AN ASSESSMENT OF THE EQUAL OPPORTUNITY PERFORMANCE
OF THE NATIONAL APPRENTICESHIP PROGRAM

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate School
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By

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* * * * *

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Labor and Human Resources
To My Parents
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<td>Apprenticeship Management System</td>
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<td>AOP</td>
<td>Apprenticeship Outreach Program</td>
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<td>BAT</td>
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CHAPTER I
INTRODUCTION

The National Apprenticeship Program is the coalition of management, labor, and government that supports the American system of apprenticeship training. The National Apprenticeship Program consists of only those programs and apprentices registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training (BAT), or a recognized State apprenticeship agency. The Program originated in 1937, when Congress passed the National Apprenticeship Act, enabling the Department of Labor (DOL) to promote labor standards necessary to safeguard the welfare of apprentices, and to bring together management and labor to form apprenticeship programs.

Registered apprenticeship can be defined as structured, comprehensive, and supervised on-the-job training for a clearly defined and commonly recognized occupation, supplemented with related theoretical instruction. The training is provided for occupations involving manual, mechanical, or technical skills and knowledge, and that require maturity and independent judgment. For a program to be registered, it must have written apprenticeship standards that comply with apprenticeship regulations issued by DOL.

The number of registered apprentices expanded quickly during the 1940s, growing from 18,300 on January 1, 1941 to 230,380 on January 1, 1949. The 1949 level was not maintained through the 1950s. After 1950, the number of apprentices ranged between a low of 158,532 and a high of 202,729.
During those two decades, apprenticeship opportunities for blacks and other racial and ethnic minorities were virtually nonexistent. Some of the larger apprenticeship programs, particularly in the construction crafts, had strong ties to organized labor. Those unions obtained close control over candidate selection and other administrative procedures of the apprenticeship programs. In the construction industry, the craft unions typically were referral unions. Those craft unions were in a position to control the supply of skilled labor in the industry.

The unions adopted existing racial employment patterns,\(^1\) which were influenced by the history of discrimination against minorities in the United States. As a result, local unions were established along racial lines. Blacks and other minorities were either excluded from specific trades and unions or were segregated into their own locals. Overt discrimination was also practiced. Whites refused to work with blacks, and also refused to accept blacks when organizing an employer’s workers into a local.

Apprenticeship programs operated unilaterally by employers also accepted the existing racial employment patterns. The acceptance of those patterns included active discrimination for the purpose of either excluding or segregating workers by race. Blacks were considered capable of only particular kinds of work. In addition, many crafts were viewed as a legacy to be passed from one generation to the next through nepotism.

By the early 1960s, increased public attention was focused on efforts to get more blacks into apprenticeships and the skilled trades. Young black males were facing higher levels of unemployment and lower levels of income as fewer traditional employment opportunities were available to them. At the same time, there was an ongoing migration of blacks from the South

to the North as employment in agriculture declined. The U.S. Civil Rights Commission stated that:

Apprenticeship training could be an important means of fulfilling the increasing demand for skilled workmen and of helping minority group emerge from their traditionally low economic status. However, present apprenticeship training programs are not training even enough craftsmen to replace those who retire, and Negroes constitute a disproportionately small minority of the inadequate number of workers being trained....

As the craft unions generally control admission to apprenticeship training programs, racial discrimination policies also operate to exclude Negroes from these programs (U.S. Civil Rights Commission 1961, pp. 160-161).

Beginning in the 1960s, Federal policy attempted to overturn institutionalized practices of discrimination in apprenticeship. In 1963, DOL developed apprenticeship regulations that required registered programs to select apprentices based on qualification alone. The regulations became effective in January 1964. In addition, to increase the number of minority applicants, DOL funded outreach programs and apprenticeship information centers. In 1972, the apprenticeship regulations were revised, requiring programs to take positive affirmative action in order to correct their underutilization of minorities in apprenticeship.

Since the 1970s, there has been no systematic assessment of the progress of the National Apprenticeship Program’s efforts to provide equal opportunity in apprenticeship training. An assessment at this time would be appropriate in light of expected demographic changes in the American labor force and the present challenges faced by the United States and the apprenticeship system: meeting the demand for skilled labor and preparing new entrants to the labor force with the skills needed for tomorrow’s jobs.

The population and the labor force of the United States are expected to grow at a slower rate during the 1990s than anytime since the 1930s. The projection is for 1.32 percent annual
growth in the labor force for 1992-2005, compared to 1.48 percent for the period of 1979-1992.\textsuperscript{2} The labor force is expected to increase by 23.5 million between 1992 and 2005. It is estimated the number of new entrants will be 51.2 million, and the number of labor force leavers will be 27.7 million. New entrants are more likely to be women and minorities. Labor force leavers are more likely to be males and whites.

The share of the labor force consisting of blacks, Hispanics and other minorities is expected to grow substantially during the 1990s. The proportion of blacks in the labor force is projected to rise, as a result of population growth, to 11.6 percent by 2005, compared with 10.7 percent in 1990. Hispanics are projected to increase their share of the labor force from 7.7 percent to 11.1 percent, reflecting increases in population and labor force participation.\textsuperscript{3} The proportion of Asian and others (American Indians, Native Alaskans, and Pacific Islanders) is expected to rise from 3.1 percent to 4.3 percent, also the result of rapid population increases.\textsuperscript{4}

Although the number of 16-to-24-year-old labor force participants is projected to increase by 13.2 percent between 1990 and 2005, their share of the labor force will decrease from 17.0 percent to 16.0 percent. Their numbers will decrease until 1996, and then gradually increase so that by 2005, they will number 2.8 million more than in 1990. The share of the labor force that


\textsuperscript{3}According to Peter Cattan, "The Growing Presence of Hispanics in the Labor Force." (\textit{Monthly Labor Review August 1988}), the continued large flow of Hispanic immigrants over the 1980s helped to make them the fastest growing labor force group in the United States. Between 1980 and 1987, the number of Hispanic workers increased by 39 percent.

is 55 years old or older is expected to increase from 12.3 percent in 1990 to 14.7 percent in 2005.⁵

The substantial growth in the share of the labor force consisting of minorities, combined with the aging of the labor force,⁶ has important implications for preparing and developing the labor force to meet the demands for skilled labor in the next few years. Aging of the labor force, with expected changes in the minority share of the labor force, suggests that minorities will have to be increasingly relied upon to fill replacement needs caused by retiring workers. As a result, there is a need to provide equal opportunity in education and training so that minorities are prepared to move into skilled occupations, which often provide a relatively high level of economic status.

Like the 1960s, blacks and Hispanics today face high rates of unemployment and tend to be concentrated in low skill and low wage jobs.⁷ Although Hispanics have had some degree of occupational upgrading during the 1980s, they are still more likely than the overall labor force to be employed in lower-skilled, lower-paid occupations. Job growth for Hispanic men has been

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⁷In 1992, the annual average civilian unemployment rate was 7.4 percent. However, for blacks the rate was 14.1 percent and for Hispanics (any race) the rate was 11.4 percent, compared to only 6.5 percent for whites. Blacks represented 10.9 percent of the civilian labor force but accounted for 20.9 percent of the unemployed. Hispanics represented 8.0 percent of the labor force but accounted for 12.4 percent of the unemployed. See U.S. Bureau of Labor Statistics, Employment and Earnings, annual averages, January 1992.
concentrated in occupations requiring intermediate skills (operators, fabricators, and laborers), which accounted for nearly a third of their employment.\textsuperscript{8}

Reflecting the skill differential between jobs held by workers from different ethnic groups, a recent survey of American workers indicates that blacks and Hispanics require less qualifying job training for their current employment than do whites.\textsuperscript{9} Employed workers were asked about the training required to qualify for their current employment. Fifty-seven percent reported needing specific training to qualify for their current jobs. However, 58 percent of whites required qualifying training compared to 47 percent of blacks and 41 percent of Hispanics.\textsuperscript{10} Occupational projections from the Bureau of Labor Statistics (BLS) indicating faster rates of employment growth for occupations requiring higher levels of education or training suggest that the differential may grow in the future. Further, workers with higher levels of education or training will have more options in the job market and better prospects for higher-paying jobs.\textsuperscript{11}

In 1987, DOL launched its \textit{Apprenticeship 2000 Initiative} to determine what role apprenticeship might play in raising the skill levels of American workers.\textsuperscript{12} Apprenticeship was viewed as having potential for meeting both the needs of employers in industries facing skill

\textsuperscript{8}Cattan, "The Growing Presence of Hispanics" , p. 13.


\textsuperscript{10}The survey estimates for minority training may be biased because the survey included only employed workers, and blacks and Hispanics are much more likely to have been unemployed during the survey period than whites.


\textsuperscript{12}The \textit{Initiative} consisted of several focus papers, public comment, research papers, and demonstration projects that apply the work-based learning model.
shortages as well as the needs of targeted populations, such as workers who may periodically require retraining or upgrading of their skills.

Several broad conclusions were reached. First, work-based learning is the most effective method of skill acquisition, because it generally works best for individual learners and can be tailored to employers' needs. Second, new training program models should encourage the expansion of structured work-based training programs, incorporating features from apprenticeship. Third, the current National Apprenticeship Program should be strengthened and expanded. However, it should be preserved as a means of training for occupations that "involve a broad range of largely mechanical skills that require long periods of time to master."\textsuperscript{13}

This study assesses how well the National Apprenticeship Program provided minorities equal opportunity by examining trends in the percentage of minority participation, the trend in the number of minority apprentices, and changes in the occupational distribution of registered apprentices by race.\textsuperscript{14} The trend in the percentage of minority apprenticeship participation is expected to increase because affirmative action goals are set to achieve a comparable representation for minorities in apprenticeship as minority representation in the labor force. The trend in the number of minority apprentices, which is sensitive to cyclical changes in the economy, is identified through regression analysis that controls for economic cycles, as well as changes in the supply of minority labor to apprenticeship. Changes in the occupational distribution of apprentices are examined to determine the extent to which occupational segregation in apprenticeship has decreased since the implementation of affirmative action. Separate

\textsuperscript{13}U.S. Department of Labor, Employment and Training Administration. \textit{(Work-Based Learning: Training America’s Workers} 1989), p.iii.

\textsuperscript{14}For the sake of convenience, I use the word race in this paper to refer to both race and ethnicity.
occupational segregation indices are constructed to control for the influence of introducing new occupations into the distribution. Equal opportunity for women is not considered here.

In Chapter II, I present a description of the National Apprenticeship Program. I describe its origin, how it is administered, identify the key players, and provide some description as to how industry uses apprenticeship. Chapter III extends the description of the National Apprenticeship Program, focusing on public policy efforts (regulation and legislation) to promote equal opportunity in apprenticeship. A review of the relevant literature is provided in Chapter IV. Chapter V presents the framework for the analysis of efforts to provide equal opportunities. Chapter VI describes the data and methodology used. Chapter VII presents the results obtained. Chapter VIII discusses the results, implications, and limitations of the study.
CHAPTER II
THE NATIONAL APPRENTICESHIP PROGRAM

Origin of the National Apprenticeship Program

The modern system of apprenticeship training in America is the result of the transformation of apprenticeship from a contractual arrangement binding a worker to his or her employer to an institution controlled by unions requiring employers to perform explicitly defined training tasks. Difficulties in enforcing the specific performance of apprentices and apprenticeship training providers led to the transformation of the American apprenticeship system in the early twentieth century.

In colonial America, the British Statute of Artificers required an apprenticeship in order to practice a skilled trade. A written indenture agreement between an apprentice and his master specified mutual responsibilities. During the 1800s, the ease of geographic mobility, linked with expansion of western settlement and the returns to independent cultivation, often lured many individuals away from apprenticeship. In addition, the legal doctrine of involuntary servitude


made it progressively easier to run away without paying for the investment made in their skills by the master.\textsuperscript{17}

By the 1880s, training providers were protecting their investments by using alternative contracting schemes that shifted the risk of nonperformance away from themselves and onto the trainees. Some training providers offered deferred compensation packages, or required the apprentice post a performance bond. In addition, implicit, rather than explicit, contracts were increasingly used. As a result, apprentices had no written assurance of the quality and quantity of training they would receive.

Concerns within industries were raised over the abuses of these contracting schemes, which were resulting in an inadequate supply of skilled workers. Apprentices were often used as cheap labor and dismissed as they approached apprenticeship completion, or were trained in only narrow aspects of a trade.

For apprenticeship to continue and meet demand for skilled labor, some new mechanism was needed that would provide mutual assurances of apprenticeship responsibilities. According to Jacoby (1991):

The mechanisms by which mutual assurances could be granted were usually anathema to employers because they required either oversight by the state, control by associations of competing employers, or cooperation with unions. As each of these was tried in the period from 1880 to 1930, the transformation of apprenticeship took root and eventually saw the weight of institutional rules shift from protection of the employer's investment to protection of the employee (Jacoby 1991, 889).

Craft unions recognized that apprenticeship could help conserve union power if they could control it. Through the collective bargaining process, organized craft labor gained sufficient

control of apprenticeship to permit the craft unions to regulate the supply and quality of skilled labor. The integrity of their crafts was protected by holding employers to specific apprenticeship standards.

Apprenticeship provided a way to develop a supply of skilled workers capable of earning high wages. The formal nature of apprenticeship ensured that the occupational content of a craft was standardized. So, apprenticed craftsmen were technically qualified for employment in many labor markets\textsuperscript{18}. Without the standardized content, the quality of the craft could be diminished, and so would the union's ability to protect the interests of its members, particularly the wage rate.\textsuperscript{19}

According to Barbash (1968), industrial unions, in contrast, were not well-suited for market-wide control of the labor supply because members commonly worked at jobs which required little training. Training was generally integrated into the internal labor market of the firm rather than the external labor market, and the administration of training was under the direction of management.\textsuperscript{20}

Apprenticeship developed only gradually in growing industries. A great majority of skilled labor was supplied through immigration from Europe. However, after World War I, the curtailment of immigration raised the need for a system of comprehensive apprenticeship training.

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\textsuperscript{18}The term \textit{journeyman} is often used to describe a master craftsman because he frequently moves from job to job, a characteristic of many skilled trades, especially in the construction industry.


Employer associations called for a revitalization of apprenticeship, and the establishment of trade schools, vocational education, and formal training certification.

In the 1920s, a concerted effort was undertaken by national employer and labor organizations, educators, and government officials to bring about a national, uniform system of apprenticeship training. That national system is now known as the National Apprenticeship Program. In 1937, Congress passed the National Apprenticeship Act. Its purpose is:

To enable the Department of Labor to formulate and promote the furtherance of labor standards necessary to safeguard the welfare of apprentices and to cooperate with the States in the promotion of such standards (emphasis added; 50 Stat. 664; 29 U.S.C. 50).

The Federal government was promoting labor standards for apprenticeship as early as 1917, when the Division of Apprenticeship Training was established under the National Youth Administration. A Federal Committee on Apprenticeship (FCA) was established in 1934 as an advisory panel to the Secretary of Labor for recommending policy with respect to apprenticeship training. The National Apprenticeship Act (also known as the Fitzgerald Act) transferred responsibility for the promotion of apprenticeship standards to DOL from the National Youth Administration, and changed the composition of the FCA from government agencies representatives to include members from labor, management, and the public.

**Administering the National Apprenticeship Program**

The Bureau of Apprenticeship and Training (BAT), formerly the Apprentice-Training Service, is the national agency within DOL responsible for administering the national system of apprenticeship. BAT does not provide training, nor fund training. Rather, it is responsible for promoting the apprenticeship concept, assisting interested employers to develop and establish
apprenticeship training programs, recognizing State Apprenticeship Agencies or Councils, registering apprenticeship programs and agreements, certifying registered apprentices, monitoring the progress of registered programs and apprentices, and monitoring and enforcing compliance with equal opportunity regulations.

Technical assistance provided by BAT varies with the needs of program sponsors. Assistance might include an analysis of content and work processes to include in the training, the development of administrative and selection procedures consistent with Bureau regulations, and development of related technical instruction curriculum.

Apprenticeship Standards

Federal apprenticeship regulations (Title 29 CFR Part 29) set out the labor standards, policies and procedures for the registration, cancellation, and deregistration of apprenticeship programs and agreements, and for the recognition and derecognition of state apprenticeship agencies.

For an occupation to be apprenticeable, it must be a skilled trade possessing the following characteristics:

(a) it is customarily learned in a practical way through a structured, systematic program of on-the-job supervised training; (b) it is clearly identified and commonly recognized throughout an industry; (c) it involves manual, mechanical, or technical skills and knowledge which require a minimum of 2,000 hours of on-the-job work experience; and, (d) it requires related instruction to supplement the on-the-job training. (29 CFR 29.4)

An apprenticeship program is eligible for registration if it complies with the labor standards for certification and the standards for equal employment opportunity in apprenticeship training (29 CFR 30). The labor standards require sponsors to state in an organized written plan
the terms and conditions of employment, training, and supervision of apprentices in the apprenticeable occupation. In addition, the plan must contain an equal opportunity pledge and, if applicable, an affirmative action plan for apprentice selection, both as specified in 29 C.F.R. 30.

Twenty-two apprenticeship standards must be met for a program to be registered. Included among those are: a minimum term of apprenticeship; an outline of work processes and approximate time allocation; provisions for related instruction; a progressive schedule of wages; periodic review and evaluation of apprentice progress; numeric ratio of apprentices to journeymen; probationary period for apprentice employment; adequate and safe equipment; minimum qualifications for persons entering the program; and a written apprenticeship agreement.

In 1990, the Department proposed revising the apprenticeship standards in order to provide a minimal set of standards that would serve as an incentive for industries that had not yet developed apprenticeship programs. The proposed revisions\(^\text{21}\) were expected to simplify the regulations and respond to comments received in response to focus papers under BAT’s Apprenticeship 2000 Initiative.

The implementation of the proposed revisions was prohibited by Congress through language in the fiscal year 1991 supplemental appropriations bill, and was permanently prohibited through language in the same bill for fiscal year 1992. In 1994, the proposed revisions were withdrawn by BAT.\(^\text{22}\)

\(^{21}\)See Federal Register, August 24, 1990, pp. 34868-34876.

\(^{22}\)See Federal Register, April 24, 1994, p. 20622.
Registration

Registration of apprenticeship programs with BAT is voluntary. Federal law does not require programs to register. Federal recognition of a program for federal purpose, however, confers certain privileges. For example, under the Davis-Bacon Act, employers do not have to pay registered apprentices the prevailing journeymen wage rate on Federal contracts.

