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ABSTRACT

The 1987 publication "Workforce 2000" included the following predictions for the remainder of the 20th century: (1) the U.S. economy would grown at a relatively healthy pace; (2) U.S. manufacturing would be a much smaller share of the economy in 2000; (3) the workforce would grow slowly, becoming older, more female, and more disadvantaged; and (4) the new jobs in service industries would demand much higher skill levels. According to available occupational information regarding 1987-2000, the four predictions have not been entirely accurate. The U.S. economy has not grown at a relatively healthy pace since 1987, and the near-term future is unclear. The manufacturing share of employment has now fallen below that in services, retail trade, and (most recently) government, and there is no reason to expect a turnaround in this trend. Although it is true that the U.S. workforce will grow slowly and become older, more female, and more disadvantaged, these changes will not occur uniformly across or within the 50 states. Whether the new service sector jobs will demand much higher skill levels will depend on the interplay of business management practices and external advocates for wholesale revision of workplace organization. (MN)

National Occupational Information Coordinating Committee

NOICC Occasional Paper 5

Occupational Information: The "Blue Highways" of the Labor Market

David W. Stevens

Toward improving communication and coordination among developers and users of occupational, career, and labor market information

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David W. Stevens

The NOICC/SOICC Network

The National Occupational Information Coordinating Committee (NOICC) promotes the development and use of occupational, career, and labor market information. It is a federal interagency committee, established by Congress in 1976. Its members represent ten agencies within the U.S. Departments of Labor, Education, Commerce, Agriculture, and Defense.

NOICC has two basic missions. One is to improve communication and coordination among developers and users of occupational and career information. The other is to help states meet the occupational information needs of two major constituencies: (1) planners and managers of vocational education and job training programs and (2) individuals making career decisions.

NOICC works with a network of State Occupational Information Coordinating Committees (SOICCs), also established by Congress in 1976. SOICC members represent state vocational education boards, vocational rehabilitation agencies, employment security agencies, job training coordinating councils, and economic development agencies. Many also include representatives from higher education and other state agencies.

The NOICC/SOICC Network supports a variety of occupational information programs and systems. Some provide data to help in planning vocational education and job training programs. Others offer information for individuals who are exploring occupational options and making career decisions.

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Foreword: New Highways

In the 1950s, the creation of the interstate highway system had a major impact on the U.S. economy, accelerating and easing the movement of people and products nationwide. In the 1990s, public and private sector leaders are talking about the creation of new super *information* highways that will speed the flow of information and ideas using fiber optics. Again, the impact on the economy will be a major one.

To meet the labor market challenges posed by this new era, people need access to occupational and labor market information. In this NOICC occasional paper, David Stevens helps increase that access. He invites data users to explore with him the "occupational information highways" that can help link education and workforce initiatives with the citizens they are intended to benefit.

Dr. Stevens offers useful advice on how to approach the wealth of economic and labor market statistics that sometimes seem overwhelming even to experienced data users. He encourages users to be discriminating, to understand and analyze published statistics in the context of their specific needs. His guidance is practical and timely.

This paper, like others in our series of occasional papers, is part of NOICC's efforts to foster the exchange of information concerning the development, delivery, and use of occupational, career, and labor market information. Through our computerized information systems, the NOICC/SOICC Network is making such information more accessible. Through our training programs and materials, the Network helps users increase their understanding of the data.

This year NOICC has launched a major project to redesign the occupational information system (OIS). Basic software will be developed for a new occupational and labor market information database. Incorporating data from many sources, this database will be used to support customized information delivery systems that serve different user groups. One such system, introduced in 1984, is NOICC's micro-OIS, which delivers data for use in planning vocational-technical education and employment training programs. The software for the system will be redesigned, and NOICC will develop new training materials for users. Other recent NOICC initiatives address the need for career information and career development assistance.

For more than a decade, the NOICC/SOICC Network has worked to make occupational and career information more accessible to people who need it. In this paper, Dr. Stevens helps data users gain a better grasp of the implications involved in its use. Access and understanding are essential if users are to analyze and apply occupational information effectively and well.

Juliette Lester
Executive Director

Occupational Information: The "Blue Highways" of the Labor Market

David W. Stevens

Introduction

A Case for the "Blues"

A 1950s' connect-the-dots exercise, which linked the nation's major cities, was sufficient to win Congressional endorsement of President Dwight D. Eisenhower's proposal to build an interstate highway system. The details of routing, selecting interchange locations, specifying paving requirements, and establishing maintenance timetables followed.

The major contribution of the interstate highway system to the nation's economy then appeared in the form of new manufacturing, distribution, commercial, and residential clusters. Local roads and back lanes soon evolved into vital secondary networks connecting these clusters with the interstates and each other. On road maps of the time, these local or connector roads were marked in blue ink, the "blue highways" that beckoned to William Least Heat-Moon on his nostalgic journey into America.[1]

In 1993, the new Administration is seeking ways to revive the nation's economy and productivity. Apprenticeships that combine school-based and work-site learning; renewal of displaced workers' skills; adjustment assistance for military and civilian personnel who are affected by base-closings and other defense downsizing; and enhanced employment opportunity for inner-city and rural residents — each of these appears among the Administration's proposals to advance the nation's competitiveness through a more productive workforce.

Ultimately, the success of these workforce initiatives will depend, in part, upon the quality of occupational information that is available to connect the broad outlines of federal policy initiatives with individual members of the targeted groups — in other words, to translate the *intent* of the initiatives into program impact and individual

outcomes. From this perspective, occupational information may be viewed as the "blue highways" of the labor market.

At the individual level, occupational information can help people connect their interests, abilities, and skills with suitable job and career opportunities in the workplace. It includes, among other things, information on working conditions, earnings, duties, and educational requirements of specific occupations. It also includes information on sources of education and training and financial assistance. It offers road maps, with a wide variety of routes, to help individuals get from one place in the labor market to another.

Occupational information can also help planners and administrators of education and training programs. Data on occupational demand and program completers, for example, are useful in deciding which programs to offer and where employment opportunities for graduates are likely to be found. Occupational information also can be used in determining what preparation students will require. At the same time, it can help employers find sources of qualified candidates for new openings and providers of training to upgrade their current workers' skills.

Those who become familiar with the "blue highways" of the country often find hidden treasures to delight the palate, the ear, or the eye. They also discover the short-cuts, the safest or most scenic alternate routes from one place to another. And they learn to avoid detours, bottlenecks, and dead-ends. Similarly, users who become familiar with the "blue highways" of the labor market may also find treasures — a rare but rewarding job or career, an excellent source of training, an idea for a successful new training program.

This paper encourages users of occupational information to be more than passive adopters of historical and projected statistics, which have different strengths and weaknesses in specific applications. Instead, data users are challenged to learn the "blue highways" — to become familiar with the short-cuts and smoothest routes for entering and moving around successfully in the world of work.

Background

Many readers are aware of a 1987 publication titled *Workforce 2000.*[2] Published by the Hudson Institute, it predicted that four trends would shape the remaining years of the twentieth century.

(1) The American economy should grow at a relatively healthy pace;

(2) U.S. manufacturing will be a much smaller share of the economy in the year 2000;

(3) The workforce will grow slowly, becoming older, more female, and more disadvantaged; and,

(4) The new jobs in service industries will demand much higher skill levels.

