DOCUMENT RESUME

ED 433 776 HE 032 326

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TITLE Employment Projections and Program Priorities. AIR 1999 Annual Forum Paper.
PUB DATE 1999-06-02
NOTE 27p.; Paper presented at the Annual Forum of the Association for Institutional Research (39th, Seattle, WA, May 30-June 3, 1999).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Bachelors Degrees; Databases; Degrees (Academic); Demand Occupations; *Education Work Relationship; Employment Projections; Higher Education; *Labor Market; Long Range Planning; Needs Assessment; Statistical Analysis; Supply and Demand
IDENTIFIERS *AIR Forum; *Alabama

ABSTRACT

This study compared occupational projections for Alabama with graduation rates in corresponding academic programs to provide a context for state and institutional policy decisions on new program initiatives and to comply with recent program viability legislation. The study examined number of degrees conferred, employment projections, and application of crosswalk data analysis to relate the two. Data on completed degrees were from the Integrated Post-Secondary Education Data System; employment projections based on Bureau of Labor Statistics data; and crosswalk data from the National Crosswalk Data Center. Application of the model yielded the general conclusion that existing programs in Alabama colleges and universities will probably meet the demand for most fast growing and high demand occupations requiring a baccalaureate degree through the year 2006. Among occupations where the supply is projected to meet or exceed demand are executives, registered nurses, elementary teachers, and accountants. Occupations where the supply may not meet demand include system analysts, special education teachers, operations research analysts, and computer engineers. Results suggest these data could be used for planning purposes, to aid in decision making, and as a catalyst for collaborative initiatives. (Contains 22 references.) (DB)

Employment Projections and Program Priorities

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June 2, 1999

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This paper was presented at the Thirty-Ninth Annual Forum of the Association for Institutional Research held in Seattle, Washington, May 30-June 3, 1999.
This paper was reviewed by the AIR Forum Publications Committee and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC Collection of AIR Forum Papers.

Dolores Vura
Editor
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Employment Projections and Program Priorities

Abstract

Institutions that respond to the economic base in their region will remain competitive and be better positioned to obtain financial support from donors and legislatures. State-funded institutions must consider employment opportunities within state borders. They can use statewide occupational projections as a tool for assessing program viability. In addition to mandated viability standards based on graduation rate, Auburn University is studying ten-year occupational trends using annual average growth rate, and annual average job openings. For example, Computer Engineering is the highest growth rate occupation in Alabama, with 365 openings projected per year (93.6% growth over ten years), and relates to our program in the College of engineering.

Employment Projections and Program Priorities

Rationale for Study

Institutions of higher education operate in highly competitive environments. The push for increased state funds, new programs, more students, and expanded services led to the establishment and increase of statewide coordination during the 1950s and 1960s as states sought to bring rationality to their rapidly growing higher education systems. However, this competition took on a new meaning during the 1980s and 1990s when state revenue increases for higher education began to dwindle or disappear as other state functions moved into priority funding positions. In addition, state legislatures and the public at large began to raise questions about accountability, performance, and productivity of the higher education systems (McGuiness, 1997). At the same time, business and industry began calling for more effective responses to employment needs.

By the late 1990s, it was clear that the market for higher education had changed. While the values and traditions of the academy remained "venerable sources of strength," institutions and their governing boards began to look to the external environment to understand the context in which those values and traditions must operate (Mingle, 1998). That environment included the changing labor market and the demand for new skills for workers, the emergence of new technologies such as the Internet, the challenge to the market share of traditional colleges and universities by new providers of postsecondary education, and the intensely competitive and changing public-policy context which exacerbated cost, price, and productivity pressures on institutions of higher education (Mingle, 1998).

To strike a balance between the demands of the market, the academy, and the public, some state-level higher education agencies have taken steps to link employment projections to academic program priorities based on several factors. These factors include 1) the connection between higher education and the economy; 2) the current focus on meeting student and employer demands for job/skills training; 3) the need for public institutions of higher education to respond to state policy directives and demonstrate wise stewardship of public resources; and 4) the benefits of academic program planning and review in a statewide context.

