The Creative Economy in Iowa

Research and Report Prepared for the
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The Creative Economy in Iowa: An Overview

This study is an assessment of Iowa's creative economy. It represents a broad inventory of the creative composition of the Iowa economy with an eye towards defining its size and scope, measuring how it compares with the U.S., and discerning the value of the creative economy to the larger Iowa economy.

The creative economy has two important dimensions. The first is Iowa's creative workforce. The second is Iowa's creative industrial composition. The creative workforce is further segmented into two groups. The first, borrowing from Florida's work (2002), is the *super creative core*, which is composed of computer and mathematical professionals; architects and engineers; life, physical, and social scientists; education, training, and library professionals; and arts, design, entertainment, sports, and media occupations. The second subgroup is composed of the occupations termed *creative professionals*. Creative professionals include managers and administrators, business and financial professionals, legal professionals and health care practitioners, high-end sales professionals, and community and social service workers.

Creative industries are those that employ large fractions of the creative workforce, invest heavily in research and development, or create and distribute technologically sophisticated or artistic goods and services. These industries include specific kinds of manufacturing; broadcasting and communications industries; professional services; scientific and technical services and activities; membership organizations for business, labor, and other groups; all education providers; applied, performing, visual, and performing arts; commercial sports; heritage institutions; and independent artists, performers, and writers.

Iowa's creative economy has both strengths and weaknesses, especially when compared with the U.S. creative economy.

- By occupational grouping, Iowa's *super-creative core* of occupations makes up 10.8 percent of the workforce compared to 12 percent for the U.S.
    - Iowa has proportionately more creative workers in education, training, and library arts and sciences, but proportionately less in computer and mathematical specialists, architecture and engineering.
    - Iowa is proportionately close to the U.S. in life, physical, and social scientists and in its arts, design, entertainment, sports, and media workers.
- Iowa's *creative professional* composition (16.2 percent) is also slightly smaller than the U.S (17.3 percent), which is more noticeable in its share of business and financial operations professionals and in its high end sales and related professionals.
- When combined, the Iowa creative occupational composition is 27 percent of the nonfarm workforce compared to a U.S. average of 29.2 percent.

During the 1990s, Iowa and the U.S. posted strong gains in creative employment growth.

- Iowa's *super creative core* occupations grew by 33 percent compared to just under 32 percent for the U.S.
    - Iowa grew faster than the U.S. in mathematics and computer careers; life, physical, and social scientists; and artists.
    - Iowa grew more slowly that the U.S. in education, training, and library professionals.

- Iowa and the U.S. posted low or negative growth in the number of engineers and architects.
- Iowa's *creative professional* occupations grew by almost 45 percent compared to just under 25 percent for the U.S.
  - Most of these gains were made in managerial and financial occupations, which grew by more than twice the rate of the U.S.
  - Legal and health related jobs grew more slowly than the U.S.
- In all, Iowa's creative occupations grew by 40 percent between 1990 and 2000 compared to 27.3 percent for the U.S.
- Iowa's creative occupations grew at a rate that was 3.5 times greater than all other occupations in Iowa during the decade.

There are distinct gender differences in the composition of Iowa's creative workforce.

- Women were about 54 percent of the *super creative core* group in 2000.
  - Men were disproportionately dominant in math and computer fields, engineers and architects, and in life, physical, and the social scients.
  - Women were much more prominent in education, accounting for 72 percent of the occupations. Prominence in this category weights the total for the super-creative core group slightly in favor of women.
- There are more male *creative professionals* than female.
  - In managerial and financial and in legal professions, there are significantly more men.
  - Women, however, make up 78.5 percent of occupations in the health care group.
- When we look at growth over the last decade, we find that women have made proportionately strong gains in the *super-creative core* professions by gaining nearly 2 of every three jobs.
  - In math and computer fields, two new jobs went to men for every one that a women got.
  - But in the education, training, and library professions, women accounted for 94.2 percent of the new jobs, and in the arts, they captured 62 percent.
- Men received the lion's share of new *creative professional* jobs.
  - Over 70 percent of new managerial and financial jobs went to men.
  - Women posted very strong gains in legal (94 percent) and health care jobs (84 percent), but these gains were not enough to offset the numerical gains men made in managerial and finance careers.
- Despite gains in many categories, 53 percent of *all creative* jobs went to men and 47 percent to women.

On an annualized basis, Iowa's creative professionals earn less than their national counterparts.

- The average for all *super creative core* workers is 82.7 percent of the U.S. average.
  - The highest percentage, 88.3 percent, was found for mathematical and computer workers.
  - The lowest percentage, 71.7 percent, was found for Iowa's arts, design, entertainment, sports, and media professionals.
- The average for all *creative professionals* was 83.7 percent of the U.S. amount.

- Community and social service professionals had the highest value at 86.3 percent.
- High end sales and related occupations fared more poorly at 80.3 percent.

When we switch our focus to Iowa's *creative industries*, some interesting comparisons with the U.S. emerge

- Iowa's creative industries make up 22.5 percent of all nonfarm jobs compared to 25.6 percent for the U.S.
  - Iowa is proportionately very under-represented in creative manufacturing, broadcast and media firms, scientific and technical firms, applied and performing arts, and in jobs in heritage establishments.
  - Iowa is proportionately competitive with the U.S. in post-secondary education, all other education, in the literary and visual arts, and in commercial sports.
- During the decade of the 1990s, jobs in Iowa's creative industries grew by 14 percent, ten percentage points less than the U.S. rate.
  - The state had relatively high growth rates in professional services firms (43 percent), performing arts (49 percent), visual arts (35 percent), commercial sports (39 percent).
  - Rates of growth were low or negative in creative manufacturing, broadcast and media firms, literary arts, and membership organizations.
- Average earnings per job in Iowa's creative industries were 73.4 percent of the U.S. average
  - Iowa's post-secondary education jobs paid slightly above the U.S. average. All other industry groupings were substantially less.
  - Among the lowest paying industries were commercial sports (25 percent), performing arts (29.5 percent), broad cast and media jobs (53 percent), scientific and technical jobs (63 percent), and applied arts (64 percent).

The study also finds rural and urban differences in the accumulation of creative jobs in Iowa.

- Nonmetropolitan areas were able to capture nearly 33 percent of all jobs in creative industries between 1990 and 2000.
  - They, however, post substantially smaller shares of the gains in scientific and technical jobs (17.5 percent) and arts and entertainment jobs (6.8 percent).
  - The study concludes that there are concentrations of creative job change in the state that align with the state's more populated regions.

Economic impact estimates were estimated for Iowa's creative workers and Iowa's creative firms.

- In all, Iowa's creative workforce converts $8.57 billion of its take home compensation into spending in the Iowa economy, which in and of itself supports 45,812 jobs.
- After all of this household spending multiplies its way through the Iowa economy, Iowa's creative workforce sustains $13.1 billion state sales, creates $8.002 billion in value added, and pays $4.7 billion in labor income to 195,464 job holders.

- Iowa's creative industries directly generate $18.1 billion in industrial output, create $12.1 billion in value added, and require 305,972 job holders receiving $10.95 billion in labor income.
- When compared to all other jobs in the economy, jobs in creative industries pay 60 percent higher earnings per worker.
- It is inappropriate to add creative industry economic impact values together as many firms purchase from each other, however, the major industries that stand out are
    - Search and navigation equipment manufacturing creating $2.9 billion in total industrial output, 22,724 jobs, and $868 million in labor income
    - Total economic effects of newspaper publishing was $828.8 million in output, 10,833 jobs, and $292 million in labor income.
    - Iowa's hospitals accounted for $6.22 billion in total industrial output, required 96,188 jobs, and paid $2.8 billion in wages.
    - Doctors and dentists created $5.1 billion in total, multiplied through output, 61,059 jobs, and $2.3 billion in labor income.
    - All other education (primary and secondary) linked to $5.26 billion in total statewide industrial output, 107,156 jobs, and $3.8 billion in labor income.
    - Post-secondary education created $3.3 billion in total output, 60,192 jobs, and $2.94 billion in labor income.

How does this research inform policy makers? There are serious efforts currently underway in Iowa to promote the retention of specific kinds of creative workers, to entice professionals to consider the state, and to attract the kinds of firms that provide employment opportunities for a talented and industrious workforce that will help Iowa rise above current rates of economic change. Strong arguments have been made that Iowa's creative occupational structure needs more attention from state leaders than it perhaps has received in the past.

An honest summary of this research would conclude that Iowa has a ways to go if it is to achieve creative economy competitiveness with much of the rest of the nation. This research represents the statistical baseline from which planners and policy makers can proceed in promoting the state and its human resources. Politically and professional there is now an obvious open-mindedness regarding what is needed to stimulate economic and social growth. It is equally obvious that the state has tremendous assets to use in cultivating its creative economy. It has nationally ranked universities that are powerful magnets for talent. It has major cities that are highly livable places with exciting and diverse economies, social structures, and entertainment options. It has rural spaces that are diverse and interesting, offering hosts of recreation and entertainment opportunities.

Comparatively few places in Iowa will likely realize the majority of economic and social growth over the next decade. Still, the overall livability in those places and the rest of the state depends on far more than merely the number of jobs they create. There is great opportunity for growth and enhancement in non-traditional areas of Iowa's economy – its artistic, cultural, and recreational institutions. These opportunities can only be enhanced when state and community leaders recognize that the sum of a community is greater than the sum of its jobs.

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The Creative Economy in Iowa

I
Introduction

Congress shall have the power ... to promote the Progress of Science and the useful Arts .... (Article 1, Section 8, The Constitution of the United States)

This country was founded with an expressed acknowledgement that the sciences and the arts were special and to be both nurtured and protected. Technology and creativity drive cultural and economic growth. This maxim, apparent throughout history, has been strikingly evident during recent decades of rapid technological and economic change in the United States. Growth was so rapid and change so profound during the last years of the 20th century to warrant the declaration of a "New Economy," an "Information Age," and a "Knowledge Economy." These labels were attempts to characterize an economy in which innovation and the rapid dissemination of ideas were the new standard – the rule rather than the exception.

The composition of the U.S. economy has changed to reflect the importance of innovation. Much of the recent growth in the U.S. economy has occurred in industries producing goods and services requiring high levels of artistic, professional, scientific, and technical skill. Some of the growth has occurred in specific kinds of manufacturing and communications systems, some has occurred in financial industries, some has occurred in business and personal services, and some has occurred in traditional culture-enhancing industries, like education, the arts and entertainment, and recreation. Meanwhile, employment in traditional commodity production, like agriculture, forestry, mining, and several manufacturing industries, has declined. Peter Coy, writing in *Newsweek* in an article entitled, "The Creative Economy," and perhaps one of the first references to the phrase in print, notes that

... advanced economies have gotten so efficient at producing food and physical goods that most of the workforce has been freed up to provide services or to produce abstract goods: data, software, news, entertainment, advertising, and the like....

People are cranking out computer programs and inventions, while lightly staffed factories churn out the sofas, the breakfast cereals, the cell phones (August, 2000).

From arts and entertainment, to software development and recreational technology, to law and education, and to engineering and the applied sciences, more and more of the value that is added to industrial production consists of ideas, of intellectual content that can be patented, copyrighted, trademarked, and marketed. Accordingly, the idea and the implementation of the idea becomes the valuable commodity in much of modern commerce. The commodification of ideas provides the basis for the "Creative Economy."

What is the Creative Economy?

Of late there have been a series of compilations and reports quantifying different aspects of what might constitute a creative economy. Richard Florida, in his popular book, *The Rise of the Creative Class (2002)*, used distinct sets of creative occupations as his primary focus. John Howkins, in *The Creative Economy (2001)*, identified 15 creative industries ranging from research and development, applied and performing arts, entertainment industries, software, literature, and music as his basis for assessment. This investigatory research is an amalgam of both focuses, and develops an occupational—industrial matrix to help us to choose our creative industries and our creative occupations for analysis.

This study, sponsored and funded by the Iowa Department of Cultural Affairs, describes the creative content and the creative structure of the Iowa economy. Creative content refers to the mix of occupations requiring high levels of artistic, design, scientific, engineering, or professional skill. Creative structure refers to the mix of industries producing technically or artistically creative goods and services, or those industries employing a high fraction of creative occupations.

All industry requires creativity, but some require substantially more than others in order to survive and thrive. This study does not slight unanalyzed industries or occupations as intrinsically un-creative. To conclude that would miss the point. The emphasis in this research is on industries and workplace activities that

require comparatively high amounts of creative input versus traditional mechanical, commodity, or labor inputs.

Florida tells us that creative workers "add economic value through their creativity (p. 68)." They are workers who develop new ideas, help shape literature and the arts, apply new techniques to material and non-material problems, and implement the skills and learning of extended educations in the service of education, commerce, and households. It is an eclectic combination of workers in a variety of industries and circumstances. Measuring those workers and those industries in Iowa is the objective of this research.

Why Study the Creative Economy?

Recent literature suggests that modern economic growth depends significantly on a variety of intangibles, generally summarized as quality of life variables. The National Governors Association issued a 2001 report on "The Role of the Arts in Economic Development," where they urge governors to "use the arts effectively by promoting new partnerships among state agencies, communities, and the business sector and by harnessing the power of the arts and culture as tools that unite communities, create economic opportunity, and improve the quality of life." On another promotional front, the research division of the National Endowment for the Arts has been producing economic summaries of the Arts since 1982.

A major regional assessment of the New England arts and cultural economy was done in 2000. Their assessment and quantification of the economic values keyed on three important components of that region's creative heritage. They looked at *creative clusters* consisting of the agglomeration of industries and talent that produce cultural goods. Next they identify the *creative workforce*, which they define as "the thinkers and the doers trained in specific cultural and artistic skills...." Last they characterize the *creative community*, which is simply the location of significant concentrations of creative industrial clusters and creative workers.

Studies like these emphasize the role of the arts, cultural, and heritage organizations in promoting and sustaining economic activity in their own right, as well as their role providing the foundation for an enhanced quality of life. These

studies generally argue promote the livability of an area and its overall development potential. Florida especially takes great pains to link the artistic and cultural activities with sets of other highly creative occupations to demonstrate that there is simultaneity among the different dimensions of a creative workforce that either feed off of or otherwise promote growth economically and culturally. Citing other research and his own, he believes that "creativity and diversity work together to attract talent, generate high-tech industries, and spur regional growth (p. 265)." Venturelli (1999) is more direct:

> *...a nation without a vibrant creative labor force of artists, writers, designers, scriptwriters, playwrights, painters, musicians, film producers, directors, actors, dancers, choreographers, not to mention engineers, scientists, researchers, and intellectuals does not possess the knowledge base to succeed in the Information Economy, and must depend on ideas produced elsewhere. (emphasis added) (p. 16)*

Both Florida and Venturelli argue that the nation's creative workforce must be assessed broadly, that to over-stratify the different occupations and the different industries with high levels of creative content may unnecessarily segregate the interest in this topic into traditional camps: the artistic-cultural groups pitted against the techno-scientific and professional groups. The result would be to miss much of what is really new about the New Economy. As Scott noted in 1999, "...there are powerful versions of philosophy that arrogate to themselves special authority to issue warrants for aesthetic or scientific practices, but this view is increasingly in retreat... (p. 808)." He notes that the practice of functionally distinguishing between the cultural and the scientific loses sight of the importance of the cultural economy as an economy, but that in doing so there is not implicit a "...denial of the talents or dispositions of the individual cultural worker (808)." He argues convincingly for an awareness of not just the artistic, but also the spatial, technical, and economic dimensions of what he calls the "cultural economy."

This research brings the two broad workforces together, the artistic and the scientific, in a broad and open-minded assessment of the state's creative workforce, its industries, and their respective economic impacts on the state of Iowa.

How is the Creative Economy Relevant to Iowa?

Iowa has a modern heritage of earnestly assessing its industrial structure, its strengths, and its economic vulnerabilities. Like many states it has worked hard to promote its advantages and its workforce. This creative economy study is relevant to Iowa because it links two objectives of economic development: (1) to attract and retain a dynamic and well-educated labor force, and (2) to balance and modernize the state's industrial structure.

On the industrial side, Iowa's economic development efforts have targeted specific sets of industries that the state feels complement its existing industrial structure or will provide economic stability and growth to the state. As currently configured, the state's targeted industry list aligns quite strongly with the creative economy concept. Iowa's three broad targeted industry groups include life sciences, advanced manufacturing, and information solutions. *Life sciences* industries focus especially on biotechnology firms and biotech-related R & D, as well as the promotion of value added food and agricultural commodity processing. *Advanced manufacturing* firms generally have a high amount of technological content or are the inputs into technologically sophisticated manufactured goods. *Information solutions* industries include, broadly, information technologies, data processing, computing, and financial services.

As an economic development tool, many cities in the state are beginning to concentrate on attracting and retaining a diverse, highly educated, and sophisticated population base. To do that, they are focusing on the health and well-being of their central business and entertainment districts and the overall livability of their communities. Economic development for the past two decades in Iowa has concentrated significantly on attracting and retaining jobs and firms. Economic development in the next two decades might well have to focus seriously on amenities, housing and recreational opportunities, and the cultural vibrancy of an area for it to remain competitive, not just with other Iowa cities, but with major regions in the Midwest.

One business community has explicitly acknowledged the importance of the creative economy. In a news story on the Des Moines economy, it was recently noted:

> *The new theory is that you attract jobs that pay well in the information age by creating environments that are attractive to workers. In the new age, business follows people - well-educated, interesting, creative people - not the other way around (Elbert, January 15, 2003)*

The incoming chairman of the Greater Des Moines Partnership, a regional economic development consortium, believes that means creating a city with

> *...amenities that pull people here - like a riverwalk, a new Science Center, Events Center, downtown library, professional soccer stadium, new restaurants and more. It means erecting housing close to downtown so people can walk to work (ibid).*

Along similar lines, the state, in partnership with local governments, is energetically and significantly investing in the promotion of cultural, recreational, and community amenities through its *Vision Iowa* investment program. To date $225 million have been spent or committed to 12 projects including several convention and events centers, riverfront development projects, recreational facilities, historical and cultural learning centers, and entertainment venues.

In all, there is both tacit and explicit acknowledgement that for Iowa to grow, it needs to invest significantly in the promotion of cultural, recreational, and community amenities and attributes. The state of Iowa must compete with its neighbors for labor, industry, people, and new ideas. On a regional basis the state is surrounded by economic powerhouses: Chicago, Minneapolis, Omaha, Kansas City, St. Louis. Each of these places has a heritage of industrial strength. Each too serves as a cultural and artistic center. Iowa's potential for growth may well depend on its active promotion of an awareness of a creative economy and the ability of communities and the state to attract and retain both creative industries and creative workers.

II
Creative Occupations

There are dozens of occupations that are considered creative for the purposes of this study, and they are scattered across a spectrum of disciplines. In the appendix to this report there is a detailed list of slightly more than 300 major occupations that fit into the five sub-categories listed in Table 2.1. Florida's work, which we rely on for this research, allows that there is a Super-Creative Core group of workers and another important group called the Creative Professionals. With only slight modification, we have adopted this list for this study.

Table 2.1

Occupational Groupings

Super-Creative Core	Working Class
Computer and mathematical	Construction and extraction
Architecture and engineering	Installation, maintenance and repair
Life, physical, and social sciences	Production and assembly
Education, training, and library	Transportation and material movement
Arts, design, entertainment, sports, and media	
Creative Professionals	**Service Class**
Management and administration	Health care support
Business and financial operations	Food preparation and food services
Legal	Building and grounds maintenance
Healthcare practitioners, technicians, and specialists	Personal care services
High-end sales and sales management	Low-end sales
	Office and administration support
	Community and social service
Agriculture, Fishing, and Forestry	

The table begins with a set of *super-creative* occupations. These include highly technical occupations dealing with computers and mathematics, along with the applied science and design occupations of architecture and engineering. Physical, life and social scientists are next, followed by education and library professionals. The list is rounded out with artists, designers, entertainers, sports performers and professionals, and media occupations. These occupations constitute the primary creative group of professionals and are considered leaders in scientific, commercial, artistic, entertainment, and literary ideas.