Each of these four predicted trends is reëxamined in this paper. Available information about actual economic and demographic forces since 1987 is introduced to illustrate how unforeseen and interdependent domestic and international forces have affected the trends.

The four predicted trends are then used to illuminate two major points for users of occupational information. One point of the following discussion is to help users become more discriminating and skillful in selecting and translating published statistics to meet specific needs. A second purpose is to heighten users' sensitivity to workplace changes that they "know" are happening, but that are not yet reflected in the statistics available to them.

Two Key Concepts

Agreement on the meaning of two key concepts is important to this analysis. One requirement is a common understanding of *competitiveness*. The second is an understanding of the importance of the scope or focus of analysis in the use of data.

Competitiveness. The sustained vitality of any economy — local, state or national — is ultimately determined by its *competitiveness*.

> Competitiveness is the degree to which [an area] can, under free and fair market conditions, produce goods and services that meet the test of international markets while simultaneously maintaining or expanding the real incomes of its citizens.[3]

Select any basis for comparison — individuals you know, demographic groups you have read about, businesses in your community, industries that have been the subject of recent news stories, or towns in your state. Now, using any one of these as a basis for comparison, visualize a continuum from the least competitive one you know to the most competitive one.[4]

This exercise highlights a fact that should be kept in mind at all times when using occupational information — people, businesses, and locations differ in competitiveness. Most want to advance along this continuum. They want to move from less competitive to more competitive. However, the target is moving. It is wise to monitor the efforts that others are making to gain advantage. Today's opportunities may be lost in the future if a defensive, "stand still" competitive strategy is adopted. New rivals threaten previously stable alliances between businesses and their customers, between employers and incumbent employees, and between elected officials and their constituents.

Focus of Analysis. Users of statistical information need to be aware of the scope or coverage of the data they are using. For example, do the data pertain to a particular geographic area, such as a state, county, or region of the country, or are they national in scope? Do they apply to all sectors of the economy or to only one, or even a subset of only one sector?

This analysis focuses primarily on the nation as a whole. Occupational information also is used in analyzing employment and training needs at the state or local level, for example, in Job Training Partnership Act (JTPA) Service Delivery Areas, community college programs, area vocational-technical schools, or Job Service local offices. It also can be used by individuals who are making decisions about their own education or employment.

An essential skill in the proper use of information is to know whether the focus or scope of a statistic differs from the user's focus. If so, it is then necessary to determine the implications, if any, for the user in applying the information. As you think about the recent economic and demographic trends that are examined here, you can, and should, keep in mind the focus of the analysis in which you will be using occupational information.

A Reëxamination of the Four Predicted Trends

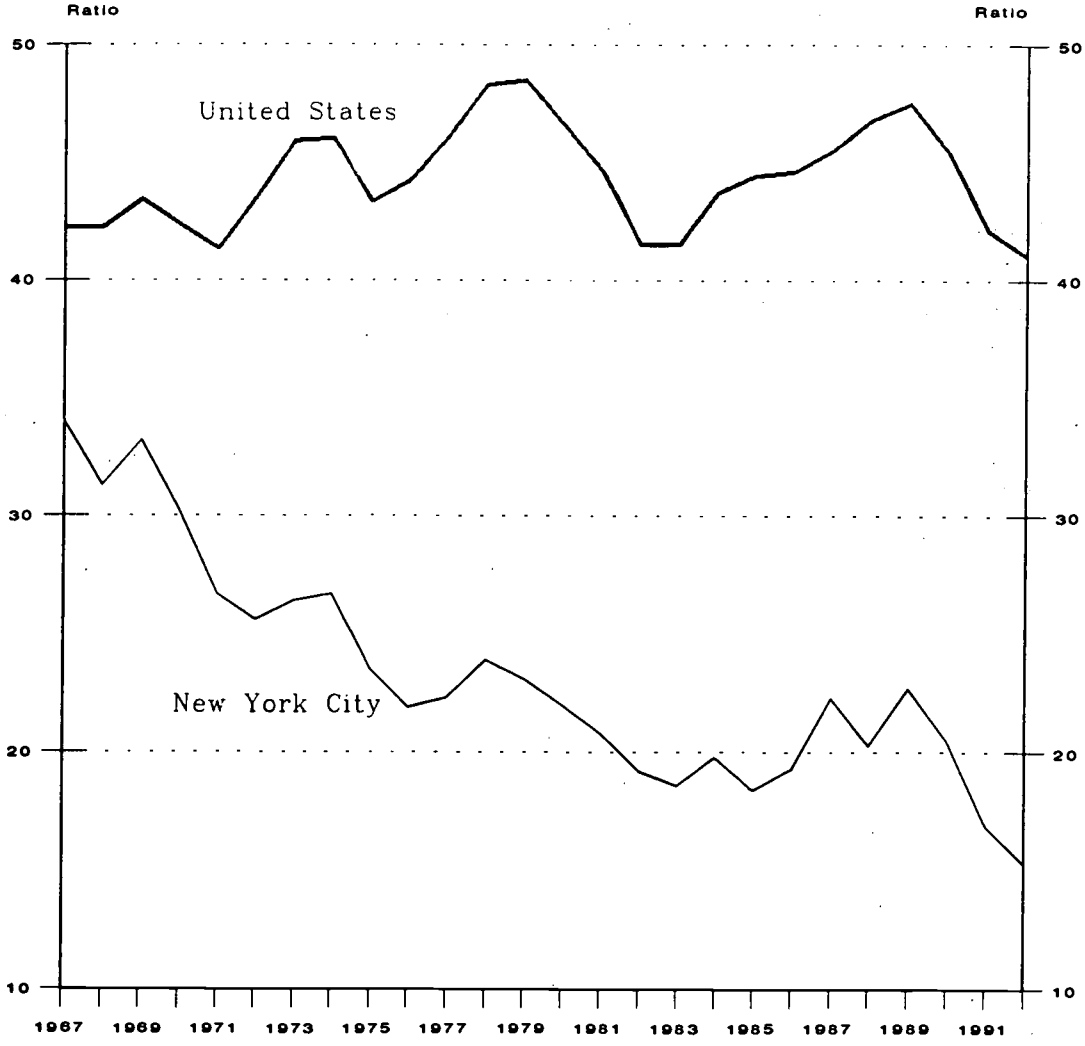
(1) Growth at a relatively healthy pace

The optimistic outlook that was expressed in 1987 has been replaced by widespread caution.[5] A 9-month national recession began in July 1990 and continued through March 1991.[6] No strong trend toward recovery had been detected before voters went to the polls in early November 1992.[7] Some developments since that time have been more promising,[8] but recent evidence has been mixed.

As was the case in the past few years, the effects of any recession can be extremely uneven among regions, industries, occupations, and demographic groups. Areas hard hit early in a recession may already be emerging from it when other areas are just beginning to feel its impact. Similarly, variations in any trend from state to state or region to region are common. Some states may lead, others lag the national trend. Figure 1 illustrates the variation that can occur in a trend nationally and in a local area.

Figure 1[9]

Youth Employment-Population Ratios
United States and New York City, 1967-1992



NOTE: Data relate to persons of both sexes, aged 16 to 19 years.
Source: U.S. Bureau of Labor Statistics

Figure 1 shows the employment-population ratio for youth aged 16-19 in the United States and in New York City over the time period from 1967 to 1992. In 1967, 34 percent of the total youth population in New York City was employed, while the figure for the United States was approximately 42 percent. Both rates fluctuated over time. However, 25 years later, the youth employment-population ratio in the United States was essentially the same, but the ratio for New York City had dropped to below 16 percent.

