City-Ogden, UT
1988-98

Salt Lake City-Ogden is one of the 318 metropolitan areas in the United States. Its 1998 population of 1,263,310-ranked 46th in the nation.

PER CAPITA PERSONAL INCOME
In 1998, Salt Lake City-Ogden had a per capita personal income (PCPI) of $24,698. This PCPI ranked 152nd in the United States and was 91 percent of the national average, $27,203. In 1988, the PCPI of Salt Lake City-Ogden was $14,350 and ranked 236th in the United States. The average annual growth rate of PCPI over the past 10 years was 5.6 percent. The average annual growth rate for the nation was 4.6 percent.

TOTAL PERSONAL INCOME
In 1998, Salt Lake City-Ogden had a total personal income (TPI) of $31,201,322*. This TPI ranked 54th in the United States. In 1988, the TPI of Salt Lake City-Ogden was $15,116,723* and ranked 61st in the United States. The average annual growth rate of TPI over the past 10 years was 7.5percent. The average annual growth rate for the nation was 5.6 percent.

EARNINGS BY INDUSTRY
Earnings of persons employed in Salt Lake City-Ogden increased from $11,652,594* in 1988 to $24,856,220* in 1998, an average annual growth rate of 7.9 percent. The largest industries in 1998 were services, 25.8 percent of earnings; state and local government, 11.5 percent; and retail trade, 10.3 percent. In 1988, the largest industries were services, 23.2 percent of earnings; state and local government, 12.0 percent; and durable goods manufacturing, 11.1 percent. Of the industries that accounted for at least 5 percent of earnings in 1998, the slowest growing from 1988 to 1998 was federal civilian government (5.5 percent of earnings in 1998), which increased at an average annual rate of 2.7 percent; the fastest was finance, insurance, and real estate (9.3 percent of earnings in 1998), which increased at an average annual rate of 12.5 percent.

*All income estimates with the exception of PCPI are in thousands of dollars.

Source: Bureau of Economic Analysis

5.2.5. *San Jose*

San Jose also ranks high in terms of economic growth – in the top fourteen percent (42 of 318) in the economic strength ranking. *Fortune* heralds its low unemployment, low crime, highly educated workers, and boomtown draw of professional and capital, in spite of extremely high priced real estate. *Fortune* concedes, however, San Jose's lack of cultural opportunities and evidence of good urban planning. Furthermore, in spite of its urban sprawl, the median home price in San Jose is close to half a million dollars. Notice, however, that this cost of living is partially offset by the relatively high per capita personal income (given by the Bureau of Economic Analysis below).

Figure 5.5

San Jose, CA
1988-98

San Jose is one of the 318 metropolitan areas in the United States.
Its 1998 population of 1,641,848-ranked 30th in the nation.

PER CAPITA PERSONAL INCOME
In 1998, San Jose had a per capita personal income (PCPI) of $40,828. This PCPI ranked 4th in the United States and was 150 percent of the national average, $27,203. In 1988, the PCPI of San Jose was $23,562 and ranked 9th in the United States. The average annual growth rate of PCPI over the past 10 years was 5.7 percent. The average annual growth rate for the nation was 4.6 percent.

TOTAL PERSONAL INCOME
In 1998, San Jose had a total personal income (TPI) of $67,033,578*. This TPI ranked 23rd in the United States. In 1988, the TPI of San Jose was $34,688,317* and ranked 26th in the United States. The average annual growth rate of TPI over the past 10 years was 6.8percent. The average annual growth rate for the nation was 5.6 percent.

EARNINGS BY INDUSTRY
Earnings of persons employed in San Jose increased from $30,990,678* in 1988 to $62,529,734* in 1998, an average annual growth rate of 7.3 percent. The largest industries in 1998 were services, 33.9 percent of earnings; services, 32.3 percent; and wholesale trade, 6.9 percent. In 1988, the largest industries were durable goods manufacturing, 36.2 percent of earnings; services, 24.3 percent; and state and local government, 7.2 percent. Of the industries that accounted for at least 5 percent of earnings in 1998, the slowest growing from 1988 to 1998 was state and local government (5.7 percent of earnings in 1998), which increased at an average annual rate of 4.9 percent; the fastest was services, which increased at an average annual rate of 10.4 percent.