Registration of an apprenticeship program implies that BAT accepts and records the program as meeting the basic standards and requirements (stated at 29 C.F.R. 29; 29 C.F.R. 30) for approval of the program for Federal purposes. A certificate of registration is evidence that a set of apprenticeship standards substantially conforms to the standards of apprenticeship. A certificate of registration indicates that an individual is eligible for probationary employment as an apprentice under a registered apprenticeship program.

BAT has its national office in Washington. There are also 10 regional offices (coverage of these offices is described in Table 1), 50 state offices, and 70 area and local offices. The national office registers a few large multi-state programs and all military programs. State and local Bureau offices are responsible for all other programs.

Apprenticeship standards permit BAT to recognize State Apprenticeship Agencies or Councils (SACs) as appropriate agencies for registering apprenticeship programs for Federal purposes. Recognition gives the SAC authority to determine whether an apprenticeship program conforms with DOL's published apprenticeship standards. In 1990, there were 30 Bureau

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23 There are some state laws that require apprenticeship. For example, in Washington D.C., a 1978 law requires any employer receiving in excess of $500,000 in D.C. funds in 12 months to establish an apprenticeship program and abide by all District and Federal regulations. In California, there is a law that pertains to state public works projects that requires one hour of apprenticeship time for every 5 hours of journeymen time.
Table 1.--Regional offices of the Bureau of Apprenticeship and Training

<table>
<thead>
<tr>
<th>Regional Office</th>
<th>States in Each Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Boston</td>
<td>Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont</td>
</tr>
<tr>
<td>2. New York</td>
<td>New Jersey, New York, Puerto Rico, Virgin Islands</td>
</tr>
<tr>
<td>3. Philadelphia</td>
<td>Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia</td>
</tr>
<tr>
<td>4. Atlanta</td>
<td>Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee</td>
</tr>
<tr>
<td>5. Chicago</td>
<td>Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin</td>
</tr>
<tr>
<td>6. Dallas</td>
<td>Arkansas, Louisiana, New Mexico, Oklahoma, Texas</td>
</tr>
<tr>
<td>7. Kansas City</td>
<td>Iowa, Kansas, Missouri, Nebraska</td>
</tr>
<tr>
<td>8. Denver</td>
<td>Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming</td>
</tr>
<tr>
<td>9. San Francisco</td>
<td>Arizona, California, Guam, Hawaii, Nevada</td>
</tr>
<tr>
<td>10. Seattle</td>
<td>Alaska, Idaho, Oregon, Washington</td>
</tr>
</tbody>
</table>

Source: U.S. Department of Labor.

recognized SACs. Figure 1 illustrates this structure of apprenticeship administration in the National Apprenticeship Program.

BAT works cooperatively with SAC staff so as not to duplicate efforts. The level of Bureau involvement in SAC states varies with the amount of resources devoted by the individual states. In non-SAC states, BAT handles all administrative matters. In a recent survey of SAC state directors, the U.S. General Accounting Office (1992) found that in 21 of the 30 SAC states, combined fiscal year 1990 spending for administering apprenticeship was $18.2 million, compared
Figure 1. Structure of Administration of National Apprenticeship Program
to BAT's appropriations of $15.5 million for administering apprenticeship in 50 states. Some SAC states provide very large investments and others very little. California, the state with the largest number of registered apprentices, for example, spent $6 million for administering apprenticeship.

One potential problem for BAT, as mentioned in the GAO (1992) report, is that state budget concerns may force cuts in state funding to SACs. If SAC resources are eliminated, or greatly reduced, BAT may have to assume more of the administrative duties in those states. However, BAT staffing and funding cannot sustain an increased workload. During the 1980s, BAT's staffing ceiling was reduced from 426 positions in 1980 to 250 in 1990. On average, in 1990 there were 0.8 full time equivalent professional staff and 0.5 clerical staff in a Bureau field office. In fact, in 15 states and 42 area offices, there were no clerical staff.24

Monitoring Programs and Apprentices

BAT instituted the State and National Apprenticeship System (SNAPS) as a management information system in 1973. SNAPS was used to track programs and apprentices registered in the National Apprenticeship Program. The system provided detailed information on all registered programs and apprentices. Appendix 6 describes the SNAPS data in more detail.

SNAPS was discontinued after 1979. According to Herbert Hammerman (1984), the U.S. Office of Management and Budget, which is responsible for approving all forms for public surveys and reports by Federal agencies, disapproved the SNAPS in 1982. It is not clear why SNAPS was discontinued three years before the disapproval. However, SNAPS may have been one victim of the Paper Work Reduction Act.

In 1982, the forerunner of the next apprenticeship management information system was initiated by the Chicago regional office, which is the largest in terms of the number of registered apprentices. Over the next four years that regional system was expanded to include all ten regions. This new Apprenticeship Management System (AMS) was used to generate quarterly management reports for regional directors. However, the AMS information was not comprehensive (it did not cover all programs and apprentices) because a few state apprenticeship agencies did not participate in the system. The main reason for non-participation was the incompatibility of computerized information systems. Some comprehensive management reports were generated, however, with information supplied by the non-participating states. See Appendix 6 for further information about the AMS data and management reports.

Beginning in 1991, the AMS was transferred from the Chicago regional office to the national office of BAT in Washington, and was renamed the Apprenticeship Information Management System (AIMS). For fiscal year 1993, BAT received additional funding to upgrade the AIMS hardware and software in order to improve its tracking system. As of March 1993, no management reports were yet available from the system.

Key Players in the National Apprenticeship Program

The Federal Committee on Apprenticeship

The Federal Committee on Apprenticeship (FCA) is an advisory committee to the Secretary of Labor on matters concerning apprenticeship training. It serves as a policy recommending body. When it was first formed in 1934, its membership consisted of Federal government agency representatives. When the National Apprenticeship Act was passed in 1937, the composition of the committee was changed to include representatives from management and labor.
In 1992, the FCA had 25 members appointed by the Secretary of Labor for two-year terms. Ten of its members represented labor, ten were from management, and five represented the public. In addition, there were three ex-officio members: the president of the National Association of State and Territorial Apprenticeship Directors, a representative of the U.S. Department of Education, and the Assistant Secretary of Labor for Employment and Training. The Committee was chaired by a public member selected by the Secretary of Labor. The Committee's recommendations to the Secretary of Labor concern a broad range of activities to improve and extend apprenticeship, including the proposed revisions to the apprenticeship regulations and improving the AMS.

In 1992, the FCA made a request to the President to include an additional $24.5 million for fiscal year appropriations to BAT. The request sought $2.5 million for upgrading the computer hardware and software used for tracking registered programs and apprentices, $3 million for strengthening existing programs, and the remaining $19 million for promoting apprenticeship training.

**Program Sponsors**

An apprenticeship program is registered in the name of a sponsor. A sponsor may be a person, a committee, an association, or an organization. Programs are categorized by the type of employer sponsorship, either *group* (multiple employers) or *individual* (single employer). Programs are further differentiated by the participation of organized labor. *Unilateral* programs are those in which a collective bargaining agent (i.e., union) is not participating in the program sponsorship. This may occur even if an employer's workers are covered by a collective bargaining agreement, if they have chosen to waive their right to participate in program sponsorship.
Joint committees, on the other hand, have equal numbers of representatives for the employer, or group of employers, and for the employees represented by a collective bargaining agreement. It should be noted that in joint apprenticeship programs, the apprentice is indentured to (signed an apprenticeship agreement with) the joint apprenticeship committee (JAC), not the employer. Figure 2 illustrates the program categories.

<table>
<thead>
<tr>
<th>Group (Multi-Employer) Sponsorship</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Joint (with union)</td>
</tr>
<tr>
<td>- Unilateral (without union)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individual (Single-Employer) Sponsorship</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Joint (with union)</td>
</tr>
<tr>
<td>- Unilateral (without union)</td>
</tr>
</tbody>
</table>

Figure 2. Categorization of Registered Apprenticeship Programs

Apprenticeship committees act on behalf of the sponsor in the administration of a program. JACs typically perform the specific tasks involved in directing an apprenticeship program. However, some committees might act more in an advisory capacity to employers and employee organizations responsible for carrying out each program, while in others the joint
apprenticeship committees are merely directed to develop craft or trade standards for apprenticeship agreements, and to give any aid necessary for their operation.25

The specific tasks involved in directing an apprenticeship program include: determining the need for apprentices in the plant or locality and the adequacy of available facilities for training; registering the program and apprentices with BAT or SAC; establishing entrance qualifications; approving apprenticeship agreements; monitoring progress of apprentices; developing schedules of work processes; arranging the related instruction; and certifying successful completion of apprenticeships and recommending that BAT (or SAC) issue a certificate of completion.

Although joint apprenticeship committees are normally composed of equal numbers of management and union personnel, the day-to-day operation of the apprenticeship committee is handled by a apprentice coordinator who traditionally is a union member. It is the apprentice coordinator who will meet with applicants and provide them with information concerning the apprenticeship program.

Joint apprenticeship committees exist not only at the local level, but also at the national level. For example, the International Brotherhood of Electrical Workers (IBEW) and the National Electrical Contractors Association jointly formed the National Joint Apprenticeship and Training Committee of the Electrical Industry (NJATC) for the electrical construction industry. The NJATC developed uniform standards that are used nationwide by local joint apprenticeship committees in that industry.

Glover (1988) identifies the use of multi-employer sponsorship and the establishment of the training trust fund as two key institutions of the National Apprenticeship Program that have

contributed to the continued use of apprenticeship in certain industries. Multi-employer sponsorship provides economies of scale in the provision of on-the-job training and related instruction. Training trust funds generate revenues on a per-employee, or per-hour worked, basis. Those revenues help finance the administration of programs, development of apprenticeship standards, development of curriculum, and instructor training.

Characteristics of the National Apprenticeship Program

Volume of Apprenticeship Training

Apprentices. The volume of registered apprenticeship is one indicator of the size of the National Apprenticeship Program. Two alternative measures of volume can be considered. One is the number of apprentices in training during a given period of time, say one year. The other is the number in training as of a given date. The difference between the two measures is that the first is larger because it includes apprentices who have either cancelled or completed their training during the year. The second measure, in contrast, represents the actual number of apprentices in training. Table 2 compares these two measures of the volume of apprenticeship for the period between 1975 and 1990. The table indicates that the number of civilian registered apprentices in training rarely exceeds 300,000 at year-end, or 400,000 annually. The annual number of apprentices represented less than 0.5 percent of the size of the employed civilian labor force between 1975 and 1990.

During fiscal year 1990, 98,218 apprentices were newly registered, 39,411 apprentices completed training, and 38,583 apprentices cancelled or dropped out. The year began with 276,677 apprentices in training, and ended with 283,352 in training as of September 30.\(^{26}\)

\(^{26}\)BAT Summary Management Report for fourth quarter of fiscal year 1990.
Table 2.—Number of registered civilian apprentices

<table>
<thead>
<tr>
<th>Year*</th>
<th>Annually</th>
<th>Year-end</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>368,000</td>
<td>266,477</td>
</tr>
<tr>
<td>1976</td>
<td>354,000</td>
<td>254,968</td>
</tr>
<tr>
<td>1977</td>
<td>362,000</td>
<td>263,586</td>
</tr>
<tr>
<td>1978</td>
<td>395,000</td>
<td>290,224</td>
</tr>
<tr>
<td>1980</td>
<td>420,000</td>
<td>320,073</td>
</tr>
<tr>
<td>1981</td>
<td>400,000</td>
<td>315,887</td>
</tr>
<tr>
<td>1988</td>
<td>335,507</td>
<td>253,134</td>
</tr>
<tr>
<td>1989</td>
<td>350,000</td>
<td>263,023</td>
</tr>
<tr>
<td>1990</td>
<td>365,000</td>
<td>283,352</td>
</tr>
</tbody>
</table>

*Data for 1980 and 1982-87 were not available. 1975-1978 represent calendar years; 1980-90 represent fiscal years (ending September 30).

Source: Employment and Training Report of the President; USDOL Annual Report for Fiscal Year; various years, and unpublished data from the Bureau of Apprenticeship and Training.

Programs. A second indicator of the size of the National Apprenticeship Program is the number of registered programs. GAO (1992) reports that the number of registered civilian apprenticeship programs remained fairly constant at about 43,000 since about 1985. For fiscal year 1990, about 3,000 new programs were registered, and about 4,000 existing programs were cancelled.

An examination of AMS data for the first quarter of 1991 suggests that the 43,000 registered programs is not an accurate representation of the size of the National Apprenticeship Program. Just over half (51%) of the registered programs had no active apprentices for the quarter, and 68 percent of those were individual programs operated unilaterally.
Among the programs that have at least one apprentice registered, only 27 percent had five or more apprentices. However, those programs account for 89 percent of the registered apprentices. As will be discussed in the next chapter, only programs with at least five registered programs are required to have a written affirmative action plan. Although most apprenticeship programs are operated unilaterally, most apprentices are trained through programs operated jointly. Table 3 provides the percentage of registered apprentices by program type and size.

Table 3.--The percentage of registered apprentices by program type and size

<table>
<thead>
<tr>
<th>Program Type</th>
<th>Program Size</th>
<th>&lt;5</th>
<th>5 or More</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unilateral</td>
<td>0.3</td>
<td>6.8</td>
<td></td>
<td>7.2</td>
</tr>
<tr>
<td>Joint</td>
<td>0.7</td>
<td>40.5</td>
<td></td>
<td>41.2</td>
</tr>
<tr>
<td>Individual</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unilateral</td>
<td>8.1</td>
<td>32.9</td>
<td></td>
<td>40.9</td>
</tr>
<tr>
<td>Joint</td>
<td>1.8</td>
<td>8.8</td>
<td></td>
<td>10.6</td>
</tr>
</tbody>
</table>


Industry Use of Apprenticeship

The U.S. Department of Labor reported the distribution of registered apprentices across industries in the Employment and Training Report of the President submitted to Congress in 1976. As of June 30, 1974, construction and manufacturing accounted for 70.5 percent of all

27Subsequent issues of the Employment and Training Report of the President did not provide information on apprenticeship by industry.
registered apprentices. The construction industry alone accounted for nearly one-half of the apprentices. See Table 4.

Table 4.--Registered apprentices by industry, as of June 30, 1974

<table>
<thead>
<tr>
<th>Industry</th>
<th>Number of Apprentices</th>
<th>Percentage of Apprentices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>60</td>
<td>a</td>
</tr>
<tr>
<td>Mining</td>
<td>1,378</td>
<td>0.5</td>
</tr>
<tr>
<td>Construction</td>
<td>136,590</td>
<td>49.2</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>59,146</td>
<td>21.3</td>
</tr>
<tr>
<td>Transportation</td>
<td>7,603</td>
<td>2.7</td>
</tr>
<tr>
<td>Wholesale/retail trade</td>
<td>8,602</td>
<td>3.1</td>
</tr>
<tr>
<td>Fire</td>
<td>170</td>
<td>0.1</td>
</tr>
<tr>
<td>Services</td>
<td>21,910</td>
<td>7.9</td>
</tr>
<tr>
<td>Public Administration</td>
<td>6,436</td>
<td>2.3</td>
</tr>
<tr>
<td>Nonclassifiable</td>
<td>34,490</td>
<td>12.4</td>
</tr>
<tr>
<td>Unknown</td>
<td>1,166</td>
<td>0.4</td>
</tr>
<tr>
<td><strong>All Industries</strong></td>
<td><strong>277,551</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Note: Column percentage does not sum to 100 due to rounding; a indicates percentage is less than 0.1 percent.


The Bureau of Apprenticeship and Training collected the data through its SNAPS management information system. Comparable apprenticeship data by industry are not available after 1979 because the information system that followed SNAPS was not comprehensive. Complete apprenticeship information was not available from several SACs that did not participate in that new apprenticeship management information system (AMS).

Table 5 presents the distribution of registered apprentices across industries as of September 30, 1987-90. A comparison of this table with Table 4 should be carefully interpreted because Table 5 is not based on comprehensive data. Also, the industry classifications are slightly
different. In 1974, there are two classifications not used in the more recent years: *nonclassifiable* and *unknown*. In addition, in 1974 public administration was not divided between civilian and military classifications as in the later years.

Table 5.--Distribution of registered apprentices by industry, 1987-1990

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>a</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Mining</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Construction</td>
<td>49.2</td>
<td>49.7</td>
<td>52.9</td>
<td>53.1</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>15.0</td>
<td>13.9</td>
<td>14.6</td>
<td>14.7</td>
</tr>
<tr>
<td>Transportation</td>
<td>2.5</td>
<td>2.6</td>
<td>2.6</td>
<td>2.5</td>
</tr>
<tr>
<td>Wholesale/retail</td>
<td>1.1</td>
<td>1.1</td>
<td>1.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Fire</td>
<td>0.1</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Services</td>
<td>3.0</td>
<td>3.1</td>
<td>3.3</td>
<td>3.0</td>
</tr>
<tr>
<td>Public Administration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civilian</td>
<td>7.3</td>
<td>7.9</td>
<td>8.3</td>
<td>8.6</td>
</tr>
<tr>
<td>Military</td>
<td>21.7</td>
<td>21.3</td>
<td>17.0</td>
<td>16.7</td>
</tr>
<tr>
<td>All Industries</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total Apprentices</strong></td>
<td><strong>221,683</strong></td>
<td><strong>234,483</strong></td>
<td><strong>233,725</strong></td>
<td><strong>247,902</strong></td>
</tr>
</tbody>
</table>

Note: Column percentages might not sum to 100 due to rounding; a indicates percentage is less than 0.1 percent.

Source: AMS Reports.

Between 1974 and 1990, the construction industry was training about half of all registered apprentices. In contrast, the percentage of apprentices in manufacturing appears to have decreased by at least 6 percentage points. The percentage of apprentices in services and public administration increased substantially, especially for military apprentices. Table 6 illustrates the growth in the number of registered military apprentices.
Table 6.--The number of uniformed military apprentices

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Military Apprentices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1977</td>
<td>7,075</td>
</tr>
<tr>
<td>1978</td>
<td>9,500</td>
</tr>
<tr>
<td>1979</td>
<td>NA</td>
</tr>
<tr>
<td>1980</td>
<td>16,000</td>
</tr>
<tr>
<td>1981</td>
<td>24,423</td>
</tr>
<tr>
<td>1982</td>
<td>29,678</td>
</tr>
<tr>
<td>1983</td>
<td>40,071</td>
</tr>
<tr>
<td>1984</td>
<td>38,370</td>
</tr>
<tr>
<td>1985</td>
<td>44,474</td>
</tr>
<tr>
<td>1986</td>
<td>43,808</td>
</tr>
<tr>
<td>1987</td>
<td>48,028</td>
</tr>
<tr>
<td>1988</td>
<td>49,942</td>
</tr>
<tr>
<td>1989</td>
<td>39,696</td>
</tr>
<tr>
<td>1990</td>
<td>41,504</td>
</tr>
</tbody>
</table>

NA = not available.