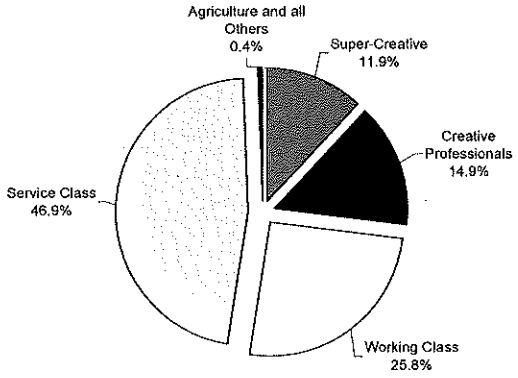
The next important creative group consists of the *creative professionals*. In this group we find managers and administrators, business finance specialists, along with lawyers, physicians, and special allied health care practitioners and technicians. The creative professional list also includes sales managers and high-end sales people. We have added community, religious, and counseling specialists to this list as their training and roles seem indistinguishable from many of the other professionals.

The *working class* consists of construction, extraction, assembly and production workers, maintenance and repair specialists, along with transportation and materials handling professions. The *service class* is the broadest and largest group. It contains support positions for office, health care, and community and social care jobs. It also includes food preparation and other food services, building and grounds maintenance, and personal services. To this list we add low-end sales and services. Our last grouping is for *agriculture, fishery, and forestry* workers.

Stratified thus, our analysis identifies the distribution of these occupations in the U.S. in the following graph. Of all nonfarm occupations, the super-creative group accounted for 12 percent of positions, and the creative professionals nearly 15 percent. Combined the creative groups are 27 percent of the nation's occupations. The working class group is just under 26 percent of jobs. The service class accounts for 47 percent of nonfarm occupations, and the ag and all other sector amounts to just four-tenths of a percent of all occupations.

Figure 2.1

U.S. Occupational Distributions, 2000



III
Creative Industries

Now that the broad occupational groupings have been identified, we shift our focus to specific industries producing innovative, technological, and artistic goods and services. Table 3.1 contains a relatively detailed itemization of creative industries. This listing was informed significantly by National Science Foundation research that helps us identify industries that have comparatively high spending levels on R & D and industries that have high numbers of scientists and engineers.* These, along with arts, education, and communications industries depend heavily on creative occupations. This listing aligns somewhat with the work of Howkins, but has been expanded and itemized to allow readers to truly grasp the scope of industrial activity that fits into this broad grouping.

The *manufacturing* subgroup contains highly technical instrument and computer manufacture, along with navigation, and aerospace products. Manufacture of pharmaceuticals, chemicals, and medical equipment are also included, as are creative recreational goods like toys, games, crafts, and video games.

The *broadcast media and communications* group identifies TV and radio productions, motion picture activities, sound recording, and the news syndicates. The *professional services* industries range from legal, financial, architecture, to health care institutions. *Scientific and technical* picks up applied sciences like engineering, computer systems design, management and consulting activities, along with research, development, and testing services, both commercial and non-commercial. *Membership organizations* include business, labor and civic associations, and other nonprofit organizations.

The *education* category includes all post-secondary education institutions, fine arts and vocational schools and all other educational institutions including public and private primary and secondary schools

* National Science Foundation, Division of Science Resources Statistics, Research and Development in Industry, 1999. NSF 02-312.

The artistic and cultural categories are highly delineated and broken down into functional sub-groupings: *applied, performing, visual,* and *literary* arts, along with *heritage institutions*. To the extent that we are able, we also include and measure *independent artists, writers, and performers.*

Table 3.1

Creative Industry Groups

Manufacturing
- Aerospace products
- Instruments for navigation, measuring, and electro-medical instruments
- Other medical equipment
- Chemicals
- Pharmaceuticals and medicines
- Communications equipment and signaling systems
- Semiconductors and related
- Computers and peripherals
- Creative Recreation: Toys and games, crafts, and video games (soft and hardware)

Broadcast Media and Communications
- TV and radio productions
- Motion picture and sound recording
- News Syndicates

Professional Services
- Legal services
- Accounting services
- Architecture
- Health care services

Scientific and Technical
- Engineering
- Computer systems design and related
- Management, scientific, and technical consulting
- Commercial and governmental scientific research and development and testing facilities

Membership Organizations
- Business associations
- Labor and civic associations
- Religious organizations
- Other non-profit organizations

Education
- All post secondary education institutions – private and public
- Vocational schools
- All other education

Art – Applied
- Graphic design
- Advertising
- Commercial photography

Art – Performing
- Theater
- Dance
- Bands, orchestras, and other entertainers
- Musical instrument manufacturing

Art – Visual
- Commercial art dealers
- Mfg of photographic film, etc
- Photofinishing laboratories
- Art print gravure printing

Arts – Literary
- Book publishing
- Magazine publishing
- Newspaper publishing
- Greeting card publishing

Commercial Sports
- Racing
- Professional Sports

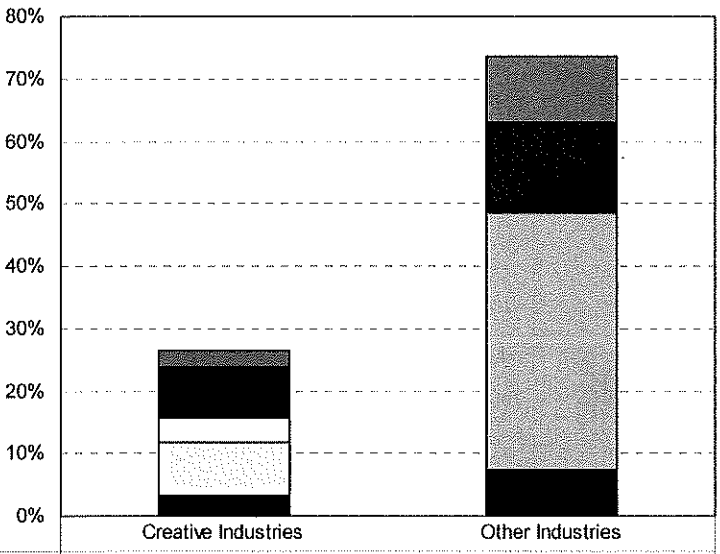
Heritage
- Museums and art galleries
- Historical sites
- Heritage and theme parks

Independent artists, writers, and performers

The following chart shows the distribution of creative and all other industries in the U.S. in 2000. In all, the creative industries accounted for 26.4 percent of nonfarm jobs. Education was the largest segment at 8.6 percent, followed by professional services at 8 percent. Scientific and technical services industries accounted for nearly 4 percent of nonfarm jobs, and creative manufacturing 2.7 percent. Combined, broadcast media, all arts, and all other creative industries were 3.1 percent of jobs. We can see that all other manufacturing accounted for 10.4 percent of jobs, other services, 14.6 percent, with over 41 percent of nonfarm jobs found in all other firms.

Figure 3.1

U.S. Jobs by Creative and All Other Industry Distributions



	Creative Industries	Other Industries
Creative Manufacturing	2.7%	
Professional Services	8.0%	
Scientific & Technical Services	3.9%	
All Education	8.6%	
Broadcast & Media, All Arts, and All Other Creative	3.2%	
Other Manufacturing		10.4%
Other Services		14.6%
Trade, Finance, and All Other Nonfarm Private Industries		41.1%
Government		7.4%

IV
Industrial – Occupational Matrix

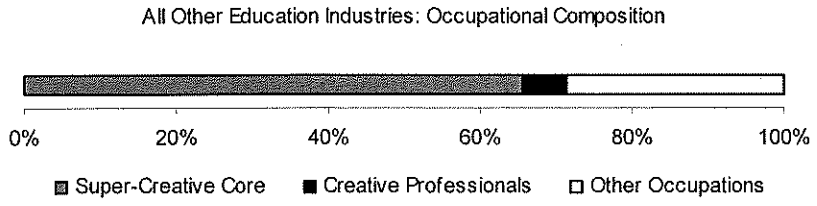
The value of our dual focus, an analysis of creative occupations and creative industries, is revealed when we look at the occupational make-up of industries in the United States. Relying on 2000 BLS data*, and controlling for our categories of creative industries and creative occupations, we are able to discern the distribution of creative jobs in the U.S. either by industry or in total.

Table 4.1 shows the incidence of creative occupations and all other occupations within creative industries and all other industries in the United States. Key findings in the table include the following:

- Among creative industries, the highest incidence of creative occupations occurs in *all other education* (71.5 percent), followed by *scientific and technical services* (68.8 percent), *post-secondary education* (66.7 percent), *performing arts* (61 percent), and *broadcast and media* firms (60 percent).

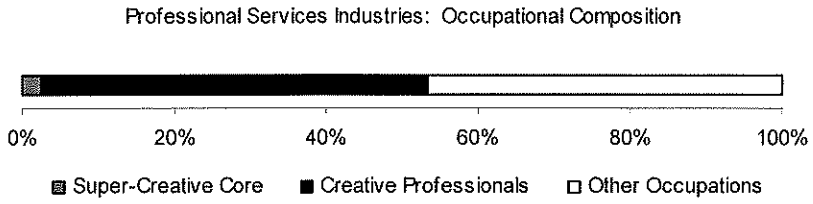
- For the group of creative industries as a whole, 33 percent of the occupations are in the super-creative category and 24.5 percent are in creative professional occupations.

- The highest incidence of super-creative occupations is found in "all other education," where super-creative occupations are 66 percent of all jobs. Post-secondary education, broadcast and media firms, and performing arts industries all have over 50 percent of all jobs in super-creative occupations.



* Bureau of Labor Statistics, "2000 National Industry-Specific Occupational Employment and Wage Estimates. U.S. Department of Labor, 2002.

- The highest incidence of creative professionals is posted in professional service industries at 51 percent, followed much farther back by membership organizations and scientific and technical services both at just under 23 percent.



- Two other industry groups warrant mention. A large fraction of the visual arts category in the creative industry group contains production workers in commercial printing – hence the comparatively low fraction of creative workers (17.6 percent). Creative workers have 30 percent of the jobs in the government sector, one of our All Other industry classifications, which distinguishes it strongly from the remaining industries in that group.

Table 4.1

The Composition of U.S. Industries by Type of Occupation, 2000

(Percentage of Industry Employment by Occupation)

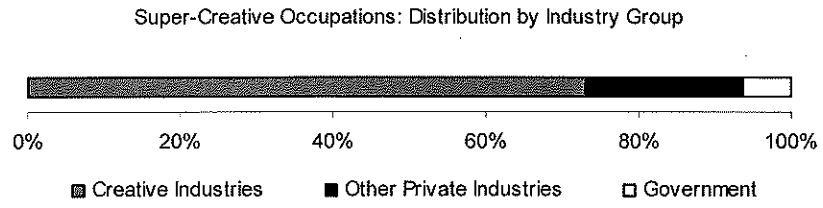
		Creative Occupations				
	Industry	Super-Creative Core	Creative Professionals	Creative Total	All Other Occupations	Total, All Occupations
Creative Industries	Creative Manufacturing	25.0	13.7	38.7	61.3	100.0
	Broadcast and Media	51.3	8.7	60.0	40.0	100.0
	Professional Services	2.4	51.0	53.4	46.6	100.0
	Scientific & Technical Services	46.3	22.5	68.8	31.2	100.0
	Post-secondary Education	51.8	14.9	66.7	33.3	100.0
	All Other Education	65.6	5.9	71.5	28.5	100.0
	Arts-Applied	19.9	15.7	35.7	64.3	100.0
	Arts-Literary	24.0	10.5	34.5	65.5	100.0
	Arts-Performing	50.8	10.3	61.0	39.0	100.0
	Arts-Visual	9.5	8.0	17.6	82.4	100.0
	Commercial Sports	14.5	8.8	23.3	76.7	100.0
	Heritage Institutions	22.9	10.8	33.7	66.3	100.0
	Membership Organizations	10.9	22.6	33.5	66.5	100.0
	Total, Creative Industries	**33.0**	**24.5**	**57.6**	**42.4**	**100.0**
Other Industries	Agriculture Services	1.4	11.5	12.8	87.2	100.0
	Other Manufacturing	5.4	7.7	13.1	86.9	100.0
	Other Services	5.2	11.1	16.3	83.7	100.0
	All Other Nonfarm Private	2.8	10.9	13.7	86.3	100.0
	Government	10.0	20.0	30.0	70.0	100.0
	Total, Other Industries	4.4	11.4	15.8	84.2	100.0
Grand Total, All Industries		11.9	14.9	26.8	73.2	100.0

Table 4.1 clearly illustrates the creative occupational content of our combined creative industry types. The incidence of creative occupations was three times greater in the creative industries than the all other industry average. In 2000, creative occupations comprised

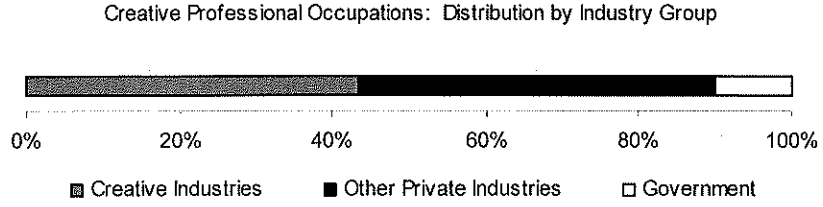
57.6 percent of creative industry jobs, and
15.8 percent of jobs in all other industries.

Table 4.2 shows an alternative view of the occupation-by-industry matrix. This view allows us to see which industries in the U.S. employ the greatest number of super-creative, creative professional, and all other occupations.

- Of the super-creative occupations, over 73 percent are found in the creative industries. The biggest employer is all other education (34.4 percent), followed by scientific and technical firms (15.2 percent), post-secondary education (10.3 percent), and creative manufacturing (5.7 percent). All other industries employ almost 27 percent of the nation's super creative workers.



- The percentage of creative professionals in the creative industries, 43.5 percent, is much less than its super-creative figure. Professional services firms account for 27.3 percent of these jobs, followed at much lower levels by science and technical services firms (5.9 percent) and creative manufacturing (3.9 percent).



As a group, creative industries employ the majority of all creative occupations in the United States. In 2000, the creative industries employed

56.7 percent of all creative occupations, and
15.3 percent of all other occupations.

All other private industries employ 35.0 percent of the nation's creative workforce, and government employs the remaining 8.3 percent. Together, private industry and government employ almost 85 percent of workers not classified in creative occupations.

Table 4.2

The Distribution of Occupation Types Among U.S. Industries, 2000

(Percentage of Occupation Type by Industry)

		Creative Occupations				
	Industry	Super-Creative Core	Creative Professionals	Creative Total	All Other Occupations	Total, All Occupations
Creative Industries	Creative Manufacturing	5.7	2.5	3.9	2.3	2.7
	Broadcast and Media	1.8	0.2	0.9	0.2	0.4
	Professional Services	1.6	27.3	15.9	5.1	8.0
	Scientific & Technical Services	15.2	5.9	10.1	1.7	3.9
	Post-secondary Education	10.3	2.4	5.9	1.1	2.4
	All Other Education	34.4	2.5	16.7	2.4	6.3
	Arts-Applied	0.8	0.5	0.7	0.4	0.5
	Arts-Literary	1.1	0.4	0.7	0.5	0.6
	Arts-Performing	0.7	0.1	0.4	0.1	0.2
	Arts-Visual	0.4	0.3	0.3	0.6	0.5
	Commercial Sports	0.1	0.1	0.1	0.1	0.1
	Heritage Institutions	0.2	0.1	0.1	0.1	0.1
	Membership Organizations	0.8	1.3	1.1	0.8	0.8
	Total, Creative Industries	**73.2**	**43.5**	**56.7**	**15.3**	**26.4**
Other Industries	Agriculture Services	0.1	0.7	0.4	1.0	0.9
	Other Manufacturing	4.7	5.4	5.1	12.3	10.4
	Other Services	6.4	10.9	8.9	16.7	14.6
	All Other Nonfarm Private	9.4	29.5	20.6	47.4	40.2
	Government	6.2	10.0	8.3	7.1	7.4
	Total, Other Industries	26.8	56.5	43.3	84.7	73.6
Grand Total, All Industries		100.0	100.0	100.0	100.0	100.0

The value of the industrial and occupational matrix is to point out that industrial targeting should attract creative workers, and *worker targeting* will provide the necessary labor pool for creative industries. The two are inextricably linked.

V

Creative Occupations – Iowa and the U.S.

The Current Distribution of Occupations in Iowa and the U.S.

The composition of the national workforce provides a useful benchmark in assessing Iowa's creative workforce. Table 5.1 itemizes the state and the national occupational distributions in super-creative, creative professional, and all other occupations. It lists these occupations as a percentage of total nonfarm employment to facilitate side-by-side comparison. Finally, the table lists occupational *location quotients* for Iowa. The location quotient is simply the percentage of nonfarm employment in Iowa in any category divided by the national percentage in the same category. It allows us to gauge the relative strengths and weaknesses of Iowa's occupational mix.

Table 5.1

Employment by Major Occupation in Iowa and the United States, 2000

			Total Employment		Percentage of Employment		Location Quotient
			Iowa	U.S.	Iowa	U.S.	
Creative Occupations	Super-Creative Core	Computer and Mathematical	22,710	2,932,810	1.6%	2.3%	0.69
		Architecture and Engineering	18,820	2,575,620	1.3%	2.0%	0.66
		Life, Physical, and Social Sciences	10,230	1,038,670	0.7%	0.8%	0.88
		Education, Training, and Library	89,040	7,450,860	6.2%	5.7%	1.07
		Arts, Design, Entertainment, Sports, and Media	14,930	1,513,420	1.0%	1.2%	0.89
		Subtotal, Super-Creative	*155,730*	*15,511,380*	*10.8%*	*12.0%*	0.90
	Creative Professional	Management	86,770	7,782,680	6.0%	6.0%	1.00
		Business and Financial Operations	46,720	4,619,270	3.2%	3.6%	0.91
		Community and Social Services	6,240	522,390	0.4%	0.4%	1.07
		Legal	7,630	890,910	0.5%	0.7%	0.77
		Healthcare Practitioners and Technical	66,100	6,041,210	4.6%	4.7%	0.98
		Sales and Related	21,170	2,534,130	1.5%	2.0%	0.75
		Subtotal, Creative Professional	*234,630*	*22,390,590*	*16.2%*	*17.3%*	0.94
	Total, Creative		*390,360*	*37,901,970*	*27.0%*	*29.2%*	0.92
Other Occupations	Agriculture, Working Class, and Service Class	Farming, Fishing, and Forestry	5,970	460,700	0.4%	0.4%	1.16
		Construction and Extraction	56,770	6,187,360	3.9%	4.8%	0.82
		Installation, Maintenance, and Repair	59,520	5,318,490	4.1%	4.1%	1.00
		Production	175,220	12,400,080	12.1%	9.6%	1.27
		Transportation and Material Moving	125,690	9,592,740	8.7%	7.4%	1.18
		Community and Social Services	14,640	946,610	1.0%	0.7%	1.39
		Healthcare Support	37,300	3,039,430	2.6%	2.3%	1.10
		Protective Service	20,130	3,009,070	1.4%	2.3%	0.60
		Food Preparation and Serving Related	121,550	9,955,060	8.4%	7.7%	1.10
		Building and Grounds Cleaning and Maint.	43,420	4,318,070	3.0%	3.3%	0.90
		Personal Care and Service	27,240	2,700,510	1.9%	2.1%	0.90
		Sales and Related	130,820	10,972,750	9.0%	8.5%	1.07
		Office and Administrative Support	237,480	22,936,140	16.4%	17.7%	0.93
	Total, Other		*1,055,750*	*91,837,010*	*73.0%*	*70.8%*	1.03
Total, All Occupations			1,446,110	129,738,980	100.0%	100.0%	1.00

In 2000, Iowa had 155,730 workers in super-creative occupations. This represented 10.8 percent of nonfarm occupations in Iowa, compared to a national average of 12 percent. Iowa had 234,630 workers in professional creative occupations. This was 16.2 percent of the state's nonfarm occupations, compared to the national figure of 17.3 percent. The 390,367 workers in all creative jobs were 27 percent of the state's occupations, compared 29.2 percent of the national nonfarm workforce.

Figure 5.1 displays the location quotients (LQs) for Iowa for occupations within the super-creative grouping. As the U.S. average for any category is 1.0, the values for Iowa represent the relative position in Iowa to the U.S. norm. The LQs for computer and mathematical and for architectural and engineering occupations in Iowa are .69 and .66, respectively. This means that, distributively, Iowa has only 69 percent and 66 percent of the expected employment in these two sets of occupations. The life, physical, and social science quotient is .88, and the art, design, sports, and media quotient was .89, or 88 percent and 89 percent, respectively, of what would be expected. Iowa scores higher than the national average at 1.07 in education, training, and library occupations. In total, the weighted LQ for all super-creative professionals is .90, or 90 percent of what would be the norm were we to mirror national nonfarm averages.