*All income estimates with the exception of PCPI are in thousands of dollars.

Source: Bureau of Economic Analysis

Appendix A

Target Missouri II:

The St. Louis Metro Region

Executive Summary

Six analysis tools are used to determine which industries should be chosen for targeting in The St. Louis Metro Region. The first two, Specialization Ratios (SR) and the Regional Shift (RS) component of Shift-Share Analysis (SSA), help to determine which industries might have a competitive advantage in a region. The third and most important type, the Economic Impact (EI) analysis, helps to identify which industries will benefit the region most should they expand. The Skills-Mismatch Index (SMI) determines whether the skills of the available workforce in a region match the needed skills for a particular industry. The Industrial Mix (IM) component of SSA helps to identify emerging industries. Finally, the Current Employment (CE) level of a regional industry helps to determine whether needed infrastructure is in place to attract particular industries and is an important factor when considering SRs. Industries are awarded points on a scale of 0 to 100 based on whether they meet necessary criteria in these six categories. Those industries that score the highest are those recommended for targeting.

The diagram below presents a graphic illustration of this methodology. The orange lines connect those factors that have a specific relationship as described above.

Industries chosen for targeting are those industries that have high scores in the six categories discussed above. For each category, a condition has been established that determines whether an industry has performed well in a category. For each category in which an industry performs well, that industry is awarded a set amount of points. If an industry does not meet the condition for that category, no points are awarded. The categories and their point values are as follows:

Category	Point Value
Condition 1: High Economic Impact	40
Condition 2: High Specialization Ratio	20
Condition 3: Strong Regional Shift	20
Condition 4: Low Skills-Mismatch	10
Condition 5: Positive Industrial Mix & Regional Shift	5
Condition 6: High Current Employment	5
Total Points:	100

An industry that scores well in each of the categories receives a score of 100 points, while those industries that perform poorly receive 0 points. Industries that score 50 or more points are those recommended for targeting.

The tables that follow present those industries with scores of 50 or higher on the target scale. (The full report presents the scores for all industries in the St. Louis Metro Region.) not surprisingly, the top industries in the region are Motor Vehicles and Equipment Mfg. (SIC 371), with a score of 100 points, and Aerospace Mfg. (SIC 372 & 376), with a score of 95 points. Another six industries (of the 74 total) scored 80 points or higher, while 31 of these scored the minimum 50 points.

It is important to note the strong showing of firms in Life Sciences industries, represented by SICs 28 (Chemical Mfg.), 384 (Medical Equip. Mfg.), and 873 (Research Services). In addition, SIC 48, Communications, represents Information Technology industries.

The map on the final page shows the current locations of target industries in the St. Louis Metro Region. More importantly, it implies that those locations already have needed infrastructure in place to attract additional target industries.

TM2 has provided a list of 74 industries that have the best potential results for economic development in the St. Louis Metro Region. The original Target Missouri provided a list of 34 target industries for the entire St. Louis Metro region. Of these, 26 appear on both lists, so in this case, the two studies have obtained very similar results. The expanded list generated by TM2 provides a list of industries that better fits the specifics of the St. Louis Metro Region, as well as providing rankings that shed some light on the relative importance of certain industries.