Variations in a trend reinforce the importance of having a particular focus of analysis or application in mind when using occupational information. Three aspects of variation warrant mention here:

(1) The timing of a trend's turning point (if any);

(2) The magnitude of economic change; and,

(3) The timing of a second turning point (if any).

Many years ago, the following way of making the same point appeared in the *Wall Street Journal*:

> A trend is a trend is a trend.
> The question is, will it bend?
> Will it alter its course
> through some unforeseen force,
> and then start all over again?

Visualize a competitiveness continuum again; only this time select the commercial construction industry as the focus of the analysis. Nationally, the commercial construction sector remains weak following a precipitous deceleration from an unsustainable pace in the 1980s. The most recent projections released by the Bureau of Labor Statistics indicate that "construction is one sector in which the rate of employment growth is expected to be less than one-half its rate of growth over the previous 15 years [1975-1990]."[10]

The timing and magnitude of deceleration differed among the nation's regions, and the timing and magnitude of renewed growth will be uneven, too. An extreme example of this point occurred in the Homestead, Florida, area, which was devastated by Hurricane Andrew in August 1992. This area has witnessed a tremendous unexpected upsurge in commercial building activity.

With the increase in construction, a sudden imbalance occurred between the demand for building-trades skills and the *local* supply of trained workers. Obviously local educators could not have been expected to anticipate this event nor should it have been a factor in their scheduling of courses in the building trades. Many training programs are long-term in nature; they neither can nor should be expected to address short-term imbalances.

Literally overnight, the shortage of required skills began to diminish. Itinerant workers descended on Homestead. Individuals in pickup trucks and vans were on their way while the devastating winds and waves were still destroying the area. Entire crews left other work sites across the country in anticipation of higher wages and longer hours.

What can be learned from this example of a local economy's turning points?

(1) The timing of a turning point can be sudden and unpredictable.

(2) The magnitude of change can be substantial, creating a dramatic imbalance between required occupational competencies and local candidate qualifications.

(3) This imbalance may be eliminated as rapidly as it arose.

While the timing of a turning point can be unpredictable, in other cases, it can be quite predictable, even when loud protests to the contrary are heard. For example, recommendations for the closing of military facilities were recently announced. These could have been placed along a predictability continuum. Some were obvious candidates for closure, while others may have been surprising. Although hope springs eternal, and global events can instantly revise the prospects for specific facilities and personnel, contingency planning is usually a wise investment.

The magnitude of change also can vary widely, as can the imbalances that are created in the demand for and availability of occupational skills. The imbalances may be eliminated quickly or they may persist for a long time. The implications for policy makers and program administrators will differ accordingly.

Hurricane Andrew created a demand for many skills far in excess of the local availability of these skills. At the same time, it created an excess *supply* of other skills. Retail stores were destroyed, dramatically and suddenly reducing the need for salespeople, cashiers, and managers.

The building-trades skills imbalance vanished quickly, when outside contractors poured into Homestead. The unemployed salespeople, cashiers, and managers were faced with

different job circumstances and choices. They could wait out the rebuilding process, accept temporary employment elsewhere, or leave the area altogether.

This example provides a dramatic illustration of a major point for data users: national trend information must be treated only as a starting point for accurately describing conditions in a smaller geographic area. The example also heightens awareness of the role of unanticipated market forces. They can suddenly and seriously impact the most successful occupational training programs. However, if the impact is likely to be temporary, it may be neither possible nor appropriate for planners to respond. Training for individuals and for institutions that provide it is often a long-term enterprise.

A natural disaster provides an extreme example, but a large reduction-in-force, relocation of government personnel, announcement of a new professional sports facility, or growth of a new retail trend (e.g., Wal-Mart, Office Depot, or Nordstrom) can be substituted. The story-line remains the same. Sooner or later, depending on the magnitude and duration of economic change, some occupational skills will be in demand; others will not. Workers who are displaced may decide to seek new jobs in other locations; others may pursue training to qualify for jobs close to home. Some training programs will become outmoded or unneeded; others will suddenly be in demand.

Some adjustments occur quickly and without active government intervention. Others occur slowly, or not at all, accompanied by substantial personal and collective loss. Program administrators bear some responsibility for determining whether to intervene and what course of action to follow. Familiarity with the many types of available occupational information can help them assess the impact of such events on their community and figure out the best route to pursue.

(2) U.S. manufacturing will be a much smaller share of the economy in the year 2000

Recently, the Bureau of Labor Statistics reported that the number of manufacturing jobs in the U.S. now falls below the combined total of local, state, and federal government jobs.[11] Earlier, the nation's total number of manufacturing jobs had been surpassed by the number of service sector jobs (in 1982), and by the number of retail trade jobs (in 1989).

This trend suggests another lesson: users of occupational information must translate national trends into their own specific context. Furthermore, they must examine the underlying reason(s) for these national trends, because such forces may, or may not, be pertinent to the specific context of a user's application.

Consider the following three statements found in the Bureau of Labor Statistics' latest projections.[12]

(1) Ten of the 20 fastest-growing industries, based on output, are manufacturing industries.

(2) Of the 20 industries projected to have the fastest rate of employment growth, only one — miscellaneous publishing — is a manufacturing industry.

(3) Of the 20 industries projected to have the sharpest rate of employment decline, 18 are manufacturing industries.

Each of these three statements is consistent with the other two, and all three are consistent with the Hudson Institute's prediction. The first statement focuses on *output*, while the second and third statements address *employment* issues. Data users must understand this distinction if they hope to offer useful advice to others.

Why does the difference between growth (decline) of output and growth (decline) of employment matter? It matters because technological innovation and improvements in work practices often translate into output and employment changes of opposite sign — output can be increasing, while employment is declining[13]. This is important for users of occupational information to understand because the availability of higher output levels translates into advances in the well-being of some people, gained at the expense of those whose jobs have been sacrificed. This improvement in living standards, in turn, translates into new job opportunities in other sectors. And so it goes: an always changing mix of growth and decline, and of opportunity and threat.

Each of the three statements about output and employment trends refers to a *rate* of change. Typically, rates of change in output or employment are most volatile in relatively small sectors of the economy. If employment rises from 1,000 employees to 1,500 employees, or falls from 1,000 to 500, a 50 percent change has occurred. However, if employment rises or falls by 500 from a previous level of 100,000, the change is only one-half of one percent. The number of employees affected remains the same. Caution should be exercised in reacting to evidence of high *rates* of change.

Each of the following *scenarios* would be consistent with a shrinking manufacturing share in the U.S. economy.

- Manufacturing is growing, but the economy as a whole is growing even more.

- Manufacturing is declining, but the economy as a whole is growing. This is the most recent projection of the Bureau of Labor Statistics.

- Manufacturing is declining, and the economy as a whole is declining too, but not as much.

These possibilities translate into very different consequences for the U.S. workforce. If both manufacturing and the economy are growing, then manufacturers may have to compete with other employers to attract and retain employees. This might hasten the substitution of technology for labor. As a result, stable or declining employment opportunity might then occur in some parts of the manufacturing sector,[14] accompanied by robust growth in output.