Figure 5.1

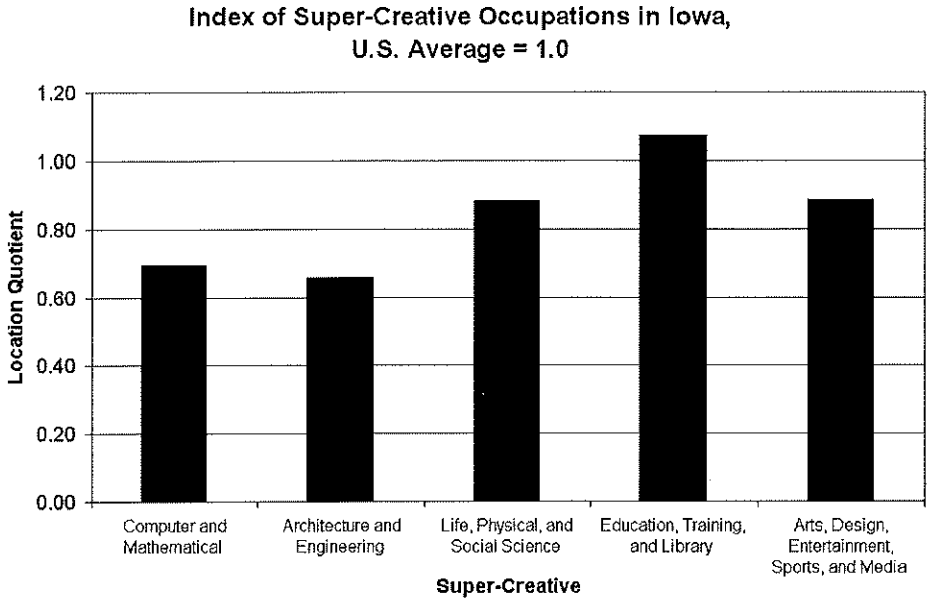
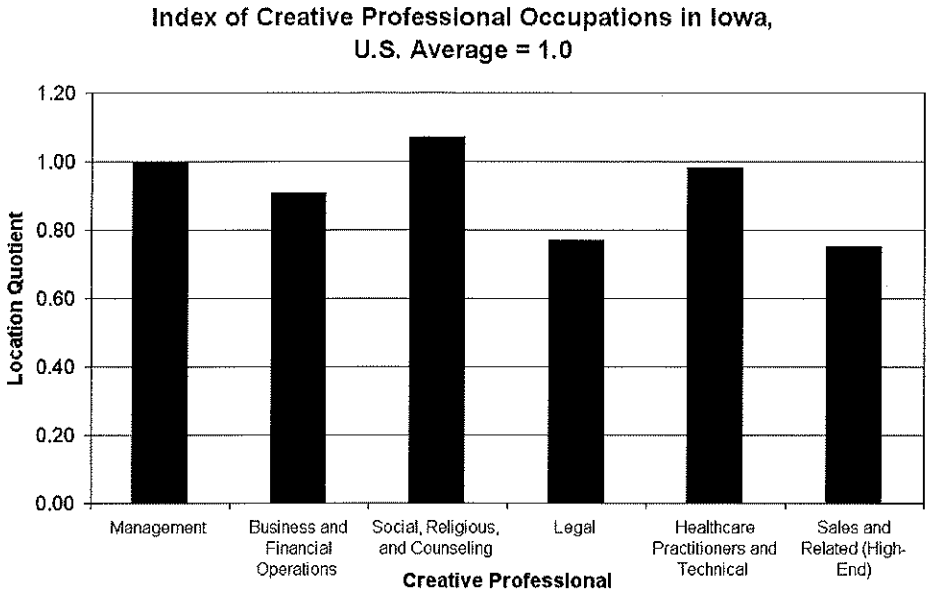


Figure 5.2 displays the same index measure of creative professionals in Iowa. Iowa ranks at or very near the national average in management professions and in healthcare practitioners and technical occupations. Iowa is higher than the national norm (1.07) in social religious and counseling occupations, and significantly lower than the national norm in legal occupations (.77) and in high-end sales occupations (.75). Referring back to Table 5.1, the LQ for all creative professionals is .94, higher than the super-creative index. The weighted value for all creative occupations is .92.

Figure 5.2



Looking at all other occupations in Table 5.1 the state has comparatively higher concentrations of employment in farming, production, transportation and material moving, and in community and social services, as indicated by LQs greater than 1.10. It has significantly lower concentrations in construction and extraction (mining) fields and in protective services, as indicated by LQs that are lower than .90.

Changes in Creative Occupations: 1990 to 2000

In this section, we analyze data from the 1990 and the 2000 census for the U.S. and for Iowa to identify the composition of occupational changes in our creative categories. Due to differences in classification, the categories are slightly different than those presented thus far, but these data allow us to identify meaningful amounts of change and the composition of change.

Table 5.2 indicates that between 1990 and 2000, the number of creative occupations increased by 126,885 in Iowa. According to this breakdown, the greatest growth in Iowa and in the U.S. occurred in the managerial and financial occupations, followed by education, training and library fields, and by math and computers.

Very high rates of growth were recorded for both the U.S. and for Iowa in math and computing occupations at 125.6 percent and 142.5 percent, respectively. Iowa's rates of growth significantly exceeded the U.S. in life, physical, and the social sciences (45.5 percent to 22.8 percent), managerial and financial (55.1 percent to 22.6 percent), and for artists (25.9 percent to 21.7 percent). Iowa posted minor growth in the engineer and architects category while the U.S. totals declined by 8.5 percent. In all, Iowa's super-creative group grew just over one percentage point faster than the U.S., but its creative professional occupations grew 20 percentage points faster than the national rate. Among its creative professional occupations, the state realized strong gains in managerial and financial jobs, but comparatively less in legal professions. Combined, there is a stark difference in creative professional growth in Iowa compared to the U.S. Iowa's total creative occupations grew by about 40 percent over the decade, while the U.S. total was just over 27 percent. The number of persons employed in all occupations grew by 11.2 percent in Iowa and 12.1 percent in the United States.

Table 5.2

Employment Change in Selected Creative Occupations, 1990-2000

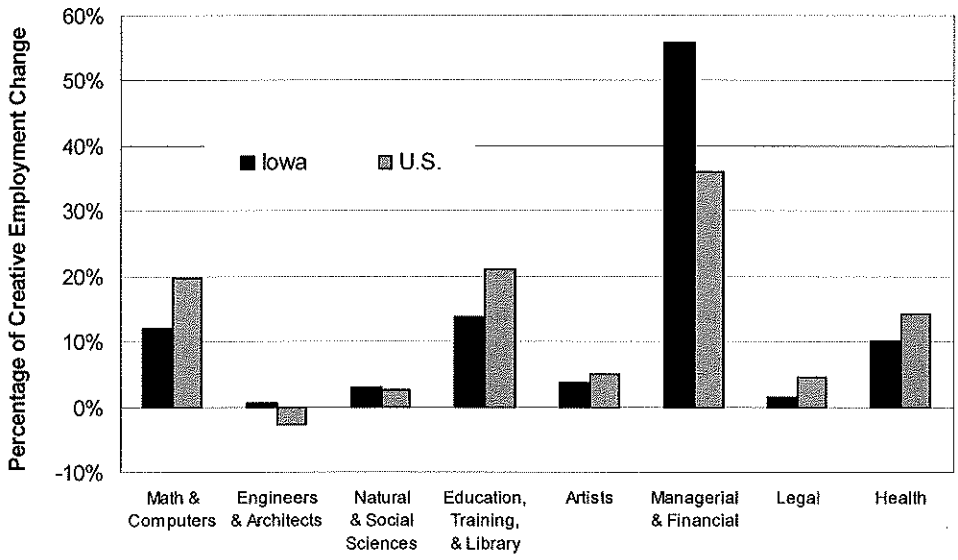
Occupation	Actual Change 1990-2000		Percentage Change 1990-2000	
	Iowa	U.S.	Iowa	U.S.
Math & Computers	15,137	1,764,210	142.5%	125.6%
Engineers & Architects	662	(246,422)	3.1%	-8.5%
Life, Physical, and Social Sciences	3,733	223,795	45.5%	22.8%
Education, Training, and Library	17,369	1,877,582	25.5%	34.4%
Artists	4,532	443,734	25.9%	21.7%
Subtotal, Super-Creative	41,434	4,062,899	33.0%	31.8%
Managerial & Financial	70,937	3,220,122	55.1%	22.6%
Legal	1,869	399,703	25.4%	39.5%
Health	12,646	1,263,676	23.0%	26.8%
Subtotal, Creative Professional	85,451	4,883,501	44.7%	24.5%
Total Creative	126,885	8,946,400	40.1%	27.3%
All Occupations	149,574	14,040,310	11.2%	12.1%

Figure 5.3 provides additional insights into the nature of change in our super-creative and our creative professional occupations over the decade. Managerial and financial occupations were disproportionately greater in Iowa, accounting for 56

percent of all creative employment growth, compared to 36 percent for the U.S. As a consequence, other categories of creative employment growth in Iowa generally were much less than the U.S. averages. The composition of U.S. creative occupation growth significantly outdistanced Iowa in education, training, and library skills (21 percent to 14 percent), in math and computer occupations (20 percent to 12 percent), and in health occupations (14 percent to 10 percent). Of the change it is interesting to note that life, physical, and social scientists, artists, engineers and architects, and legal occupations combined accounted for a comparatively small fraction of all creative occupation changes over the decade.

Figure 5.3

Composition of Creative Occupation Change, Iowa and the U.S., 1990-2000

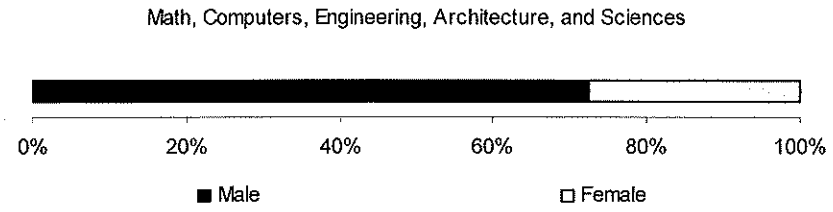


Gender Differences in Creative Occupations

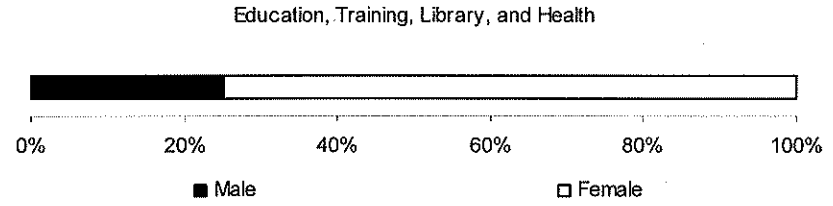
This section explores the composition of creative employment occupations in Iowa by gender. Again, the data relied upon are from the 1990 and the 2000 census. Accordingly, these data are based on a 5 percent sample of the state's population and the totals are extrapolated to the entire population of the state.

If we look at the creative occupation total, we see that the occupational split between the genders is essentially even. There are, however, high degrees of gender-

based differences among the creative categories. In math and computers, there were, in 2000, two males for each female professional. In engineering and architecture, men were 87 percent of the professionals, and in the life, physical, and social sciences, men were 60 percent of the total. The combined male percentage for these occupations was 73 percent.



The number of women exceeded men by a wide margin in education, training, and library sciences (72 percent). Women were also strongly predominant in health care professions (78.5 percent). The combined female percentage for these occupations was 75 percent.



The gender distribution among the remaining creative occupations was more even. Women outnumbered men only slightly among artists (54 percent), while men had 62 percent of the managerial, financial, and legal jobs.

When we look at the composition of job change over time by gender for each creative occupation category, some interesting patterns emerge. In math and computers, the economy added two men for every female professional. Men also had the edge in managerial and financial occupations, gaining 70 percent of the net new positions. Women accounted for significant net growth in education, training, and library professions (94 percent), legal professions (94 percent), health care professions (84 percent), and artists (62 percent). Comparatively, women accounted for 64 percent of the super-creative net occupation changes, men accounted for 61 percent of creative professional growth, but when all was summed men gained more than women in total creative jobs, accounting for 53 percent of the change.

Table 5.3

Gender-Based Characteristics of Creative Occupations in Iowa

Occupation	Gender Composition in 2000		Distribution of Change by Gender, 1990 to 2000	
	Male	Female	Male	Female
Math & Computers	65.6%	34.4%	66.1%	33.9%
Engineers & Architects	87.4%	12.6%	43.6%	56.4%
Life, Physical, & Social Sciences	59.7%	40.3%	51.7%	48.3%
Education, Training, & Library	28.1%	71.9%	5.8%	94.2%
Artists	46.3%	53.7%	38.1%	61.9%
Subtotal, Super-Creative	46.3%	53.7%	36.1%	63.9%
Managerial & Financial	62.8%	37.2%	70.3%	29.7%
Legal	54.8%	45.2%	5.6%	94.4%
Health	21.5%	78.5%	15.9%	84.1%
Subtotal, Creative Professional	52.4%	47.6%	60.8%	39.2%
Total Creative	50.1%	49.9%	52.7%	47.3%

Earnings in Creative Occupations

One important measure of the overall value of different occupations to the state and its economy is the average earnings. Table 5.4 details average annual earnings in our creative groups and all other occupations in Iowa and in the U.S. It also shows the Iowa average as a percentage of the U.S. average. Of the super-creative subgroup, weighted average earnings were just under 83 percent of the U.S. average. For the creative professionals, earnings were just under 84 percent of the national amount. The weighted earnings per worker for all other Iowa occupations as compared to the U.S. norms were higher than for the creative groups. All other occupations earned 92.2 percent of the U.S. average, while all creative occupations earned 83.7 percent of the U.S. average.

Table 5.4

Average Annual Earnings by Occupation in Iowa and the United States, 2000

			Iowa	U.S.	Iowa as a Percentage of the U.S.
Creative Occupations	Super-Creative Core	Computer and Mathematical	51,465	58,279	88.3%
		Architecture and Engineering	45,839	53,341	85.9%
		Life, Physical, and Social Science	40,067	49,447	81.0%
		Education, Training, and Library	33,077	37,464	88.3%
		Arts, Design, Entertainment, Sports, and Media	27,690	38,641	71.7%
		Subtotal, Super-Creative	*37,195*	*44,973*	*82.7%*
	Creative Professional	Management	56,873	68,584	82.9%
		Business and Financial Operations	40,853	48,217	84.7%
		Community and Social Services	30,690	35,502	86.4%
		Legal	61,805	72,381	85.4%
		Healthcare Practitioners and Technical	40,118	47,326	84.8%
		Sales and Related	41,585	51,724	80.4%
		Subtotal, Creative Professional	*47,137*	*56,226*	*83.8%*
	Total, Creative		*43,270*	*51,698*	*83.7%*
Other Occupations	Agriculture		22,765	18,603	122.4%
	Working Class		27,346	29,002	94.3%
	Service Class		20,392	22,858	89.2%
	Total, Other		*23,083*	*25,043*	*92.2%*
Total, All Occupations			28,335	32,474	87.3%

Figure 5.4 displays the Iowa and U.S. earnings comparisons for the super-creative occupations.* The highest scores are the computer and mathematical workers and the education, training, and library professionals in Iowa each at 88.3 percent of the U.S. average. Close behind are architects and engineers at 86 percent. Iowa's life, physical, and social scientists scored 81 percent of the national norm. The lowest earnings average is in the broad art, design, entertainment, sports, and media category. Their category average was under 72 percent of the U.S. norm in 2000.

Figure 5.5 displays the earnings averages for the creative professionals. These earnings do not range as much as the super-creative group. Social, religious, and counseling occupations earned 86.4 percent of the U.S. norm in 2000, followed by legal (85.4 percent), health care professionals (84.8 percent), business and financial (84.7 percent), and management (83 percent). Higher-end sales professionals earned just 80.4 percent of the U.S. average in those occupations

* These values have been calculated at annual, full-time amounts, even though not all occupations are full-time, year-round positions. The data upon which we relied does not allow us to adjust for average hours and average weeks worked.

Figure 5.4

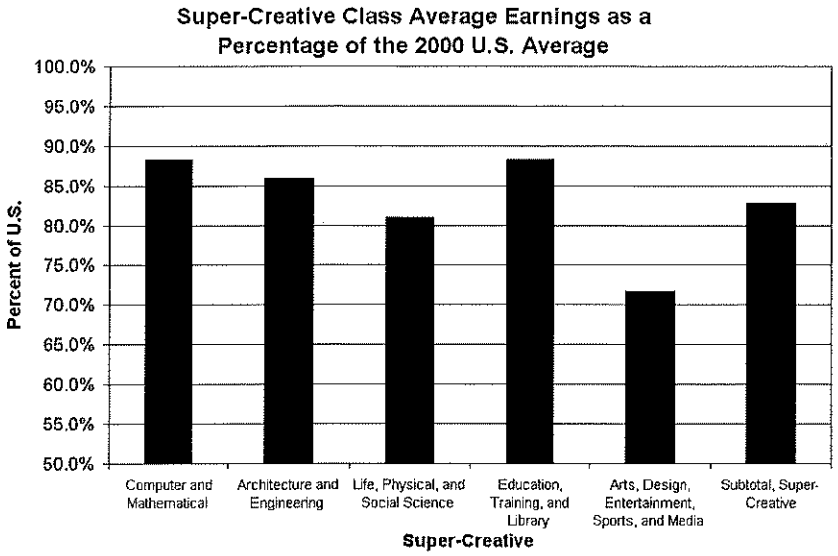
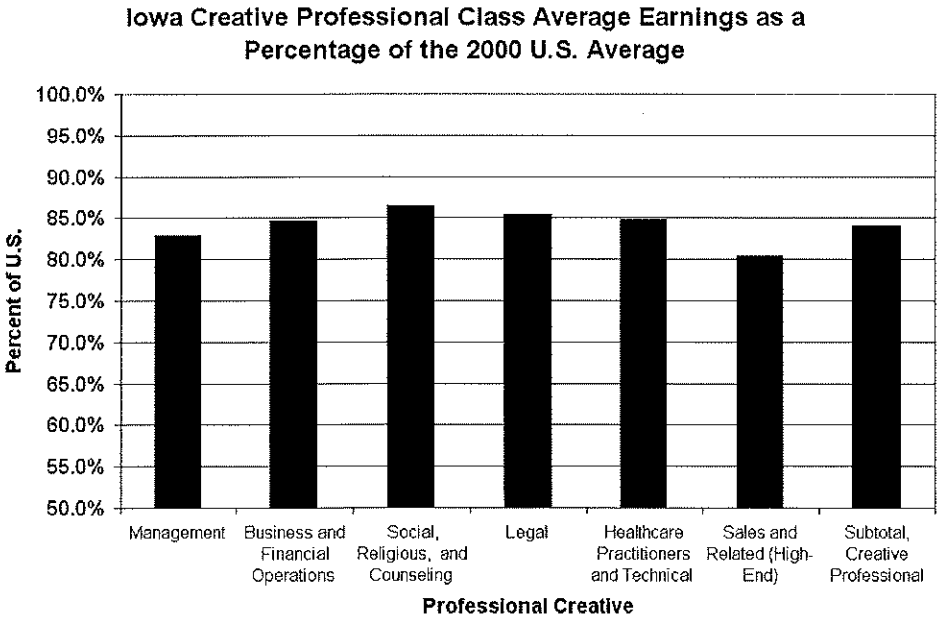


Figure 5.5



VI

Creative Industries – Iowa and the U.S.

Creative Industry Employment

Iowa's comparative situation regarding creative industry employment is displayed in Table 6.1. The table is instructive about Iowa's current overall composition of jobs in creative industries when compared to the U.S. We also display a location quotient for these jobs (LQ), which is the percent of nonfarm employment in Iowa in a measurement category divided by the corresponding U.S. percentage.