Connection Between Higher Education & the Economy

The Carnegie Foundation (1976) suggests that the two best restraints on higher education are competition and state budgets. An institution which responds to the economic base in its region will remain competitive and will be better positioned to obtain financial support from donors and legislators. Further, one of the key characteristics of strategic planning is "matching institutional capabilities with environmental conditions to achieve goals" (Seymour, 1988). Seymour lists three considerations for determining program priority: mission, internal factors and external factors. Toombs and Tierney (1991) recognize environmental factors, and specifically "market forces," in their components of curriculum design.

Although it may be appealing to define mission, role and program priorities in isolation, successful universities understand that this process cannot occur without a consideration of their higher education constituencies (WICHE a, 1992). In fact, many higher education plans include education of personnel needed for "an advanced economy" (WICHE b, 1992). As long ago as 1862, the Morrill Act empowered the

federal government to establish land grant colleges to "improve the economy in agriculture and commerce" (Hines, 1988). Colleges and universities added academic programs in areas such as computer engineering and management information systems as those knowledge areas became crucial for industrial development.

Current Focus on Meeting Student and Employer Demands for Job/Skills Training

Mingle notes that higher education is moving from a producer-dominated enterprise to one fully sensitive to and focused on the consumer. He states that public expectations of higher education appear to have no bounds and that these expectations will likely put considerable pressure on colleges and universities.

> "The American labor market is both extraordinarily diverse and exceptionally dynamic, making it difficult not only to generalize about the knowledge and 'skill sets' college graduates need but also to make predictions about the future demand for specific occupations. Through surveys and interviews of employers and external advisory groups, increasing numbers of colleges stay closely tuned to this changing job market. This information is shaping college programs in important ways." (Mingle, p. 6).

The need to stay focused on the consumer is reinforced by the Joint Commission on Accountability Reporting which recommends that institutions survey graduates and report placement rates. Placement can measure accountability, but it is more closely related to current than future employability. Nor can placement identify employment possibilities for which no training is being conducted. State-level coordinating agencies are exploring ways to conduct market analyses to determine how best to address the

needs of a particular state. A recent review of the Alabama Commission on Higher Education recommended that the agency devote more effort and resources to statewide market analyses (ACHE, 1999), and the State Higher Education Executive Officers Association is offering an on-line distance technology course this summer on conducting market analyses for state agency staff.

Need for Public Institutions of Higher Education to Respond to State Policy Directives & Demonstrate Wise Stewardship of Public Resources

Historically, states have required academic program review and approval as a way of curbing unnecessary duplication of programs among public institutions and to judge the appropriateness of existing programs (McGuiness, 1997). Most criteria for the review of new or existing programs require a needs analysis which provides some indication of how the new or existing program responds to employers. In some cases, however, the link between employment and program graduates is a critical factor. For example, the Alabama legislature adopted "program viability" legislation in 1996 which required academic programs in all public institutions to meet specific graduation rates or be terminated. After a three-year monitoring period of non-viable programs, the institutions can request waivers for programs which still do not meet the graduation standards if they can document unique or extraordinary characteristics of the program. Factors which may be considered in this evaluation are placement of graduates in program-related areas of employment, success of program graduates, and market demands. The Alabama institutions are evaluating how best to assess the link between their graduates in low-producing programs and the State's employment needs.

Benefits of Academic Program Planning and Review in a Statewide Context

One economy driven process is to related occupational projections to institutional programs. For example, Gottlieb (1995) used occupational projections to identify industries likely to provide future entry level and advanced training jobs as a way to re-prioritize job training programs in the Cleveland-Akron area of Ohio. While individual institutions or systems can and do analyze occupational trends within their States, the limitations of such an approach are obvious. It does not take into account what other institutions within or outside the state are doing to meet the need. Given the limited state resources available to higher education, institutional representatives, legislators, and policy makers all should be committed to the best use of state dollars to the greatest benefit of all citizens. This approach to academic program planning and review requires institutions to think "outside the box," because what is best for the state may not be best for an individual institution. For example, an institution may identify a particular occupation as high demand based on labor market projections and informal or formal communication with employers. Additionally, the employer may offer a sizeable donation to the institution to develop a new program in this occupation. Based on this information, the institution makes a commitment to offer the new program. However, if the plans of other institutions in the state and the productivity of existing programs in public and private institutions are not taken into account as the employment projections are reviewed, the potential exists for expensive duplication of programs and oversupply of the market. While employers may benefit from an oversupply of persons trained for a specific occupation, institutions of higher education will not. The public trust demands that state dollars be spent on programs that have the most priority and benefit for the state, rather than for an individual institution.