Alternatively, if manufacturing is declining, but the economy is growing, then opportunities are likely to arise for qualified candidates to move into the more viable sectors. In the worst case scenario, if the decline affects all sectors of the economy, few new opportunities are likely to arise.

It is sobering to read conclusions reached by the authors of a recent Office of Technology Assessment report.[15]

> Sinking market share alone is not proof of failing competitiveness. ... [but] U.S manufacturing fails the test of improving competitiveness on two counts: decisively on meeting the test of international markets, and substantially on increasing standards of living. ... If there are no major changes in government policies of developed countries, we expect U.S. manufacturing competitiveness to continue to sink, ...

This statement applies a broad brush to a diverse sector of the U.S. economy. Each of the following types of enterprises falls under the manufacturing umbrella.

(1) vineyards

(2) oyster shucking

(3) logging

(4) perfumes/cosmetics

(5) athletic shoes

(6) asbestos

(7) oil and gas field machinery and equipment

(8) computer storage devices

(9) burial caskets

This list suggests yet another point that data users must bear in mind. Not only do they have to be alert to differences between national trends and their specific needs for occupational information, but they also have to be aware of the *aggregation* issue. The statistics that are routinely used to describe the economy often refer to a set of activities (e.g. manufacturing) that is larger than a user's particular interest or application when occupational information is sought.

The following questions are designed to illustrate this issue. Some of the concepts that were mentioned earlier can be used to answer them. These concepts are *competitiveness*, *focus or scope of analysis*, *output changes* versus *employment changes*, and *rate* of change versus *magnitude* of change (of either output or employment). Proper understanding and use of these concepts in examining each of the questions will build expertise in the analysis of occupational information and its use in decision making.

- Does the *Workforce 2000* document's specter of a smaller share of the economy apply uniformly to each of the nine industries listed above, each of which is classified within the manufacturing sector?

- Does the location of the manufacturing activity matter?

- Are the identities of particular brand names pertinent?

- Are judicial rulings relevant?

- Must weather conditions and seasonal factors be considered?

- Are technological innovations relevant?

As the questions indicate, multiple forces can have a different impact on various subsectors within the manufacturing sector.

Users of occupational information must accept some responsibility for interpreting information appropriately for the specific context in which it is being used. The more far

reaching an influencing force is, the more important it becomes for data users to consider its implications for their situation. They need to recognize that conditions are changing and may not be reflected in the available statistics. Instead of relying strictly on the numbers, data users need to take new developments into account in making their decisions. One example that comes to mind is the proposed nationwide health care reform. According to BLS projections for occupational growth between 1990-2005, the growth of "half of the 30 fastest increasing occupations [will stem] from the rising demand for health services."[16] These projections were prepared before the government launched its new policy initiatives on health care reform. As this paper is being written, no one knows what shape the reform will take or what impact it will have on occupations in health care. But it could have far-reaching consequences for institutions and programs that offer preparation for work in health-related fields.

(3) The workforce will grow slowly, becoming older, more female, and more disadvantaged

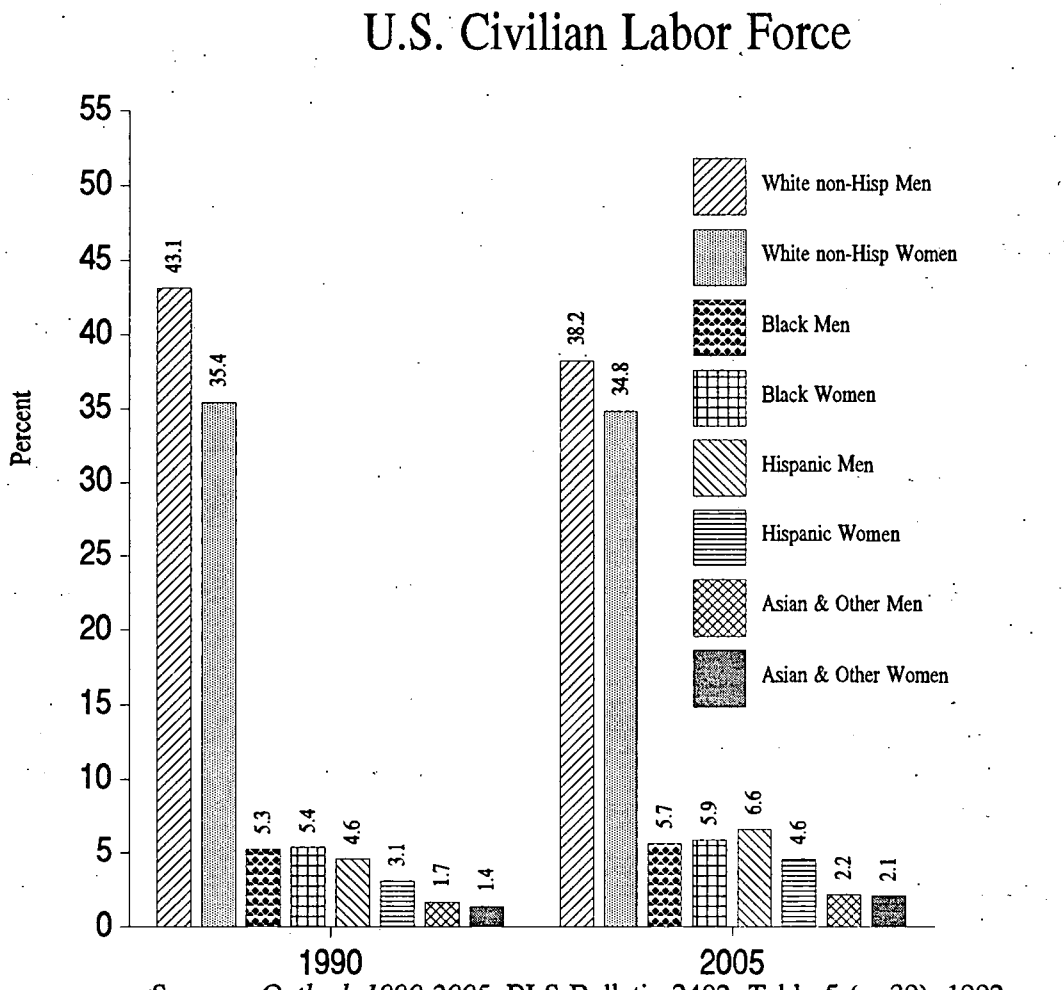
The following statement appears in a 1992 publication titled *A Demographic Look at Tomorrow*.[17]

> "The NEW workers in 2000 will be 85 percent combinations of immigrants, women and minorities. About 15 percent of new workers will be white males, according to the Hudson Institute's *Workforce 2000* report. That's a *net* figure."

Figure 2 (next page) presents the civilian labor force figures for 1990 and 2005 in the most recent projections released by the Bureau of Labor Statistics.[18]

The *Workforce 2000* prediction that "the new workers in 2000 will be 85 percent combinations of immigrants, women and minorities" appears to contradict the stability of the sex-race composition of the civilian labor force projected by the Bureau of Labor Statistics for 1990-2005, right? Wrong.

Figure 2



Source: *Outlook 1990-2005*, BLS Bulletin 2402, Table 5 (p. 39), 1992, Washington, D.C.: U.S. Government Printing Office.

Columns 1 and 2 in Figure 3 (next page) are taken directly from the *Workforce 2000* volume.[19] Column 3 is the sum of columns 1 and 2.