Source: Employment and Training Report of the President; USDOL Annual Report for Fiscal Year; various years, and unpublished data from the Bureau of Apprenticeship and Training.

In the mid-to-late 1970s, the armed forces (Army, Navy, and Marines) adopted national apprenticeship standards for training both military and civilian personnel as skilled craft workers. Apprenticeship programs were also developed in cooperation with the Federal Bureau of Prisons to train female inmates.

The content of civilian and military apprenticeship programs cannot be compared because military programs are designed to meet military rather than civilian needs. There is no general acceptance of military apprentices in the civilian sector as comparable to those trained in civilian programs, especially for trades requiring licensing.
Table 7 presents the number of registered programs by industry and the distribution of programs by industry and program type. Although the construction industry trains about half of all apprentices, the construction industry accounts for only 33 percent of the registered programs. In contrast, manufacturing accounts for 36 percent of the programs, but only about 18 percent of registered apprentices. Apprenticeship programs in manufacturing tend to be very small.

**Occupations of Apprenticeship Training.** The Bureau of Apprenticeship and Training recognizes over 800 occupations as apprenticeable. Despite this large number, most registered apprentices have been concentrated in only about 20 occupations between 1973 and 1990. In fact, as few as 10 occupations in each year accounted for more than 60 percent of all registered apprentices. Table 8 lists the ten apprenticeship occupations with the largest number of registered civilian apprentices. All, except two, corrections officer and machinist, are in the construction industry.

**Geographic Location of Apprenticeship.** The limited use of apprenticeship training by industry and occupation suggests that apprenticeship opportunities might be limited geographically if industries are concentrated in certain geographic areas. Table 9 indicates that the distribution of registered apprenticeship has changed somewhat between 1975 and 1990. But it also indicates that two regions, 5 and 9, together have accounted for about 40 percent of all registered apprentices.

To help understand those changes, Tables 10 and 11 present the distributions of construction employment and manufacturing employment, respectively. Region 6 sustained a large loss of construction employment, while region 9 had a substantial increase in employment between 1979 and 1990. This change might explain the loss of registered apprenticeship in region 6. Also, Regions 4 and 9 had increases in their shares of manufacturing employment.
Table 7.--The percentage of industry apprenticeship programs by program type, as of September 30, 1990

<table>
<thead>
<tr>
<th>Industry</th>
<th>Number of Programs</th>
<th>Group</th>
<th>Individual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Joint (%)</td>
<td>Unilateral (%)</td>
</tr>
<tr>
<td>Agriculture</td>
<td>42</td>
<td>4.8</td>
<td>0.0</td>
</tr>
<tr>
<td>Mining</td>
<td>57</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Construction</td>
<td>8,603</td>
<td>24.8</td>
<td>3.9</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>9,481</td>
<td>1.6</td>
<td>0.9</td>
</tr>
<tr>
<td>Transportation</td>
<td>736</td>
<td>6.4</td>
<td>6.8</td>
</tr>
<tr>
<td>Wholesale/retail trade</td>
<td>1,893</td>
<td>1.6</td>
<td>3.0</td>
</tr>
<tr>
<td>Finance, insurance and real estate</td>
<td>250</td>
<td>0.0</td>
<td>7.6</td>
</tr>
<tr>
<td>Services</td>
<td>3,864</td>
<td>1.4</td>
<td>1.9</td>
</tr>
<tr>
<td>Public Admin., civilian</td>
<td>1,100</td>
<td>6.2</td>
<td>1.9</td>
</tr>
<tr>
<td>Public Admin., military</td>
<td>17</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>26,043</strong></td>
<td><strong>9.5</strong></td>
<td><strong>2.5</strong></td>
</tr>
</tbody>
</table>

Source: AMS Reports.

Table 8.--Apprenticeship occupations with the largest number of registered apprentices on December 31, 1990

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Total Civilian Apprentices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrician</td>
<td>34,746</td>
</tr>
<tr>
<td>Carpenter</td>
<td>28,827</td>
</tr>
<tr>
<td>Corrections officer</td>
<td>12,513</td>
</tr>
<tr>
<td>Plumber</td>
<td>12,080</td>
</tr>
<tr>
<td>Pipefitter</td>
<td>11,630</td>
</tr>
<tr>
<td>Sheet metal worker</td>
<td>11,103</td>
</tr>
<tr>
<td>Roofer</td>
<td>7,607</td>
</tr>
<tr>
<td>Painter</td>
<td>5,930</td>
</tr>
<tr>
<td>Machinist</td>
<td>5,898</td>
</tr>
<tr>
<td>Structural steel worker</td>
<td>5,278</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>135,612</strong></td>
</tr>
</tbody>
</table>

Table 9.--The percentage of registered apprentices by region for 1975, 1985, and 1990

<table>
<thead>
<tr>
<th>Region</th>
<th>1975</th>
<th>1985</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Boston</td>
<td>5.4</td>
<td>7.7</td>
<td>8.0</td>
</tr>
<tr>
<td>2. New York</td>
<td>9.4</td>
<td>11.3</td>
<td>11.9</td>
</tr>
<tr>
<td>3. Philadelphia</td>
<td>10.8</td>
<td>11.5</td>
<td>14.1</td>
</tr>
<tr>
<td>4. Atlanta</td>
<td>12.7</td>
<td>11.6</td>
<td>9.0</td>
</tr>
<tr>
<td>5. Chicago</td>
<td>23.6</td>
<td>19.0</td>
<td>20.5</td>
</tr>
<tr>
<td>6. Dallas</td>
<td>9.9</td>
<td>11.3</td>
<td>5.4</td>
</tr>
<tr>
<td>7. Kansas City</td>
<td>3.6</td>
<td>3.9</td>
<td>4.0</td>
</tr>
<tr>
<td>8. Denver</td>
<td>3.8</td>
<td>2.7</td>
<td>1.6</td>
</tr>
<tr>
<td>9. San Francisco</td>
<td>15.6</td>
<td>17.1</td>
<td>20.4</td>
</tr>
<tr>
<td>10. Seattle</td>
<td>5.3</td>
<td>3.9</td>
<td>5.1</td>
</tr>
<tr>
<td>All Regions</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Total Apprentices 266,477 230,326 277,582

Note: The values are based on the number of apprentices in training as of December 31. Column percentages might not sum to 100 due to rounding.

Source: SNAPS and Summary Management Reports.

Table 10.--The distribution of construction employment, by region, December 1979 and December 1990

<table>
<thead>
<tr>
<th>Region</th>
<th>1979</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Boston</td>
<td>4.3</td>
<td>4.5</td>
</tr>
<tr>
<td>2. New York</td>
<td>7.2</td>
<td>8.8</td>
</tr>
<tr>
<td>3. Philadelphia</td>
<td>11.4</td>
<td>12.2</td>
</tr>
<tr>
<td>4. Atlanta</td>
<td>18.7</td>
<td>19.8</td>
</tr>
<tr>
<td>5. Chicago</td>
<td>17.0</td>
<td>16.4</td>
</tr>
<tr>
<td>6. Dallas</td>
<td>15.1</td>
<td>10.9</td>
</tr>
<tr>
<td>7. Kansas City</td>
<td>5.0</td>
<td>4.0</td>
</tr>
<tr>
<td>8. Denver</td>
<td>4.0</td>
<td>2.6</td>
</tr>
<tr>
<td>9. San Francisco</td>
<td>13.2</td>
<td>16.4</td>
</tr>
<tr>
<td>10. Seattle</td>
<td>4.1</td>
<td>4.1</td>
</tr>
<tr>
<td>All Regions</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Total Construction Employment 4,571,400 4,984,700

Table 11.—The distribution of manufacturing employment, by region, December 1979 and December 1990

<table>
<thead>
<tr>
<th>Region</th>
<th>1979</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Boston</td>
<td>7.2</td>
<td>6.3</td>
</tr>
<tr>
<td>2. New York</td>
<td>10.9</td>
<td>8.9</td>
</tr>
<tr>
<td>3. Philadelphia</td>
<td>10.8</td>
<td>9.5</td>
</tr>
<tr>
<td>4. Atlanta</td>
<td>17.3</td>
<td>19.7</td>
</tr>
<tr>
<td>5. Chicago</td>
<td>25.6</td>
<td>24.2</td>
</tr>
<tr>
<td>6. Dallas</td>
<td>8.1</td>
<td>8.5</td>
</tr>
<tr>
<td>7. Kansas City</td>
<td>4.9</td>
<td>5.1</td>
</tr>
<tr>
<td>8. Denver</td>
<td>1.7</td>
<td>2.1</td>
</tr>
<tr>
<td>9. San Francisco</td>
<td>10.6</td>
<td>12.3</td>
</tr>
<tr>
<td>10. Seattle</td>
<td>2.9</td>
<td>3.4</td>
</tr>
<tr>
<td>All Regions</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Total Manufacturing Employment | 20,950,000 | 19,038,400


Summary

This chapter described the modern American apprenticeship system, also referred to as the National Apprenticeship Program. The system is a business, labor, and government effort to promote apprenticeship and apprenticeship standards. The Bureau of Apprenticeship and Training administers the program under the direction of the Federal Committee on Apprenticeship. BAT does not provide training. Instead, it registers apprenticeship programs, agreements, and apprentices, provides technical assistance to program sponsors, and promotes registered apprenticeship. Apprenticeship training sponsors consist of single or multiple employers operating jointly (with organized labor participation) or unilaterally. Joint programs train about half of registered apprentices. The vast majority of apprentices (89 percent) are trained in programs with at least five registered apprentices.
The use of apprenticeship by industry is not widespread. The construction industry accounts for more than half of all apprentices. During the 1970s and 1980s, the percentage of registered apprentices in manufacturing decreased substantially, while the percentage in public administration increased. In addition, most apprentices are trained in only a handful of occupations.

Because the volume of registered apprenticeship has not kept pace with the growth in the size of the labor force during the 1970s and 1980s, it represents less than 0.5 percent of the labor force. Consequently, the opportunity for apprenticeship training is quite limited.
CHAPTER III
POLICIES PROMOTING EQUAL OPPORTUNITY IN APPRENTICESHIP

This chapter describes the Federal policies implemented for the purpose of promoting equal opportunity in the National Apprenticeship Program. Although state and local legislation also prohibit discrimination in apprenticeship training, these laws are not reviewed here. The first section provides a review of executive orders and legislation pertaining to apprenticeship. The second section presents the equal opportunity and affirmative regulations pertaining to the National Apprenticeship Program. The last section highlights special measures designed to increase the supply of qualified minority applicants for apprenticeship programs.

Executive Orders and Legislation

Policies of antidiscrimination in apprenticeship are part of a broader set of policies of antidiscrimination in employment. Federal efforts to combat employment discrimination can be traced to the President Roosevelt’s Committee on Fair Employment Practices (PCFEP), established by executive order in 1941. Racial discrimination in the skilled trades, and apprenticeship training, was a major concern of the PCFEP and its successor committees throughout the 1940s and 1950s.28

In 1961, Executive Order 10925 required for the first time that employers holding Federal contracts take affirmative action to ensure nondiscrimination. Affirmative action meant an active

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28This chapter is based, in part, on the review of government efforts to provide equal opportunity in employment, including apprenticeship, by Marshall, F. Ray, The Negro and Apprenticeship, (Baltimore: The John Hopkins Press), 1967.
program to hire, promote, and train minorities, including active outreach and recruitment. Although initially not covered by the executive order, the construction industry was brought under its provisions in 1963 by Executive Order 11114.

Executive Order 10925 created the President’s Committee on Equal Employment Opportunity (PCEEO) to administer provisions of the order. Because the order pertained to government contractors only, the PCEEO, like its predecessors, had no jurisdiction over labor unions or joint apprenticeship training committees. However, the PCEEO required employers to submit compliance reports that included information supplied by their respective labor unions.

Because of the lack of an effective means of compelling compliance, the PCEEO emphasized voluntary action, such as "Plans for Progress," a program designed to increase employment and promotion opportunities for minorities. Under the program, employers and unions were urged to sign equal opportunity agreements, and national unions were urged to use their influence to get their locals to comply. In addition, BAT was instructed to include a nondiscrimination clause in new apprenticeship agreements with firms doing work for the Federal government, and to make apprentice selection (without regard to race) one of the nine standards for registering apprenticeship programs.

Marshall (1965) reports that 118 international unions, representing over 90 percent of the AFL-CIO’s membership, signed pledges with the PCEEO in November of 1962 agreeing to accept all qualified members on a non-discriminatory basis; to ensure equal job opportunities for all workers; to abolish segregated local unions; and to work with management to place antidiscrimination clauses in collective bargaining agreements that would also eliminate discrimination in apprenticeship programs; and to abolish segregated facilities in plants.29

Congress demonstrated its support for employment antidiscrimination policies when it passed the Civil Right Act of 1964. Title VII of the Act, later amended by the Equal Employment Opportunities Act of 1972, specifically forbids discrimination in apprenticeship training based on race, color, religion, sex, or national origin.

It shall be an unlawful employment practice for any employer, labor organization, or joint labor-management committee controlling apprenticeship or other training or retraining, including on-the-job training programs to discriminate against any individual because of his race, color, religion, sex, or national origin in admission to, or employment in, any programs established to provide apprenticeship or other training (Section 703 (d) of the Civil Rights Act of 1964, as amended).

Initially, the Equal Employment Opportunity Commission (EEOC), created under the Act, had power only to receive complaints and attempt settlements through informal conferences, conciliation efforts, and persuasion. If those measures failed, civil action could be brought in Federal district court by the aggrieved party. The U.S. Attorney General was empowered to bring civil actions.

The EEOC had investigative powers and could examine an employer's hiring and payroll records, its collective bargaining agreement, and conduct on-site investigations. If charges were made against a labor union, it could inspect the local's membership, hiring hall, and apprenticeship records, and examine the union's qualifications for referral, membership, and apprenticeship. Based upon its findings, the EEOC would render a decision as to whether or not it found reasonable cause to believe that the charge was true.

Once a decision of reasonable cause was made, the EEOC was empowered to attempt to eliminate the unlawful employment practice through informal methods of conciliation. The primary objective of conciliation was to secure a written agreement that provided relief to the charging party and affected class members and eliminated the discriminatory practices and
policies. The major sanction for failure to settle was notifying the discriminatee to sue in Federal court, or to recommend the matter to the Justice Department which could institute a suit charging that a pattern or practice of discrimination exists.

In 1972, amendments to Title VII gave the EEOC further authority to investigate individual discrimination charges, to promote voluntary compliance, and to institute civil actions against employers or unions named in a discrimination charge. The Act was further amended by the Civil Rights Act of 1991 (105 STAT. 1071). The amendment was intended to provide for damages in cases of intentional employment discrimination, and to clarify provisions regarding disparate impact actions.

In 1965, through Executive Order 11246, the PCEEO was replaced by the Office of Federal Contract Compliance (OFCC) of the U.S. Department of Labor. OFCC assumed responsibility for implementing the order and supervising contracting agencies that ensured compliance of individual contractors with the equal employment opportunity program. The Secretary of Labor and contracting agencies, had the power to impose sanctions, including cancellation, termination, or suspension of contracts, and debarment from future contracting with the government. In 1975, OFCC was reorganized and became the Office of Federal Contract Compliance Programs (OFCCP), monitoring the activities of the contracting agencies to assure that Federal contractors provide equal employment opportunity without regard to race, color, religion, sex, national origin, handicap, or status as a Vietnam era or disabled veteran. In 1978, through Executive Order 12086, OFCCP assumed full responsibility (from other agencies) for conducting compliance reviews of service, supply, and construction contracts.
Apprenticeship Antidiscrimination Regulations

Prior to the 1960s, program sponsors were free to recruit and select apprentices according to their own rules and procedures. In 1963, BAT developed Federal equal opportunity "standards" to guide nondiscrimination policies in apprenticeship training. According to Marshall (1965), the initial standards were not well-received by the building trades unions, who alleged that DOL was attempting to establish a racial quota system for apprentices.\textsuperscript{30} The proposed standards required programs "to take whatever steps were necessary to offset the effect of previous practices." It was also proposed that apprenticeship lists based on merit systems prior to the adoption of the new standards be disregarded to the extent necessary to provide opportunities for selection of qualified minorities for a significant number of positions.

BAT modified some of the language. However, the unions objected to the implication that blacks should be given preferential treatment to overcome past discrimination. They were also reluctant to follow the suggestion of notifying civil rights organizations of apprenticeship vacancies.

Nevertheless, the modified standards were later issued virtually unchanged, becoming effective January 17, 1964. Those standards for equal opportunity in apprenticeship and training (Title 29 CFR Part 30) set forth national policies and procedures to promote equal opportunity and to prevent discrimination based on race, creed, color or national origin in all phases of apprenticeship and training programs registered with BAT. The regulations brought government influence over the process of recruitment and selection of apprentices. Program sponsors retained control over the process, but they had to exercise that power in conformity with the regulations.

The 1964 standards required each registered apprenticeship program to select apprentices on the basis of qualification alone, in accordance with objective standards, unless the selections would themselves demonstrate that there is equal opportunity. Also, programs had to take whatever steps necessary, in acting upon application lists developed prior to the regulations, to remove the effects of previous practices under which discriminatory patterns of employment may have resulted, and be nondiscriminatory in apprenticeship and employment during the apprenticeship.

If selection of apprentices was based on qualification alone, qualification could be determined through a fair aptitude test, school diplomas, age requirements, occupationally essential physical requirements, fair interviews, school grades, and previous work experience. And, if the number of apprenticeship openings was less than the number of applicants, then selection would be based on a ranking, using those criteria. For selections from an existing pool of employees, admission to the pool must have been on a nondiscriminatory basis.

The apprenticeship equal opportunity standards were revised in 1972 to require registered programs to take affirmative action in recruitment and selection. Before discussing those revisions, however, regulations pertaining to apprenticeship issued by other agencies during the 1960s are discussed briefly.

Pursuant to Section 709 of the Civil Rights Act of 1964, the EEOC established regulations requiring employers, labor organizations, and joint labor-management committees, among others, to maintain records and furnish information to aid the EEOC in the administration and enforcement of Title VII. Apprenticeship programs were required to file annually an apprenticeship information report, either EEO-2 for joint apprenticeship training committees, or EEO-2E for non-joint programs. The data collected were sometime used by other Federal, state,
and local agencies, as well as researchers concerned with equal opportunity. The EEOC published some, but not all of the data.