Similar Efforts in Other States

Although state-level agencies have been interested in links between occupational projections and academic programs for some time, the challenge has been to assess these relationships while institutions review existing programs, and before institutions propose new programs. Some states have developed comprehensive approaches to needs assessment from a statewide level, while other states simply react to institutional plans.

Arizona. For example, in 1998, the Arizona legislature challenged the Arizona Board of Regents and the State Board of Directors for Community Colleges of Arizona to develop a mutual statewide process for identifying and meeting needs for advanced postsecondary education. To respond to this challenge, the Boards jointly convened the 1998 Higher Education Study Committee (HESC) which developed a new statewide process for identifying and meeting needs. This process utilizes a Joint Review Committee who evaluate requests for new or expanded programs based on statewide criteria for need. Needs assessment remains an institutional function, although the case for a new program may be strengthened if more than one institution joins in partnerships to meet the need. The Report of the Arizona Higher Education Study Committee suggests several sources of data to support the demonstration of need for programs, including the Arizona Department of Commerce, the Arizona Department of Economic Security, and the Bureau of Labor Statistics (Report of the Arizona Higher Education Study Committee, 1998).

Idaho. Idaho has taken a somewhat broader approach to statewide needs assessment through statewide roundtable discussions and the use of specific advisory committees (Dodson, 1999).

Wisconsin. The University of Wisconsin System supports a market research unit which works with universities to identify needed programs regionally looking at demand from employers and students. Faculty still identify areas of interest for new programs, but the market research unit then samples regional businesses using the Dunn and Bradstreet list (Sell, 1999).

Florida. Sanchez, Laanan, and Wiseley (1999) provide an excellent summary of state efforts to measure students' post-college earnings. Most of these initiatives follow program completers or graduates into the workplace to estimate average annual earnings or placement. Florida is considered to be the pioneer in this area with the Florida Education and Training Placement Information Program (FETPIP) which resulted from a legislative directive and a joint agreement between the Florida State Department of Education and the Florida Department of Labor and Employment. Other states such as Ohio, California, North Carolina, Texas, and Washington have pursued similar approaches. However, these statewide efforts provide little information on whether graduates are being trained in fields most needed by employers.

Illinois. The Illinois Board of Higher Education (IBHE) is a member of a consortium of state agencies in that state committed to sharing labor market information. Using this information, the IBHE has conducted statewide analyses by field of study comparing employment projections to graduate survey data. Typically, the IBHE will conduct a statewide study of existing programs in a field to be followed by

institutional studies a few years later of related programs. Their initial statewide analysis gives institutions a useful context for their own assessments. One recent IBHE study included social work and human services (Illinois, 1997).

A similar review of health professions education in Illinois in 1992 compared projected average annual job openings in various health professions fields with the estimated total supply and the number of degrees conferred and made recommendations for capacity adjustment in individual programs. This analysis was followed by an identification of and recommendations for health professions education in 1993, and implementation of policies on health professions education in 1995. The purpose of this study was to adjust current capacity to reflect the priorities of higher education in the state and occupational demands. Recommendations ranged from reducing and monitoring existing programs to maintaining and increasing productivity (Illinois, 1995).

In 1998, the IBHE published a report which identified and proposed solutions to educational needs in Lake County. This study used several data components, including a market research report by a private consulting firm. In addition, the IBHE staff convened a number of different forums for Lake County residents to express educational needs and conducted further research to analyze demographic and economic data relevant to education demand and need. Several approaches were taken for examining educational demand, including an analysis of the number and percent of positions in Lake County which required some type of postsecondary education. This analysis was based on specific employment projections for the county by occupation and level of training required (first professional degree, doctoral degree,

master's degree, etc.) compiled by the Illinois Occupational Information Coordinating Committee (Illinois, 1998). This study served as the basis for the establishment of a University Center in Lake County to offer high quality, convenient, and affordable education by building upon the resources and programs of existing institutions.