Widespread confusion has arisen from misinterpretation of column 2. The figures in this column *do not* represent the Hudson Institute's prediction of the *gross* flow of new entrants into the labor force between 1985 and 2000. Instead, as the *Workforce 2000* publication correctly states, these are *net* changes that take into account both *entrants* and *leavers* during the 15-year interval.

Figure 3

1985 Labor Force, Projected 2000 Labor Force and *Net* New Workers

	(1)		(2)		(3)	
	1985 Labor Force (000's)		1985-2000 Net New Workers (000's)		2000 Labor Force (000's)	
	N	%	N	%	N	%
Total	115,461	100	24,750	100	140,211	100
Native White Men	54,267	47	3,750	15	58,017	41
Native White Women	41,566	36	10,500	42	52,066	37
Native Nonwhite Men	5,773	5	1,750	7	7,523	5
Native Nonwhite Women	5,773	5	3,250	13	9,023	6
Immigrant Men	4,618	4	3,250	13	7,868	6
Immigrant Women	3,464	3	2,250	9	5,714	4

The important difference between *gross* and *net* changes is illustrated by revisiting the Bureau of Labor Statistics' labor force projections. Over the 15-year period 1990-2005, the non-Hispanic male labor force of 53,784,000 is expected to be reduced by 14,204,000 *leavers*, while adding 17,965,000 *entrants*. The latter figure is the *gross* number of *entrants*. The *net* number of *entrants*, which Harold L. Hodgkinson and the Hudson Institute call "the NEW workers," is 3,761,000 (entrants minus leavers).[20]

The distinction between *gross* and *net* can be remembered using the following metaphor. Imagine that you are standing by the only revolving doorway through which all *entrants* to and *leavers* from the U.S. workforce must pass. One out of every three persons who are expected to *enter* this doorway between 1990 and 2005 will be white non-Hispanic

men, while nearly one out of every two who *leave* through this doorway will be white non-Hispanic men.

This common confusion of gross and net figures in national demographic trends is compounded when they are applied in an analysis of a smaller geographic jurisdiction, such as a Service Delivery Area or a school district. Too often, the national *Workforce 2000* projections find their way into local deliberations without modification.

Hodgkinson has extracted the following statistics from recently released 1990 census reports.[21]

- Only three states — California, Florida, and Texas — absorbed half of the entire nation's population increase between the 1980 and 1990 censuses.

- By 2010 one-third of all youth (ages under 18) are expected to live in California, Florida, New York, and Texas.

- Twenty-six California municipalities have no single racial majority.

The direction, magnitude, and demographic mix of population change must each be considered in the context of the particular geographic area that is appropriate for your intended use of occupational information.

Consider the following complement to the fact that the nation's Hispanic population grew by 53 percent between the 1980 and 1990 censuses.

> The proportion of men born in the United States by Hispanic group varies sharply as a consequence of the different migration histories. Nearly three-fourths of all native-born Hispanic men are of Mexican origin..., 5 percent are of Puerto Rican origin, and only 1 percent of Cuban origin.[22]

Users of occupational information must be conscious of the difference between well publicized national averages and local or regional population characteristics that are pertinent to their specific need. How, for example, might the pending North American Free Trade Agreement be expected to affect the flow of Mexican immigrants into the United States? How might resolution of the Haitian refugee problem affect Florida's labor market? How might Puerto Rican statehood affect the demographic composition of particular local economies?

The lesson to be learned here is that caution must be exercised in adopting sound-bites of demographic information. The following subsections explore the interplay among four elements of change in the composition of the workforce: that it will (1) grow slowly and become (2) older, (3) more female, and (4) more disadvantaged.

The workforce will grow slowly. Nationally, slow growth will result from three main variables: (1) the relative sizes of the youth and potential retiree[23] populations, as well as of how accurately expectations about (2) women's labor force participation rates and (3) patterns of immigration hold up. Again, the relative importance of these age, sex, and immigration attributes will differ for particular locales across the U.S.

The workforce will become older. The Bureau of Labor Statistics reports that labor force participants in the age bracket 16-24 declined by 6 percent between 1975 and 1990, but that this group is expected to grow by 13 percent between 1990 and 2005.[24] Those in the age bracket 25-54 are expected to make up about the same share of the labor force in 2005 as they did in 1990. However, the number of labor force participants who are 55 or older is expected to grow between 1990 and 2005 at five times the rate of growth between 1975 and 1990.[25]

A note of caution should be added to this projection of rapid growth in the number of older labor force participants. The following finding was reported by Towers Perrin, an international management consulting firm headquartered in New York City.

> The golden years are looking less so: A survey of 150 large manufacturers found that changes in retiree health packages are being made in response to a new rule that calls for accrual of estimated payments for future benefits while an employee is still working, instead of payments during retirement. In response, more than one-third of companies have changed plans so that future retirees will have to pay more out-of-pocket health coverage, and almost 20% have set limits on their benefits ...[26]

Employer actions of this type, future public policy decisions that affect health benefit costs and coverage, and fluctuations in interest rates, stock and bond values, real estate prices, taxes, and inflation can all translate into dramatic changes in the timing and permanency of workers' retirement.

The workforce will become more female. The number of women in the labor force is expected to grow faster than the labor force as a whole between 1990 and 2005, but not as fast as between 1975 and 1990.[27] This slowdown was inevitable because the pool of

nonparticipant women available to enter the labor force is smaller than it was in the 1970s.

The projected rate of growth of the female labor force in the U.S. also should be accompanied by a caution. Public policy decisions that affect health care benefits, access to adequate child care services, welfare eligibility, the "glass ceiling," abortion rights, and the availability of educational grants and loans can have a dramatic cumulative effect on women's labor force participation.

The workforce will become more disadvantaged. It is difficult to assess this prediction in a paragraph or two because there is no consensus about the meaning of the word "disadvantaged." In general, populations that have higher than average proportions of high school dropouts, lower educational attainment levels than the general population, and a higher incidence of poverty-level incomes or welfare dependency are considered educationally and economically disadvantaged. Members of some racial and ethnic groups tend to be over-represented in these disadvantaged categories. They have higher rates of unemployment, and, even when they are employed, they are disproportionately concentrated in lower-skill and low-wage jobs. These facts, combined with growing evidence that jobs are requiring increasing levels of education and skills, contribute to a fear that disadvantaged groups may fall even further behind economically unless the educational and job skill disadvantages are corrected.

Thus, a major concern revolves around determining what level of education and types of skills are actually required to obtain jobs with high enough wages to permit family formation and support — in other words, to escape from or avoid poverty.

There is also a pervasive anxiety that many high-wage jobs are disappearing from the U.S. scene, leaving only low-wage opportunities for those who have been displaced.[28] In addition, there is growing concern that residents in the nation's urban cores and rural areas are physically isolated from the suburban job opportunities.

It is widely agreed that the mismatch between employer requirements and candidate qualifications is growing. The question for program planners and administrators is whether this trend has resulted from employer requirements rising above relatively stable candidate qualifications, or whether candidate qualifications are retreating from stable employer requirements, or both. A mismatch occurs in any case, but the implications for action differ.

For example, if an employer's precision requirements have risen, then a local community college's course offerings might need to be revised to reflect the new standards. New equipment might be needed as well as changes in the curriculum. On the other hand, the

employer's requirements may have remained the same, but available candidates for employment are less qualified than previous incumbents. In this event, the college might need to provide remedial help as well as occupational training to prepare students for employment.