St. Louis Metro Region Target Industries		
SIC	Industry	Total Score
371	Motor vehicles and equipment	100
372,376	Aerospace	95
324	Hydraulic cement	90
333	Primary nonferrous smelting & refining	90
40	Railroad	90
48	Communications	90
494-497,%493	Water and sanitation	85
50,51	Wholesale trade	85
358	Refrigeration and service industry machinery	75
384	Medical equipment, instruments and supplies	75
283	Drugs	75
284	Soap, cleaners, and toilet goods	75
308	Miscellaneous plastics products, nec	75
355	Special industry machinery	70
204,207	Grain mill products and fats and oils	70
205	Bakery products	70
208	Beverages	70
285	Paints and allied products	70
287	Agricultural chemicals	70
289	Miscellaneous chemical products	70
295,299	Miscellaneous petroleum and coal products	70
311,315-317,319	Luggage, handbags, and leather products, nec	70
14	Nonmetallic minerals, except fuels	70
367	Electronic components and accessories	65
63	Insurance carriers	65
64	Insurance agents, brokers, and services	65
62	Security and commodity brokers	65
341	Metal cans and shipping containers	60
267	Converted paper products except containers	60
273	Books	60
473,474,478	Miscellaneous transportation services	60
491,%493	Electric utilities	60
492,%493	Gas utilities	60
752-754	Automobile parking, repair, and services	60
791,799	Amusement and recreation services, nec	60
871	Engineering and architectural services	60
874	Management and public relations	60
254	Partitions and fixtures	55
252,253,259	Office and misc. furniture and fixtures	55
336	Nonferrous foundries	55
751	Automotive rentals, without drivers	55
873	Research and testing services	55
872,89	Accounting, auditing, and other services	55

St. Louis Metro Region Target Industries		
SIC	Industry	Total Score
331	Blast furnaces and basic steel products	50
334,339	All other primary metals	50
335	Nonferrous rolling and drawing	50
351	Engines and turbines	50
352	Farm and garden machinery and equipment	50
353	Construction and related machinery	50
357	Computer and office equipment	50
361	Electric distribution equipment	50
362	Electrical industrial apparatus	50
364	Electric lighting and wiring equipment	50
365	Household audio and video equipment	50
374	Railroad equipment	50
381	Search and navigation equipment	50
382	Measuring and controlling devices	50
385	Ophthalmic goods	50
386	Photographic equipment and supplies	50
387	Watches, clocks, and parts	50
201	Meat products	50
202	Dairy products	50
203	Preserved fruits and vegetables	50
206	Sugar and confectionery products	50
209	Miscellaneous food and kindred products	50
281,286	Industrial chemicals	50
282	Plastics materials and synthetics	50
291	Petroleum refining	50
301	Tires and inner tubes	50
313,314	Footwear, except rubber and plastic	50
10	Metal mining	50
12	Coal mining	50
15-17	Construction	50
793	Bowling centers	50

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URL: http://www.ded.state.mo.us/research/default.html
Missouri Works Research & Planning, Missouri Economic Development, State of Missouri

Appendix B: The Data

Data Information and Sources

1. Average Annual Earnings: 1998; Source: Bureau of Economic Analysis (BEA]
2. Income: 1998 personal income ($000's); Source: BEA
3. Per Capita Income: 1998 per capita income ($); Source: BEA
4. Percent of Income from Dividends, Interest, and Rent: 1998; Source: BEA
5. Percent of Income from Transfers: 1998; Source: BEA
6. Agriculture (income %): 1998; Source: BEA
7. Construction (income %]: 1998; Source: BEA
8. Finance, Insurance, and Real Estate [income %]: 1998; Source: BEA
9. Government (income %]: 1998; Source: BEA
10. Manufacturing— total [income %]: 1998; Source: BEA
11. Manufacturing— durable goods [income %]: 1998; Source: BEA
12. Manufacturing— nondurable goods [income %]: 1998; Source: BEA
13. Military [income %]: 1998; Source: BEA
14. Mining [income %]: 1998; Source: BEA
15. Retail Trade [income %]: 1998; Source: BEA
16. Services [income %]: 1998; Source: BEA
17. Transportation and Utilities [income %]: 1998; Source: BEA
18. Wholesale Trade [income %]: 1998; Source: BEA
19. Population: 1998; Source: BEA
20. Percent over 64: 1999; Source: Bureau of Census Population Estimates
21. Percent 45 to 64: 1999; Source: Bureau of Census Population Estimates
22. Percent 20 to 45: 1999; Source: Bureau of Census Population Estimates
23. Percent 15 to 19: 1999; Source: Bureau of Census Population Estimates
24. Percent under 15: 1999; Source: Bureau of Census Population Estimates
25. Percent Change in Population: 1999; Source: Bureau of Census Population Estimates
26. Percent Change in Population (20-45]: 1999; Source: Bureau of Census Population Estimates
27. Population Density: 1990 (#/sq. mile); Source: Bureau of Census
28. Net Migration [last 10 years]: 1999; Source Bureau of Census: Population Estimates
29. Unemployment Rate: Dec. 2000; Source: Bureau of Labor Statistics
30. Percent Change in the Median Home Price [last year]: 00Q4; Source: National Association of Realtors