Table 6.1

Iowa and U.S. Employment in Creative Industries, 2000

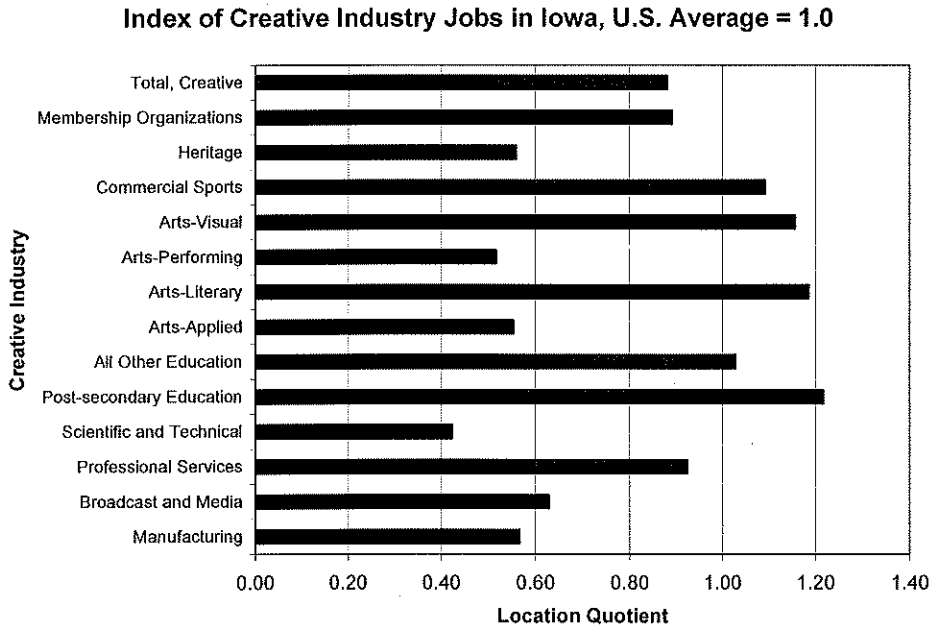
Creative Industry Group	2000 Total Employment		Percent of Nonfarm Employment		Location Quotient
	Iowa	U.S.	Iowa	U.S.	
Manufacturing	17,298	2,738,239	1.3	2.2	0.57
Broadcast and Media	3,783	540,537	0.3	0.4	0.63
Professional Services	110,577	10,736,790	8.1	8.8	0.92
Scientific and Technical	17,246	3,655,069	1.3	3.0	0.42
Post-secondary Education	39,764	2,935,133	2.9	2.4	1.22
All Other Education	88,533	7,733,259	6.5	6.3	1.03
Arts-Applied	2,427	393,629	0.2	0.3	0.55
Arts-Literary	9,210	697,586	0.7	0.6	1.19
Arts-Performing	1,257	218,145	0.1	0.2	0.52
Arts-Visual	2,375	184,448	0.2	0.2	1.16
Commercial Sports	1,805	148,394	0.1	0.1	1.09
Heritage	792	127,019	0.1	0.1	0.56
Membership Organizations	10,907	1,098,690	0.8	0.9	0.89
Total, Creative	305,972	31,206,938	22.5	25.6	0.88
All Nonfarm	1,359,871	122,136,512	100.0	100.0	1.00

In 2000, Iowa had almost 306,000 jobs in creative industries, 22.5 percent of the nonfarm total compared to 25.6 percent for the U.S.. The category with the greatest number of jobs is professional services (110, 577), followed by all other education (88,533), and post-secondary education (39,764). As a share of all nonfarm jobs, Iowa has slightly fewer than the U.S. in professional services (8.1 percent to 8.8 percent). It has slightly higher fractions of jobs than the U.S. in post-secondary education and in all other education, and otherwise compares similarly with all of the remaining categories excepting these: Iowa's creative manufacturing

share is 1.3 percent of nonfarm jobs compared to the U.S. average of 2.2 percent, and scientific and technical jobs in Iowa are 1.3 percent of the total compared to 3 percent for the U.S. These differences are illustrated in the next graph.

Figure 6.1 allows a visual gauge of the overall composition of creative industry jobs in Iowa compared to the nation. As before, we display location quotients (LQ). In each category, the U.S. average is 1.0. Iowa posts high LQs for post-secondary education, 1.22, for literary arts, 1.19, and for visual arts, 1.16. Iowa is relatively close to the U.S. averages in professional services, all other education, commercial sports, and in membership organizations. Iowa is significantly lower than the U.S. norm, distributively, in science and technical employment (.42), performing arts (.52), applied arts (.55), commercial sports (.56), creative manufacturing (.57), and broadcast and media industry jobs (.63).

Figure 6.1



Employment Changes in Creative Industries, 1990 to 2000

As with our creative occupational analysis, it is instructive to assess the changes in our creative industries in Iowa and in the U.S. In Table 6.2 we see the numerical and the percentage changes in creative industry jobs in Iowa and the U.S.

from 1990 to 2000. Professional services growth was greatest among our Iowa creative industries adding 16,342 jobs. The second greatest gain was in all other education, followed by post-secondary education (5,322) and by scientific and technical firms (5,146). Declines were posted in creative manufacturing (-1,055) and in literary arts firms (-1,888).

Overall, jobs in Iowa's creative industries increased by 14 percent, compared to a U.S. gain of 24 percent. In nearly every major category, the U.S. out-distanced Iowa. Iowa's professional services jobs grew by 17 percent between 1990 and 2000, 5 percentage points less than the U.S. experience. Iowa's scientific and technical jobs grew by 43 percent, 21 percentage points less than the U.S. rate of growth. Iowa's education categories grew by only half as much as the U.S. Creative manufacturing declined by 6 percent compared to a U.S. decline of 13 percent.

Iowa posted performing arts gains of 49 percent compared to a U.S. gain of 23 percent, and it had a 35 percent increase in visual arts employment where the U.S. experienced no growth.

Table 6.2

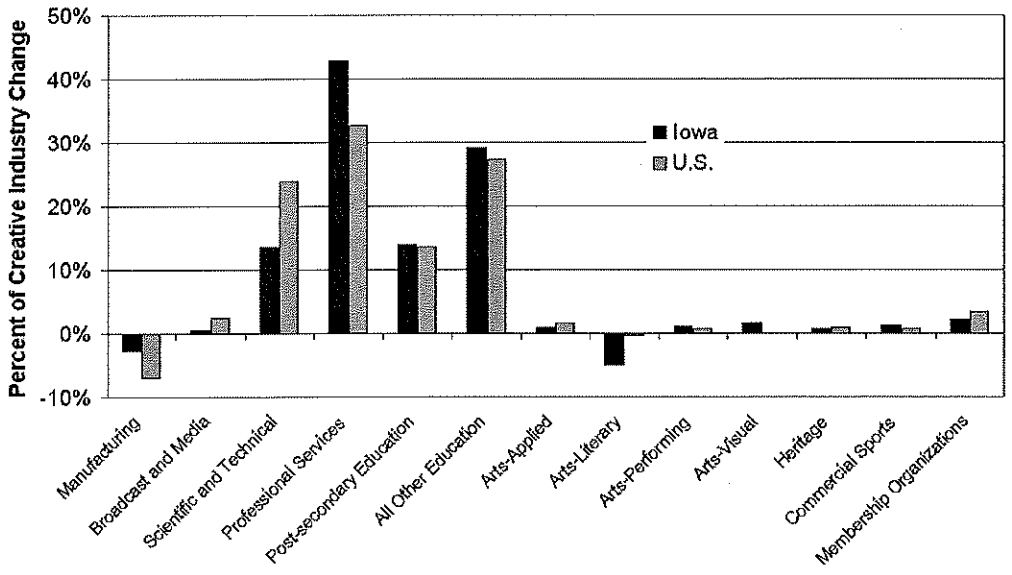
Employment Change in Iowa and U.S. Creative Industries, 1990 to 2000

Creative Industry Group	Actual Change, 1990 to 2000		Percentage Change	
	Iowa	U.S.	Iowa	U.S.
Manufacturing	(1,055)	(410,481)	-6%	-13%
Broadcast and Media	176	147,732	5%	38%
Professional Services	5,146	1,422,926	43%	64%
Scientific and Technical	16,342	1,945,509	17%	22%
Post-secondary Education	5,322	804,491	15%	38%
All Other Education	11,109	1,630,647	14%	27%
Arts-Applied	324	92,240	15%	31%
Arts-Literary	(1,888)	(16,541)	-17%	-2%
Arts-Performing	412	40,368	49%	23%
Arts-Visual	617	(7)	35%	0%
Commercial Sports	279	52,285	54%	70%
Heritage	505	45,303	39%	44%
Membership Organizations	827	197,636	8%	22%
Total, Creative	38,116	5,952,108	14%	24%

Figure 6.2 displays the composition of change in creative industry jobs in Iowa and in the U.S. Professional jobs accounted for 43 percent of all creative industry job growth in Iowa, compared to 22 percent for the U.S. In the U.S. 24 percent of creative job growth accrued to scientific and technical firms, but the corresponding percentage for Iowa was 13 percent. For all practical purposes, the remaining share changes are very small and comparatively similar.

Figure 6.2

Composition of Creative Industry Job Change, Iowa and the U.S., 1990 to 2000



The professional services and scientific and technical categories underscore the major difference in creative industry change in Iowa and in the U.S.: Iowa is more attractive to professional services and less attractive to scientific and technical firms.

Earnings Per Job in Creative Industries

As with the creative occupations, it is instructive to assess job quality via wages paid in Iowa in our creative industries compared with U.S. averages in similar

industries. These compilations are found in Table 6.2. The table also shows recent changes in average earnings per job.

Table 6.2

Average Earnings per Job in Creative Industries, Iowa and the U.S.

Creative Industry Group	2000 Average Earnings per Job			Percentage Change in Average Earnings, 1997-2000	
	Iowa	U.S.	Iowa: Percent of U.S.	Iowa	U.S.
Manufacturing	46,033	73,466	62.7%	17.3	34.46
Broadcast and Media	29,362	55,812	52.6%	11.5	15.13
Professional Services	35,523	41,906	84.8%	12.9	11.91
Scientific and Technical	41,816	66,799	62.6%	14.6	25.97
Post-secondary Education	35,874	34,955	102.6%	15.0	12.22
All Other Education	25,016	30,801	81.2%	8.4	10.93
Arts-Applied	36,992	57,994	63.8%	8.5	23.00
Arts-Literary	31,370	42,743	73.4%	8.6	18.46
Arts-Performing	11,071	36,968	29.9%	29.5	11.62
Arts-Visual	20,587	29,251	70.4%	-10.5	15.19
Commercial Sports	17,162	69,906	24.6%	16.0	28.49
Heritage	17,951	24,434	73.5%	13.6	10.18
Membership Organizations	16,764	23,016	72.8%	13.4	14.04
Total, Creative	32,249	43,935	73.4%	12.4	17.76

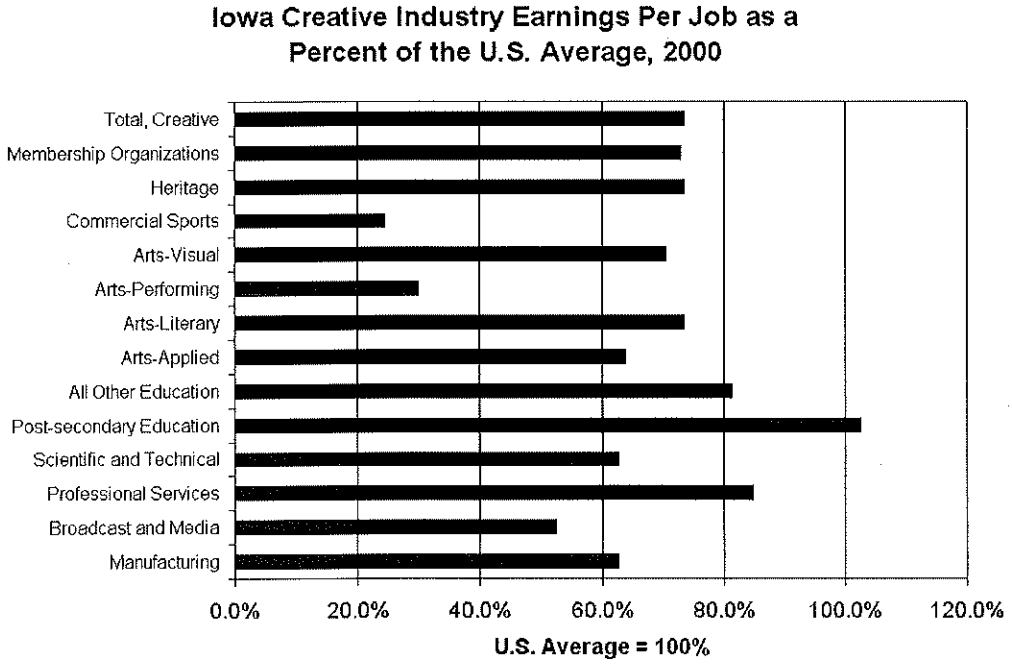
The highest average earnings per job in our creative industries is found in creative manufacturing at $46,033. The next highest is in scientific and technical firms ($41,816), followed by applied arts ($36,992), and post-secondary education ($35,874). The lowest values were found in the performing arts ($11,071), membership organizations ($16,764), commercial sports ($17,162), and heritage institutions ($16,764). Overall, average pay in creative industry jobs increased by 12.4 percent in Iowa compared to 17.8 percent for the U.S. over the 1997 to 2000 period. For Iowa the highest gains were found in the performing arts at 29.9 percent. Stronger gains were also posted in creative manufacturing (17.3 percent), visual arts (16 percent), post-secondary education (15 percent), and in scientific and technical firms (14.6 percent).

Nationally, average wages in creative manufacturing grew by nearly twice as much as in Iowa. A similar pattern is also evident for scientific and technical firms, where the national rate of growth was 26 percent, just under twice as much as the

Iowa rate. In the applied arts firms, the national average wage growth rate was 23 percent, nearly three times greater than the Iowa rate, and the literary art jobs nationally earned 18.5 percent more in 2000 than in 1997, nearly ten percentage points more than the average Iowan in the same industry.

The average job in Iowa's creative industries paid $32,249 annually in 2000, which was 73.4 percent of the U.S. average for the same mix of industries. These indexed comparisons are displayed in Figure 6.5. Iowa workers in post-secondary education jobs earned slightly more than the national average at 102.6 percent. The workers next closest to the national average were those in professional services (84.8 percent). Earnings much worse than the national average were posted in commercial sports (24.6 percent) and in the performing arts (29.9 percent). The state also fared comparatively poorly in broadcast and media earnings per job at 52.6 percent of the U.S. average, scientific and technical firm jobs (62.6 percent), and in creative manufacturing (62.7 percent).

Figure 6.5

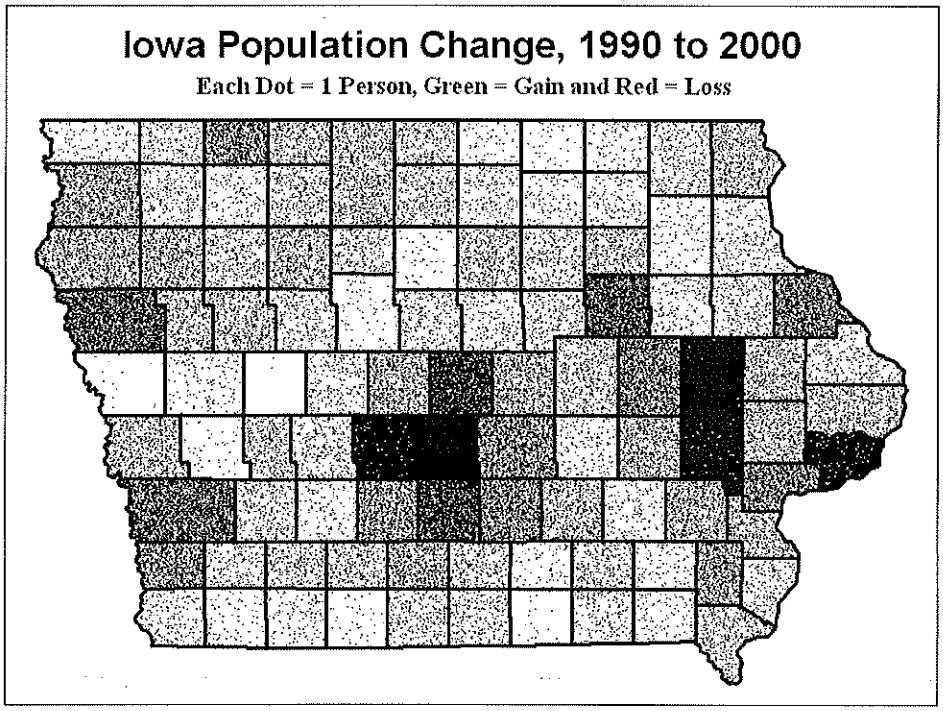


VII

Creative Industrial Growth – Iowa Metropolitan and Non-Metropolitan Changes

Over the past decade or so, there have been significantly uneven changes in the state's employment and population. Most of the state's counties have enjoyed nonfarm job growth, but nonfarm job growth has not been sufficient in many to assure population stability. Figure 7.1 dramatically portrays the fortunes of much of Iowa: 45 of the state's counties lost population, and losses were significantly evidenced among 25 counties in the north, north-central, and southern portions of the state. Gains are, however, highly concentrated among Iowa's metropolitan counties and counties adjacent to the metropolitan counties.

Figure 7.1



The gap between job growth and population growth among the state's metropolitan and nonmetropolitan areas is pronounced. Iowa's nonmetropolitan counties realized 39 percent of nonfarm job gains over the previous decade but only received 12 percent of the population gains. Among nonmetropolitan counties there

is an equal number of counties losing population and gaining population. This raises the question of the distribution of creative economy jobs in Iowa and whether there are population-based differences in the changes in the number of these jobs over the years. Stated differently, do creative jobs accrue primarily to populous areas?

Table 7.1 compares sets of creative industry and all other industry job changes in Iowa between 1990 and 2000 for metro and nonmetro counties in Iowa. Of the 38,116 creative industry jobs that were added to the state economy over this period, 32.6 percent accrued to nonmetro counties. The highest nonmetro gain was in total education at 36.3 percent, followed by jobs in the professional categories at 32.7 percent. Nonmetro counties gained only 17.5 percent of positions in scientific and technical firms and just under 7 percent of the arts and entertainment job change. In contrast, nonmetro counties gained the lion's share of ag services jobs and all other manufacturing positions over this period (66.4 percent and 89.8 percent, respectively). They also realized comparatively strong growth in government positions (46.8 percent) owing primarily to the construction of new prisons.