(4) New jobs will demand much higher skill levels[29]

This is the most perplexing of the four *Workforce 2000* predictions for many users of occupational information.

- There is confusion about what is meant by *new* jobs.
- Many people are unclear about the connection between skill level requirements and education standards.
- Others have questions about the future roles for school-based and work-site training facilities.

One reason why many people are puzzled about this issue is the publicity that has accompanied the release of reports by the Commission on the Skills of the American Workforce[30] and the Secretary of Labor's Commission on Achieving Necessary Skills (SCANS)[31]; and by the deliberations of the U.S. Department of Labor's National Advisory Commission on Work-Based Learning.

The Commission on the Skills of the American Workforce concluded:

> Because most American employers organize work in a way that does not require high skills, they report no shortage of people who have such skills and foresee no such shortage. With some exceptions, the education and skill levels of American workers roughly match the demands of their jobs. ... Only five percent of employers were concerned about a skills shortage. These were mainly large manufacturers, financial service organizations and communications companies.[32]

This conclusion does not contradict the *Workforce 2000* prediction because the Commission's conclusion refers to a then current snapshot of the U.S. workforce and workplace. The Hudson Institute's prediction refers to anticipated future skill needs. The Commission's theme, which has been popularized as "America's Choice," is that the nation's employers must reorganize themselves to maintain and advance their competitiveness. Front-line workers in high performance facilities will be expected to

accept more responsibilities, use judgment, and make decisions. In other words, *high skills will be needed to remain competitive in the international marketplace.*[33]

The Secretary's Commission on Achieving Necessary Skills (SCANS) took an important step that built on the "America's Choice" conclusion. The SCANS identified five competencies and a three-part foundation of skills and personal qualities that constitute required workplace know-how. The SCANS has published a collection of job-specific applications of this framework.[34] It provides a guide to assessing SCANS skill requirements in specific enterprises.

The U.S. Department of Labor's National Advisory Commission on Work-Based Learning, whose members were appointed in October 1991, focused on what is seen as a weak link in the chain from either school-based or work-site training for higher skills to productivity improvement and a potential for higher real incomes — i.e., competitiveness as it was defined at the beginning of this paper. The Advisory Commission identified the weak link as work-based learning, which is defined as "the process of applying knowledge and skills to problem-solving and continuous improvement."[35] The Commission members recommended that enterprises devote simultaneous attention to upgrading skills, making effective use of technology, and restructuring work.

Users of occupational information can visualize the issues these three commissions are addressing by thinking in terms of four vessels. They are labeled old supply, new supply, old demand, and new demand, respectively. These categories are generalizations, used to illustrate a point. In reality, individuals move across and may even be in more than one category at a time.

Old supply refers to those who have left the formal education and training system. They may be in the labor force (working or seeking work) or they may not. *New supply* includes those people who are still enrolled in education or training. It should be apparent that a person can move from *old supply* to *new supply* (e.g. an adult worker who returns to a community college to learn new skills) and that eventually those who are now in *new supply* will move to *old supply*.

Old demand is intended to include all the existing positions for which skill requirements have not been upgraded or diminished significantly and recently. It can include new openings created by growing employment in existing occupations and openings that occur, for example, when workers retire, change jobs, or move to a new location. *New demand* covers all positions that do reflect different skill requirements than might have been reported in the past. It may include jobs in occupations with new requirements, as well as jobs in new and emerging occupations.

This four-vessel approach highlights the importance of zeroing in on the target groups (people and jobs) that are pertinent for the intended use of occupational information.

- Work-based learning offers a means of retraining workers (*old supply*) to meet the emerging requirements of *new demand*. It can also be a means of training new supply, e.g. through youth apprenticeships, to meet either old or new demand.

- Vocational-technical education concentrates on a portion of *new supply* to satisfy some *old demand* needs. It also strives to identify and meet requirements for *new demand*. In particular, the tech prep concept is designed to promote this shift of emphasis. (Tech prep is a major initiative of the Carl D. Perkins Vocational and Applied Technology Education Act. It is designed to help young people make an efficient transition from secondary vocational education to postsecondary technical education and training.)

- Community colleges are devoting increasing attention to the *old supply* population as a marketing target. This focus complements the work-based learning emphasis on meeting *new demand* requirements.

- Private career schools serve multiple constituencies — extending the retention of some youths in *new supply* by providing a bridge from high school to the workplace, while simultaneously attracting a segment of *old supply* back into (re)*new*(ed) *supply* status. These schools typically meet *old demand* requirements that offer a sustainable market, as well as responding to the emerging requirements of *new demand*.

- JTPA programs for dislocated workers are intended to serve members of the *old supply* population through relatively short-term training. Other JTPA progams, such as those for the disadvantaged, train both old and new supply.

Much of the nation's available occupational information is more suited to the measurement of *new supply* and *old demand* than it is to the accurate recording of *old supply* or *new demand*. This should not be alarming; nor should it deter anyone from persisting in the proper use of occupational information. Routinely available data sources simply permit a more timely and accurate monitoring of the flow of newly emerging trainees (*new supply*) than they do in keeping track of the labor force status and skills of individual members of *old supply*. Conversely, routine data sources can record the details of *old demand* (current employment) more easily than they can detect the emerging features of *new demand*.

What is measured best is information about the compatibility of the qualifications of people who are now enrolled in public and private skill-training programs with respect

to the requirements of job opportunities that are, or soon will be, available. Information on new and emerging occupations, and the skills they will require, is more difficult to obtain. SCANS and the National Advisory Commission on Work-Based Learning have attempted to address this lack of information, particularly the skills required. As this information is developed and becomes available to users, all forms of occupational education and training will be better equipped to meet new demand needs.

The Four Predicted Trends in a Nutshell

The American economy has not grown at a relatively healthy pace since the 1987 prediction was published. The near-term future is unclear. There are reasons to be optimistic. Postponed purchases of new automobiles, as well as new homes and the consumer durable goods that typically accompany such a purchase, may represent a source of pent-up demand. The same may be true of business deferrals of investments in new facilities and capital equipment. However, there are also reasons to be cautious — continuing realignment of personnel commitments by businesses in many industries and parts of the country and persistence of high personal and corporate debt levels.

The manufacturing share of employment has now fallen below that in services, retail trade, and most recently government. There is no reason to expect a turnaround in this trend. Even if a spurt in manufacturing output occurs, recent changes in personnel commitments and the continuous appearance of new technologies combine to preclude this historic cornerstone of the U.S. economy as a source of expanding job opportunities. Nonetheless, there will continue to be a substantial number of challenging jobs in the manufacturing sector, some of which will continue to offer an attractive compensation package and stable employment opportunity. The trick, for a user of occupational information, is to dig beneath the surface of aggregate statistics to find the hidden pockets of economic vigor *within* the manufacturing sector, i.e., to travel the "blue highways" of available statistics.

The nation's workforce is likely to grow slowly, becoming older, more female, and more disadvantaged. But the appearance of these changes will not occur uniformly across, or within, the states. In addition, various forces can affect the size and demographic mix of the nation's workforce, for example: events in the former Soviet Union and its satellites, pending approval of the North American Free Trade Agreement, the dynamics of defense spending and downsizing of military commitments, business practices that affect retirement benefits, proposed changes in health care benefits, and the recent reauthorization of the Higher Education Act.