The EEO-2 apprenticeship information reports were required from joint labor-management apprenticeship committees which had five or more apprentices in the entire program, at least one employer with 25 or more employees, and at least one union sponsor which operated a hiring hall or had 25 or more members. The EEO-2E apprenticeship information reports were required from private employers who had a total company-wide employment of 100 or more employees, unilaterally conducted and controlled an apprenticeship program, and had five or more apprentices in an establishment.\(^{31}\)

One of the first questions asked on the reporting form was whether or not the program was registered with BAT or another government agency. However, in its published reports the EEOC did not distinguish registered from non-registered programs. After 1979, the apprenticeship information reports were no longer required to be filed.

As early as 1966, the EEOC developed guidelines on employee selection procedures for employers and other entities covered under Title VII. The guidelines were formalized in 1970 when they were published in Title 29 CFR Part 1607.\(^{32}\) The purpose of the guidelines was to serve as a workable set of standards for employers, labor unions, and others in determining whether their selection procedures were nondiscriminatory. Section 703 of the Civil Rights Act authorizes the use of professionally developed ability tests not designed, intended, or used to


\(^{32}\)Federal Register August 1, 1970, p. 12,333.
discriminate. In 1978, the EEOC, along with the Civil Service Commission, DOL, and the Department of Justice jointly adopted Uniform Guidelines on Employee Selection Procedures.

The OFCC's predecessor, the President's Committee on Equal Employment Opportunity, established rules effective in July 1964 that stipulated compliance with BAT's regulations (29 CFR 30) to meet compliance with Executive Orders 10925 and 11114. The standards applied to all apprenticeship programs of contractors covered by the executive orders, regardless of their registration status with BAT. Such a requirement might have acted as an incentive for programs to become registered with BAT.

In 1968, the OFCCP issued affirmative action regulations for non-construction (service and supply) contractors and sub-contractors. To increase the utilization of minorities on current Federal and federally assisted contracts, contractors are required to identify deficiencies in the utilization of minorities in their work force. Deficiencies are to be corrected by establishing attainable goals and timetables. The regulations were revised in 1971 (Title 41 CFR Part 60-2, Revised Order No. 4) to provide a much clearer definition of affirmative action.

Separate regulations (Title 41 CFR Part 60-1) were established for the construction industry, because organized labor had considerable control over entrance to construction trades, particularly through apprenticeship, and through the referral and hiring hall systems. The regulations required contracting agencies to include an equal opportunity clause in each government contract which stated that the contractor would not discriminate, and would take affirmative action. To ensure compliance by labor unions and recruitment or training agencies, the Director of the OFCCP can notify Federal, state, or local agencies, as well as the EEOC and

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the Department of Justice, of his conclusions and recommendations about a union which in his judgment has failed to cooperate.

To increase minority employment opportunities, OFCCP encouraged the creation of area wide plans that included annual minority employment goals for individual trades. Individual contractors were required to incorporate the area plan obligations in their bids for particular jobs.

Two approaches were used to develop special area plans for increasing minority representation in the construction trades. Under "imposed plans," OFCCP set goals and timetables for individual contractors and unions pertaining to specific trades considered deficient in minority representation. The other approach had local committees, consisting of contractors, unions, and minority organizations, set goals and timetables voluntarily through negotiation.

In contrast to the imposed plans, the "hometown plan" goals were area-wide obligations of the construction industry and the unions, and individual trade goals were assigned by an administrative committee. In areas not covered by either type of plan, special bid conditions plans set minority hiring goals established by OFCCP for contractors on high-visibility jobs.

In total, there were approximately 60 cities with hometown plans, and 7 cities with imposed plans, before the system of establishing goals and timetables through hometown and imposed plans was discarded in 1980. Now a single percentage goal for all construction trades within each area is set periodically by the Director of the OFCCP. The goals are based on civilian labor force figures for the respective areas from decennial Census data.

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BAT's equal opportunity apprenticeship standards were revised in 1971\(^{35}\) to require affirmative action and the adoption of a written affirmative action plan in order to provide equal opportunity in apprenticeship programs for minorities. Program sponsors are required to recruit, select, employ, and train apprentices during their apprenticeship without discrimination. Also, they must uniformly apply rules and regulations concerning apprentices, include in their apprenticeship standards the equal opportunity pledge specified in the regulations, and adopt a selection procedure from Section 30.5 of the regulations.

Sponsors with fewer than five apprentices are not required to adopt an affirmative action plan or a selection procedure specified in the regulations, provided that a smaller program is not adopted to circumvent the regulations. However, smaller programs are required to include in their apprenticeship standards the equal opportunity pledge, which includes a statement that the sponsor will take affirmative action to provide equal opportunity in apprenticeship. So, although only 27 percent of registered programs had 5 or more registered apprentices as of January 1, 1991 based on AMS data\(^{36}\) and, therefore required to have a written affirmative action plan, all programs are expected to take affirmative action.

Affirmative action involves positive recruitment and selection. Affirmative action is defined in the standards as:

...not mere passive nondiscrimination. It includes procedures, methods, and programs for the identification, positive recruitment, training, and motivation of present and potential minority and female (minority and nonminority) apprentices including the establishment of goals and timetables. It is action which will equalize opportunity in apprenticeship so as to allow full utilization of the work potential of minorities and women. The overall

\(^{35}\)The revised standards became effective in January 1972, and were revised again in 1978 to expand affirmative action requirements to include coverage for women. The standards as they applied to minorities were virtually unchanged in 1978.

\(^{36}\)See p. 25 in Chapter 2.
result to be sought is equal opportunity in apprenticeship for all individuals participating in or seeking entrance to the Nation’s labor force (Title 29 CFR Part 30 Section 30.4 (b)).

**Affirmative Action Plans**

An acceptable affirmative action plan must include outreach and positive recruitment that would reasonably be expected to increase minority participation in apprenticeship by expanding their opportunities to become eligible for apprenticeship selection. To achieve these objectives, sponsors are required to undertake specific activities, such as disseminating information, engaging in programs of outreach and positive recruitment, and utilizing journeymen to assist in the implementation of the affirmative action plan. An affirmative action plan also must have percentage goals and timetables for the admission of minority applicants for the apprenticeship program, or for admission into an eligibility pool, depending upon the selection method chosen.

Based upon an analysis of the utilization of minorities, a sponsor determines whether goals and timetables are needed. Underutilization is a situation where there are fewer minorities in the particular craft or crafts represented by the program than would reasonably be expected in view of an analysis of the five specific factors:

- the *size* of the working age minority population in the program sponsor’s labor market area;
- the *size* of the minority labor force in the program sponsor’s labor market area;
- the percentage of minority participation as apprentices in the particular craft as compared with the percentage of minorities in the labor force in the program sponsor’s labor market area;
- the percentage of minority participation as journeymen employed by the employers participating in the program as compared with the percentage of minorities in the sponsor’s labor market area;
- the general availability of minorities with present or potential capacity for apprenticeship in the program sponsor’s labor market area.
The determination of deficiencies is written into the sponsor’s affirmative action plan. If the sponsor determines that it has no deficiencies, no goals and timetables are needed. However, the affirmative action plan must include a detailed explanation of why no goals and timetables are established. If a sponsor fails to submit goals and timetables as part of its affirmative action plan, or submits unacceptable goals and timetables when the sponsor has deficiencies, goals and timetables applicable to the sponsor will be set by DOL.

Selection of Apprentices

The selection methods available under the revised standards include (1) selection on the basis of rank from a pool of eligible applicants, (2) random selection from a pool of eligible applicants, (3) selection from a pool of current employees, and (4) an alternative method that meets specific requirements concerning objective and specific qualifications.

A sponsor adopting a selection method based on a pool of eligible applicants that determines it has deficiencies must include in its affirmative action plan percentage goals and timetables for the admission of minority applicants into the eligibility pool. A sponsor adopting a selection method based on a pool of current employees and having deficiencies must include percentage goals and timetables for the selection of minority applicants for the apprenticeship program.

Compliance Monitoring and Enforcement

Compliance with equal apprenticeship opportunity standards is to be determined by considering whether the sponsor has met its goals within its timetables, or failing that, whether it has made good faith efforts to meet its goals and timetables. Good faith efforts are judged by whether the sponsor is following its affirmative action program and attempting to make it work,
including evaluation and changes in its program where necessary to obtain effectiveness toward the attainment of its goals.

When a sponsor, despite its good faith efforts, fails to meet its goals and timetables within a reasonable period of time, the sponsor is required to make appropriate changes in its affirmative action program. The sponsor may also be required to develop and adopt an alternative selection method if the failure is attributable to the selection method.

DOL is required under 29 CFR 30 to regularly conduct systematic reviews of apprenticeship programs to determine the extent to which sponsors are complying with the regulations. Reviews are also required when circumstances warrant, such as the filing of complaints. A compliance review consists of a comprehensive analysis and evaluation of each aspect of the apprenticeship program, including on-site investigations and audits.

When the compliance review indicates that the sponsor is not operating in accordance with the regulations, DOL notifies the sponsor in writing of the review results. DOL is expected to secure voluntary compliance within a reasonable time before undertaking sanctions. DOL may institute proceedings to deregister the program or refer the matter to the EEOC, or the Attorney General, with recommendations for court action under Title VII of the Civil Rights Act of 1964.

On November 8, 1990, Order No. 4-90 from the Secretary of Labor authorized and assigned responsibility for enforcing the equal opportunity in apprenticeship standards (29 CFR 30) jointly to the assistant secretary for employment standards and the assistant secretary for employment and training. Thereafter, OFCCP and BAT, the respective representatives for the two assistant secretaries, entered into a memorandum of understanding to carry out the provisions of the order.

The memorandum states that BAT will act as the coordinating agency. Both BAT and OFCCP are authorized to select apprenticeship program sponsors for compliance reviews, to
receive and investigate complaints regarding equal opportunity in apprenticeship, to negotiate voluntary resolutions of violations, and to refer legal proceeding cases in which resolution of violations have not been obtained.

It is important to note that OFCCP is not obligated to conduct compliance reviews, but may conduct such reviews if it finds it desirable to do so for its compliance activities under Executive Order 11246. BAT is providing training for OFCCP personnel to help them understand the National Apprenticeship Program, particularly the voluntary nature of registration. If deregistration of apprenticeship programs were to be used more frequently as an enforcement tool, it would defeat the BAT’s efforts to promote registered apprenticeship. When a program is deregistered, it no longer has the BAT’s recognition, which, in turn, implies that the apprentices in the program no longer have a program that will provide the credentials of a registered program.

Special Measures to Increase Minority Participation

One of the first efforts to improve the number of minority apprenticeship applicants in the 1960s was the establishment of apprenticeship information clearinghouses, or Apprenticeship Information Centers. The intent was to provide a central location where a minority person interested in apprenticeship could get information on qualifications, procedures, time and place of making an application, and the career possibilities in different trades.

DOL established a policy for the operation of Apprenticeship Information Centers (AICs) in a number of cities in 1963. The operation of the centers was placed under the joint control of BAT and the Employment Service (ES). BAT is responsible for stimulating local interest and securing community support from labor, management, civic, education, and minority groups. It provides essential apprenticeship information, such as apprenticeship requirements, to the centers.
The ES has responsibility for securing the cooperation of state employment security agencies to help with the administration of the AICs.\textsuperscript{37}

During 1979, 43 AICs were in operation in 23 states and the District of Columbia. The AICs referred 44,000 applicants to apprenticeship sponsors, of which 10,000 were accepted. Approximately 20 percent of those accepted were minorities.\textsuperscript{38}

The Apprenticeship Outreach Program (AOP) is another special effort to increase the supply of minorities to apprenticeship. Funded initially through the Manpower Development and Training Act, the AOP consisted of several programs, either operated by the Workers Defense League,\textsuperscript{39} or patterned after that program, that worked to get more minorities into apprenticeship through active recruitment, tutoring, and counseling.

The Workers Defense League (WDL) recognized early in its efforts that it would be difficult to fill apprentice positions because few minorities were interested and qualified. So WDL focused on recruiting minorities as applicants by identifying minority youths who were already qualified. Some other civil rights organizations sought instead to change the prescribed qualifications in order to increase the number of minority apprentices.\textsuperscript{40}

The WDL recruited by contacting schools, parents, local YMCAs, community organizations, and underemployed youth. It screened youth for those who could most easily


\textsuperscript{38}Employment and Training Report of the President, 1979.

\textsuperscript{39}The Workers Defense League program was later known as the Joint Apprenticeship Program and the Recruitment-Training-Program, Inc.

obtain other work or who were considering higher education. Those youth would then be interviewed and given an aptitude test. Through counseling, interested youth were given information about apprenticeship and the programs accepting applicants. Tutoring was provided to prepare the potential applicants for the written and oral tests given by the apprenticeship program sponsors. For those who passed the tests, WDL helped them find temporary jobs until they entered the apprenticeship.\(^{41}\)

For fiscal years 1970 through 1977, the Department funded the AOP at $87.4 million. As of December 1977, there were 102 active projects nationwide. WDL operated 31, while the National Urban League’s Labor Education Advancement Program operated 31, the Human Resource Development Institute of the AFL-CIO operated 22, and another 18 were operated by state agencies, local trade union leadership councils, or local civic minority groups.\(^{42}\) Most of these programs continue to operate in the 1990s.

**Summary**

This chapter has provided a review of the Federal policies implemented to promote equal opportunity in apprenticeship. Various policies were used to influence the demand for minority apprentices. Executive orders sought to promote an active program of hiring, promotion, and training of minorities by requiring affirmative action among Federal contractors. Civil rights legislation prohibited discrimination in employment, including apprenticeship and training. Initially these efforts were limited by the slowness to develop regulations to implement affirmative

\(^{41}\) Marshall and Briggs *Equal Apprenticeship Opportunities* pp. 38-45.

action requirements, and the limited powers of the EEOC to investigate and to institute legal proceedings. By the early 1970s, affirmative action rules were in place. Later in the 1970s, EEOC's powers were expanded and contract compliance responsibilities were consolidated into the OFCCP.

Equal opportunity in apprenticeship standards, requiring selection of apprentices on the basis of qualification alone, were first implemented in 1964. Realizing the need to increase the supply of qualified minorities to apprenticeship, DOL funded special programs to provide a clearinghouse of information on apprenticeship and to promote outreach and recruitment of minorities for apprenticeship. Consistent with other Federal equal opportunity efforts, affirmative action in apprenticeship was required by 1972. Apprenticeship programs are in compliance as long as they make good faith efforts toward attaining self-determined affirmative action goals (and timetables).
CHAPTER IV  
LITERATURE REVIEW

Chapter III described equal opportunity policy in apprenticeship as part of a larger effort to provide equal opportunity in employment. This study attempts to assess the performance of the national apprenticeship system to provide equal opportunity in apprenticeship for racial/ethnic minorities. Hence, the scope of the literature reviewed here is primarily concerned with minority apprenticeship participation, not the impact of that participation on minority employment, earnings, occupational turnover, or on the challenge it presents to the work place norms of whites.

Over the course of reviewing the literature on equal opportunity in apprenticeship, it became clear that only limited research has been presented regarding the equal opportunity performance of the national apprenticeship system. One reason is the lack of appropriate and sufficient data. Some researchers have collected apprenticeship data from program sponsors in several cities or interviewed journeymen workers. Data obtained from program sponsors were not collected to be nationally representative, and typically were limited to the building and construction trades only. Other researchers have relied upon either EEOC annual reporting forms, or management information system data of the Bureau of Apprenticeship and Training (BAT).

Studies that relied on EEOC data could only consider the period of 1967 through 1979 because EEOC apprenticeship reporting forms were no longer used after 1979, having been disallowed by the Office of Management and Budget. In addition, prior to 1980 reporting forms were required from both registered and non-registered apprenticeship programs. Only registered programs were subject to apprenticeship registration and equal opportunity regulations issued by
DOL. Non-registered programs were not necessarily subject to affirmative action requirements. The EEOC reporting forms identified registered programs. However, the literature did not distinguish registered from non-registered programs.

BAT data, on the other hand, pertains only to registered apprenticeship, that is, the national apprenticeship system. These data have not been continuously and consistently maintained. The first BAT data system, the State and National Apprenticeship System (SNAPS) was comprehensive and fairly detailed. However, it was never analyzed to assess equal opportunity in apprenticeship.\textsuperscript{43} After 1979, the Office of Management and Budget disallowed its further use.

A new Bureau data system began in 1982 at the regional level but was not expanded to all regions until 1987. Data from this new Apprenticeship Management System (AMS) is not comprehensive because several state apprenticeship agencies did not participate. However, the AMS data have been reliable when supplemented with state data. No attempt has yet been made to use the SNAPS and AMS data together to examine equal opportunity progress over the 1970s and 1980s.

A second reason for the lack of research is that the earlier studies were focused on minority access to skilled construction trades and trade unions, rather than on the performance of the apprenticeship system across all apprenticeship industries and trades. Some of the research focused on programs that were attempting to increase the number of minority applicants to apprenticeship, while other research considered apprenticeship outcomes, including union membership and journeyman status.

\textsuperscript{43}However, DOL did use SNAPS data to report to Congress on apprenticeship by race and ethnicity.
Research interest in apprenticeship for minorities seems to have been replaced in the 1980s by interest in apprenticeship for women, perhaps because minority apprenticeship participation was very close to the rate of minority representation in the labor force. In addition, there was a growing effort during the 1980s to provide equal access for women in nontraditional occupations. Apprenticeship could serve as a direct route for women to the skilled trades.

The first section of this chapter examines the equal opportunity performance of the national apprenticeship system from the 1960s through 1990, including efforts to increase the number of minority applicants. The second section examines enforcement of equal opportunity and affirmative action in the apprenticeship system. The third section briefly reviews the literature concerning the impact of equal opportunity and affirmative action in employment, highlighting the methodological approaches used in that broader literature.

**Equal Opportunity in Apprenticeship**

Prior to 1963, blacks and black apprentices in the skilled building trades were concentrated in largely low-status occupations such as carpenters and the trowel trades (e.g., plasterer, painter, bricklayer). Throughout the country, the elite mechanical trades—electricians, plumbers, and sheet metal workers—were largely white, as were the ironworkers, except for a large proportion of Native Americans among ironworkers.44

Racial prejudice and discrimination in the 1950s and early 1960s reflected prevailing social attitudes. Employers felt that blacks were suited mainly for hot, dirty, or otherwise disagreeable jobs. Blacks were hired for "white" jobs only when blacks would work for lower wages than whites or would act as strikebreakers or otherwise prevent unionization. Out of fear

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of boycotts by white customers or strikes by employees, employers were reluctant to hire blacks. In the construction industry, where employers relied on the union as a source of skilled manpower, employers were strongly motivated to maintain good relations with unions because union leaders were able to refer better workers to preferred employers. Therefore, employers would not raise concerns over discriminatory practices by the unions.