Appendix B (continued): Data on St. Louis and Most Similar Areas

Variable	Metropolitan Area					
	St. Louis	Baltimore	Newark	Pittsburgh	Cleveland	Oakland
Region	Plains	Mid-Atlantic	Mid-Atlantic	Mid-Atlantic	Great Lakes	Pacific
% over 64	12.900	12.300	12.600	17.700	14.700	10.900
% 45 to 64	20.700	21.300	22.100	22.400	21.600	20.400
% 20 to 44	37.500	39.300	37.900	34.200	36.500	40.100
% 15 to 19	7.100	6.500	6.400	6.400	6.900	6.500
% under 15	22.300	20.800	20.900	18.400	20.400	21.700
Population Density	390.500	915.600	1,214.300	518.000	813.800	1,450.900
Population % Change	3.300	5.500	1.300	(2.700)	0.800	14.300
% Change Aged 20 to 44	(0.700)	0.200	(5.800)	(7.400)	(3.300)	5.700
% Change Median Home Price	2.900	24.900	14.500	5.400	1.500	16.800
Net Migration	(3.000)	(0.400)	(5.000)	(12.600)	(11.100)	18.100
Unemployment Rate	4.000	4.400	3.800	4.200	4.200	2.800
Average Annual Earnings	33,570	34,339	44,263	33,918	34,753	39,735
Per Capita Income	29,089	29,548	37,136	28,149	29,239	33,667
Population	2,561,646	2,480,971	1,948,065	2,345,139	2,224,657	2,315,020
Personal Income ($000)	74,516,354	73,308,182	72,343,219	66,012,578	65,046,796	77,939,605
% Income from Dividends, Interest, and Rent	0.212	0.177	0.187	0.188	0.197	0.185
% Income from Transfers	0.125	0.126	0.108	0.175	0.143	0.099
Military [income %]	0.008	0.013	0.001	0.002	0.002	0.002
Government (income %]	0.089	0.155	0.095	0.081	0.092	0.102
Services [income %]	0.208	0.215	0.214	0.219	0.213	0.199
Finance, Insurance, Real Estate [income %]	0.060	0.066	0.081	0.052	0.060	0.051
Retail Trade [income %]	0.061	0.058	0.045	0.060	0.056	0.059
Services [income %]	0.050	0.044	0.057	0.042	0.058	0.045
Transportation and Utilities [income %]	0.056	0.040	0.068	0.057	0.034	0.050
Manufacturing— nondurable goods [income %]	0.056	0.030	0.086	0.043	0.050	0.039
Manufacturing— durable goods [income %]	0.086	0.038	0.035	0.083	0.128	0.058
Manufacturing— total [income %]	0.143	0.068	0.122	0.126	0.179	0.098
Construction (income %]	0.044	0.043	0.029	0.040	0.036	0.045
Mining [income %]	0.000	0.000	0.002	0.006	0.003	0.004
Agriculture (income %)	0.003	0.000	0.003	0.002	0.000	0.004

Appendix C:

The Centroid Method For Cluster Analysis

The procedure applied finds hierarchical clusters of the observations in a data set. The data are considered to be coordinates and the procedure computes Euclidean distances to compare across observations. Typical clustering methods vary in how the distance between two clusters is computed.

In the centroid method the distance between two clusters is defined as the squared Euclidean distance between their centroids or means. The centroid method is considered to perform well relatively to other hierarchical clustering methods when there are extreme values, or outliers in the data.

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struments (382), surgical, medical & dental instruments & supplies (384); service = telephone communications services (481), computer programming, data processing & other computer related services (737), motion picture production & allied services (781), engineering, architectural & surveying services (871), research, development & testing services (873), p. 8

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