Whether the new jobs in the service sector will demand much higher skill levels will depend upon the interplay of business management practices and external advocates for a wholesale revision of workplace organization. If proposed work-based learning, apprenticeship, tech prep, and related modifications (e.g. widespread adoption of industry skill standards) occur quickly, then higher workforce skill levels are likely to result. This could, in turn, address some of the sources of disadvantage and mitigate the impact of predicted changes in workforce composition.

Beyond the *Workforce 2000* Predictions

In conclusion, two recent trends warrant attention when using occupational information — economic turbulence[36] and so-called "broad-banding" compensation practices[37] that are one manifestation of this turbulence. These illustrate how important it is to keep up with innovations in the workplace.

Economic Turbulence[38]

Recall the competitiveness concept that was introduced at the beginning of this paper. There, two criteria of competitiveness were stated — meeting the test of markets and maintaining or increasing real incomes. In recent years, many U.S. enterprises have struggled to meet the test of international markets by restraining or reducing labor costs. Wage increases have been denied, benefits have been withdrawn, productivity expectations have been raised, and job security has diminished.

A pervasive uncertainty about personal job security and prospects for advancement has settled in across the U.S. Many incumbent workers fear that their current employer will close, merge, relocate, or downsize. Even public sector workers have been affected.

Fear of displacement causes employees to behave differently. Introduction of new technologies may be resisted. Suspicion of employer actions and motives translates into heightened tensions between management and worker. This can result in more frequent miscommunication and lapses in productivity.

This insecurity on the employee side is mirrored by employers, who are faced with a loss of previously insulated markets, a threat of hostile takeovers, and workplace constraints that interfere with their ability to respond to competitive pressures. One result is that traditional work rules and compensation practices have been replaced by employee

leasing, contract employment, widespread revision of job classification systems, and creative ways to limit employee costs.

What practices like these mean for users of occupational information is that more variance is appearing within occupations defined by available classification systems. It also has become more difficult to identify in employment statistics who is working at what site. And it means that many more combinations of a wage or salary rate with bonuses and benefits must be considered. The broad-banding concept illustrates a popular version of such an innovation.

Broad-Banding Compensation Practices

Some employers have responded to increasing global competition by dismantling rigid internal lines-of-promotion with associated hierarchical titles and pay scales. In their place, these employers have established more flexible employee mobility paths and accompanying compensation packages. The concept is called "broad-banding" because the affected employees move within a cluster of assignment possibilities, rather than through a sequential progression of specific jobs. For example, an employer may combine ten different job titles, with separate duties, into a much broader single occupation in which a worker may perform various combinations of all those duties. In such situations, employees need adaptability and a broader range of skills.

Broad-banding offers employers flexibility, allowing them to respond more quickly and effectively to changing competitive threats and opportunities. It also permits and promotes adaptability in employees. As the practice spreads, it will challenge users of occupational information, who have traditionally sought accurate estimates of incumbents in narrowly defined occupational groups.

Driving Responsibly in the 1990s

Occupational information specialists are akin to the rural resident who has traveled an uncrowded "blue highway" for years. But then he ventures forth on the Sunday afternoon that the *New York Times* travel section has identified the road as an idyllic route for day-trippers. Like that hapless driver, occupational information specialists are in for a shock. They are about to be blessed with what was once a pipe-dream — enthusiastic public demand for their information products and services.

This new era of public interest will create unprecedented pressures for quality control standards in the collection, consolidation, and dissemination of occupational information.

Data collectors and producers will be pressed to provide ever more timely and specific data. With increasing demand for their products and services, those who package and distribute occupational information must be careful to select and present the information accurately, to avoid overselling what it can do, and to help consumers understand what it means.

Travelers in the labor market need not be "accidental tourists"[39] bewildered by unfamiliar terrain. This paper encourages them to be discerning and responsible drivers and urges them to take advantage of the occupational information and assistance that are available to them.

Endnotes

1. See: William L. Heat-Moon (1983), *Blue Highways: A Journey Into America*, New York, NY: Atlantic Monthly Press. The term 'blue highways' refers to the map color that once designated the local, or connector, roads in the United States.

2. William B. Johnson and Arnold E. Packer (1987), *Workforce 2000: Work and Workers for the Twenty-First Century*, Indianapolis, IN: Hudson Institute.

3. U.S. Congress, Office of Technology Assessment (1991), *Competing Economies: America, Europe, and the Pacific Rim*, OTA-ITE-498, Washington, DC: U.S. Government Printing Office, p.3.

4. See: Michael E. Porter (1990), *The Competitive Advantage of Nations*, New York, NY: The Free Press.

5. See: G. Pascal Zachary and Bob Ortega (1993), "Age of Angst: Workplace Revolution Boosts Productivity at Cost of Job Security," *The Wall Street Journal*, March 10, 1993, p. A1.

6. This three-quarter peak-to-trough period was determined by a panel of experts convened by The National Bureau of Economic Research, Inc.. This panel's identification of turning points is generally acknowledged to be the "official" business-cycle definition for the U.S.

7. See: Thomas Nardone, Diane Herz, Earl Mellor, and Steven Hipple (1993), "1992: Job market in the doldrums," *Monthly Labor Review*, 116:2, pp. 3-14. Also see, in the same issue: Mary C. Dzialo, Susan E. Shank, and David C. Smith, "Atlantic and Pacific coasts' labor markets hit hard in early 1990's," pp. 32-39; and, Samuel M. Ehrenhalt, "Economic and demographic change: the case of New York City," pp. 40-50, for recent documentation of a point made earlier in this paper--a statistic's focus of analysis may affect what is revealed.

8. See: John M. Berry (1993), "Jobless Rate Fell to 7% in February," *The Washington Post*, March 6, 1993, p. A1.

9. This figure is based on Chart 4 in "Economic and demographic change: the case of New York City" by Samuel M. Ehrenhalt, *Monthly Labor Review*, 116:2, p. 49. Two years of additional data provided by the Bureau of Labor Statistics were added.

10. Ronald E. Kutscher (1992), "New BLS projections: findings and implications," *Outlook 1990-2005*, BLS Bulletin 2402, Washington, DC: Government Printing Office, p. 6.

11. Barbara Vobejda (1992), "In Job Strength, Manufacturing Eclipsed by Public Sector," *The Washington Post*, August 18, 1992, p. A11.

12. *Ibid.*

13. See: Al Ehrbar (1993), "Price of Progress: 'Re-Engineering' Gives Firms New Efficiency, Workers the Pink Slip," *The Wall Street Journal*, March 16, 1993, pp. A1 and A11; Clare Ansberry (1993), "Hired Out: Workers Are Forced To Take More Jobs With Fewer Benefits," *The Wall Street Journal*, March 11, 1993, pp. A1 and A9; and, G. Pascal Zachary and Bob Ortega (1993), "Age of Angst: Workplace Revolution Boosts Productivity At Cost of Job Security," *The Wall Street Journal*, March 10, 1993, pp. A1 and A8.

14. It is important to remember that the substitution of technology for labor *creates* new manufacturing employment opportunities for some workers — those who actually produce the new technology.

15. U.S. Congress, *op. cit.*, pp. 3, 4 and 7.

16. Bureau of Labor Statistics, *Occupational Outlook Quarterly*, Fall 1991, Washington, DC: U.S. Department of Labor, p. 31.