The results of a 1963 survey covering 989 construction industry contractors, 281 employer associations, and 731 unions by field teams of the President’s Committee on Equal Employment Opportunity (PCEEO) indicated that among 3,696 apprentices selected in 30 southern cities for five trade unions (plumbers, electricians, sheet metal workers, ironworkers, and carpenters), only 26 were black, of which 20 were selected for the carpenters program. Not one black was among the 441 apprentices selected for the sheet metal workers program or the 365 selected for the ironworkers program. However, the PCEEO revealed that very few blacks applied for any of the apprenticeship programs in the South. In non-southern areas, of 5,908 apprentices selected for the five building trades, 133 were black, 70 of whom were carpenters.

Increasing the Number of Minorities in Apprenticeship

In 1965, DOL funded a study to examine minority participation in apprenticeship. The objective was to identify successful approaches of increasing black participation in apprenticeship programs that had low black representation. Marshall and Briggs (1967) examined, through personal interviews and a review of documents, black participation in six apprentice trades in ten

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45 Marshall and Briggs The Negro and Apprenticeship, p. 34.
46 Marshall and Briggs The Negro and Apprenticeship, pp. 29-33, describe a 1964 compliance survey of government contractors. The survey indicated few black apprentices; of 21,500 apprentices, only 483 (or 1.3 percent) were blacks.
major cities selected to be nationally representative and to reflect a variety of problems and remedial programs. The trades included: electrician, ironworker, sheet metal worker, plumber or pipefitter, printer, and mechanical trades within industrial plants.

Marshall and Briggs (1967) found that little progress had been made in those trades where discrimination had been the greatest. The lack of progress was attributed not just to discrimination, but also to the lack of interest by blacks and the failure of blacks to qualify.

For decades, lack of political and economic power left blacks with limited employment opportunities, confining them primarily to relatively low-status occupations. Gradually, black employment patterns became entrenched. Not having worked in a variety of skilled, technical jobs, blacks became stereotyped for certain jobs by employers, white workers, and even themselves. Hence, blacks had little or no exposure and knowledge about apprenticeship training programs.47

Lacking knowledge of apprenticeship, black youth were often not interested, or discouraged from, applying for or accepting apprenticeship positions. In addition, apprenticeship programs in the elite trades generally required a high school diploma and specific coursework in mathematics and science. Years of segregated schools and neighborhoods left blacks with an inferior education and a high dropout rate. Consequently, many blacks did not meet program qualifications, or did poorly on written aptitude tests used in the selection procedure.

The general conclusion by Marshall and Briggs (1967) was that anti-discrimination regulations had to be supplemented with policies to recruit and counsel minorities, and even supply remedial training.

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47Marshall and Briggs The Negro and Apprenticeship, p. 34.
Although we are persuaded, moreover, that racial discrimination continues to be an important problem, we are convinced that its relative importance has declined in recent years and that measures to recruit, train, and counsel qualified applicants currently are much more important. Our assumption is based on the belief that we have already adopted an imposing array of antidiscrimination policies which have done much to increase the demand for Negro workers by changing the thinking of apprenticeship sponsors about the necessity of admitting qualified Negro youngsters but have done relatively little on the supply side to get Negroes into apprenticeship programs (Marshall and Briggs 1967, p. 231).

The literature evaluating special efforts to increase the number of minority applicants is small and limited to the period prior to the 1980s. Studies focused on the placement experience of Apprenticeship Information Centers and Apprenticeship Outreach Programs.

The main function of Apprenticeship Information Centers (AICs) is to act as a clearinghouse of information on apprenticeship. Among the AICs in the ten cities visited by Marshall and Briggs (1967), the Washington, D.C., AIC was considered the most successful. They attribute the success to a number of factors including: its director, who had served an apprenticeship and had good contacts with the labor movement; much of the work done by the unions in the area was on government contracts; there was a large black community that had become involved in the Center’s operations; and the Center did not have problems associated with a joint Federal-state arrangement.

Overall, the AICs succeeded in getting blacks into apprenticeship programs. But the results were disappointing because of a lack of cooperation from apprenticeship institutions and state employment services, and the lack of imagination by some of the Centers’ directors. Yet, the experience of successful AICs suggested that the centers could be made effective under the proper circumstances.48

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48 Marshall and Briggs The Negro and Apprenticeship, p. 218. At the time of their study, AICs had been active for only about two years.
An early study of the Apprenticeship Outreach Program (AOP) prepared for DOL reports that in the 12 cities examined in 1969, the AOP participants were all male, 88 percent black and 4 percent nonminority. By the end of 1969, 5,000 participants were placed as apprentices, with a retention rate in apprenticeship of 51.8 percent.49

Schneider (1975) provides a more detailed analysis of program statistics on the operation of the AOP. Statistics were compiled from summary reports completed on a monthly basis between 1968 and 1973. The reports contained information on the number of placements, the cumulative number of placements, the craft or trade of placement, the number of dropouts and whether dropping out was voluntary or a dismissal, and the sponsoring agency and local project.

To consider how AOP contributed to the level of minority participation in apprenticeship programs, Schneider compared the number of AOP placements to the number of apprentices in federally serviced apprenticeship programs, either for the construction industry50 (an analysis limited to 12 trades) or for a grouping of industries,51 including construction, manufacturing, public utilities/transportation, trade and services, and mining (an analysis of 17 trades).

For both the construction industry, and the combined industries, AOP placements accounted for a substantial and increasing number of the minority members in the apprenticeship


50 The construction industry was of primary interest, and represented about 84 percent of all AOP placements.

51 A given trade may be in any industry that utilizes that trade. Many apprenticeship trades are found in construction. The trades included for the construction industry comparison are: (1) electro-mechanical; electrician, pipe, iron workers, sheet metal workers, (2) intermediate; carpenter, glazier, painter, roofer, (3) trowel; brick-stone-tile mason, cement mason, lathe, and plasterer. The five other crafts are: asbestos worker, elevator constructor, machinist, operating engineer, and miscellaneous.
programs. Between June 1969 and December 1972, the proportion of minorities entering apprenticeship increased from 11.4 percent to 17.2 percent for the combined industries, and from 12.4 percent to 19.3 percent for the construction industry. For the construction trades, the AOP placements represented 57.1 percent of minority entries in June 1969 and 74.5 percent by December 1972. Among the combined industries, the AOP placements represented 36.9 percent of minority entries in June 1969 and 70.3 percent in December 1972.\(^{52}\) Among the twelve construction trades, electro-mechanical trades represented 40.5 percent of the placements in June 1973; intermediate crafts accounted for 43.7 percent of the placements, and the trowel trades accounted for 15.8 percent.\(^{53}\)

Gatewood (1979) assessed the performance of the AOP operated by Recruitment and Training Program Inc. (RTP), in the construction industry. At the time of the study, RTP had 29 offices across the country. Gatewood examined data for all RTP offices. He utilized computerized data files on RTP placements, and outreach program activity reports.

Approximately 9,000 AOP applicants were placed in the building construction trades between September 1966 and August 1975. Placements were not all made to apprenticeship: 26.1

\(^{52}\) Schneider, Stephen A. "Apprenticeship Outreach Program." In Perry, Charles R., Bernard E. Anderson, Richard L. Rowan, and Herbert Northrup, The Impact of Government Manpower Programs in General, and on Minorities and Women. (Philadelphia: The University of Pennsylvania 1975). pp. 237-239. Because the Federally serviced apprenticeship programs represented about two-thirds of all apprentices (the others were serviced at the state level), the estimated representation of AOP placements among minorities entering apprenticeship are inflated by about one-third.

\(^{53}\) Schneider "Apprenticeship Outreach Program, p. 246."
percent were placed as journeymen; 60.2 percent were placed as apprentices; and 11.9 percent were placed as trainees or helpers. Another 1.7 percent of placements were not identified.54

Most of the special efforts to increase the number of minority applicants were initiated in the '60s or early '70s. AICs and AOPs continued to operate, but research interest had disappeared. Based upon the limited evidence presented here, it appears that AICs and AOPs made significant contributions to increasing the number of minority applicants to apprenticeship.

In 1977 DOL funded four demonstration projects called Youth Apprenticeship Projects. Four more were added in 1978. The projects implemented linkages with local school systems, developed apprenticeship job slots with employers, and coordinated registration activities with BAT and/or SACs. At all but one demonstration site, training stipends were offered to employers as an incentive to participate.

The major goals of the YAPs were (1) to demonstrate the feasibility of in-school apprenticeship; (2) to promote the use of registered apprenticeship by employers; and (3) to ease the school-to-work transition of youth. It was hoped that the efforts would help bridge the gap between apprenticeship and secondary education, especially vocational education. The projects placed high school seniors in part-time apprenticeship positions during school with the expectation that they would continue with the same employment after graduation from high school.

The projects were sponsored by non-profit organizations, community colleges, city school systems, and state systems of education. The projects funded in 1978 targeted economically disadvantaged students. Seven of the eight sites were funded through September 1981.

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Williams, et. al., (1981) conducted surveys during the summer of 1980 with a random sample of former YAP student apprentices from class years 1978-80 who had been registered since 1977, and a comparison group constructed from a sample of students matched on high school attended, sex, race, year of graduation and vocational curriculum, to compare education and post-high school experiences. In addition, a sample of employers and work supervisors were surveyed.

Examining first the implementation of the programs, Williams, et. al., concluded that apprenticeship-school linkages were achievable in diverse local settings and under different types of local sponsorship. The linkage concept was viewed to have considerable potential as an education-training pathway for youth interested in skilled trades.55

Results of the survey indicated that 77 percent of the apprenticeship sample was employed as of the summer of 1980. About 42 percent were still employed in their student apprenticeship jobs. Of the 58 percent who were not employed in their apprenticeship job, 22 percent left it before graduation. Most (62 percent) of the student apprentices who were not still employed in the apprenticeship job left voluntarily. Another 22 percent left because of slack work.56

Among the sample of student apprentices, 19 percent were minorities. The comparison group had 20 percent minority representation. The student apprentices were more likely to have plans to stay in their high school job than the comparison group (53 percent versus 40 percent), but they were also more likely to be currently employed (77 percent versus 68 percent) and less likely to be primarily a student (11 percent versus 18 percent) at the time of survey.


A majority of the employers surveyed were very small in size: 58 percent had less than 20 employees, and 88 percent had less than 100 employees. Only 10 percent of the employers had workers represented under a collective bargaining agreement. Manufacturing (44 percent) and services (38 percent) were the primary industries represented among the employers. More than three-fourths of the employers said they would be willing to participate in apprenticeship if the stipend was not available, however, nearly 60 percent saw the stipend as important for their decision to participate. The average number of students hired was 3.4, but 59 percent of employers hired no more than 2 student apprentices. More than two-thirds considered registered apprenticeship as a permanent part of their company's training, and less than one-third had previous apprenticeship experience.57

Since the early 1980s, BAT has been registering youth in its School-to-Apprenticeship program. AMS reports indicate that the number of these apprentices has been increasing from 528 in 1984 to 2,481 in 1990. However, there has been no formal study of the program to determine the extent to which the youth participants are continuing in registered apprenticeship, the representation of minorities, nor the completion rates for youth in registered apprenticeship. According to AMS reports, the number of completions for the period 1984-90 was 400, with the largest number, 147, occurring in 1990.

Minority Representation in Apprenticeship

Hammerman (1972) examined the representation of minorities in apprenticeship and local construction referral unions from annual data reported to the EEOC for 1969. Although the annual reporting forms contained information to identify programs registered with BAT or a SAC,

Hammerman did not examine registered and non-registered programs separately. Therefore, minority representation obtained from EEOC data might have been biased downward because only registered programs were subject to DOL equal opportunity apprenticeship standards.

Hammerman compared minority participation in apprenticeship with minority representation in construction referral unions. He expected that if minority representation in apprenticeship was substantially higher than in referral unions, minority referral union membership would increase in a few years as the minority apprentices completed their training. He found that black, but not Hispanic, participation in apprenticeship was considerably higher than their membership in referral unions—see Table 12. He concluded there appeared to be an accelerated trend toward enrolling blacks in referral unions by comparing the percentages of minorities in apprenticeship by year of their training. There were higher percentages in the first year.

One should note, however, that the rate of apprenticeship enrollment for first year apprentices relative to second and third year apprentices, is affected by the rate of apprenticeship cancellation as well as accession. Drawing conclusions about an accelerated trend in black union membership in the late 1960s was probably premature. Programs might not have been able to maintain all apprentices over the duration of training; some apprentices might have quit; and others might have been dismissed. In addition, it would be inappropriate to interpret the volume of minority apprenticeship as indicating the increase in minority union membership; because apprenticeship was not the only source of access to union membership or journeyman status.
<table>
<thead>
<tr>
<th>Minority Group and Trade</th>
<th>Minority Group Percentage</th>
<th>Among Referral Union Members</th>
<th>Among Apprentice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Trades</td>
<td>2.9</td>
<td>5.3</td>
<td></td>
</tr>
<tr>
<td>Mechanical</td>
<td>1.6</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>Roofer and Trowel</td>
<td>12.1</td>
<td>17.2</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>2.9</td>
<td>6.7</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Trades</td>
<td>3.9</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>Mechanical</td>
<td>3.2</td>
<td>2.3</td>
<td></td>
</tr>
<tr>
<td>Roofer and Trowel</td>
<td>7.4</td>
<td>5.1</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>4.0</td>
<td>4.4</td>
<td></td>
</tr>
</tbody>
</table>

Note: Apprenticeship statistics are not limited to construction industry. Roofer and trowel trades exclude laborers.


Hammerman (1984) later compared EEOC annual reporting data from apprenticeship programs for the years 1970 and 1979.\(^{58}\) He examined the apprenticeship participation rates of minorities in construction programs and found considerable increases in the participation of both blacks and Hispanics between 1970-79, notably in the mechanical trades, which had exceptionally low minority representation in 1970. Black representation among apprentices increased from

\(^{58}\)The reliability of EEOC data over time is questionable because no attempts were made to verify the information provided by the sponsors on the reporting forms. It is possible that program sponsors may have reported self serving information. Programs were asked to report apprenticeship statistics for any calendar week or other appropriate period in the months of August or September.
4.2 percent to 9.1 percent, and Hispanic representation increased from 2.6 percent to 5.0 percent\(^5\) between 1970 and 1979—see Table 13.

**Table 13.--Percentage of minorities in construction industry apprenticeship programs by trade, 1970 and 1979**

<table>
<thead>
<tr>
<th>Trades</th>
<th>Percentage of Total Apprentices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Minorities</td>
</tr>
<tr>
<td>Mechanical Trades</td>
<td>7.9</td>
</tr>
<tr>
<td>Boilermaker</td>
<td>8.3</td>
</tr>
<tr>
<td>Electrical worker</td>
<td>7.1</td>
</tr>
<tr>
<td>Iron worker</td>
<td>10.8</td>
</tr>
<tr>
<td>Plumber/pipefitter</td>
<td>7.1</td>
</tr>
<tr>
<td>Sheetmetal worker</td>
<td>10.3</td>
</tr>
<tr>
<td>Other Construction Trades</td>
<td>15.9</td>
</tr>
<tr>
<td>All Construction Trades</td>
<td>10.6</td>
</tr>
</tbody>
</table>

Note: Minorities include black, Hispanic, Asian, and American Natives.


Hammerman (1984) also examined apprenticeship graduation statistics—see Table 14. By 1979, blacks accounted for 9.5 percent and Hispanics for 4.3 percent of apprentice graduates, compared to only 1.4 percent and 1.7 percent, respectively, in 1970.\(^6\) He concluded that the figures reflected a growing supply of trained minority journeymen within the construction industry.

\(^5\)Hammerman *A Decade of New Opportunity*, p. 52.

\(^6\)Hammerman *A Decade of New Opportunity*, pp. 52-53.
Table 14.--Percentage of minorities among apprenticeship graduates in the construction industry by trade, 1970 and 1979

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Trades</td>
<td>3.7</td>
<td>16.5</td>
<td>1.4</td>
<td>9.5</td>
<td>1.7</td>
<td>4.3</td>
</tr>
<tr>
<td>Boilermaker</td>
<td>5.2</td>
<td>9.4</td>
<td>1.3</td>
<td>5.9</td>
<td>2.6</td>
<td>2.2</td>
</tr>
<tr>
<td>Electrical worker</td>
<td>3.5</td>
<td>16.5</td>
<td>1.7</td>
<td>9.0</td>
<td>1.4</td>
<td>5.1</td>
</tr>
<tr>
<td>Iron worker</td>
<td>5.5</td>
<td>14.3</td>
<td>1.4</td>
<td>8.2</td>
<td>3.1</td>
<td>4.1</td>
</tr>
<tr>
<td>Plumber/pipefitter</td>
<td>2.5</td>
<td>18.2</td>
<td>1.0</td>
<td>10.8</td>
<td>1.4</td>
<td>3.8</td>
</tr>
<tr>
<td>Sheetmetal worker</td>
<td>5.0</td>
<td>19.1</td>
<td>0.8</td>
<td>12.9</td>
<td>2.4</td>
<td>4.1</td>
</tr>
<tr>
<td>Other Construction</td>
<td>9.2</td>
<td>19.8</td>
<td>4.5</td>
<td>9.3</td>
<td>3.4</td>
<td>8.3</td>
</tr>
<tr>
<td>Trades</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All Construction</td>
<td>5.3</td>
<td>17.9</td>
<td>2.3</td>
<td>9.4</td>
<td>2.2</td>
<td>6.0</td>
</tr>
</tbody>
</table>

Note: Minorities include black, Hispanic, Asian, and Native Americans.


In 1979, mechanical trades accounted for 56.7 percent of apprenticeship graduates. The largest two mechanical trades were electrical worker and plumber/pipefitter.

The U.S. General Accounting Office (GAO) (1979) conducted an evaluation of major Federal programs for their impact on the representation of minorities in the unionized skilled construction trades for the years 1972 through 1976. The construction trades included: asbestos workers, brick masons, carpenters, cement masons, electricians, glaziers, iron workers, lathers, operating engineers, painters, plasterers, plumbers, roofers, and sheet metal workers. The laborer trade was excluded because its membership was predominantly minority. GAO (1979) reviewed Federal agency policies, regulations, practices, and procedures; interviewed Federal and state agency officials, as well as federal construction contractors, craft union officials, and
apprenticeship outreach program contractors in 13 cities, and obtained apprentice and journeyman membership data from union officials in 7 of the 13 cities. Their field work was completed in July 1978.