Statement of the Problem

The state of Alabama does not have a systematic statewide process for matching occupational projections prepared by the Bureau of Labor Statistics with the number of graduates of academic programs for use by educators in academic program planning. Although individual institutions, such as Auburn University, have made such comparisons as needed to foster strategic planning for program prioritization, resource allocation, curriculum development, and course availability, this approach fails to consider the statewide perspective. The need to analyze occupational and graduation data at the state level is highlighted by several recent developments, such as limited resources to support higher education in the state, the passage of the program viability bill with provisions for waiver of non-viability based on factors related to meeting occupational needs, and recommendations by the Evaluation Committee of the Commission for a change in focus of the agency to incorporate more market research into planning for the state. Although other states have done some work in this area, a process needs to be developed which will incorporate the unique characteristics of Alabama higher education.

Purpose of the Study

The purpose of this study is to compare occupational projections for the state of Alabama with graduation rates in corresponding academic programs to provide a

context for state and institutional policy decisions on new program initiatives, and to comply with recent program viability legislation.

Methodology

We use three major tools to establish a context for state and institutional policy decisions on new programs: number of degrees conferred, employment projections and a crosswalk to relate one to the other. This analysis was limited to high-demand and fast-growing occupations in Alabama *that require a Bachelor's degree or higher* (excluding first professional) as identified by the Alabama Department of Industrial Relations based on Bureau of Labor Statistics (BLS) surveys. High-demand occupations have at least 535 annual job openings and fast-growing have at least 50 average annual job openings and an annual growth rate of at least 3.2% (Alabama Occupational Trends, 2006, April 1998)[1]. The comparison will show whether the expected number of graduates will meet the employment needs of the Alabama economy in these occupations.

Number of degrees conferred

On an annual basis, public and private Institutions of higher education in Alabama prepare a mandatory Completions Survey as part of reporting for the federal Integrated Post-Secondary Education Data System (IPEDS) for the National Center for Education Statistics. The completions survey is organized by program based on the six-digit Classification of Instructional Programs (CIP) taxonomy and award level. (For more information on academic program definitions, see Classification of Instructional Programs, 1990 edition). The reports are forwarded to the Alabama Commission on Higher Education (ACHE), which serves as a statewide repository due to its statutory

designation as the state coordinating agency for all data collection requirements of the federal government which require state level coordination and relate to postsecondary education.

Completions are reported by program name and CIP code. For example, the number of degrees conferred in Nursing in Alabama in a given year in Registered Nurse preparation programs can be determined by summing the number of Nursing degree completions reported at CIP code 51.1601 at each institution for that year. Thus, we can determine the total number of degree completions reported for every academic discipline in the state. In this study, we define *degrees conferred* as the average annual number of IPEDS completions reported by post-secondary institutions in Alabama based on the five year period 1993-94 through 1997-98 (July 1 - June 30 reporting period). The averages include both public and private institutions.

Employment projections

At the national level, employment projections are prepared by the Bureau of Labor Statistics of the US Department of Labor. The Bureau of Labor Statistics (BLS) has prepared employment projections since 1957 (Employment Outlook: 1994-2005, December 1995). Minimal input data was available at first, but by the early 1970s, a standard methodology was developed that is still in use today (BLS Handbook of Methods, April 1997; Employment Projections for 1995: Data and Methods, April 1986).

The BLS uses several key tools for making predictions, including the composition of the labor force, economic growth, demand and occupational trends. Labor force is based in part on population data obtained from the US Bureau of the Census. The census data includes age, sex, race and origin, as well as birth rates, death rates, and

net migration. BLS uses this demographic data, along with labor force participation rates.

Economic growth is projected from nearly 300 variables, including inflation rate, unemployment rate, interest rate, and money supply. Growth is forecast using a complex simulation model. Demand is based on personal consumption, business investment, government purchases, and trade (imports and exports). Examples include expenditures for rent, apparel, food and transportation.

Occupational trends are based on data collected from the Occupational Employment Survey which is prepared and summarized by the BLS. The survey, which is administered by each state, collects data on approximately 775 occupations in 350 industries. Survey data includes the number of employees in each occupation and the salary range in which they fall, providing regular empirical data on occupational employment.