Table 7.1

Metro and Nonmetro Job Changes, 1990 to 2000 in Creative and All Other Industries in Iowa

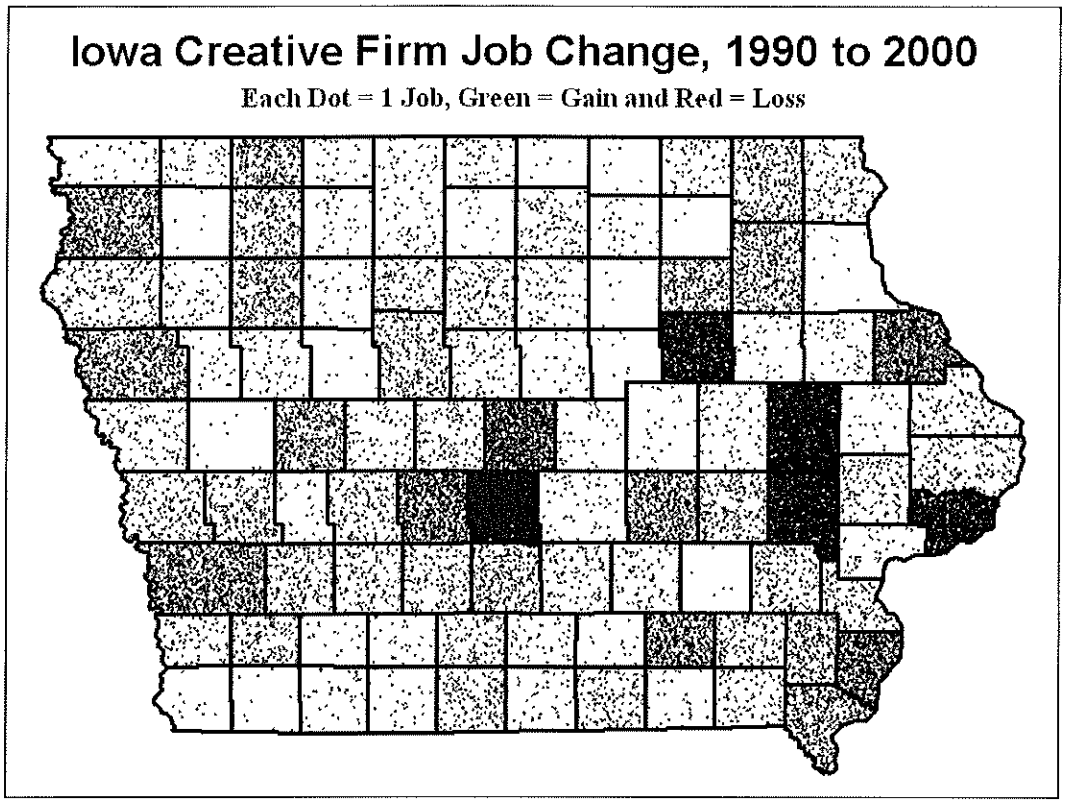
Creative Industries	Total Education	Creative Manufacturing	Scientific & Technical	Professional	Arts and Entertainment	Creative Total
Nonmetro Change	5,969	-84	901	5,614	29	12,430
Metro Change	10,461	-971	4,244	11,555	396	25,686
State Total Change	16,431	-1,055	5,146	17,169	425	38,116
Nonmetro Shares of Change	*36.3%*	*7.9%*	*17.5%*	*32.7%*	*6.8%*	*32.6%*

All Other Industries	Agriculture Services	Other Manufacturing	Other Services	All Other	Government	Total All Other Firms
Nonmetro Change	4,650	25,646	26,082	29,186	2,051	87,615
Metro Change	2,351	2,926	52,241	74,214	2,331	134,063
State Total Change	7,001	28,572	78,323	103,400	4,382	221,678
Nonmetro Shares of Change	*66.4%*	*89.8%*	*33.3%*	*28.2%*	*46.8%*	*39.5%*

The data suggest that there are concentrations of creative job change in the state that align with the state's more populated regions. Figure 7.2 bears this out. Large fractions of creative job changes are accruing among the state's metropolitan

and adjacent counties, with the remaining gains distributed relatively evenly across the state.

Figure 7.2



When we compare the two maps, there is the suggestion of a correlation between population growth and with creative industry employment growth. Table 7.2 shows the correlations between population growth rates, employment growth rates for major creative industry groupings, and all other industry employment growth rates in Iowa's counties. The time period measured is 1990 to 2000. The major creative industry groupings are arts and entertainment industries, post-secondary education, all other education, creative manufacturing, and professional and scientific industries. Two of these creative industry categories are positively correlated with population: all other education, which includes primary and secondary education, and professional and scientific industries. Both of these categories posted stronger correlations with population growth than growth in all

other industries, which includes most government, trade, services, and financial industries.

Among the creative industry groups, there is a slight correlation between job growth in professional and scientific industries and growth in arts and entertainment industries. Employment growth in these categories demonstrated a correlation of .335. This was the only creative group pairing in which the industries demonstrated a significant, positive relationship with each other.

Table 7.2

Correlations Between Creative Industry Employment Growth Rates and Other Growth Rates in Iowa's Counties

	Arts and Entertainment	*Post-Secondary Education*	*All Other Education*	*Creative Manufacturing*	*Professional and Scientific*	*All Other Industries*
Arts and Entertainment	1.000					
Post-Secondary Education	0.003	1.000				
All Other Education	0.134	0.069	1.000			
Creative Manufacturing	0.118	0.259	0.050	1.000		
Professional and Scientific	**0.335**	0.014	0.211	0.023	1.000	
All Other Employment	0.169	-0.030	0.071	0.035	0.299	1.000
Population Total	0.195	0.079	**0.464**	0.010	**0.525**	**0.344**

VIII

The Economic Impacts of Creative Workers and Creative Firms

Introduction to Terms and Scope of Analysis

Additional economic dimensions of our creative workers and our creative firms in Iowa are isolated in this section. These measurements are made with an input-output econometric model of the Iowa economy. An input-output model (I-O) is an accounting of inter-industrial transactions in an area that helps us to determine the magnitude and value of linkages that firms have with the remainder of the state economy. By looking at these linkages, we can discern the value of these creative occupations and creative firms as they work their way through the remainder of the Iowa economy.

These models are sometimes called "impact" models, because they are often used to discern economic impacts associated with plant closings or openings. We employ a highly restrictive use of the term *economic impact*, usually limiting it to situations where there is clear evidence that a firm's opening or closing is, in fact, causing a discernible impact on the industrial accounts in our region of study. We distinguish, therefore, between goods and services that are produced for export, versus those that are designed to be consumed locally by other firms or by households. Exporting goods brings money into a region. Loss of export production capacity results in a loss of income to the region.

Goods that are produced regionally for regional consumption have *economic values* that are measurable and quite meaningful, but do not have measurable economic impacts on the overall structure of economic accounts in a region unless they result in a substantial substitution for imports. Detailed explanations of input-output modeling and the characteristics of economic impacts are contained in an appendix to this study.

Our dual focus on creative workers and creative industries allows two different approaches to measure the economic importance of the creative economy for the state of Iowa. Our creative workers take their pay and spend it in the state economy. In this case, we simply will measure the economic outcomes of their total

household consumption based on estimates of their earnings. Even though there is an extensive array of creative occupations in Iowa, this analysis aggregates their earnings by the super creative subgroup and by creative professional subgroup to illustrate the overall magnitude of economic value contained in their consumption. These values can be added together to ascertain their total economic effects in the state.

Our creative firms and services are quite extensive, as well, but these firms are measured separately by industrial type. Given the extensive array of firms and the likelihood that many of the scientific, professional, arts, and education firms and institutions rely heavily on each other as both customer and supplier, it is inappropriate to add these values together as we would be guilty, often, of double counting. In this case we list highly detailed tables of potential economic effects or impacts by kind of firm.

There are four kinds of economic values that we will measure. The first is called *industrial output*. For our purposes, industrial output is usually gross sales. For public entities, industrial output is simply their annual spending. The next value is *jobs*. As people can have more than one job in more than one kind of firm, the number of jobs is greater than the number of employed persons in an economy. *Labor income* represents wages, salaries, and normal profits to sole proprietors. It is an important measure because it and the jobs from which it comes are highly localized. Finally, we measure *value added.* Value added is composed of the aforementioned labor income, plus returns to investors in the forms of interests, rents, and dividends. To that we add indirect payments to governments for sales, use, and excise taxes.

There are also four dimensions to each economic value that we account for. The first are the *direct* values. The direct amounts are those directly attributable to the activity that we are measuring. For the creative occupations, the direct amounts are the estimates of creative workers' disposable incomes that are spent in the regional economy. For the creative industries, the direct amounts are the output, employment, labor income, and value added characteristics of the creative firms. The second dimension, the *indirect* values, measure inputs into production. All

industrial and service activity requires inputs. Firms need wholesale goods, utilities, professional services, and financial products. The more of these goods and services available in a region, the greater the potential linkages with the direct firm, as firms are more likely to buy locally. The third measure occurs when all of the workers in the firms that we are measuring spend their paychecks on household goods and services creating *induced* values. We sometimes call induced values the household values. Finally, when we add the direct, indirect, and induced values, we get the *total* values. The total values represent the duplicated accounting of transactions in an economy attributable to some level of productivity or some level of consumption.

Creative Occupation Economic Values

The first measure of the economic importance of the creative economy is the estimation of the work-based purchasing power of Iowa's creative workers. The specific distribution of earnings is displayed in Table 8.1. Among the Super Creative workers, $2.95 billion is found in the education, training, and library group. The smaller groupings are in arts, design, etc, at $413.4 million, and in life, physical, and the social sciences at $409.9 million. All super creative core occupations in Iowa earned an estimated $5.8 billion in 2000, just over a third of all creative earnings in Iowa. In the creative professional group, managers earned $4.93 billion, followed by health care practitioners and allied workers at $2.7 billion. The smallest group at $1.9 billion is found in the social, religious, and counseling occupations. In all, the creative professionals earned $11.1 billion in 2000, close to two-thirds of the total for all creative workers.

Before proceeding with the analysis, a few adjustments need to be made. First, the values must be adjusted to reflect disposable income. According to U.S. Bureau of Labor Statistics data for 2000, our adjustment factor for disposable income is 84.2 percent. This leaves $14.229 billion in disposable income for creative workers that were entered into our model. Once those values were entered, the model determined that $5.7 billion of that amount was used for purchases outside of the Iowa economy. That leaves $8.57 billion, 50.8 percent of total creative occupational earnings that are in fact spent in the Iowa economy.

Table 8.1

Earnings in Iowa's Major Creative Occupational Groups, 2000

		Total Earnings	Percent of Total
Super-Creative Core	Computer and Mathematical	1,168,771,674	6.9%
	Architecture and Engineering	862,687,271	5.1%
	Life, Physical, and Social Science	409,888,296	2.4%
	Education, Training, and Library	2,945,214,122	17.4%
	Arts, Design, Entertainment, Sports, and Media	413,404,996	2.4%
Subtotal, Super-Creative		5,792,430,930	34.3%
Creative Professional	Management	4,934,849,785	29.2%
	Business and Financial Operations	1,908,635,162	11.3%
	Social, Religious, and Counseling	191,506,800	1.1%
	Legal	471,569,970	2.8%
	Healthcare Practitioners and Technical	2,651,819,879	15.7%
	Sales and Related (High-End)	880,364,800	5.2%
Subtotal, Creative Professional		11,059,754,463	65.5%
Total, Creative		16,890,705,301	100.0%

Adjustments

Amount Available for Household Spending	14,228,711,825	84.2%
Amount Spent Outside of the Iowa Economy	5,655,661,312	33.5%
Amount Spent in the Iowa Economy	8,573,050,513	50.8%

The results of the input-output analysis of creative occupation are displayed in table 8.2. The values are summarized for the super creative workers and for the creative professionals separately, along with the totals for the two groups of Iowa workers. These data represent the estimated spending in Iowa by Iowa's creative workers on household goods.

Iowa's creative workers spent an estimated $8.57 billion on goods and services that were supplied by Iowa firms. That is the direct amount of industrial output stimulated displayed in Table 8.2 for all creative occupations. The Iowa economy needed 132,671 workers to supply those goods and services to creative worker households. Iowa's firms required inputs to supply these goods and services that cost $2.062 billion. These are the indirect industrial output values. In providing these inputs, the indirect sector required 26,178 jobs. When the workers in the direct firms and the indirect firms spent their labor incomes in the state economy, they helped to stimulate another $2.43 billion in induced industrial output, which in turn required 36,615 jobs. When all of these effects are added up, Iowa's creative workers are responsible for $13.1 billion in industrial output (or sales), support

195,464 workers earning $4.7 billion in labor income, and help create a total of $8.002 billion in value added.

The table also contains a statistic called the total multiplier. A multiplier is simply the ratio of the total value divided by the direct value in each economic category. An output multiplier of 1.52 means that for every dollar of creative workers household spending generated in Iowa, $.52 in additional industrial output is sustained in the rest of the economy. The multiplier of 1.53 for labor income means that for every $1 paid to workers supplying goods and services to Iowa's creative worker households, $.53 in additional labor income is sustained in the rest of the economy. Finally, the job multiplier of 1.47 means that for every job need to directly supply goods and services to creative worker households, 47/100^{ths} of another job is sustained in Iowa.

Table 8.2

The Economic Values of Iowa's Creative Occupations

	Direct	Indirect	Induced	Total	Total Multiplier
Super Creative					
Industrial Output	2,952,676,835	711,135,712	839,548,513	4,503,361,104	1.53
Value Added	1,860,077,050	382,249,561	514,046,793	2,756,373,424	1.48
Labor Income	1,056,071,424	259,228,736	300,877,563	1,616,177,688	1.53
Jobs	45,812	9,020	12,676	67,507	1.47
Creative Professionals					
Industrial Output	5,620,373,678	1,351,113,312	1,585,580,133	8,557,067,038	1.52
Value Added	3,547,907,489	727,194,440	970,834,169	5,245,936,179	1.48
Labor Income	1,990,906,686	493,349,747	568,240,539	3,052,496,990	1.53
Jobs	86,859	17,158	23,940	127,957	1.47
All Creative Occupations					
Industrial Output	8,573,050,513	2,062,249,024	2,425,128,646	13,060,428,142	1.52
Value Added	5,407,984,539	1,109,444,001	1,484,880,962	8,002,309,603	1.48
Labor Income	3,046,978,110	752,578,483	869,118,102	4,668,674,678	1.53
Jobs	132,671	26,178	36,615	195,464	1.47

Creative Industry Economic Values

The next assessment is of Iowa's creative industries. In this section, economic characteristics of specific industries that have high creative occupational content are analyzed. At the outset it is important to set some guidelines to the interpretation of the following data. Industries in Iowa purchase goods and services from each other; consequently, a portion of one firm's productivity may be a portion of another's. When we compile input-output accounts of regional economies, we statistically account for these inter-industrial transactions. We can legitimately sum

their *direct* values and compare them, but given the tremendous array of firms that we classify as creative industries, it is not appropriate to sum their *total* economic effects to determine their overall slice of the Iowa economy. Table 8.3 displays the direct values of Iowa's creative industries and compares them with the remainder of the economy.

Table 8.3

Iowa Creative Industry Direct Economic Values, 2000

Creative Group	Industrial Output	Jobs	Labor Income	Value Added
All Arts and Heritage	1,516,392,389	16,059	505,591,534	662,333,509
All Education	3,107,890,877	128,297	4,039,963,224	4,043,095,891
Professional Services	7,855,266,226	110,577	4,358,112,050	4,999,086,162
Creative Manufacturing	3,615,086,083	17,298	883,445,819	1,146,029,007
Scientific and Technical	1,160,643,932	17,246	800,137,584	812,401,611
Broadcast and Media	507,761,180	3,783	123,245,489	160,518,747
Commercial Sports	91,070,957	1,805	34,363,762	55,418,739
Membership Organizations	253,335,501	10,907	202,856,864	203,403,091
Subtotal, Creative	18,107,447,145	305,972	10,947,716,326	12,082,286,758
All Other Nonfarm Industry	144,348,331,855	1,518,659	38,899,859,674	70,322,416,242
Agriculture and Ag Services	12,740,501,000	128,812	438,960,000	4,146,189,000
Total	175,196,280,000	1,953,443	50,286,536,000	86,550,892,000

Iowa's creative industries generated $18.11 billion in direct industrial output in 2000. In so doing, these industries required 305,972 jobs that paid $10.95 billion in labor income. Total value added was $12.1 billion. The comparable worth of the jobs that are generated in creative industries is worth noting: creative industries in Iowa are 16 percent of the total jobs, but they are 22 percent of labor income. In short, creative industry jobs pay substantially more than the average per job in Iowa. According to this model of the Iowa economy, earnings in creative industry jobs are 60 percent higher per job than the average earnings in all other Iowa industries.

Among all subgroups, professional services firms generated the most economic activity, accounting directly for 110,577 jobs, $4.36 billion in labor income, and $5.0 billion in value added. All education groups combined amounted to 128,297 jobs and $4.04 billion in labor income. All arts categories combined amounted to 16,059 jobs paying just under $506 million in labor income.

Tables 8.4 through 8.6 itemize direct, indirect, induced, and total economic effects for our detailed creative industries. Interpretation of the tables is relatively straightforward: Using the first category in Table 8.4, we see that the direct industrial output of the inorganic chemicals industry in 2000 was $31.4 million. That industry had 121 jobs and paid $6.4 million in labor income. Value added (which includes labor income) was $13.3 billion. In producing its direct output, this industry required $9.51 million in supplies and services. These are the indirect industrial output values. To supply those inputs, the indirect industries needed 79 jobs paying an additional $2.4 million in labor income. When the workers in the direct and the indirect sectors spent their combined paychecks, they helped to stimulate an additional $6.7 million in induced output, which, in turn, required 101 more jobs paying $2.0 million in labor income. In total this sector linked with the remainder of the Iowa economy to an extent that it produced $47.63 million in total industrial output, 302 jobs, $10.8 million in labor income, and $21.3 million in value added.

Also listed in Tables 8.4 through 8.6 are the total multipliers. Multipliers are merely the ratio of the total values to the direct values. The industrial output multiplier for inorganic chemicals is 1.52. That means that for every dollar of direct output in this industry, $.52 in additional industrial output is supported in the rest of the economy. The multiplier of 2.49 for jobs means that for every job in this sector, nearly a job and a half (1.49) are supported in the rest of the state economy. The income multiplier of 1.6 means that for every dollar of labor income generated in this industry, an additional $.60 is supported in labor income in the remainder of the economy.

Generally speaking, the higher the multiplier, the higher the value of the firm to your economy. Multipliers do not imply causation, necessarily, and care must be used with them. In most instances, multipliers help us to understand the strength of linkages with the existing economy an industry may have. The higher the output multiplier, the higher and more extensive the linkages with other industries in the state. A high job multiplier usually means that the direct job has relatively high pay and the industry that we are measuring has strong linkages to regional suppliers. Goods producing firms tend to have high multipliers and retail and service producing

firms tend to have comparatively lower multipliers, especially for jobs and for labor income. Following is a summary of the major industries in the remaining tables.

Creative Manufacturing

Among the creative manufacturing firms in Iowa (Table 8.4) , three groups stand out. The search and navigation equipment manufacturing group had direct output of $1.844 billion, employed 9,218 workers, and paid $525.9 million in labor income. This sector linked with the rest of the economy to produce $2.9 billion in industrial output, 22,724 jobs, and $868 million in labor income.

The very broad category of drugs is also well represented in the model. This sector had direct output of $403 million, provided 2,277 jobs, and paid $94.4 million in labor income. In total, this sector links to $585.3 million in total industrial output, 4,653 total jobs, and $149.3 million in total labor income.

Radio and TV communication equipment is the third creative manufacturing category of note. This sector had $307.4 million in output, 1,015 jobs, and paid $39.7 million labor income. Linked with the rest of the economy, this sector supported $469.9 million in total output, 2,714 jobs, and $85.3 million in labor income. This sector also has very high job, labor income, and value added multipliers.

Arts, Media, and Commercial Sports

The top three industries in this sector are found in newspaper publishing, periodical publishing, and in radio and TV broadcasting (Table 8.5). The newspaper sector's industrial output was $532.3 million in 2000. It had 6,720 jobs, and it paid $186.7 million in labor income. This sector supported $828.8 million in total industrial output in Iowa, 10,833 jobs, and $291.9 million in labor income.

Radio and TV broadcasting had $480.1 million in direct output, 3,378 jobs, and paid $108 million in labor income. In all, this sector accounted for $768.2 million in total industrial output, 7,660 jobs, and $193.6 million in labor income.

Iowa's periodical publishing sector had $322.7 million in output, required 1,670 jobs, and paid $104.6 million in labor income. In total, this sector linked with the rest of the economy and produced $504.1 million in industrial output, 4,171 jobs, and $170.3 million in labor income.

Education, Professional, and Scientific and Technical

There are four very large sectors in this grouping. The first is hospitals with $3.8 billion in direct industrial output, 61,112 workers, and $1.996 billion in labor income. This sector links with $6.22 billion in total Iowa industrial output, 96,188 jobs, and $2.81 billion in labor income.

All doctors and dental offices and services had $3.15 billion in output in 2000, required 31,579 jobs, and paid $1.65 billion in labor incomes. Total industrial output attributable to this sector was $5.1 billion, employing 61,059 jobs, and paying $2.3 billion in labor income.

All other education includes Iowa's primary and secondary schools, mostly. Industrial output is analogous to total spending by Iowa's schools systems and amounted to $2.98 billion. The system had 86,729 jobs, and paid $2.41 billion in labor income. In total, this sector linked with $5.26 billion in total industrial output, 107,156 jobs, and $3.8 billion in labor income.

The last large category is post-secondary education, Iowa's private and public colleges and universities. In 2000, their total output was $1.93 billion, they had 39,764 jobs, and they paid $1.58 billion in labor income. In total this sector was responsible for $3.3 billion in total output, 60,192 jobs, and $2.94 billion in total labor income.