The data from union officials indicated that minority representation in apprenticeship increased from 13.5 percent to 20.0 percent between January 1973 and December 1976. The increase occurred despite a decrease of 2,900 construction apprentices in those cities during the same time period. In addition, the ratio of apprenticeship completers to journeymen added to unions was much higher for minorities (592:676 or 88.6%) than for whites (4,900:13,000 or 37.7%), leading GAO to conclude that apprenticeship was the primary means for minorities to become journeymen in some crafts, whereas whites attained journeyman status without going through an apprenticeship program.

GAO also considered the rates of cancellation and completion of apprenticeship. Among the 17,113 apprentices in the seven cities during the four year period of January 1973 through December 1976, minorities had a higher rate of apprenticeship cancellation compared to whites, and a lower rate of completion—see Table 15. GAO was informed by union officials that apprentices cancel out for several reasons, including the lack of adequate transportation, a lack of work during economic downturns, nonpayment of union dues, lack of self-discipline, failure to

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61The cities visited by GAO include: Atlanta, Baltimore, Cincinnati, Cleveland, Columbus, Chicago, Dallas, Forth Worth, Indianapolis, Louisville, Memphis, Philadelphia, and Washington.


63GAO "Federal Effort," p.8. In contrast, Marshall, F. Ray and Robert W. Glover, and William S. Franklin Training and Entry into Union Construction, (Manpower R&D Monograph 39, U.S. Department of Labor 1975) found that among a sample of 1,234 journeymen in interviewed in 6 cities, a greater proportion of minorities entered the trades through non-apprenticeship routes. However, the small sample size for that study limits its strength to contradict the GAO results.
Table 15.--Apprenticeship completers and cancellers, and apprentices in-training by race for January 1, 1973 through December 31, 1976

<table>
<thead>
<tr>
<th></th>
<th>Completers</th>
<th></th>
<th>Cancellers</th>
<th></th>
<th>In Training</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>White</td>
<td>6,510</td>
<td>46</td>
<td>3,218</td>
<td>23</td>
<td>4,449</td>
<td>31</td>
</tr>
<tr>
<td>Minority</td>
<td>743</td>
<td>25</td>
<td>1,080</td>
<td>37</td>
<td>1,113</td>
<td>38</td>
</tr>
<tr>
<td>Total</td>
<td>7,253</td>
<td>42</td>
<td>4,298</td>
<td>25</td>
<td>5,562</td>
<td>33</td>
</tr>
</tbody>
</table>

Source: GAO (1979), p. 35.

attend classroom instruction, and the seasonal, intermittent, and physically demanding nature of the work.64 One outreach program contractor advised that progressively more difficult classroom training and labor costs are significant factors causing minorities to cancel out of apprenticeship programs.

GAO considered minority representation in apprenticeship again in response to a 1990 Congressional request for an assessment of the operation of the Bureau of Apprenticeship and Training. Specifically, GAO was asked to determine the use of apprenticeship to train workers, determine Federal and state resources dedicated to administering apprenticeship, and determine the representation of minorities and women in apprenticeship.65

GAO (1992) obtained administrative data (AMS) from BAT to determine minority and female representation in the national apprenticeship system. In addition, it obtained administrative data from the state of California to supplement BAT data, and also conducted surveys of BAT and


65I served as a program evaluator on this study during my one-year doctoral research internship with the U.S. General Accounting Office.
state directors of apprenticeship. BAT’s administrative data did not contain information from California’s SAC.\textsuperscript{66}

GAO (1992) reports that overall, minority representation in apprenticeship increased from about 15.5 percent in 1973 to 22.5 percent in 1990, approximately equal to minority representation in the labor force. When controlling for the occupation of training, minorities tended to be concentrated in apprenticeship programs for lower-paying occupations. Approximately 64 percent of minority apprentices were training for occupations in the lower two quartiles of median weekly earnings compared to only 46 percent of white apprentices. Three of the four earnings quartiles were above national average weekly earnings.

Some of the occupations with the largest numbers of minorities include the building trades and the occupations in the public sector. Building trade occupations with large numbers of minorities—carpenter, electrician, roofer, sheet metal worker, pipefitter, plumber, painter, structural iron worker, bricklayer, operating engineer—accounted for over half of all minority apprentices. Corrections officer, fire fighter, and police officer in the public sector had large numbers of minorities as well. Table 16 presents the twenty occupations with the largest number of minority apprentices in 1990 and the percentage of minorities in each.

Minority representation is 20 percent or higher in 14 of those occupations. It appears that by 1990, the national apprenticeship system has provided many apprenticeship opportunities for minorities, despite the lack of growth in the number of registered apprentices. However, it appears minorities tended to be concentrated in lower-status occupations.

\textsuperscript{66}BAT’s administrative data is used as a tracking system for management purposes. Several states and the District of Columbia did not participate in the tracking system. As a result, the data represents approximately 70 percent of all registered apprentices. However, with the addition of California data, the representation is much higher because California has the largest number of registered apprentices—twice as much as the next largest state.
Table 16.--Twenty occupations with the largest number of civilian minority apprentices in 1990

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Total Number of Apprentices</th>
<th>Minority Apprentices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Number</td>
</tr>
<tr>
<td>Carpenter</td>
<td>28,827</td>
<td>6,416</td>
</tr>
<tr>
<td>Corrections officer</td>
<td>12,513</td>
<td>5,759</td>
</tr>
<tr>
<td>Electrician</td>
<td>34,746</td>
<td>4,805</td>
</tr>
<tr>
<td>Roofer</td>
<td>7,607</td>
<td>2,904</td>
</tr>
<tr>
<td>Sheetmetal worker</td>
<td>11,103</td>
<td>1,953</td>
</tr>
<tr>
<td>Plumber</td>
<td>12,080</td>
<td>1,880</td>
</tr>
<tr>
<td>Painter</td>
<td>5,930</td>
<td>1,715</td>
</tr>
<tr>
<td>Pipefitter</td>
<td>11,630</td>
<td>1,608</td>
</tr>
<tr>
<td>Operating engineer</td>
<td>4,268</td>
<td>1,382</td>
</tr>
<tr>
<td>Fire fighter</td>
<td>5,076</td>
<td>1,114</td>
</tr>
<tr>
<td>Structural sheet worker</td>
<td>5,278</td>
<td>1,101</td>
</tr>
<tr>
<td>Bricklayer</td>
<td>4,802</td>
<td>1,051</td>
</tr>
<tr>
<td>Cement mason</td>
<td>2,092</td>
<td>1,006</td>
</tr>
<tr>
<td>Police officer</td>
<td>2,962</td>
<td>791</td>
</tr>
<tr>
<td>Machinist</td>
<td>5,898</td>
<td>784</td>
</tr>
<tr>
<td>Drywallar</td>
<td>2,207</td>
<td>741</td>
</tr>
<tr>
<td>Cook (hotel &amp; restaurant)</td>
<td>1,938</td>
<td>677</td>
</tr>
<tr>
<td>Maintenance mechanic</td>
<td>3,223</td>
<td>522</td>
</tr>
<tr>
<td>Plasterer</td>
<td>1,309</td>
<td>458</td>
</tr>
<tr>
<td>Automobile mechanic</td>
<td>1,713</td>
<td>416</td>
</tr>
</tbody>
</table>


Riccucci (1990) maintains that unions, through their exercise of control over entry standards, are the primary barrier blocking the entrance of women and minorities into apprenticeship.  

Even if a JAC is present, where employer representatives participate in policy setting, unions will develop ways to usurp control and use their power to exclude minorities (as well as women) from the craft. Second, even if the union is willing to enforce its own apprenticeship standards (e.g., entrance test), it can and will ensure that

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friends and family of incumbent union members will meet those standards by providing them with preapprenticeship skills or training. These sorts of practices will continue to adversely affect women and minorities and deprive them of employment opportunities in the well-paying crafts (Ricucci 1990, p. 83).

A joint apprenticeship committee (JAC) is a specific form of labor-management committee established for the purpose of operating an apprenticeship training program. Through the process of collective bargaining, JACs could also promote equal opportunity goals. However, unions have used their power more often to obtain control over apprenticeship in order to control the quality and supply of skilled labor. Two court cases involving JACs, are cited by Ricucci as examples of both JAC support for blacks in apprenticeship, and the "pervasiveness and insidiousness of union/JAC discrimination" against racial minorities.68

Ricucci (1990) notes that the practices and behaviors of unions in public sector apprenticeship programs are less well known than for the private sector, perhaps due to the underutilization of apprenticeship programs in the public sector. In her examination of public sector apprenticeship, she provides some apprenticeship statistics on minority representation by sector and type of program—see Table 17.

Minority apprenticeship representation in the public sector, as of December 31, 1987, was higher than in the private sector: 31.5 percent of public sector apprentices are minorities, compared to 14.9 percent in the private sector. The large difference can be explained in part by the inclusion of military apprentices, where minority representation is quite high. Military programs are operated unilaterally.

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Table 17.--Minorities in apprenticeship, by sector and type of program, as of December 31, 1987

<table>
<thead>
<tr>
<th>Industry</th>
<th>Apprentices</th>
<th></th>
<th>Minorities by Program Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Minority</td>
<td>Joint</td>
</tr>
<tr>
<td>Public sector</td>
<td>66,303</td>
<td>20,916</td>
<td>1,950</td>
</tr>
<tr>
<td>Private sector</td>
<td>164,312</td>
<td>24,513</td>
<td>17,954</td>
</tr>
<tr>
<td>All</td>
<td>230,615</td>
<td>45,429</td>
<td>19,904</td>
</tr>
</tbody>
</table>


Including military apprenticeship is misleading because the apprenticeship standards used in the military are not the same as used in civilian programs. The military trains for its specific needs, not for the needs of private sector employers. As a result, military apprenticeship skills are not directly transferable to the civilian sector. Table 17 also indicates that 90.7 percent of minorities in public sector apprenticeship are in unilateral programs. It would be helpful if public and private sector programs were also compared for civilian apprentices only.

It is interesting to note that minority representation in apprenticeship in the private sector is only 14.9 percent, much lower than minority representation in apprenticeship overall (19.6), and lower than minority representation in the labor force. This finding suggests that minority progress in apprenticeship has been fueled in large part by the progress in the public sector, and perhaps primarily in the military.
Enforcement of Equal Opportunity in Apprenticeship

Goal of Equal Opportunity in Apprenticeship

The GAO (1979) report credits BAT for the increased minority participation in apprenticeship programs during 1973 through 1976 in the seven cities GAO visited. However, it criticized BAT for not having equal opportunity goals linked more closely to minorities completing apprenticeship and becoming journeymen. Equal opportunity goals are directed toward achieving a minority participation rate in apprenticeship programs equal to minority representation in local labor market areas. GAO (1979) recommended that the Secretary of Labor direct BAT to link minority participation goals in construction trades apprenticeship programs to minority journeymen representation in the craft unions.\(^\text{69}\)

DOL disagreed with GAO's position that apprenticeship goals be based primarily on minority participation as journeymen.\(^\text{70}\)

While journeyman participation should be considered in determining the goal itself, the major factor that should be used in determining the goal for minorities should be the percentage of minorities in the labor force in the surrounding labor market area. To require substantially higher than this might result in the imposition of unrealistic targets which would constitute an unreasonable burden on the apprenticeship program sponsor. The apprenticeship system can and should make a meaningful contribution in this area, but its capacity to correct industry-wide racial imbalances is not nearly as great as GAO suggests (Department of Labor comments, in GAO (1979), p. 80).

\(^\text{69}\)GAO "Federal Efforts," p. 41.

Because apprenticeship completion is determined by several factors,\textsuperscript{71} attaining journeyman representation goals for minorities would place an extraordinary burden on program sponsors to ensure that minorities complete training. An increase in the number of minority apprentices could raise the number of completions, but would not necessarily increase the rate of completion among minorities. On the other hand, accepting more minorities may result in accepting less qualified individuals, which could increase the number of noncompletions. At the same time, it would reduce the number of apprenticeship positions available to white applicants. Some might view such actions as making quotas out of apprenticeship goals.

The issue of apprenticeship completion is an important one. Equal opportunity generally pertains to recruitment, selection, and participation. Apprenticeship completion, or cancellation, can have equal opportunity implications as well. Equal opportunity apprenticeship regulations require nondiscrimination during apprenticeship. If cancellation is used to discriminate against minorities, BAT can take action to sanction the program, including referring the matter to the EEOC for legal action.

**Equal Opportunity and Affirmative Action Compliance Monitoring**

A study conducted as one of the research papers for the Apprenticeship 2000 Initiative, examined BAT’s role to monitor and enforce equal opportunity in apprenticeship. The study\textsuperscript{72}

\textsuperscript{71}Barocci, Thomas A., "The Drop-out and the Wisconsin Apprenticeship Program: A Descriptive and Econometric Analysis." (Ph.D. Diss., University of Wisconsin 1972), surveyed a sample of former apprentices (450) stratified by completion status and occupation who served as apprentices in Wisconsin between 1965 and 1970. Statistically significant determinants of completion included occupational area of apprenticeship, union status, marital status, sex, years of formal education, and an index of attitude.

focused on questions of management processes and system design, not on the qualitative results of Bureau monitoring and enforcement actions. The objective of the study was to determine how efficient and effective monitoring and enforcement could best be achieved.

Wilson and Silon (1988) interviewed BAT, state, and other agencies staff, employer organizations, program sponsor representatives, and advocacy groups. A survey of BAT state directors and BAT regional directors was also conducted. The authors found that using the automated Apprenticeship Management System (AMS) was inefficient for BAT to be able to fully respond to data requests from Congress, government officials, and the private sector. They recommended that additional funding was required for equipment and system enhancements in order to respond to Congress' mandate to provide current data on apprenticeship opportunities, sponsor performance, and other accurate statistical reports.

Riccucci (1990) expressed a similar concern about the apparent lack of apprenticeship data, stating that without comprehensive and reliable data on apprentices, the ability to monitor equal opportunity progress is hindered. Equal opportunity progress in apprenticeship "cannot be effectively monitored and addressed without adequate, accurate, and accessible data."

Wilson and Silon (1988) found that the implementation of the equal opportunity compliance review process varied depending upon the extent of state participation and BAT resources. On average, SAC representatives tended to view a compliance review as a BAT-imposed process that BAT should perform. In some SAC states BAT staff did all compliance

\[73\text{Riccucci Women, Minorities, and Unions, p. 96.}\]

\[74\text{The GAO (1979) study reported that compliance reviews conducted in the seven cities it visited varied in quality. Some programs were reviewed very infrequently and other not at all. In response, DOL stated that it would upgrade the compliance review procedures and revise its compliance review manual.}\]
reviews themselves. Other states had more thorough and systematic compliance review processes that closely monitored affirmative action performance outcomes.

GAO (1992) conducted surveys of BAT and SAC state directors in 1991 to obtain information about compliance review and enforcement. Useable responses were received from 46 Bureau directors and from 23 SAC directors. During fiscal year 1990, BAT staff spent on average about 8 percent of their time on equal employment opportunity compliance monitoring. About one-third of 4,845 programs with at least five registered apprentices were reviewed, and 90 percent were conducted on site. These included programs registered either by BAT or a SAC. SAC staff reviewed 2,800 SAC registered programs for equal opportunity compliance. Two-thirds of those programs had five or more registered apprentices.

**Equal Opportunity and Affirmative Action Enforcement**

Several agencies have enforcement duties with respect to apprenticeship progress. BAT monitors and enforces program compliance with equal opportunity in apprenticeship standards. OFCCP monitors and enforces compliance of government contractors with affirmative action requirements under its regulations. The EEOC investigates equal opportunity complaints, and attempts to resolve matters through conciliation. If that fails, legal action is taken to obtain compliance with Title VII of the Civil Rights Act.

Wolkinson (1973) examined whether or not the EEOC, through its conciliation process prior to 1972, was successful in remedying labor union discrimination. The unfair employment practices charges against unions ranged from complete exclusion of blacks to union failure to represent fairly individual black members of the bargaining unit. Complete exclusion included rejection of blacks for membership, failure to refer black job applicants, and exclusion of blacks from apprenticeship training programs.
In eight of twelve building craft union cases involving complete exclusion, blacks were excluded from apprenticeship programs. In all eight cases, less than one percent of all enrolled apprentices were black. In most of these cases, the local union did not have a single black apprentice.\textsuperscript{75} The unions claimed to have objective criteria for admission. However, it was determined that they frequently disregarded their own objective standards, or applied them in a subjective and arbitrary manner.

Wolkinson (1973) found that conciliation processes failed to obtain remedial objectives because local unions rejected the EEOC’s settlement efforts and refused to make concessions. In seven of eight cases, blacks were present in only token numbers more than a year after the EEOC determined that the unions’ apprenticeship practices were discriminatory.

For the period after 1972, GAO (1979) said that the EEOC did not adequately use its authority. GAO believed that EEOC could more effectively carry out its enforcement responsibility if it used its authority against construction craft unions on a planned, systematic basis. The actions taken by EEOC were viewed by GAO as isolated actions against union locals rather than systemic actions against trades nationally.

The EEOC was not very active in apprenticeship during the 1980s. Few complaints were filed directly by apprentices or applicants for apprenticeship, and few referrals were received from BAT.\textsuperscript{76} Also, most BAT and state apprenticeship staff did not receive equal opportunity complaints during the 1980s.\textsuperscript{77} When noncompliance with equal opportunity and affirmative action requirements was observed, the staff generally issued a written statement of the


\textsuperscript{76}Wilson and Silon \textit{Issues}, p.14.

\textsuperscript{77}Wilson and Silon \textit{Issues}, p. 11.
noncompliance and a recommendation to the sponsor as to what was required to bring the program into compliance. As a result, most equal opportunity problems in apprenticeship during the 1980s never reached the formal complaint process.

Affirmation action enforcement overlap by BAT and the OFCCP in apprenticeship equal opportunity was identified by Wilson and Silon (1988) as a area of contention for program sponsors and for BAT and state apprenticeship representatives. OFCCP conducts contract compliance reviews of individual employers with apprentices in its work force. BAT representatives and program sponsors regard OFCCP’s practices as bothersome and sometimes detrimental to apprentices and apprenticeship programs. Comments by BAT state directors suggest that they were not informed by OFCCP of reviews and actions which affected apprenticeship programs.

In addition, sponsors and BAT staff maintained that OFCCP’s approach to affirmative action compliance tended to conflict with the apprenticeship training model. Sponsors and BAT staff see OFCCP as seeking compliance with goals even when a sufficient pool of applicants is not available in the local labor force. Strict enforcement could be detrimental to apprenticeship if more programs are deregistered for not meeting compliance goals. Deregistration eliminates the protection of apprentices’ welfare through BAT oversight, and it eliminates BAT certification of apprenticeship completion. In addition, strict enforcement may lead program sponsors to choose not to register, or voluntarily deregister their own programs.