17. Harold L. Hodgkinson (1992), *A Demographic Look at Tomorrow*, Washington, DC: Institute for Educational Leadership, Inc., Center for Demographic Policy, p. 9.

18. Derived from figures presented in Howard N. Fullerton, Jr. (1992), "Labor force projections: the baby boom moves on," BLS Bulletin 2402, *op. cit.*, Table 5. "Civilian labor force, 1990 and projected to 2005 ...", p. 39.

19. William B. Johnson and Arnold E. Packer (1987), *op. cit.*, p. xxi.

20. Howard N. Fullerton (1992), *loc. cit.*

21. Harold L. Hodgkinson (1992), *op. cit.*, pp. 1-12.

22. Barry R. Chiswick (1988), "Hispanic men: divergent paths in the U.S. labor market," *Monthly Labor Review*, 111:11, p. 34.

23. Extreme caution is urged in deciding how to treat retirement expectations, since these are heavily dependent upon the age profile, industrial composition, presence of formal labor-management agreements, and household makeup of the relevant *focus of analysis* for OIS use. The page one headline "Hard Times Threaten IBM's Long Tradition of Eschewing Layoffs," in the July 31, 1992 number of *The Wall Street Journal* illustrates this point. Widespread buy-outs of employee contracts have occurred throughout the Nation since *Workforce 2000* appeared in 1987. The effects of these actions on the size of the Nation's workforce are negligible, but their consequences locally are another story.

24. Bureau of Labor Statistics (1992), *Occupational Outlook Handbook*, Bulletin 2400, Washington, DC: U.S. Department of Labor, p. 9.

25. *Ibid.*

26. *The Wall Street Journal* (1992), "Odds and Ends," August 17, 1992, p. B1.

27. *Ibid.*, p. 8.

28. See: Commission on the Skills of the American Workforce (1990), *America's Choice: high skills or low wages!* Rochester, NY: National Center for Education and the Economy, 147 pp.

29. See: Nabeel Alsalam (1993), "Interpreting conditions in the job market for college graduates," *Monthly Labor Review*, 116:2 (February 1993), pp. 51-53; Alan Fechter (1993), "Shortage of college graduates? more evidence is needed," *Monthly Labor Review*, 116:2 (February 1993), pp. 53-54; Michael G. Finn and Joe G. Baker (1993), "Future jobs in natural science and engineering: shortage or surplus?," *Monthly Labor Review*, 116:2 (February 1993), pp. 54-61; Peter Cappelli (1992), "Is the 'Skills Gap' Really about Attitudes?," *EQW Working Papers*, Philadelphia, PA: National Center on the Educational Quality of the Workforce, The University of Pennsylvania; John Gapper (1992), "The Challenge: To understand how the growth of technical jobs in the middle of organizations is changing the traditional ways of teaching skills and managing work," *EQW Issues*: September 1992, Philadelphia, PA: National Center on the Educational Quality of the Workforce, The University of Pennsylvania; and, John H. Bishop (1993), *Overeducation*, Working Paper No. 93-06, Ithaca, NY: Center for Advanced Human Resource Studies, New York State School of Industrial and Labor Relations, Cornell University, January 12, 1993, 17 pp.

30. *Ibid.*

31. See: Secretary's Commission on Achieving Necessary Skills (1991), *What Work Requires of Schools*, Washington, DC: U.S. Department of Labor.

32. Commission on the Skills of the American Workforce, *op. cit.*, p. 3.

33. See: Walter Kiechel III (1993), "How we will work in the year 2000," *Fortune*, May 17, 1993, pp. 39-52.

34. Secretary's Commission on the Achievement of Necessary Skills (1992), *Skills and Tasks for Jobs: A SCANS Report for America 2000*, Washington, DC: U.S. Department of Labor. For each job that was analyzed the SCANS competencies and foundation skills are "rated in descending order of importance or 'criticality' for that job. This rating indicates the degree to which the skill is important/required for performance of the specific job tasks and duties." *Ibid.*, p. 1-5.

35. National Advisory Commission on Work-Based Learning (1992), *Framework for Action*, April 7, 1992 DRAFT, Washington, DC: U.S. Department of Labor.

36. See: Peter B. Doeringer (ed.)(1991), *Turbulence in the American Workplace*, New York, NY: Oxford University Press.

37. See: Frank Swoboda, "'Broad-Banding' Concept Stresses Pay Over Promotion," *The Washington Post*, July 12, 1992, p. H2.

38. Many of the concepts and themes that are presented in this subsection are drawn directly from the individually authored chapters in Peter B. Doeringer (ed.)(1991), *loc. cit.*

39. See: Anne Tyler, *The Accidental Tourist* (1985), New York, NY: Viking Penguin, Inc.

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From 1971 to 1989, Dr. Stevens was a faculty member at the University of Missouri-Columbia. During these years he participated in partnerships with Missouri's Department of Education, Division of Employment Security, Division of Job Development and Training, and Occupational Information Coordinating Committee.

Relevant publications span a 20-year period. They begin with the *1973 Report* for Missouri's Occupational Training Information System and progress through *Employment Projections for Planning Vocational-Technical Education Curricula: Mission Impossible?* (1978) to a 1993 paper on "The Case for Revising U.S. Occupational Classification Taxonomies." This new paper will appear in the proceedings of a June 1993 international conference on occupational classification convened by the U.S. Department of Labor's Bureau of Labor Statistics and Employment and Training Administration.

Dr. Stevens' current research program concentrates on improving research and policy analysts' understanding of state administrative data sources, particularly quarterly wage records maintained by state employment security agencies. It also focuses on demonstrating pioneering uses of these data to advance understanding of the interplay among workforce productivity, business survival, and national prosperity.

NOICC Occasional Papers

1. *Occupational Information and International Development: Improving HRD Diagnostics*, John E. S. Lawrence (December 1990)

2. *An Appraisal of NOICC/SOICC Needs for Data from the 1990 Decennial Census*, Richard E. Dempsey (February 1991)

3. *National Career Development Guidelines: Progress and Possibilities*, Juliet Miller, Jane Goodman, Brooke Collison (June 1991)

4. *Career Information Delivery Systems: A Summary Status Report*, Valorie Hopkins, Joyce Kinnison, Eleanor Morgenthau, Harvey Ollis (March 1992)

5. *Occupational Information: The "Blue Highways" of the Labor Market*, David W. Stevens (August 1993)

From Pilot to Practice: Strengthening Career Development Programs, Juliette N. Lester, Editor (November 1992). This monograph was co-sponsored by NOICC and the Office of Vocational and Adult Education, U.S. Department of Education.

Remaining copies of these papers are available at cost from the NOICC Training Support Center. Copies of NOICC Occasional Papers are $5.00 each. Copies of *From Pilot to Practice: Strengthening Career Development Programs* are $10.00 each. Please add 10% for shipping and handling. You may send your request for copies with remittance (check, money order, or purchase order) made payable to:

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The NTSC operates through the Oklahoma State Occupational Information Coordinating Committee. The center is based at the Oklahoma Department of Vocational and Technical Education in Stillwater. The Oklahoma Vo-Tech agency, Oklahoma State University (OSU) Educational Television Services, and the OSU College of Education's School of Occupational and Adult Education combine resources and staff to operate the training center.

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