Table 8.4

Estimates of Total Economic Values: All Manufacturing Firms

Model Category	Economic Values	Direct	Indirect	Induced	Total	Total Multiplier
Inorganic Chemicals Nec.	Industrial Output	31,400,040	9,508,278	6,719,797	47,628,115	1.52
	Jobs	121	79	101	302	2.49
	Labor Income	6,391,187	2,365,455	2,000,972	10,757,614	1.68
	Value Added	13,260,113	4,254,772	3,766,548	21,281,434	1.60
Cyclic Crudes, Interm. & Indus. Organic Chem.	Industrial Output	124,678,619	55,646,063	18,626,238	198,950,919	1.60
	Jobs	179	464	281	925	5.16
	Labor Income	10,842,854	14,408,559	5,772,735	31,024,148	2.86
	Value Added	23,948,443	25,361,856	10,633,659	59,943,958	2.50
Drugs	Industrial Output	402,967,625	90,656,433	91,719,461	585,343,519	1.45
	Jobs	2,277	991	1,385	4,653	2.04
	Labor Income	94,393,855	27,102,647	27,762,271	149,258,772	1.58
	Value Added	190,206,872	45,039,085	51,795,233	287,041,191	1.51
Special Industry Machinery N.E.C.	Industrial Output	200,363,518	73,578,092	32,808,725	306,750,335	1.53
	Jobs	528	792	495	1,815	3.44
	Labor Income	23,022,194	25,178,383	10,972,815	59,173,392	2.57
	Value Added	31,210,001	40,058,941	19,417,645	90,686,587	2.91
Electronic Computers	Industrial Output	179,334,156	58,309,245	42,940,488	280,583,889	1.56
	Jobs	690	458	648	1,797	2.60
	Labor Income	47,320,075	16,281,371	14,431,203	78,032,649	1.65
	Value Added	55,416,289	23,644,135	25,473,704	104,534,128	1.89
Computer Storage Devices	Industrial Output	7,647,252	2,560,078	1,075,663	11,282,993	1.48
	Jobs	28	22	16	66	2.39
	Labor Income	698,995	629,558	302,172	1,630,725	2.33
	Value Added	850,796	1,042,007	587,437	2,480,240	2.92
Computer Terminals	Industrial Output	24,434	202	26,472	51,109	2.09
	Jobs	4	0	0	4	1.11
	Labor Income	93,055	141	21,122	114,318	1.23
	Value Added	93,055	359	63,092	156,506	1.68
Computer Peripheral Equipment,	Industrial Output	7,069,401	2,106,392	1,341,490	10,517,283	1.49
	Jobs	25	18	20	63	2.57
	Labor Income	1,199,250	543,885	395,686	2,138,821	1.78
	Value Added	1,423,977	876,179	748,703	3,048,860	2.14
Telephone and Telegraph Apparatus	Industrial Output	538,129	162,020	93,322	793,472	1.47
	Jobs	1	1	1	4	3.77
	Labor Income	66,738	31,031	22,183	119,952	1.80
	Value Added	154,883	56,799	47,519	259,202	1.67
Radio and Tv Communication Equipment	Industrial Output	307,435,647	115,386,440	47,112,976	469,935,062	1.53
	Jobs	1,015	988	711	2,714	2.67
	Labor Income	39,690,849	29,810,805	15,783,503	85,285,156	2.15
	Value Added	72,416,104	44,658,432	27,906,342	144,980,879	2.00
Communications Equipment N.E.C.	Industrial Output	704,837	101,975	254,030	1,060,842	1.51
	Jobs	4	1	4	9	2.15
	Labor Income	396,753	29,906	96,605	523,265	1.32
	Value Added	514,554	42,045	160,294	716,893	1.39

Table 8.4 (Continued)

Estimates of Total Economic Values: All Manufacturing Firms

Model Category	Economic Values	Direct	Indirect	Induced	Total	Total Multiplier
Semiconductors and Related Devices	Industrial Output	21,826,908	4,313,543	5,820,407	31,960,858	1.46
	Jobs	75	51	88	214	2.86
	Labor Income	7,047,293	1,548,290	1,949,838	10,545,422	1.50
	Value Added	11,789,209	2,331,469	3,447,518	17,568,197	1.49
Aircraft	Industrial Output	2,537,167	1,250,572	482,932	4,270,671	1.68
	Jobs	11	11	7	30	2.65
	Labor Income	201,769	253,020	104,031	558,821	2.77
	Value Added	287,718	452,200	236,715	976,633	3.39
Aircraft and Missile Engines and Parts	Industrial Output	112,216,959	42,853,300	29,219,613	184,289,872	1.64
	Jobs	537	461	441	1,440	2.68
	Labor Income	22,473,146	12,824,076	8,091,052	43,388,273	1.93
	Value Added	31,531,266	19,689,604	15,857,168	67,078,039	2.13
Aircraft and Missile Equipment,	Industrial Output	46,066,327	10,314,573	14,860,767	71,241,667	1.55
	Jobs	306	117	224	647	2.11
	Labor Income	15,631,524	2,920,016	4,241,458	22,792,997	1.46
	Value Added	21,173,517	4,839,567	8,172,808	34,185,893	1.61
Search & Navigation Equipment	Industrial Output	1,844,620,857	586,639,237	471,534,896	2,902,794,990	1.57
	Jobs	9,218	6,387	7,119	22,724	2.47
	Labor Income	525,912,212	181,545,947	160,440,564	867,898,724	1.65
	Value Added	582,686,787	258,454,220	281,413,245	1,122,554,252	1.93
Mechanical Measuring Devices	Industrial Output	119,069,154	33,968,405	34,957,989	187,995,548	1.58
	Jobs	833	323	528	1,683	2.02
	Labor Income	41,182,879	10,246,053	11,652,160	63,081,093	1.53
	Value Added	46,169,024	15,517,409	20,655,975	82,342,408	1.78
Instruments To Measure Electricity	Industrial Output	6,307,742	2,145,837	1,402,577	9,856,156	1.56
	Jobs	37	20	21	78	2.13
	Labor Income	1,357,067	580,943	439,530	2,377,540	1.75
	Value Added	1,556,492	913,295	804,857	3,274,643	2.10
Analytical Instruments	Industrial Output	1,852,407	612,065	482,078	2,946,550	1.59
	Jobs	9	7	7	24	2.60
	Labor Income	504,588	193,698	158,503	856,790	1.70
	Value Added	561,901	281,523	282,986	1,126,409	2.00
Optical Instruments & Lenses	Industrial Output	2,517,161	616,216	894,277	4,027,655	1.60
	Jobs	37	7	14	58	1.57
	Labor Income	1,253,072	221,638	334,177	1,808,886	1.44
	Value Added	1,268,786	301,947	559,247	2,129,979	1.68
Surgical and Medical Instrument	Industrial Output	40,698,088	16,462,255	8,571,058	65,731,401	1.62
	Jobs	255	171	129	555	2.18
	Labor Income	7,378,045	5,266,921	2,873,712	15,518,678	2.10
	Value Added	8,739,748	8,191,696	5,078,851	22,010,295	2.52
Surgical Appliances and Supplies	Industrial Output	54,232,490	20,146,394	11,746,866	86,125,750	1.59
	Jobs	291	235	177	703	2.42
	Labor Income	10,983,338	6,645,534	4,003,921	21,632,793	1.97
	Value Added	13,237,873	9,717,737	7,016,549	29,972,159	2.26

Table 8.4 (Continued)

Estimates of Total Economic Values: All Manufacturing Firms

Model Category	Economic Values	Direct	Indirect	Induced	Total	Total Multiplier
Dental Equipment and Supplies	Industrial Output	2,230,046	1,017,200	427,020	3,674,267	1.65
	Jobs	13	11	6	31	2.32
	Labor Income	293,072	347,062	145,592	785,726	2.68
	Value Added	336,496	541,495	255,102	1,133,093	3.37
X-Ray Apparatus	Industrial Output	315,082	133,286	46,285	494,653	1.57
	Jobs	1	1	1	3	2.36
	Labor Income	86,680	90,535	40,256	217,471	2.51
	Value Added	86,680	115,911	58,901	261,491	3.02
Electromedical Apparatus	Industrial Output	36,117,542	13,980,450	5,407,916	55,505,907	1.54
	Jobs	176	123	82	381	2.17
	Labor Income	3,892,913	3,744,920	1,735,721	9,373,554	2.41
	Value Added	4,659,530	5,813,141	3,138,342	13,611,013	2.92
Ophthalmic Goods	Industrial Output	6,297,862	2,894,983	1,689,131	10,881,976	1.73
	Jobs	62	30	26	117	1.90
	Labor Income	1,621,616	905,224	573,517	3,100,357	1.91
	Value Added	1,803,972	1,344,688	1,007,040	4,155,700	2.30
Jewelry, Precious Metal	Industrial Output	1,054,854	54,983	154,996	1,264,833	1.20
	Jobs	9	1	2	12	1.34
	Labor Income	214,973	20,423	53,402	288,798	1.34
	Value Added	386,047	32,350	93,069	511,465	1.32
Silverware and Plated Ware	Industrial Output	13,717,817	2,757,446	3,103,807	19,579,070	1.43
	Jobs	115	32	47	194	1.69
	Labor Income	4,219,863	1,142,431	1,217,701	6,579,995	1.56
	Value Added	7,672,954	1,550,451	1,990,426	11,213,830	1.46
Games, Toys, and Childrens Vehicles	Industrial Output	41,243,961	8,898,921	10,995,722	61,138,604	1.48
	Jobs	442	88	166	697	1.58
	Labor Income	15,075,965	3,148,992	4,137,026	22,361,983	1.48
	Value Added	22,585,921	4,636,461	6,900,315	34,122,697	1.51

Table 8.5

Estimates of Total Economic Values: Arts, Media, and Commerical Sports

Creative Group	Model Category	Economic Values	Direct	Indirect	Induced	Total	Total Multiplier
Arts-Applied	Advertising	Industrial Output	184,900,303	59,517,004	63,097,413	307,514,720	1.66
		Jobs	1,968	962	953	3,882	1.97
		Labor Income	82,606,407	24,776,305	24,623,235	132,005,947	1.60
		Value Added	92,238,215	33,350,848	40,351,267	165,940,330	1.80
	Photofinishing, Commercial Photography	Industrial Output	45,349,205	17,785,913	12,555,063	75,690,181	1.67
		Jobs	459	354	190	1,002	2.19
		Labor Income	16,985,993	11,629,885	6,573,070	35,188,948	2.07
		Value Added	21,108,888	13,360,617	9,458,682	43,928,187	2.08
Arts-Literary	Newspapers	Industrial Output	532,264,972	142,020,537	154,496,828	828,782,337	1.56
		Jobs	6,720	1,781	2,333	10,833	1.61
		Labor Income	186,732,024	51,141,793	53,988,523	291,862,341	1.56
		Value Added	245,962,172	76,703,391	93,417,633	416,103,197	1.69
	Periodicals	Industrial Output	322,682,945	91,859,122	89,555,811	504,097,878	1.56
		Jobs	1,670	1,149	1,352	4,171	2.50
		Labor Income	104,574,357	34,227,710	31,501,352	170,303,419	1.63
		Value Added	145,268,949	49,094,949	54,326,810	248,690,708	1.71
	Book Publishing	Industrial Output	177,098,734	62,929,733	32,905,830	272,934,298	1.54
		Jobs	820	679	497	1,995	2.43
		Labor Income	29,254,301	21,217,823	11,466,223	61,938,347	2.12
		Value Added	49,426,949	33,391,908	19,868,892	102,687,749	2.08
Arts-Performing	Musical Instruments	Industrial Output	4,399,177	769,931	1,225,932	6,395,040	1.45
		Jobs	60	8	19	86	1.44
		Labor Income	1,840,074	276,633	480,175	2,596,881	1.41
		Value Added	2,502,874	391,264	785,499	3,679,638	1.47
	Theatrical Producers, Bands Etc.	Industrial Output	45,710,614	16,195,728	11,073,945	72,980,287	1.60
		Jobs	758	342	167	1,268	1.67
		Labor Income	10,447,272	6,550,680	3,925,949	20,923,900	2.00
		Value Added	13,357,600	8,808,028	6,743,972	28,909,600	2.16
	Amusement and Recreation Services, N.E.C.	Industrial Output	18,715,156	3,942,553	6,242,833	28,900,543	1.54
		Jobs	438	57	94	589	1.34
		Labor Income	3,146,188	562,771	857,575	4,566,535	1.45
		Value Added	8,493,349	1,550,189	2,643,793	12,687,331	1.49

Table 8.5 (Continued)

Estimates of Total Economic Values: Arts, Media, and Commerical Sports

Creative Group	Model Category	Economic Values	Direct	Indirect	Induced	Total	Total Multiplier
Arts-Visual	Commercial Printing	Industrial Output	58,575,549	15,048,000	14,487,139	88,110,688	1.50
		Jobs	506	166	219	891	1.76
		Labor Income	18,537,753	5,789,859	5,520,562	29,848,174	1.61
		Value Added	21,850,253	8,329,382	9,151,061	39,330,696	1.80
	Portrait and Photographic Studios	Industrial Output	40,695,642	14,121,998	13,607,239	68,424,880	1.68
		Jobs	1,193	280	205	1,679	1.41
		Labor Income	20,140,719	8,771,182	6,734,573	35,646,475	1.77
		Value Added	22,225,960	10,244,590	9,918,824	42,389,374	1.91
	Photofinishing, Commercial Photography	Industrial Output	66,787,910	26,194,151	18,490,433	111,472,495	1.67
		Jobs	676	521	279	1,476	2.19
		Labor Income	15,560,830	10,654,111	6,021,574	32,236,515	2.07
		Value Added	24,112,683	15,261,833	10,804,652	50,179,168	2.08
Broadcast and Media	Radio and TV Broadcasting	Industrial Output	480,062,433	176,049,935	112,136,343	768,248,712	1.60
		Jobs	3,378	2,589	1,693	7,660	2.27
		Labor Income	108,012,137	49,520,865	36,053,155	193,586,157	1.79
		Value Added	145,144,768	70,282,580	65,128,199	280,555,548	1.93
	Other Media Related Services	Industrial Output	1,728,063	630,579	426,438	2,785,080	1.61
		Jobs	21	9	6	37	1.77
		Labor Income	1,232,475	798,985	465,644	2,497,104	2.03
		Value Added	1,232,475	751,458	529,614	2,513,547	2.04
	Motion Pictures	Industrial Output	25,970,684	13,089,666	5,839,067	44,899,417	1.73
		Jobs	385	178	88	651	1.69
		Labor Income	14,000,877	9,665,911	5,439,957	29,106,745	2.08
		Value Added	14,141,504	11,644,214	7,742,488	33,528,206	2.37
Commercial Sports	Commercial Sports Except Racing	Industrial Output	17,698,035	2,430,064	7,032,491	27,160,591	1.53
		Jobs	448	41	106	594	1.33
		Labor Income	10,238,855	1,040,319	2,611,635	13,890,809	1.36
		Value Added	11,316,864	1,493,091	4,383,950	17,193,905	1.52
	Racing and Track Operation	Industrial Output	73,372,922	25,248,723	20,610,087	119,231,732	1.63
		Jobs	1,357	393	311	2,061	1.52
		Labor Income	24,124,907	9,253,084	7,723,179	41,101,170	1.70
		Value Added	44,101,875	14,816,466	12,907,207	71,825,548	1.63
Heritage	Other Nonprofit Organizations	Industrial Output	19,212,180	5,108,615	7,507,563	31,828,358	1.66
		Jobs	792	72	113	977	1.23
		Labor Income	15,765,617	3,164,900	4,295,658	23,226,174	1.47
		Value Added	15,765,617	4,254,651	7,247,517	27,267,785	1.73

Table 8.6

Estimates of Total Economic Values: Education, Professional, and Scientific and Technical

Creative Group	Model Category	Economic Values	Direct	Indirect	Induced	Total	Total Multiplier
Post-secondary Education	Colleges, Universities, Schools	Industrial Output	1,929,088,083	565,316,021	783,044,053	3,277,448,157	1.70
		Jobs	39,764	8,605	11,823	60,192	1.51
		Labor Income	1,582,675,455	659,417,575	699,807,896	2,941,900,926	1.86
		Value Added	1,582,675,455	905,905,130	1,195,614,283	3,684,194,868	2.33
All Other Education	Elementary and Secondary Schools	Industrial Output	2,983,171,584	956,031,913	1,324,241,799	5,263,445,296	1.76
		Jobs	86,729	8,605	11,823	107,156	1.24
		Labor Income	2,411,650,422	659,417,575	699,807,896	3,770,875,894	1.56
		Value Added	2,411,650,422	905,905,130	1,195,614,283	4,513,169,835	1.87
	Other Educational Services	Industrial Output	92,035,390	31,329,951	28,718,999	152,084,341	1.65
		Jobs	1,805	408	434	2,647	1.47
		Labor Income	45,637,346	16,768,028	14,199,056	76,604,431	1.68
		Value Added	48,770,014	20,954,134	21,671,053	91,395,201	1.87
Professional Services	Doctors and Dentists	Industrial Output	3,146,304,626	611,449,695	1,351,020,060	5,108,774,382	1.62
		Jobs	31,579	9,083	20,398	61,059	1.93
		Labor Income	1,650,537,278	232,560,702	430,125,063	2,313,223,043	1.40
		Value Added	2,019,669,340	350,632,774	781,038,448	3,151,340,563	1.56
	Hospitals	Industrial Output	3,795,550,027	838,827,943	1,581,973,864	6,216,351,834	1.64
		Jobs	61,112	11,191	23,885	96,188	1.57
		Labor Income	1,996,734,536	292,651,397	523,054,595	2,812,440,529	1.41
		Value Added	2,214,453,756	448,546,466	931,131,301	3,594,131,523	1.62
	Other Medical and Health Services	Industrial Output	245,524,987	59,907,360	83,667,550	389,099,897	1.58
		Jobs	5,161	735	1,263	7,159	1.39
		Labor Income	171,424,274	35,231,460	47,539,722	254,195,456	1.48
		Value Added	175,133,357	45,840,456	67,461,369	288,435,181	1.65
	Legal Services	Industrial Output	471,137,396	59,884,861	242,631,048	773,653,305	1.64
		Jobs	6,552	892	3,663	11,107	1.70
		Labor Income	282,968,920	19,592,485	71,075,285	373,636,690	1.32
		Value Added	333,382,668	31,246,957	134,996,977	499,626,603	1.50

Table 8.6 (Continued)

Estimates of Total Economic Values: Education, Professional, and Scientific and Technical

Creative Group	Model Category	Economic Values	Direct	Indirect	Induced	Total	Total Multiplier
	Architectural Services	Industrial Output	84,772,147	30,259,503	30,691,925	145,723,575	1.72
		Jobs	932	570	463	1,965	2.11
		Labor Income	52,378,496	20,342,656	16,714,816	89,435,968	1.71
		Value Added	52,378,496	24,220,550	26,482,777	103,081,824	1.97
	Accounting, Auditing and Bookkeeping	Industrial Output	274,158,167	31,517,223	143,966,485	449,641,875	1.64
		Jobs	5,242	263	888	6,393	1.22
		Labor Income	204,068,545	16,858,511	51,594,446	272,521,502	1.34
		Value Added	204,068,545	19,510,585	82,320,639	305,899,770	1.50
Scientific and Technical	Computer and Data Processing Services	Industrial Output	245,319,352	21,585,650	123,487,629	390,392,631	1.59
		Jobs	4,517	289	1,864	6,670	1.48
		Labor Income	239,684,461	13,122,245	57,966,728	310,773,434	1.30
		Value Added	244,369,662	15,751,091	91,374,948	351,495,701	1.44
	Engineering Services	Industrial Output	303,330,789	108,274,228	109,821,519	521,426,535	1.72
		Jobs	3,333	2,041	1,658	7,032	2.11
		Labor Income	174,230,183	67,667,170	55,599,639	297,496,992	1.71
		Value Added	174,230,183	80,566,476	88,091,477	342,888,136	1.97
	Management and Consulting Services	Industrial Output	456,891,520	135,100,995	160,308,157	752,300,672	1.65
		Jobs	6,135	2,259	2,420	10,815	1.76
		Labor Income	289,313,655	90,799,065	87,276,961	467,389,681	1.62
		Value Added	294,784,090	110,432,900	136,410,159	541,627,150	1.84
	Research, Development & Testing Services	Industrial Output	155,102,271	46,698,967	56,674,680	258,475,918	1.67
		Jobs	3,261	710	856	4,827	1.48
		Labor Income	96,909,285	29,691,939	29,068,037	155,669,261	1.61
		Value Added	99,017,676	38,509,162	48,222,400	185,749,239	1.88
Membership Organizations	Other Nonprofit Organizations	Industrial Output	31,936,028	8,491,950	12,479,674	52,907,651	1.66
		Jobs	1,316	119	188	1,624	1.23
		Labor Income	30,905,946	6,204,276	8,420,943	45,531,165	1.47
		Value Added	30,905,946	8,340,557	14,207,587	53,454,089	1.73
	Business Associations	Industrial Output	99,027,160	14,637,799	49,414,850	163,079,808	1.65
		Jobs	2,090	197	746	3,033	1.45
		Labor Income	83,046,540	6,352,977	20,239,106	109,638,623	1.32
		Value Added	83,592,767	9,388,889	34,596,956	127,578,612	1.53
	Labor and Civic Organizations	Industrial Output	95,736,390	15,014,530	46,705,859	157,456,779	1.64
		Jobs	7,290	210	705	8,205	1.13
		Labor Income	84,468,888	6,850,004	20,674,605	111,993,497	1.33
		Value Added	84,468,888	10,408,679	35,315,175	130,192,741	1.54

IX
Implications and Summary

The fortunes of firms, industries, and even regions can rise and fall with the life cycles of the goods and services they produce. Just as the Iron Belt corroded to the Rust Belt, there may yet come a time when "Silicon Valley" is a derisive term describing the geographic relic of an outdated technology. Some regions are still chasing firms that peddle the latest trends and technologies. Other regions have recognized that a better long-term strategy may be to attract people who shape trends and discover technologies. There is ample evidence that Iowa may well be on the way to changing how it thinks about economic growth, how it thinks about its people, and the skills that it wishes its workforce to possess.