The conclusion reached by Wilson and Silon (1988) was that BAT appears to be miscast in a role that is not well suited to its mission, authority, and capability. Its responsibilities to monitor and enforce equal opportunity, including affirmative action, might conflict with its duty to promote and expand apprenticeship. Some BAT representatives perceived the compliance review as a violation of the trust and support they established and maintained with program
sponsors. As a result, compliance reviews were regarded more as a process for identifying good faith efforts rather than evaluating measurable accomplishments.

Riccucci (1990) asserts that during the 1980s, BAT rarely imposed sanctions for equal opportunity violations, that the EEOC did not vigorously pursue Title VII violations by joint apprenticeship committees, and that the OFCCP did not vigorously exercise its authority to debar contractors. Therefore, she calls for greater enforcement of equal employment opportunity laws and regulations to ensure equal opportunity for women and minorities.

Riccucci perceives an abuse of power by unions participating in joint apprenticeship committees (JACs) that is detrimental to women and minorities. The obstacles women and minorities face as they seek entry into apprenticeship programs are attributed in part to the practices and policies of unions:

Today apprenticeship programs are an extremely exclusive system of employment for white men. As noted earlier, the exclusivity became more pronounced as trade unions began to gain more control over apprenticeships. Women and minorities continue to be underrepresented in or excluded from apprenticeship programs and, consequently, the crafts or industries all together (Riccucci 1990, p. 76).

The context of this statement suggests that "today" means the twentieth century, not the late 1980s. Yet, no qualification of this statement was made to say that improvements in equal opportunity for women and minorities were expected after the enactment of the Civil Rights Act of 1964, and the issuance of DOL apprenticeship standards, including the requirement of affirmative action. Riccucci did not investigate changes in the opportunities for minorities and women in joint apprenticeship committees (JACs) for the post-1960 period.

However, Riccucci used EEOC data for 1978 and 1979 to suggest that the proportion of minority male applicants decreased from 21.1 percent in 1978 to 19.3 percent in 1979, that the number of minority cancellations increased, and that the number of minority graduates decreased.
But, the percentage of minority male graduates increased and the percentage of minority male cancelllees decreased. The rate of minority male applicants accepted increased from 11.3 percent to 14.2 percent—see Table 18. The change between 1978 and 1979 should not be considered as representing a long-term trend. The change in the number of minority applicants and their completion or cancellation rates can reasonably be expected to fluctuate randomly from one year to the next.

Table 18.--Minority apprentices in the United States, 1978, 1979, 1987

<table>
<thead>
<tr>
<th></th>
<th>1978a</th>
<th>1979b</th>
<th>1987b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicants</td>
<td>86,820</td>
<td>71,068</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>(21.1)</td>
<td>(19.3)</td>
<td></td>
</tr>
<tr>
<td>Cancellers</td>
<td>5,005</td>
<td>5,317</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>(24.3)</td>
<td>(23.8)</td>
<td></td>
</tr>
<tr>
<td>Graduates</td>
<td>4,837</td>
<td>4,768</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>(16.0)</td>
<td>(17.0)</td>
<td></td>
</tr>
<tr>
<td>Apprentices</td>
<td>27,989</td>
<td>31,221</td>
<td>45,429</td>
</tr>
<tr>
<td></td>
<td>(18.7)</td>
<td>(17.7)</td>
<td>(19.6)</td>
</tr>
<tr>
<td>Rate of admission</td>
<td>11.3</td>
<td>14.2</td>
<td>--</td>
</tr>
</tbody>
</table>


bU.S. Department of Labor, Bureau of Apprenticeship and Training, December 1987. Bureau data include only those programs registered with BAT (or a registered SAC) and does not include data from California, Washington, D.C., Puerto Rico, Hawaii, Rhode Island, and the Virgin Islands. These data are not separated by race and sex, therefore, minorities include males and females.

Source: Riccucci (1990), p. 76, Table 4.1.
When Riccucci later controlled for program sponsor type using apprenticeship statistics from BAT for the year 1987, the representation of women and minorities in private sector programs was greater among those operated jointly as opposed to non-jointly.

This almost seems inconsistent with the evidence presented earlier which suggests that unions in the private sector restrict apprenticeship opportunities of women and minorities (Riccucci 1990, p. 91).

In the private sector, joint apprenticeship committees train the vast majority of apprentices, even though the number of non-joint programs is larger. Therefore, it is not surprising that joint programs would include most minority apprentices.

Riccucci raises an important issue for future research on equal apprenticeship opportunity. She notes that aggregated data do not indicate the progress within traditionally white male trades for minorities. While minorities may be gaining access to apprenticeship, we do not know whether they are provided equal opportunity among apprenticeship trades from which they have traditionally being excluded. Also, if joint and non-joint programs are to be compared for their performance on equal opportunity, the occupation of training should be held constant.

**Equal Opportunity in Employment**

There exists a larger body of literature that focuses on the employment impact of Federal antidiscrimination efforts that has methodological relevance for the present study. Studies in that literature attempt to estimate the impact of affirmative action, equal opportunity legislation (Title VII), and, more broadly, the impact of the various antidiscrimination efforts in the overall economy, on minority and female employment, earnings, and occupational advancement.
Impact of Affirmative Action

The methodological approach taken in studies that estimate the impact of affirmative action has been to compare the differential changes in minority and female economic status among government contractors who are required to take affirmative action and non-contractors who are not subject to affirmative action. Those differential changes are offered as the impact of affirmative action.

These studies of affirmative action have relied exclusively on cross sectional data from the EEO-1 file of employer reporting forms collected by the EEOC. EEO-1 reports are required from all establishments of more than 100 employees. The EEO-1 file provides the number of employees, their race, sex, and occupation, as well as the industry, geographic location, and government contractor status of the establishment. Some of the studies have supplemented the EEO-1 file with compliance review information from OFCCP.

The basic model for estimating the impact of affirmative action considers changes in relative economic positions, such as the change in employment share or the change in wage share in an establishment, as dependent variables in multivariate analyses. Key independent variables included dichotomous indicators of government contractor status and whether the government contractor was subject to a compliance review—see Goldstein and Smith (1976).

Heckman and Wolpin (1976) assert that a second measure, the probability of government contractor status, is needed. Firms might change minority hiring behavior in order to obtain a contract, or they might make further changes given they have a contract and desire to maintain contractor status. Cain (1976) argues that neither the Goldstein and Smith model, nor the Heckman and Wolpin model, allows for simultaneous feedback between contract and reviews, and the level or change in minority hiring.
According to Leonard (1984a), the econometric studies of the impact of affirmative action in its first few years (1966-1973) are not directly comparable because of different specifications, samples, and periods. Nevertheless, the studies find, despite weak enforcement in early years and despite the ineffectiveness of compliance reviews, affirmative action had been effective in increasing black male employment share in the contractor sector, but was generally ineffective for other groups.\footnote{Leonard, Jonathan. "The Impact of Affirmative Action on Employment." (Journal of Labor Economics, Vol. 2, No. 4, 1984a), p. 441.}

To estimate the impact on occupational advancement, Leonard (1984b) uses an index of occupational status as the dependent variable. The index is a summation of the proportion of all workers of a demographic group who are employed in a given occupation in a given year, where the occupation is weighted by average earnings for the occupation. The independent variables include contractor and review status, establishment size, corporate structure, industry, region, and growth of total employment for a given demographic group. Black males' share of employment has increased faster in contractor than in non-contractor establishments except for laborers and white-collar trainees, and those differences are significant except for operatives and professionals. It appears that the contract compliance program raised the demand for black males more in the highly skilled white-collar and craft jobs than in the blue-collar, laborer, and service occupations.\footnote{Leonard, Jonathan. "Employment and Occupational Advance Under Affirmative Action." (The Review of Economics and Statistics, Vol. 66, 1984b), p. 382.}

Brown (1982) offers four arguments that challenge the appropriateness of noncontractor firms as a control group for the contractors. First, successful equal employment opportunity programs have favorable effects on noncontractor firms, leading them to voluntarily undertake the
voluntary programs. The estimated impact of affirmative action may be biased downward due to these favorable effects on noncontractors. If noncontractors voluntarily undertake affirmative action programs, then comparing government contractors to nongovernment contractors will indicate less affirmative action impact.

Second, some noncontractor firms might have improved their minority hiring in order to increase their chances of becoming contractors. Affirmative action then has a positive indirect effect on noncontractor firms, wherein they accept the affirmative action requirements of being a government contractor. Hence, affirmative action policy has been effective beyond the government contractor sector as noncontractor firms voluntarily adopt the affirmative action guidelines.

Third, the potential interaction of the Office of Federal Contract Compliance (OFCC) and the Equal Employment Opportunity Commission impacts (EEOC); EEOC activities may be directed equally to contractors and noncontractors, or weighted more strongly toward one or the other. The fact that equal employment opportunity activities are directed equally at contractors and noncontractors reinforces the use of noncontractors as a control group, since the only difference between the two groups is that contractors are subject to affirmative action requirements. On the other hand, if equal employment opportunity activities are weighted more heavily toward noncontractors, then the estimated impact of affirmative action would have an upward bias. But if the equal employment opportunity activities are weighted more heavily toward contractors, then the estimated impact of affirmative action would be biased downward.

Fourth, the differences in minority employment could reflect a reshuffling of minority workers from noncontractor to contractor firms. There may be no net increase in the employment of minorities. This would require no change in the labor force participation rates of the minorities. If the labor force participation rate of a group increased over the time period, then an
increased rate of employment in the contractor firms would have to exceed the labor force participation rate of the group for reshuffling to be possible. But in this scenario, the group's share of employment has increased and done so in the contractor firms. If the group's labor force participation rate was declining instead, then an increase of employment of the group in contractor firms could imply a reshuffling. But this would indicate that affirmative action has a positive influence on the group's employment in the contractor firms. However, the reshuffling side effect would exist. If minority participation rates in the nongovernment contractor sector increase or remain constant and minority participation rates increase in the government contractor sector, then it should be reasonable to conclude that reshuffling does not occur.

Impact of Equal Opportunity Legislation

Establishments with at least 15 employees are subject to Title VII of the Civil Rights Act. Because of this near-universal coverage, determining the impact of Title VII is difficult. Without a natural comparison group, researchers have attempted to infer the impact by estimating the impact of EEOC activities.

Recognizing that only firms with at least 100 employees are required to file annual employment reports (EEO-1) with the EEOC, Brimmer (1976) compares the change in the black share of total employment from 1966 to 1974 (an increase of 0.9 percentage points) to the black share of employment among EEOC-reported employment (an increase of 3.4 percentage points). He does not assert, however, that the difference is an EEOC affect because many nonreporting

---

establishments are covered by EEOC enforcement activities, and he was unable to control for other factors such as industry or firm size.

Adams (1972) compares establishments, matched by industry and metropolitan area, that either reached successful conciliation agreements with the EEOC or were not involved in EEOC proceedings between 1967 and 1968. The effects on black employment shares and their relative occupational position were statistically insignificant. Brown (1982) suggests that large standard errors, due to the small sample size, required a substantial increase in employment to obtain a significant effect. Also, the effect is likely to be underestimated because the establishments involved in conciliation processes may have slower rates of improvement.

One other approach examines the change in female earnings as a function of personal characteristics and several measures of EEOC enforcement. In addition to the number of charges of race discrimination and sex discrimination, Beller (1977) considers the number of investigations of female complaints completed per employed woman, and the ratio of successful to attempted settlements as enforcement variables. Pre- and post-1972 values of these variables are distinguished. For each year (1967 and 1974), separate equations are estimated. The differences in the coefficients between 1967 and 1974 measure their impact. The overall effect of sex discrimination enforcement was a 4.7 percent increase in earnings. Race discrimination enforcement added another 1.2 percent increase for black females.

The major difficulty with Beller's approach is to properly control for other factors that may affect earnings. When industry and occupation are held constant, the estimated impacts of enforcement activity are reduced.
Economywide Impact of Antidiscrimination Activities

Because of the potential overlap of various antidiscrimination activities and the likelihood of externalities from affirmative action, it is reasonable to consider the impact of those activities on minority and female economic status throughout the economy. Time series analyses are used to determine whether a positive and statistically significant time trend, say for the post-1964 period (enactment of the Civil Rights Act, including Title VII), can be identified after controlling for the influence of other factors that might explain changes in minority or female employment, earnings, and occupational advancement over time.

Richard Freeman (1973) examines secular and cyclical dimensions of changes in the labor market for black Americans over the period from 1948 to 1972. Dependent variables in a set of time series regressions include relative and actual incomes of black men and women and indexes of occupational position. The explanatory variables are time or the trend level of GNP, differences in black’s and white’s years of schooling, and a measure of the intensity of antidiscrimination activity—cumulated real expenditure of the EEOC per nonwhite worker.

Freeman (1973) finds for the post-1964 period an exceptional increase in black incomes unaccounted for by previous trends, cyclical change, or increased black educational attainment, and linked to antidiscrimination activity. He concludes, tentatively, that Federal policy and civil rights activities underlie the increases in black income. However, he cautions that the results are not conclusive evidence because it may be that some other factors specific to the post-1964 period might have been omitted from the analysis.

Freeman (1973) also considers whether the black population’s occupational distribution improved during the 1960s as a result of a significant supply response of black workers to economic opportunities and their increased relative educational attainment. Supply equations are
estimated that relate changes in the number of black men in approximately 50 occupations to measures of economic incentives using 1960 and 1970 Census data.

The dependent variables include the number of black workers in an occupation and the proportion of workers in an occupation who were black. Control variables include black income, white income, total number of workers in 1970, and relative number of nonwhites in 1960. The results strongly support the hypothesis that the occupational structure of the black work force was significantly affected by economic incentives.

Other studies use time series analysis to explain secular changes in an occupational index. Change in the index over time is expected as a result of antidiscrimination activity. Albeléa (1986) uses an index of occupational segregation defined by Duncan and Duncan (1955) to first identify annual changes in occupational structure for the period from 1958 to 1981. Then, regression analysis is used to determine the relative importance of structural changes, business cycle, and educational attainment in shaping the occupational distributions. The inclusion of the square of time (as well as time) as an explanatory variable identifies whether occupational convergence or divergence is more rapid in the earlier part of the period of examination.

For racial distributions of occupations, the results indicate that changes in time can explain the decrease in racial occupational segregation, especially at the beginning of the period. Educational attainment and the business cycle significantly contribute to the lessening of occupational segregation by race.

Fosu (1992) also uses an occupational index as the dependent variable in a time series regression. However, he uses a different index than Albeléa in order to distinguish upward from downward occupational mobility. The index is weighted by occupational median wages. After controlling for prior trends, cyclical conditions of the economy, and supply factors, a significant
post-1964 positive impact was obtained for the increase in black women’s relative occupational mobility over the 1965-81 period.

**Summary**

In the early 1960s, research on equal opportunity in apprenticeship indicated that minority apprenticeship participation was very low, and, to increase it substantially, programs were needed to increase the supply of minorities to apprenticeship. DOL responded by establishing and funding Apprenticeship Information Centers and the Apprenticeship Outreach Program. Later, these programs were found to have increased the supply of minority applicants to apprenticeship.

Minority participation in apprenticeship increased during the 1970s, particularly in the construction trades, including mechanical construction trades that historically had very low minority participation. In addition, minorities were a growing proportion of apprenticeship graduates.

Because of a dearth of research interest during the 1980s, little is known about the extent of equal opportunity progress for minorities during that period. One study indicated that minority participation was comparable to minority representation in the labor force, but that minorities tended to be concentrated in apprenticeship occupations in the bottom two quartiles of the average earnings distribution. That study did not investigate, however, the extent of occupational segregation. In addition, it did not examine the trend in minority participation over time.

Other researchers have expressed concern about lax enforcement during the 1980s, and the possibility that BAT may have a conflict of interest because of its roles of promoting apprenticeship and enforcing affirmative action compliance. Yet, little or no evidence is presented to indicate the extent of those problems.
Literature on the impact of equal opportunity in employment was reviewed for the methodological approaches used, and to determine the usefulness of those approaches for assessing the equal opportunity performance of the National Apprenticeship Program. The contractor/non-contractor approach cannot be used to assess the impact of affirmative action in registered apprenticeship. First, affirmative action covers all registered apprenticeship programs. Second, apprenticeship programs technically are not government contractors. Third, an appropriate comparison group of non-covered programs cannot be developed because of the lack of information regarding non-registered apprenticeship programs. Non-registered programs are expected to differ qualitatively from registered programs, and they too may be subject to other equal opportunity requirements. Fourth, EEOC apprenticeship reports were discontinued after 1979.

The universal applicability of equal opportunity and affirmative action regulations in apprenticeship makes it difficult to determine the impact of these policies in the National Apprenticeship Program. Even though only programs with five or more registered apprentices are required to have a written affirmative action plan, it would be inappropriate to compare those programs with programs with less than five apprentices because of the differences in size and because the smaller programs are also expected to take affirmative action.

As discussed earlier in this chapter, equal opportunity complaints in apprenticeship are rare and handled informally. If sufficient data on compliance reviews and enforcement activities are available by program area, and for relevant control variables, then it would be possible to consider the impact of reviews and enforcement on minority apprenticeship participation.

To assess the impact of equal opportunity requirements in apprenticeship, time series analysis could be used to identify a positive and significant time trend in the number of minority apprentices for the post-1964 (equal opportunity regulations) and/or post-1972 (affirmative action)
periods. It would necessary to control for minority supply and apprentice demand factors. An index of occupational segregation could be used to determine the extent to which occupational segregation in apprenticeship, by race, has changed.
CHAPTER V
CONCEPTUAL FRAMEWORK

This chapter presents a framework for assessing the equal opportunity performance of the National Apprenticeship Program. Equal opportunity implies that minorities and non-minorities are considered for apprenticeship without regard to their race (and ethnicity). To attain equal opportunity in the National Apprenticeship Program, the U.S. Department of Labor has required since 1972 that all registered apprenticeship programs take positive affirmative action. Programs with at least five registered apprentices must establish a written affirmative action plan which states specific goals and timetables to correct for the underutilization of minorities in their programs.

If one accepts affirmative action as an appropriate policy tool, affirmative action should be viewed as only a temporary process necessary for developing new, nondiscriminatory patterns of recruitment and selection. In that process, barriers that once prevented minorities from being considered for apprenticeship should be eliminated. Affirmative action should be continued only as long as minority representation in local apprenticeship programs is less than minority representation in the labor force of local labor market areas of program sponsors.