BLS stores this information in a Projections database that is programmed to generate employment trends over a ten-year period. The Bureau makes several key assumptions during the projection process, such as, work patterns will not change during the projection period (e.g., length of average work week), broad social and educational trends will continue, there will be no major war, there will not be a significant change in the size of the Armed Forces, and there will be fluctuations in economic activity due to the business cycle. The most recent national projections are for the ten-year period 1996 - 2006 (Monthly Labor Review, November 1997). (See, also, Occupational Quarterly, Summer, 1998.)

BLS monitors and validates its own Employment Projections. Exceptions to general assumptions are reported regularly. For example, the Bureau recently reported that the manufacturing and health industry suffered unexpected setbacks in 1998 . These setbacks were attributed to the Asian economic crisis and more stringent health care reimbursement policies (Monthly Labor Review, February 1999).

BLS conducted a detailed analysis of the educational requirements of occupations and published the minimum preparation that most employers required to be hired in an occupation. However, requirements can vary from employer to employer, and there may be more than one way to qualify. For example, the educational preparation listed for registered nurses is "associate," although baccalaureate graduates take the same licensure exam and are hired for the same entry level positions. For that reason, the BLS educational requirements for each occupation must be evaluated for their accuracy in a given state (Employment Outlook: 1994-2005, December 1995).

Changes in employment growth can be due to the growth of an industry and the change in occupational structure. For example, health-related professions grow along with the growth of the health services industry. An example of structural change is the increased use of computer technology which is expected to increase the need for systems analysts and programmers, and decrease the need for typists (Employment Projections for 1995: Data and Methods, April 1986). BLS provides a data set to each state for producing local projections. Using special software, states prepare projections parallel to the national one that are based on their local populations, industries and employees.

This study uses the Alabama Occupational Trends data for April 1998, which are derived from November 1997 federal projections, as the basis for estimating statewide employment demand in various occupations (Alabama Occupational Trends for 2006, April 1998). In this study, we define *employment demand* as the projected annual average number of job openings in Alabama for the period 1996 - 2006. Specifically, we evaluated the projected employment need for all high-demand and fast-growth occupations that require a bachelor's degree or higher. These occupations include: secondary school teachers, general managers and top executives, registered nurses, elementary school teachers, systems analysts, special education teachers, accountants and auditors, computer engineers, engineering, science and computer systems managers, residential counselors, preschool and kindergarten teachers (combined group), physical therapists, operations research analysts, speech-language pathologists and audiologists, and occupational therapists.

Crosswalk

In many cases there is an obvious relationship between Occupational Employment codes (used in the Employment Projections) and Classification of Instructional Program codes (used in the Completions Survey). When questions arose, we consulted a database at the National Crosswalk Data Center, which is funded by the National Occupational Information Coordinating Committee to help identify these relationships. They provide a crosswalk table that relates one set of codes to the other (National Crosswalk Data Center, April, 1999).

For example, for the occupational category of Systems Analyst, 24 Alabama colleges and universities have reported baccalaureate and master's completions at CIP

codes related to the Systems Analyst occupation based on the crosswalk. Degrees are conferred in these instructional program areas: 11.0101, Computer and Information Sciences, General; 11.0401, Information Sciences and Systems, 11.0701; Computer Science; 11.9999, Computer and Information Sciences, Other; 52.1201, Management Information Systems and Business Data Processing, General. Note that all programs are offered at the Bachelor's level, and two programs at the Master's level as well (11.0101 and 52.1201).

Constructing a crosswalk data base query for all Systems Analysts instructional program codes resulted in these occupational codes: 25102, Systems Analysts, Electronic Data Processing; 25103, Data Base Administrators; 25104, Computer Support Specialists; 25105, Computer Programmers; 25108, Computer Programmer Aides; 25199, All Other Computer Scientists; 31226, Computer Science Teachers, Post Secondary. The query shows that people who earn a Systems Analyst type of degree are reported on the Occupational Survey as working as Systems Analysts, as well as in several related jobs. Thus, we can relate the number of Systems Analysts type degrees conferred to the number of job openings projected for Systems Analysts, although some graduates will enter related computer fields.

As you can see, the articulation between academic program and occupation is more precise for some occupations than for others. Occasionally, crosswalk relationships were adjusted to better reflect specific conditions in Alabama.