Two decades ago there was an uproar over the perceived lack of competitiveness of America's workers in science and mathematics. In response, elementary, secondary, and post-secondary systems retooled their curricula and aggressively promoted scientific and technical education and training. A decade ago, communities and states were cautioned to upgrade telecommunications capacities significantly else risk missing out on the emerging information revolution. Ours is a nation that has significant technical talent and technical capacity. Industrial productivity is extremely high, and America's industrial capacity is well developed.

Events of the past couple of years have taught us, however, that technology adoption goes through boom and bust cycles. There is much more to regional growth than investment in technological infrastructure and technical talent. An economy needs to be managed, services need to be professionally delivered to both households and to industry, workers and families need to be entertained and afforded recreational opportunities. Cities are not merely enterprise zones. Cities are the sum of all that makes community, culture, and place special.

There is a wonderful simultaneity to economic growth. People go where they expect to find work. Industries go where they expect to find people to work for them. The trick is attracting the right kinds of people and the right kinds of

industries that allow communities, regions, and states to grow in new and exciting ways.

Strong arguments have been made that Iowa's creative occupational structure needs more attention from state leaders than it perhaps has received in the past. There are conscious efforts currently underway in Iowa to promote the retention of selective grades of creative workers, especially recent university graduates, to entice professionals to consider Iowa, and to attract the kinds of firms that will provide employment opportunities for the state's talented workforce and help to lift the state above current rates of economic change. More has been said about retaining scientists, engineers, and technical professionals than other creative workers. There are those arguing that active and energetic programs promoting artistic and cultural enhancement will play a vital role in assuring prosperity for Iowa and enhancing the quality of life in the state – that the state needs to expand its definition of what it wants to retain – that the state needs to look at all of the creative components of the state's workforce and industrial structure as it figures out what it wants to do next.

There have been several assessments of Iowa's economy over the years. Generally speaking, the state has produced nonfarm jobs, but it has had trouble holding onto its people. During the 1990s, the state gained in excess of 350,000 nonfarm jobs, but only attracted 90,000 people. Current population growth is among the lowest in the nation, and there have been aggregate erosions in the earnings value of jobs – the average nonfarm job holder in Iowa in 1982 made about 92 percent of the U.S. average; by 2000 that fraction had declined to 73 percent. These simple statistics alone raise serious questions about the overall efficacy of state and local job creation efforts. Political and industrial leaders recognize these facts. The state currently is poised to shift its emphasis in economic development away from traditional job creation to targeted industrial growth, retaining its key professionals, and attracting more people to Iowa.

Jobs in and of themselves are important, but the quality of jobs and the quality of communities is measured in many more ways that just the jobs produced. That is the core of a creative economy focus to economic development: that community vitality, industrial innovation, artistic and cultural outlets all are

inextricably linked and create highly desirable economic activities and highly desirable communities in which to live.

This report has uncovered a myriad of details, facts, and categories all relating to Iowa's creative workers and the industries that employ them. The effort has been part statistical assessment, part data archeology, and part accounting. The idea was to determine a modern baseline of Iowa's creative industrial and occupational structures, compare Iowa's creative composition to the nation's, and to assess just how large this component of the economy is. There are qualitative components, as well: we assess the quality of these jobs as measured by mean earnings, we look at the mix and distribution of these jobs by gender, and we acknowledge rural-urban differentials that are evident in creative industrial growth in Iowa.

What have we learned? Iowa has some strengths and some weaknesses in its creative industrial and occupational structures. Iowa has a slightly lower share of employment in super-creative and creative professions than the U.S., but within those categories, it exceeds the national averages in education and social work, and it is at the national average in managerial professions.

Even though Iowa's creative occupational fraction is less than the U.S., it has made strong gains relative to the U.S. over the past decade. Rates of growth in Iowa's creative occupations exceeded national average rates of growth in all categories except for education, legal, and health. Categorically, Iowa's performance was slightly stronger in the creative professional group than in the super-creative group. All together, creative occupations were 85 percent of the net growth in the number of employed persons in Iowa between 1990 and 2000. The corresponding value in the United States was 64 percent.

Distinct gender preferences are evident in Iowa and the U.S. In Iowa, men dominate the math and computers, engineering and architecture, and the science occupations. Women dominate the education, training, library, and health occupations. Over the decade of the 1990s, however, women made small gains in science and larger gains in engineering jobs. Nearly two of three super creative job

gains were by women over that decade, but the vast majority of those gains were in education professions. In contrast, women gained just 39 percent of the new creative professional positions, despite strong gains in the individual categories of legal services and health care.

Iowa's creative workers earn, on average, slightly less than 84 percent of the national average, but there are categories that are closer to the national average than others. Computer and mathematical workers, for example, earn roughly 88 percent of the national norm, while art, design, entertainment, sports, and media workers earn 72 percent of the U.S. average.

Jobs in Iowa's creative industries account for 22.5 percent of all nonfarm jobs, compared to a U.S. average of 25 percent. Nationally, there was a 24 percent gain in creative industry jobs between 1990 and 2000. The corresponding growth amount for Iowa was 14 percent. Though most Iowa creative industries grew more slowly than their national counterparts, jobs in performing and the visual arts grew more rapidly than the national rate.

Earnings per job in creative industries are dismal in many instances when compared to the U.S. In all, Iowa's creative industries pay only 73 percent of the national average. Growth in average earnings between 1990 and 2000 was slower in Iowa than in the U.S. Iowa's creative industry job-holder earnings grew faster than the U.S. average in post-secondary education, performing arts, and in heritage institutions.

Iowa is doing better in creative occupation growth than in creative industry growth. Location quotients by occupation suggest the state has close to its expected number of creative occupations in many categories. Earnings by occupation are more competitive with national averages than they are at the industrial level.

Iowa is very self conscious about the welfare of its rural areas. During the 1990s, non-metropolitan counties accounted for almost 33 percent of the growth in creative industry jobs. Their highest creative industry percentage is in all education,

at 36 percent of all jobs. They only accumulated 7 percent of the new arts and entertainment jobs.

We measured two dimensions of overall economic value of creative employment in Iowa. The first looked at the purchasing power of all creative jobs. Of the $16.9 billion in annual earnings to Iowa's creative workers, we estimated that they directly spent $8.6 billion on Iowa produced goods and services, which in total supported $13.1 billion in total industrial output, $4.7 billion in total labor income in all other industries, and 195,464 additional jobs.

The second dimension looked at creative industries by eight major categories. Initially, looking only at the direct values of the firms, Iowa's creative industries account for $18.1 billion in output, 306,000 jobs, and $10.95 billion in labor income. Creative industry pay earnings that are 60 percent higher per job than the in all other industries. Although it is not appropriate to sum all industrial findings, we itemize the potential economic impacts of all of Iowa's creative industries in the study.

An honest summary would admit that Iowa must work hard for its creative economy to become competitive with the rest of the nation. It has extremely strong educational foundations, but it lags in computer, mathematics, and scientific and technical talent and capacity, as measured by the composition of the creative workforce. It also has a dearth of artistic employees. If one is to believe that growth in science and technology is correlated with growth in the arts, and that both of which in turn correlate with community growth, then this study suggests areas in which the state's economic development efforts might target.

Politically and professionally there is currently an obvious open-mindedness in Iowa regarding what is needed to stimulate economic and social growth. Iowa's universities are magnets for talent, and state policies and community development efforts are attempting to parlay those strengths into industrial growth. Iowa's major cities are highly livable places with exciting and diverse economies, entertainment options, and social structures. Iowa's rural spaces are diverse and interesting, and they offer hosts of recreation and entertainment opportunities.

Comparatively few places in Iowa will likely realize the majority of economic and social growth over the next decade. Still, the overall livability in those places and the rest of the state depends on far more than merely the number of jobs they create. There is great opportunity for growth and enhancement in non-traditional areas of Iowa's economy – its artistic, cultural, and recreational institutions. These opportunities can only be enhanced when state and community leaders recognize that the sum of a community is greater than the sum of its jobs.

Works Cited or Consulted in this Report

Bell, Daniel. The Coming of Post-Industrial Society: A Venture in Social Forecasting.. New York: Basic Books. 1973.

Bluestone, Barry and Harrison, Bennett. The Deindustrialization of America. New York: Basic Books. 1982.

Coy, Peter. "The Creative Economy." Business Week. 28 August 2000.

Florida, Richard. The Rise of the Creative Class. New York: Basic Books, 2002.

Gerds, Warren. "Arts Play Key Role in Area Economy." Green Bay Press-Gazette, Green Bay, Wisconsin. 31 October, 2002.

Gouldner, Alvin W. The Future of the Intellectual and the Rise of the New Class. New York: Seabury Press. 1979.

Howkins, John. The Creative Economy: How People Make Money from Ideas. London: Allen Lane. The Penguin Press, 2001.

Ingelhart, Ronald J. The Silent Revolution: Changing Values and Political Styles Among Western Publics. Princeton: Princeton University Press. 1977.

Landefeld, Steven J. and Fraumeni, Barbara M. "Measuring the New Economy." Survey of Current Business, U.S. Bureau of Economic Analysis, March, 2001. Pp. 23 – 40.

Nakamura, Leonard I. Economics and the New Economy: "The Invisible Hand Meets Creative Destruction." Business Review, Federal Reserve Bank of Philadelphia. July/August 2000. Pp. 15-30.

National Endowment for the Arts. "The Arts in GDP: Consumers spent $9.4 Billion on Admission Receipts for Performing Arts Events in 1998." Research Division Note #75. March, 2000.

New England Council/Mt. Auburn Associates. "The Creative Economy Initiative: The Role of the Arts and Culture in New England's Economic Competitiveness." Boston: The New England Council. June, 2000.

NGA Center for Best Practices. "The Role of the Arts in Economic Development." Issue Brief: Economic and Technology Policy Studies. National Governors Association. June 2001.

Norton, R.D. "Industrial Policy and American Renewal." Journal of Economic Literature, Vol. XXIV (March 1986). Pp. 1-40.

Opinion. "'Creative Class' Key to Economic Growth." Wausau Daily Herald, Wausau, Wisconsin. 14 September, 2002.

Schumpter, Joseph. Capitalism, Socialism, and Democracy. New York: Harper. 1942.

Scott, Allen J. "The Cultural Economy: Geography and the Creative Field." Media, Culture, and Society, 21(6). Pp. 807-817.

Venturelli, Shalini. "From the Information Economy to the Creative Economy: Moving Culture to the Center of International Policy." Cultural Comment Series. Center for Arts and Culture, Washington, D.C. 2001. Pp 1-40.

Major Data Sources

- Employment and earnings by detailed occupation in 2000: Employment and earnings by detailed occupation for Iowa and the United States were obtained from the Bureau of Labor Statistics program entitled Occupational Employment Statistics. The OES program provides annual estimates of employment and wages for about 750 occupations and 400 nonfarm industries for the nation and individual states. The estimates do not include self-employed persons.

- Occupation by industry in 2000: National occupational employment estimates by specific industry were obtained from the Bureau of Labor Statistics. The 2000 OES National Industry-Specific Occupational Employment and Wage Estimates are calculated from data collected in a national survey of employers of every size, in every state, including metropolitan and non-metropolitan areas. These survey data are used to calculate industry-specific occupational employment and wage estimates for most 2- and 3-digit Standard Industrial Classification (SIC) industry groups.

- Changes in employment by occupation, 1990-2000: Data comparing occupational employment in Iowa and the United States in 1990 and 2000 were obtained from Summary File 3 (SF3) Decennial Census of the United States. The Census Bureau compiles the SF3 data from the sample of households receiving the long-form questionnaire. Approximately 19 million housing units (about 1 in 6 households) received the Census 2000 long-form questionnaire.

  Drastic revisions in the occupational classification system between 1990 and 2000 make direct comparison of employment change over time impossible for some occupations. The 1990 Census classified occupations according to the 1980 Standard Occupation Classification (SOC). The 2000 Census classified occupations according to the revised 1998 SOC. Wherever possible, the 1990 occupational data were matched to the corresponding 2000 data.

- Employment by gender and occupation, 1990-2000: Iowa and U.S. data on employment by gender and occupation were obtained from the 1990 and 2000 Decennial Census SF3 data.

- Employment by industry, 1990-2000: Employment and earnings by industry for Iowa and the United States were obtained from the Bureau of Labor Statistics. The program providing these data is called the Covered Employment and Wages (CEW) program. This program, also referred to as the ES-202 program, produces comprehensive employment and wage data by detailed industry for workers covered by unemployment insurance laws. The BLS derives its data from quarterly tax reports submitted to State Employment Security Agencies by employers subject to State unemployment insurance (UI) laws and from Federal

agencies subject to the Unemployment Compensation for Federal Employees (UCFE) program. Jobs that are exempt or otherwise not covered by unemployment insurance are not included in the CEW/ES-202 tabulations. In the private sector, this may include wage and salary agricultural employees, self-employed farmers, self-employed nonagricultural workers, domestic workers, and unpaid family workers. Additionally, many state and local government workers are also excluded. Certain types of nonprofit employers, such as religious organizations, are given a choice of coverage or exclusion in a number of states, so data for their employees are reported to a limited degree.

- Iowa county-level employment by industry: The BLS CEW data are provided at the county, state, and national levels. Public access to county level data is limited in many specific industries due to non-disclosure requirements. Iowa State University has access to the unsuppressed county-level data from the Iowa Department of Employment Statistics.

- Gross output by industry: National estimates of the market value of production by industry for 1990 and 2000 were obtained from the Bureau of Economic Analysis Gross Output by Detailed Industry series. These files provide annual estimates of gross output for detailed nonmanufacturing industries. Gross output represents the market value of an industry's production, including commodity taxes. This value differs from GDP by industry, which measures an industry's contribution to GDP, and is often referred to as value added. GDP by industry is obtained as gross output less intermediate goods and services purchased.

Appendix 1: Creative Occupations and Their Classifications

Group	*Code*	*Occupation*
Super-Creative Core	15-0000	Computer and Mathematical Occupations
	15-1011	Computer and Information Scientists, Research
	15-1021	Computer Programmers
	15-1031	Computer Software Engineers, Applications
	15-1032	Computer Software Engineers, Systems Software
	15-1041	Computer Support Specialists
	15-1051	Computer Systems Analysts
	15-1061	Database Administrators
	15-1071	Network and Computer Systems Administrators
	15-1081	Network Systems and Data Communications Analysts
	15-2011	Actuaries
	15-2021	Mathematicians
	15-2031	Operations Research Analysts
	15-2041	Statisticians
	15-2091	Mathematical Technicians
	15-9999	Computer and Mathematical Occupations - Other
Super-Creative Core	17-0000	Architecture and Engineering Occupations
	17-1011	Architects, Except Landscape and Naval
	17-1012	Landscape Architects
	17-1021	Cartographers and Photogrammetrists
	17-1022	Surveyors
	17-2011	Aerospace Engineers
	17-2021	Agricultural Engineers
	17-2031	Biomedical Engineers
	17-2041	Chemical Engineers
	17-2051	Civil Engineers
	17-2061	Computer Hardware Engineers
	17-2071	Electrical Engineers
	17-2072	Electronics Engineers, Except Computer
	17-2081	Environmental Engineers
	17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors
	17-2112	Industrial Engineers
	17-2121	Marine Engineers and Naval Architects
	17-2131	Materials Engineers
	17-2141	Mechanical Engineers
	17-2151	Mining and Geological Engineers, Including Mining Safety Engineers
	17-2161	Nuclear Engineers
	17-2171	Petroleum Engineers
	17-3011	Architectural and Civil Drafters
	17-3012	Electrical and Electronics Drafters
	17-3013	Mechanical Drafters
	17-3021	Aerospace Engineering and Operations Technicians
	17-3022	Civil Engineering Technicians
	17-3023	Electrical and Electronic Engineering Technicians
	17-3024	Electro-Mechanical Technicians
	17-3025	Environmental Engineering Technicians
	17-3026	Industrial Engineering Technicians

Group	Code	Occupation
	17-3027	Mechanical Engineering Technicians
	17-3031	Surveying and Mapping Technicians
	17-9999	Architecture and Engineering Occupations - Other
Super-Creative Core	19-0000	Life, Physical, and Social Science Occupations
	19-1010	Agricultural and Food Scientists
	19-1021	Biochemists and Biophysicists
	19-1022	Microbiologists
	19-1023	Zoologists and Wildlife Biologists
	19-1031	Conservation Scientists
	19-1032	Foresters
	19-1041	Epidemiologists
	19-1042	Medical Scientists, Except Epidemiologists
	19-2011	Astronomers
	19-2012	Physicists
	19-2021	Atmospheric and Space Scientists
	19-2031	Chemists
	19-2032	Materials Scientists
	19-2041	Environmental Scientists and Specialists, Including Health
	19-2042	Geoscientists, Except Hydrologists and Geographers
	19-2043	Hydrologists
	19-3011	Economists
	19-3021	Market Research Analysts
	19-3022	Survey Researchers
	19-3031	Clinical, Counseling, and School Psychologists
	19-3032	Industrial-Organizational Psychologists
	19-3041	Sociologists
	19-3051	Urban and Regional Planners
	19-3091	Anthropologists and Archeologists
	19-3092	Geographers
	19-3093	Historians
	19-3094	Political Scientists
	19-4011	Agricultural and Food Science Technicians
	19-4021	Biological Technicians
	19-4031	Chemical Technicians
	19-4041	Geological and Petroleum Technicians
	19-4051	Nuclear Technicians
	19-4091	Environmental Science and Protection Technicians, Including Health
	19-4092	Forensic Science Technicians
	19-4093	Forest and Conservation Technicians
	19-9999	Life, Physical, and Social Science Occupations - Other
Super-Creative Core	25-0000	Education, Training, and Library Occupations
	25-1011	Business Teachers, Postsecondary
	25-1021	Computer Science Teachers, Postsecondary
	25-1022	Mathematical Science Teachers, Postsecondary
	25-1031	Architecture Teachers, Postsecondary
	25-1032	Engineering Teachers, Postsecondary
	25-1041	Agricultural Sciences Teachers, Postsecondary
	25-1042	Biological Science Teachers, Postsecondary
	25-1043	Forestry and Conservation Science Teachers, Postsecondary
	25-1051	Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary

Group	Code	Occupation
	25-1052	Chemistry Teachers, Postsecondary
	25-1053	Environmental Science Teachers, Postsecondary
	25-1054	Physics Teachers, Postsecondary
	25-1061	Anthropology and Archeology Teachers, Postsecondary
	25-1062	Area, Ethnic, and Cultural Studies Teachers, Postsecondary
	25-1063	Economics Teachers, Postsecondary
	25-1064	Geography Teachers, Postsecondary
	25-1065	Political Science Teachers, Postsecondary
	25-1066	Psychology Teachers, Postsecondary
	25-1067	Sociology Teachers, Postsecondary
	25-1071	Health Specialties Teachers, Postsecondary
	25-1072	Nursing Instructors and Teachers, Postsecondary
	25-1081	Education Teachers, Postsecondary
	25-1082	Library Science Teachers, Postsecondary
	25-1111	Criminal Justice and Law Enforcement Teachers, Postsecondary
	25-1112	Law Teachers, Postsecondary
	25-1113	Social Work Teachers, Postsecondary
	25-1121	Art, Drama, and Music Teachers, Postsecondary
	25-1122	Communications Teachers, Postsecondary
	25-1123	English Language and Literature Teachers, Postsecondary
	25-1124	Foreign Language and Literature Teachers, Postsecondary
	25-1125	History Teachers, Postsecondary
	25-1126	Philosophy and Religion Teachers, Postsecondary
	25-1191	Graduate Teaching Assistants
	25-1192	Home Economics Teachers, Postsecondary
	25-1193	Recreation and Fitness Studies Teachers, Postsecondary
	25-1194	Vocational Education Teachers, Postsecondary
	25-2011	Preschool Teachers, Except Special Education
	25-2012	Kindergarten Teachers, Except Special Education
	25-2021	Elementary School Teachers, Except Special Education
	25-2022	Middle School Teachers, Except Special and Vocational Education
	25-2023	Vocational Education Teachers, Middle School
	25-2031	Secondary School Teachers, Except Special and Vocational Education
	25-2032	Vocational Education Teachers, Secondary School
	25-2041	Special Education Teachers, Preschool, Kindergarten, and Elementary School
	25-2042	Special Education Teachers, Middle School
	25-2043	Special Education Teachers, Secondary School
	25-3011	Adult Literacy, Remedial Education, and Ged Teachers and Instructors
	25-3021	Self-Enrichment Education Teachers
	25-4010	Archivists, Curators, and Museum Technicians
	25-4021	Librarians
	25-4031	Library Technicians
	25-9011	Audio-Visual Collections Specialists
	25-9021	Farm and Home Management Advisors
	25-9031	Instructional Coordinators
	25-9041	Teacher Assistants
	25-9999	Education, Training, and Library Occupations - Other
Super-Creative Core	27-0000	Arts, Design, Entertainment, Sports, and Media Occupations
	27-1011	Art Directors
	27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators

Group	Code	Occupation
	27-1014	Multi-Media Artists and Animators
	27-1021	Commercial and Industrial Designers
	27-1022	Fashion Designers
	27-1023	Floral Designers
	27-1024	Graphic Designers
	27-1025	Interior Designers
	27-1026	Merchandise Displayers and Window Trimmers
	27-1027	Set and Exhibit Designers
	27-2011	Actors
	27-2012	Producers and Directors
	27-2021	Athletes and Sports Competitors
	27-2022	Coaches and Scouts
	27-2023	Umpires, Referees, and Other Sports Officials
	27-2031	Dancers
	27-2032	Choreographers
	27-2041	Music Directors and Composers
	27-2042	Musicians and Singers
	27-3010	Announcers
	27-3020	News Analysts, Reporters and Correspondents
	27-3031	Public Relations Specialists
	27-3041	Editors
	27-3042	Technical Writers
	27-3043	Writers and Authors
	27-3091	Interpreters and Translators
	27-4011	Audio and Video Equipment Technicians
	27-4012	Broadcast Technicians
	27-4013	Radio Operators
	27-4014	Sound Engineering Technicians
	27-4021	Photographers
	27-4031	Camera Operators, Television, Video, and Motion Picture
	27-4032	Film and Video Editors
	27-9999	Arts, Design, Entertainment, Sports, and Media Occupations - Other
Creative Professionals	11-0000	Management Occupations
	11-1011	Chief Executives
	11-1021	General and Operations Managers
	11-1031	Legislators
	11-2011	Advertising and Promotions Managers
	11-2021	Marketing Managers
	11-2022	Sales Managers
	11-2031	Public Relations Managers
	11-3011	Administrative Services Managers
	11-3021	Computer and Information Systems Managers
	11-3031	Financial Managers
	11-3040	Human Resources Managers
	11-3051	Industrial Production Managers
	11-3061	Purchasing Managers
	11-3071	Transportation, Storage, and Distribution Managers
	11-9011	Farm, Ranch, and Other Agricultural Managers
	11-9021	Construction Managers

Group	Code	Occupation
	11-9031	Education Administrators, Preschool and Child Care Center/Program
	11-9032	Education Administrators, Elementary and Secondary School
	11-9033	Education Administrators, Postsecondary
	11-9041	Engineering Managers
	11-9051	Food Service Managers
	11-9061	Funeral Directors
	11-9071	Gaming Managers
	11-9081	Lodging Managers
	11-9111	Medical and Health Services Managers
	11-9121	Natural Sciences Managers
	11-9131	Postmasters and Mail Superintendents
	11-9141	Property, Real Estate, and Community Association Managers
	11-9151	Social and Community Service Managers
	11-9999	Management Occupations - Other
Creative Professionals	13-0000	Business and Financial Operations Occupations
	13-1011	Agents and Business Managers of Artists, Performers, and Athletes
	13-1021	Purchasing Agents and Buyers, Farm Products
	13-1022	Wholesale and Retail Buyers, Except Farm Products
	13-1023	Purchasing Agents, Except Wholesale, Retail, and Farm Products
	13-1031	Claims Adjusters, Examiners, and Investigators
	13-1032	Insurance Appraisers, Auto Damage
	13-1041	Compliance Officers, Except Agriculture, Construction, Health and Safety, and Transportation
	13-1051	Cost Estimators
	13-1061	Emergency Management Specialists
	13-1071	Employment, Recruitment, and Placement Specialists
	13-1072	Compensation, Benefits, and Job Analysis Specialists
	13-1073	Training and Development Specialists
	13-1111	Management Analysts
	13-1121	Meeting and Convention Planners
	13-2011	Accountants and Auditors
	13-2021	Appraisers and Assessors of Real Estate
	13-2031	Budget Analysts
	13-2041	Credit Analysts
	13-2051	Financial Analysts
	13-2052	Personal Financial Advisors
	13-2053	Insurance Underwriters
	13-2061	Financial Examiners
	13-2071	Loan Counselors
	13-2072	Loan Officers
	13-2081	Tax Examiners, Collectors, and Revenue Agents
	13-2082	Tax Preparers
	13-9999	Business and Financial Operations Occupations - Other
Creative Professionals	23-0000	Legal Occupations
	23-1011	Lawyers
	23-1021	Administrative Law Judges, Adjudicators, and Hearing Officers
	23-1022	Arbitrators, Mediators, and Conciliators
	23-1023	Judges, Magistrate Judges, and Magistrates
	23-2011	Paralegals and Legal Assistants

Group	Code	Occupation
	23-2091	Court Reporters
	23-2092	Law Clerks
	23-2093	Title Examiners, Abstractors, and Searchers
	23-9999	Legal Occupations - Other
Creative Professionals	29-0000	Healthcare Practitioners and Technical Occupations
	29-1011	Chiropractors
	29-1020	Dentists
	29-1031	Dietitians and Nutritionists
	29-1041	Optometrists
	29-1051	Pharmacists
	29-1061	Anesthesiologists
	29-1062	Family and General Practitioners
	29-1063	Internists, General
	29-1064	Obstetricians and Gynecologists
	29-1065	Pediatricians, General
	29-1066	Psychiatrists
	29-1067	Surgeons
	29-1071	Physician Assistants
	29-1081	Podiatrists
	29-1111	Registered Nurses
	29-1121	Audiologists
	29-1122	Occupational Therapists
	29-1123	Physical Therapists
	29-1124	Radiation Therapists
	29-1125	Recreational Therapists
	29-1126	Respiratory Therapists
	29-1127	Speech-Language Pathologists
	29-1131	Veterinarians
	29-2011	Medical and Clinical Laboratory Technologists
	29-2012	Medical and Clinical Laboratory Technicians
	29-2021	Dental Hygienists
	29-2031	Cardiovascular Technologists and Technicians
	29-2032	Diagnostic Medical Sonographers
	29-2033	Nuclear Medicine Technologists
	29-2034	Radiologic Technologists and Technicians
	29-2041	Emergency Medical Technicians and Paramedics
	29-2051	Dietetic Technicians
	29-2052	Pharmacy Technicians
	29-2053	Psychiatric Technicians
	29-2054	Respiratory Therapy Technicians
	29-2055	Surgical Technologists
	29-2056	Veterinary Technologists and Technicians
	29-2061	Licensed Practical and Licensed Vocational Nurses
	29-2071	Medical Records and Health Information Technicians
	29-2081	Opticians, Dispensing
	29-2091	Orthotists and Prosthetists
	29-9010	Occupational Health and Safety Specialists and Technicians
	29-9091	Athletic Trainers
	29-9999	Healthcare Practitioners and Technical Occupations - Other

Group	Code	Occupation
Creative Professionals		Miscellaneous occupations from other major categories
	21-1011	Substance Abuse and Behavioral Disorder Counselors
	21-1012	Educational, Vocational, and School Counselors
	21-1013	Marriage and Family Therapists
	21-1014	Mental Health Counselors
	21-1015	Rehabilitation Counselors
	21-1091	Health Educators
	21-2011	Clergy
	21-2021	Directors, Religious Activities and Education
	41-3011	Advertising Sales Agents
	41-3021	Insurance Sales Agents
	41-3031	Securities, Commodities, and Financial Services Sales Agents
	41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products
	41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products
	41-9021	Real Estate Brokers
	41-9031	Sales Engineers

Appendix 2: An Introduction to Economic Impact Assessment

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Regional analysts are often asked to assess local economic conditions. As regional and national economies change, and they continually do, we are called upon to try to assess and interpret the consequences. These consequences are sometimes called *economic impacts*, but we will make distinctions in this short report between reporting on the economic *structure* of an economy, identifying regional economic *values* or *effects*, and isolating economic *impacts*.

There are several steps to describing and understanding regional economic structures, values, effects, and, if appropriate, economic impacts. In the first instance, we need to scrutinize the structure of the local economy. The structure of the local economy entails not only its obvious composition – agriculture, manufacturing, trade, etc. – but those industries' relationships with each other locally and non-locally, and those industries' relationship with households in the region of scrutiny. To do this we have come to rely on input-output accounts of local economies.

At its most basic, an input-output (I-O) model is an accounting of transactions among industries, governments, households, and imports and exports. These types of models help us to track the flow of resources and commodities into and out of industrial production. They help us to identify the value and the extent of *linkages* among firms and industries in our study territory. When one firm makes a purchase of an input from another in a region, there is a linkage. The stronger the linkages, the more important the two (or more) industries are to each other and to the regional economy. Input-output models, allow us to identify the structure and the linkages that exist in the regional economy. It is that strength that allows us to take I-O modeling a step forward and compile economic effects and economic impact studies. We also produce an array of output from these models that helps us to further characterize the economy that we are studying. Among this output are sectoral multipliers. These will be explained later, but in short multipliers are a ratio

of regional economic value in relation to the particular industry that you may be scrutinizing.

Once we understand industrial structures and linkages, we can then assess the overall importance of a set of industries in a region or the likely economic consequences if there is some change in production, earnings, or employment in these firms. We can also identify whether the effects are localized or regional.

I. Kinds of Economic Measures and Key Terminology

Input-output models (I-O) produce quite a bit of information for planners and decision makers. The more useful results for most projects are estimates of total industrial output, different kinds of income, value added, and jobs.

Total industrial output for most industries is simply gross sales. For public or quasi-public institutions we include all public outlays, to include the value of government sales and other subsidies received. This helps us to isolate the current economic value of their output to the citizens or the area served.

Employment compensation includes all salaries, wages, and wage-like benefits paid to workers.

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Proprietor incomes are the normal returns to sole proprietors.

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Other property incomes are composed of dividends, interests, and rents. They are the payments to owners of land and capital or to investors.

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Indirect tax payments are those to local, state, and the federal government that are part of the production or consumption process among households and industries. They are primarily use and sales taxes, along with excise taxes. These taxes are built into the value of the product that is produced or consumed (e.g., sales and use taxes on household consumption, sales taxes on office supplies, state and federal taxes on petroleum products).

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Value added is a measure of regional product. It includes all of the aforementioned employment compensation, incomes to sole proprietors, property incomes (dividends, interests, and rents), and indirect tax payments (primarily excise, use, and sales taxes paid by individuals to businesses). Value added is closely analogous to Gross Regional Product, and it is usually the preferred statistic for measuring productivity, income, and wealth produced in a region or by a type of manufacturing activity.

Jobs, the last measure, represent the number of positions in the economy, not the number of employed persons. The distinction is important. Many industries produce full-time jobs, primarily. Manufacturing firms, for example, tend only to hire full-time, full-year positions. Many other industries, like recreational services, retail sales, and dining and drinking establishments may hire a preponderance of part time or seasonal workers.

We also get detailed breakdowns of these economic data into the direct, indirect, induced, and total economic effects.

Direct effects refer to the operational characteristics of the firms or institutions that we are studying directly.

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Indirect effects measure the value of additional economic demands that the direct firms or institutions place on supplying industries in the region. When firms conduct business or public entities provide public goods, they must make many direct purchases from suppliers in the area.

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Induced effects accrue when workers in the direct and indirect industries spend their earnings on goods and services in the region. Induced effects can also be called household effects.

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Total economic effects are the sum of direct, indirect, and induced effects. They are all of the transactions attributable, either directly or indirectly, to the activities that we are measuring.

The term ***multiplier*** or ***multiplier effect*** is often used when referring to economic effects or economic impacts. There are different ways in which industrial activity can be expressed. The most commonly used multiplier is a ratio of the total economic effects in a particular category divided by the direct effects. The multiplier tells you how much the overall economy changes per unit change in the direct effects (e.g., how much the remaining economy changes per change in a dollar of output, a dollar of personal income, or per job in the direct industries or institutions that we are analyzing). Multipliers help us to anticipate the potential change in the regional economy attributable to a change in direct activity in a particular industry.

They are calculated two ways: one way isolates linkages with other industries. We can call this the ***inputs multiplier*** **(or Type I)**; the second identifies all regional transactions to include linkages with other industries and the associated induced

spending by workers and households. This is called the ***total multiplier*** **(or Type II or Type "SAM").**

Type I	=	**(direct + indirect) / direct**
Type II	=	**(direct + indirect + induced) / direct**

The Type I multiplier helps us to understand the value of industrial linkages by gauging input (indirect) sales, employment, and incomes in the region in relation to the industry that we are studying. The Type II multiplier helps us to understand how the whole economy might be related to the industry that we are studying.

Multipliers can be instructive for anticipating economic growth, in the case of a new or expanding firm, and economic decline, in the case of a plant closing. Firms with strong linkages to area supplying firms or that pay relatively high earnings may yield comparatively higher multipliers. Firms that are otherwise not linked strongly to local suppliers or that pay lower than average wages will usually produce lower multipliers. Urban areas with their more highly developed and diversified economies have, on the average, much higher multipliers than rural or smaller urban areas.*

The generic term ***economic impact*** is frequently used to describe a set of economic activities in a region. This term also suffers from misapplication. A distinction must be made between a multiplier that expresses the value of a set of inter-industrial linkages in a region versus multipliers that can be interpreted to mean causation.

To help illustrate this we need to be aware that there are several kinds of economic activities that may occur within a particular region. A useful distinction

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* Economic multipliers are often misunderstood or misused because users fail to account for regional production and cost of living differences, they use the wrong multiplier to describe a phenomenon, or they seek out the largest multiplier possible within a range of industrial activity without consideration of either the appropriateness of the application or of the actual scope of local production.

For these reasons and others, there has been a generalized inflation in the reporting of multipliers by those not trained in their generation and interpretation. The multiplier that we produce is called the Type II multiplier. The multipliers for different categories of economic activity that are produced by our research are specific initially to region that we are studying and are not directly derivative of national averages. The resulting data are more sensitive to the kinds and amounts of earnings and incomes that are produced in the region than would be determined using national averages.

can be made between firms that produce goods or services for export or which otherwise attract outside income and firms that produce goods and services for local consumption (either by industries or by households). Firms that produce goods intended primarily for export sales generate economic impacts because outside demand supports local employment.

If my town has a Tastee Freeze drive-in, it is probably primarily serving mostly local household demand. We can measure the overall size and contribution of the drive-in to the local economy, but the presence or absence of that particular place in the region does not necessarily present an economic impact -- one way or another the aggregate regional demand for cones and corn-dogs will be met somehow. What we can identify is the overall size and contribution of the firm to the local mix of economic activity. Accordingly, we can measure its ***economic effect*** or ***economic value*** in the region along with interdependencies that exist between it and other firms or service suppliers. In this instance, when we use I-O models we are isolating the strength of linkages that exist among industries and the firm that we are studying and the overall value (output, incomes, and jobs) of its production.

In contrast, if my town has a rocking chair factory, then it is producing a good that is intended primarily for sales beyond my community. Money from outside of the region flows into our community and supports employment, industrial purchases, and household spending in my community. An external demand (for rocking chairs) is creating local economic activity. The associated local production that is linked to this demand is producing an export. In this instance we have a measurable and clear economic impact – were it not for the external demand for the locally produced product, the economic activity would not be in the community. We are declaring economic causality. The firm is *causing* a measurable set of economic activity in the region that would otherwise not have existed were it not for the external (exported) demand.

Another clear example of economic impact can be associated with tourism. Here we know that large fractions of transactions in the region are attributable to some set of local attractions or events. Along with those direct purchases of entertainment or recreation, the initial economic impacts, are also collateral purchases of food, lodging, transportation, and other trade and services. These, too, are considered economic impacts for a region. We call them the visitor effects.

Large government institutions like a military base, hospital, school, or a prison also can represent a discernible economic impact to a region. Payments for institutional maintenance along with wages and salaries are primarily borne by non-resident tax payments. Non-residents are purchasing a locally produced good (public safety), the residual economic benefits of which remain largely in the community. Hence, in the last decade, the incredible inter-community bidding war for prisons.

Another category where a local impact may be evident is called ***import substitution***. If an indigenous firm can begin to produce for sale a commodity that people had been importing, then money that would otherwise have gone elsewhere stays in the community. A true import substitution can be counted as a localized economic impact.

We are cautious about using the term economic impact when assessing the overall size or contribution of one industrial sector unless is very clear that the industrial activity is totally new to the area and the industrial activity will stimulate export sales or act as an import substitute. Otherwise, we prefer to use the terms ***economic value*** or ***economic effect***. The distinction to our mind is not trivial.

The Study Region

Input-Output study regions can range from a single county, to multiple counties, to states, to multiple states, to the nation, depending on the nature of the study and the industries assessed. Care must be take when specifying an economic region. We are often called to assess county level impacts because for one reason or another that is the locus of all decision making and expected economic impacts. But county level analysis may not adequately capture the regional value of the economic change that we are trying to measure. Consequently, we believe that care should be given at the outset to adequately describing the economic territory that is being measured. It is usually more adequate to describe a collection of counties as comprising a study region instead of just one. It is usually inadequate to describe a set of non-adjacent counties as representing a study region.

The Data

The Iowa Department of Workforce Development, the U.S. Department of Labor, and the U.S. Department of Commerce periodically compile information on specific Iowa industries, their employment, and their production and payroll characteristics. A major data source for the state of Iowa is the ES-202 file (ES

means "employment security"), which isolates firm-level employment and the amount of payroll subject to withholding for social insurance tax purposes. Estimates of detailed industrial sector activity are generally not available at the county level. The state and federal agencies simply do not produce the estimates at that detail or there are so few firms that state and federal disclosure rules prevent reporting on the firms and their characteristics to protect their identities.

Very reliable estimates are produced by a private firm, however. Minnesota Implan, Inc., (MIG) which produces the input-output modeling software that we use, annually produces a complete set of county level industrial accounts for the U.S. for up to 538 industrial, governmental, and household sectors. These data sets are manufactured from data from:

- Benchmark input-output accounts of the U.S. economy (BEA—Commerce)
- National income a product accounts (BEA -- Commerce)
- Quinquennial industrial surveys (Commerce; USDA)
- ES 202 files (BLS – IDWD)
- County Business Patterns (Commerce)