Results

The application of this model yielded the general conclusion that existing programs in Alabama colleges and universities will probably meet the demand for most

fast growing and high demand occupations requiring the minimum of a baccalaureate degree through the year 2006. Supply/demand analyses are grouped into three categories: 1) those occupations in which the supply/demand appear to be in balance, 2) those occupations for which the supply may not meet the demand, and 3) those occupations which require further study.[2]

Occupations Where Supply Projected To Meet or Exceed Demand

General Managers & Top Executives, Registered Nurses, Elementary Teachers, Accountants & Auditors, Engineering, Math & Natural Science Managers, Residential Counselors, Teachers, Preschool & Kindergarten, Physical Therapists, Speech Pathologists/Audiologists, and Occupational Therapists.

Occupations Requiring Further Study

Secondary Education (Analysis Needed in Specific Certification Areas).

Occupations Where Supply May Not Meet Demand

Systems Analysts, Special Education Teachers, Operations Research Analysts, and Computer Engineers.

Discussion

We recommend three primary uses of the data, as a: 1) planning tool; 2) decision making tool; and 3) catalyst for collaborative initiatives.

Planning Tool

This data provides a valuable contextual base for statewide discussions on employment needs in Alabama and ways that higher education can address those needs. The findings do not make absolute judgments on occupational categories, but rather, provide a starting place for asking the right questions. For example, the IPEDS

completions data on secondary education are not the best source of information on available supply of teachers because institutions can award teaching certificates without offering academic programs and teachers may be certified through alternative routes. Consultation with officials at the State Department of Education about these data revealed that for the most part, Alabama produces more new teachers than local education agencies need, with the exception of a few areas, such as special education, foreign languages education, and sciences other than biology. Given the difficulty in hiring foreign language teachers, and the low productivity in many foreign language programs in the state, questions need to be formulated to understand the problem and focus on solutions. These questions cannot be addressed effectively by one or a few institutions in the state. Rather, strategies for meeting these needs should be developed by involving all stakeholders (institutional representatives, staff members of the State Department of Education, school principals and superintendents, legislators, etc.) in meaningful discussions.

Decision Making Tool

Data from this model can be used by individual institutions and by the Commission as one component in making academic program decisions. Although a comparison of occupational projections to academic program graduates should be viewed as a focal point of discussion for the state, it is not an absolute assessment of need for the continuance or existing programs or the establishment of new programs. Such a comparison also can serve as an important source of information in determining whether institutions of higher education are meeting the needs of business and industry in training employees. If an occupation is identified as high demand or fast growing,

for example, and an institution's faculty express interest in developing an academic program in this field, the productivity of other existing or new programs should be taken into consideration. Several years ago three new master's level programs in physical therapy were approved in Alabama institutions. When the future productivity of these new programs was taken into account, the supply and demand for physical therapists in the state was in approximate balance, even though physical therapy is projected to be a fast growing occupation for 1996-2006. However, if the productivity of the existing and new programs is not considered, an institution might conclude that a significant demand exists and invest limited state resources in an occupation where needs are being met.

Institutions may also use this data to identify areas which are not currently being addressed by the educational system. For example, information technology (computer engineers, systems analysts) appears to be an area where the existing programs in the state are not producing adequate numbers of professionals. Institutions may want to implement strategies to increase enrollment in their existing programs or plan new programs. Another useful analysis would be to highlight any high demand or fast growing programs which are not offered by any institution in the state. Finally, the selection of an occupation is an individual's choice, and a state process should never attempt to dictate consumer decisions. However, the state should strive to give the consumer valid information about employment projections and available supply to enable the consumer to make informed choices.

Catalyst for Statewide Cooperative Initiatives

Unfortunately, it is difficult for individual institutions to foster relationships with other institutions for cooperative ventures. Collaboration is not the norm in most

institutions of higher education. However, if this model can identify certain occupational areas which are ripe for cooperative initiatives and if these relationships can be encouraged through collaborative inter-institutional discussions and financial incentives, then statewide cooperative programs may be established which benefit the entire state.

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Footnotes

[1]We wish to thank Douglas Dyer, Chief, Labor Market Information Division, Alabama Department of Industrial Relations, and his staff, for providing us with state employment projections and related materials, and for meeting with us to discuss this project.

[2]Additional data is available from the authors.

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