The purpose of affirmative action in the National Apprenticeship Program is to provide minorities with increased opportunity for registered apprenticeship training by changing the pattern and practice of recruitment and selection activities. The impact of equal opportunity in apprenticeship, however, is not solely a function of recruitment and selection activities, but also the decisions of individuals to participate in the National Apprenticeship Program. In other words,
both the demand for apprentices and the supply of applicants to apprenticeship will determine the racial content of apprenticeship.

The equal opportunity performance of the National Apprenticeship Program can be measured in terms of minority\(^8\) apprenticeship participation, which represents the interaction of minority apprentice demand and minority apprentice supply. The model of minority participation is derived from the supply function of minorities to apprenticeship and the demand function for minority apprentices:

\[
(5-1) \quad \text{SUPPLY}_t = f(\text{RETURNS}_c, \text{MQUALITY}_c, \text{MLFSHARE}_c, \text{OUTREACH}_c, \text{LOCATION}_c)
\]

\[
(5-2) \quad \text{DEMAND}_c = f(\text{ACTION}_c, \text{ENFORCE}_c, \text{ADEMAND}_c, \text{MQUALITY}_c, \text{MLFSHARE}_c)
\]

where

\[
t = \text{time, and } t = 0, 1, ..., T,
\]

\[
c = \text{a constant,}
\]

\[
\text{MAPART} = \text{minority apprenticeship participation},
\]

\[
\text{SUPPLY} = \text{the supply of minorities to apprenticeship},
\]

\[
\text{DEMAND} = \text{the demand for minority apprentices},
\]

\[
\text{RETURNS} = \text{the expected returns to apprenticeship training},
\]

\[
\text{MQUALITY} = \text{the qualification level of minorities},
\]

\[
\text{MLFSHARE} = \text{the minority share of the labor force},
\]

\[
\text{OUTREACH} = \text{public and private outreach and recruitment efforts},
\]

\[
\text{LOCATION} = \text{the geographic distribution of minorities},
\]

\[
\text{ACTION} = \text{the positive affirmative action taken by program sponsors},
\]

\[^8\text{The term minority is used to refer to all non-white individuals. More specific race/ethnic identifiers, such as black or Hispanic, could be substituted for the term minority in the model.}\]
ENFORCE = the enforcement activity of BAT and SACs,
ADEMAND = the total volume of apprentices demanded.

The model of minority apprenticeship participation is specified as:

\[ MAPART_i = c + ACTION_i + ENFORCE_i + ADEMAND_i + MQUALITY_i + MLFSHARE_i \\
+ RETURNS + OUTREACH_i + LOCATION_i + \epsilon_i \]

where \( \epsilon \) is an error term.

According to the model, minority (white) apprenticeship participation is determined by the factors that determine the demand for minority (white) apprentices and the supply of minorities (whites) to apprenticeship. It is expected that both the supply and demand for minority apprentices would increase after the implementation of equal apprenticeship opportunity policies. Beginning in the early 1960s, registered programs were required to make apprentice selection decisions based upon qualifications alone, and not to discriminate based on race. In addition, DOL funded outreach and recruitment programs designed to increase the supply of qualified minorities to apprenticeship. Further increase in the demand for minority apprentices is expected after 1972 because of the implementation of affirmative action requirements. The general policy expectation is that opportunities for minorities to enter apprenticeship will be increased as a result of the regulation of the recruitment and selection process.

The minority share of the labor force in a program's local labor market is used as a benchmark to establish affirmative action goals. To the extent that enforcement is required to ensure affirmative action compliance, the demand for minority apprentices should increase directly with enforcement. It is possible, however, that strict enforcement can have a detrimental effect on the entire apprenticeship system, and on the demand for minority apprentices, if program
sponsors choose to deregister their programs to protest strict enforcement, or if programs are deregistered by BAT for non-compliance.

Increases in expected returns from apprenticeship training should increase the supply of minorities to apprenticeship. Under policies of equal opportunity in employment and training, including affirmative action, minorities are likely to adjust expected returns to reflect lower costs (reduced discrimination in recruitment and selection), and increased benefits (secure employment and higher wages relative to other employment and training options available) associated with apprenticeship training. In the process of calculating returns from apprenticeship, minorities might have first decided about a career (occupation), or they might be doing so simultaneously with the decision about apprenticeship.

Minority qualifications reflect their accumulated human capital, including education, work experience, training, health, and current employment status. Increases in the general level of minority qualifications should lead to more minorities applying for apprenticeship positions and more being accepted. Applicants that perform well on aptitude tests and oral interviews are much more likely to be selected for training. However, it is possible that there may be diminishing returns to increases in minority qualification levels. As more minorities meet apprenticeship qualifications, minorities might also become qualified for other opportunities that provide alternative training or careers. Minority apprenticeship participation does not necessarily represent the market-clearing levels of minority apprentice supply and demand. A shortage of qualified minority applicants to a program, despite the presence of a substantial local minority labor force, can result in unmet demand for minority apprentices.

Because goals are based upon minority representation in the labor force of local labor market areas, a change in the minority share of the labor force will directly affect affirmative action goals. An increase in the minority share of the labor force will lead to relatively higher
goals for the selection of minorities to apprenticeship. But, even in the absence of affirmative action, it is possible that an increase in the minority share of the labor force would increase minority opportunities for apprenticeship because minorities are more numerous in the labor force. Discriminatory employers, finding it difficult economically to ignore a growing segment of the labor force that is productive and motivated, might lower their tastes for discrimination. Hence, if the increase in the minority share of the labor force has a significant and positive effect on minority apprenticeship participation, after controlling for other factors (such as the effect of affirmative action), it would suggest that discrimination has diminished over time.

The geographic distribution of minorities relative to the geographic distribution of registered apprentices is important to the extent that minorities are concentrated in geographic areas with high or low proportions of registered apprentices. In addition, the level of concentration of minorities in local labor market areas directly influences affirmative action goals.

The volume of apprenticeship directly determines the number of opportunities available for minorities. However, if the volume of apprenticeship remained constant, the demand for minorities, and minority apprenticeship participation, would still increase under the policy of affirmative action. Affirmative action goals and timetables are based upon making the percentage of minority apprenticeship participation to be comparable to minority representation in the labor force.

Nevertheless, ADEMAND is an important determinant because it reflects the impact of cyclical and structural changes in the economy, and institutional aspects of the labor market, on apprenticeship opportunity. Because apprenticeship is employment-based, the volume of apprenticeship is sensitive to cyclical fluctuations in the economy. Apprenticeship volume is expected to increase during periods of economic growth and decrease during recessionary periods. Despite the fact that apprenticeship is a form of investment, short-run changes in demand are
expected to influence the general level of training. For example, employers might have to use short-term layoffs or abandon their training commitments to get through a difficult recessionary period. Other sponsors might continue to train with a smaller program, keeping only a portion of the registered apprentices. Because all industries are not affected in the same manner by economic cycles, opportunities for apprenticeship can vary by industry and occupation.

Structural changes in the economy, such as the development of new technologies or increased international competition, directly affect the volume of apprenticeship through the influence on the long-term demand for skilled labor by industry and occupation. It is also possible that new occupations will be recognized as apprenticeable by BAT, thereby creating new opportunities for apprenticeship training. Some industries have more apprenticeship occupations than others because the definition for an apprenticeship occupation established by DOL limits the use of apprenticeship to occupations that are manual, mechanical, or technical.

The introduction of new occupations for training can affect the occupational distribution of apprenticeship by race. Consider the following occupational segregation index for demographic groups $i$ and $j$ at a given point in time.

Let $X_i^K$ and $X_j^K$ be the percentage distributions of groups $i$ and $j$ in occupation $k$ and $\sum_i^K = 100$, where $i$ represents minorities and $j$ represents non-minorities. The segregation measure is:

$$D_{i-j}^K = \frac{\sum_{k=1}^K |X_i^k - X_j^k|}{2}$$

(5-4)

The value of the index indicates the percentage of minority (or white) apprentices who must change occupations to achieve the same race mix in each occupation as in all civilian
registered apprenticeship. When the index equals zero, there is no occupational segregation. That is, the occupational distribution of minorities and whites are identical. When the index equals 100, there is complete occupational segregation.

Changes in the occupations of training can affect the distribution of apprentices in two ways. First, new occupations of apprenticeship training can be recognized by BAT, thereby creating new opportunities for training. Second, the volume of apprenticeship in existing recognized occupations can increase or decrease because of structural changes in the economy.

The impact of these changes on the occupational distribution of apprentices depends upon the existing concentration of minorities relative to whites in each occupation. If the concentration of minorities is very high or very low, the measure of occupational segregation in apprenticeship will increase. The magnitude of the increase will depend on the volume of apprentices in each occupation because the occupational segregation index is a weighted index. Occupations with larger numbers of apprentices will have a greater effect on the index.

The degree of occupational segregation is further influenced by the occupational choices of individual apprentices and the extent of affirmative action by program sponsors. If there were no changes in the occupations of apprenticeship training, occupational segregation should decrease during the period of affirmative action as individual programs (that are occupationally based) take positive outreach and recruitment efforts to achieve their individual affirmative action goals. But this expectation assumes that a large proportion of potential minority apprentices want to train in occupations that traditionally have low minority participation. It is possible that the extent of affirmative action impact will be limited by the occupational choices of individual minorities. Occupational choices will be determined by several factors, including the expected returns, outreach and recruitment efforts, and changes in the composition of minorities.
The volume of apprenticeship is also determined by institutional aspects of the labor market. Collective bargaining agreements often specify ratios for the number of apprentices relative to the number of journeymen to ensure that the number of apprentices under the supervision of a journeyman are reasonable for the safety of all workers and for product quality. The ratios also serve to protect journeymen employment by limiting an employer’s ability to substitute lower-wage apprentices for journeymen. The ratios act as a restriction on the expansion of existing programs.\textsuperscript{82}

Collective bargaining agreements (and some internal labor markets in non-union firms) also establish rules for the workplace based on seniority. Those rules sometimes specify who is eligible for participation in training programs. But perhaps more importantly, they offer employment security to the journeymen workers who are expected to train apprentices in their crafts. Without protection of journeymen’s jobs, employers would have been unable to secure their cooperation.

The collective bargaining process can also be effective for developing an affirmative action plan (voluntarily adopted by private parties) to eliminate traditional patterns of racial segregation. In \textit{United Steelworkers vs. Weber}, the U.S. Supreme Court (1979) approved the setting aside of a specific proportion of apprenticeship positions (50 percent in that case) to be filled by minority members.

Yet another institutional aspect of the labor market influencing the volume of apprenticeship is the wage determination process in the construction industry. The Davis-Bacon

\textsuperscript{82}In the late 1960s, there was some debate as to which was more important in determining the volume of apprenticeship training, market forces or institutional power exercised by unions. David Farber (1967) emphasized market forces, whereas Jack Barbash (1967) emphasized institutional power. The issue was never resolved empirically. However, Howard Foster (1968) suggests that a range of apprenticeship volume is established through institutional power, within which market forces are responsible for yearly fluctuations.
Act permits employers to pay registered apprentices less than the prevailing wage rate of journeymen. This facilitates employer willingness to provide training because the productivity of apprentices is lower than that of journeymen during the training process. With a progressive pay scale based on scaled proportions of the journeymen rate, apprentice earnings increase as apprentice productivity increases.

The promotion of apprenticeship, including technical assistance, by BAT and state apprenticeship agencies can be considered as an additional institutional factor that determines the volume of apprenticeship. BAT attempts to sell the apprenticeship concept and apprenticeship registration to employers and industry in order to expand the use of apprenticeship.

Based on the foregoing discussion, three measures of minority participation are suggested for assessing the equal opportunity performance of the National Apprenticeship Program. First, the percentage of minority apprenticeship participation should have increased since 1972, and now approach the minority share of the labor force. It is possible for the percentage of minority apprenticeship participation to surpass the minority representation in the national labor force because of aggregation of apprentices across occupations. Some occupations may have large numbers of apprentices and large proportions of minorities.

Second, we would expect to find not only a positive trend in the percentage of minority apprenticeship participation, but also a positive trend in the number of registered minority apprentices during the post-1972 period if the National Apprenticeship Program provided a quantitatively significant increase in apprenticeship opportunities for minorities.

The third measure suggested is the degree of occupational segregation in civilian registered apprenticeship. Occupational segregation in apprenticeship by race is expected to change during the post-1972 period as a result of (1) changes in the occupations of apprenticeship training, (2) affirmative action requirements, and (3) changes in the occupational choices of apprentices. The
change is difficult to predict. If changes in the occupations of apprenticeship are held constant (that is, only a constant set of occupations is considered), then occupational segregation would be expected to decrease during the period of affirmative action, unless occupational choices are such that they limit the attainment of affirmative action goals, and/or compliance with and enforcement of affirmative action is weak.

If the occupational segregation index decreased over the post-1972 period, holding constant the occupations of apprenticeship, it would appear that affirmative action was instrumental in reducing occupational segregation. A change in occupational choices would have a positive effect only if sponsors were accepting minorities into training for occupations with low minority participation. If, on the other hand, occupational segregation increased during the post-1972 period, one could not determine whether affirmative action compliance and enforcement were weak, or if occupational choices limited the attainment of affirmative action goals.
CHAPTER VI
METHODOLOGY

Data on the National Apprenticeship Program

To assess the performance of the National Apprenticeship Program, information specific to registered apprenticeship is required. BAT is a primary source of such data. For this study, I obtained national, regional, state, and occupational apprenticeship data maintained by BAT under its State and National Apprenticeship System (SNAPS) and its Apprenticeship Management System (AMS). The SNAPS data covered the period from 1973 through June of 1979.\(^3\) It is representative of the National Apprenticeship Program for the period. SNAPS and AMS data were provided by BAT in the form of tabulated reports. In addition, AMS data were provided on computer tape.\(^4\) Appendix A provides a discussion of AMS and SNAPS data.

Previous research examining equal opportunity in apprenticeship used information obtained from annual apprenticeship reports collected by the EEOC from both registered and non-registered programs (Hammcrman, 1972 and 1984; GAO, 1979). The EEOC data provided detailed race (and ethnicity) information for apprentices, apprenticeship graduates, apprenticeship applicants,

\(^3\)In 1982, the U.S. Office of Management and Budget which has responsibility for approving all forms for public surveys and reports by federal agencies, disapproved both the EEO-2 and the "SNAPS" surveys at the request of the construction industry’s Associated General Contractors. The grounds stated were that the surveys were a hardship and that their information had not been utilized by the government.” Hammcrman A Decade of Equal Opportunity, p. 52.

\(^4\)As a doctoral research intern with the U.S. General Accounting Office, I was directly involved in an investigation of the national apprenticeship system. A formal request was made by the GAO to obtain AMS and SNAPS data for their investigation and for my dissertation.
and apprenticeship dropouts, by sex, by craft, by industry, by state, by SMSA, and by international union. For the purpose of evaluating the performance of the National Apprenticeship Program, EEOC data have two major limitations. One, although the apprenticeship information reports (EEO-2 and EEO-2E) requested information to identify a program registered with BAT (or a SAC), such information is not reported in the available published data. Second, the apprenticeship data collection was discontinued after 1979, and the original reports were retained by EEOC for only 10 years.

Prior research has also examined equal opportunity in apprentices using apprenticeship information obtained from BAT (Riccucci, 1990; GAO, 1992). Riccucci (1990) used AMS data for 1987 to examine apprenticeship by sector (public or private) and to determine minority and female participation. GAO (1992) used occupation-specific data from the AMS to examine minority and female representation in specific trades. However, GAO provided only a static picture of the extent of minority and female representation, not the change in the occupational distribution of apprentices over time. In the present study, I use occupation-specific data from SNAPS and AMS to examine the change in the degree of occupational segregation between 1973 and 1990.

The AMS began in the first half of the 1980s as a management tracking system for one of BAT’s ten regional offices. By 1986, the AMS was used in all ten regions. However, the AMS data are not nationally representative of the National Apprenticeship Program because several SACs did not participate in the AMS.\textsuperscript{85} As a result, the AMS includes only about 70 percent of all registered apprentices.

\textsuperscript{85}The states and territories that did not participate include California, the District of Columbia, Delaware, Hawaii, Puerto Rico, and the Virgin Islands. The absence of California is very important because it has the largest number of registered apprentices, nearly twice as many as any other state.
Among the tabulated reports from BAT were AMS Summary Management Reports. These reports are nationally representative because they were based upon AMS data amended with information supplied from nonparticipating states. The reports are reliable for the years 1987 through 1990. However, these AMS summary management reports do not provide occupation-specific detail. Other AMS-based reports provide occupation-specific information, but are not nationally representative.

Because most of the AMS data are not nationally representative, apprenticeship statistics are not directly comparable to those from SNAPS. However, data for the state with the largest number of registered apprentices, California, were obtained in hard copy. These data were used to supplement AMS occupational data. The coverage of the AMS data, supplemented with the California information, is approximately 90 percent of all registered civilian apprentices. The accuracy of the occupational match between AMS and California data is subject to coding error because the occupation descriptors for California were provided only as titles without numeric codes. The error is expected to be minor because many of the job titles were easy to understand and match.

One important variable in the AMS and SNAPS data is an identifier of the race/ethnicity of registered apprentices. This variable identifies apprentices as white-non Hispanic, black-non Hispanic, Hispanic, Asian or Pacific Islander, and American Indians or other natives. These data were collected at the time of apprenticeship application. Unfortunately, the non-white categories were sometimes combined and labeled as minority. This situation happened for most of the occupation-specific data. It would have been preferable to examine opportunities for each race/ethnic category instead of an aggregate measure.

Occupation-specific data for minorities and non-minorities are not available for each year from 1973 through 1990. Occupation-specific data for the years, 1973, 1979, and 1990, are used
here for establishing the trend in the distribution of occupations by race (minority versus white). The year 1979 represents a midpoint for the years of available data.

Unless otherwise specified, the data used in this analysis covers the years 1973 through 1990 and refer to the number of registered civilian apprentices in training as of December 31 of a given year. This measure is smaller than the number of apprentices in training during a year, because some apprentices will complete training and some indenture agreements will be cancelled during a given year. The number in training at year-end is approximate 70 to 80 percent of the number in training for the year.

**Methodology**

In Chapter 5, three measures of minority participation were suggested for assessing the impact of affirmative action in the National Apprenticeship Program. Those measures—the percentage of minority participation in apprenticeship, the number of registered minority apprentices, and the degree of occupational segregation—are considered here.

**Percentage of Minority Participation in Apprenticeship**

Program sponsors with written affirmative action plans are required to establish goals for minority participation comparable to the minority representation in their local labor market area. For the period 1973-1990, a continuous time series of the number of minorities in the labor force is not available for the category of white-non-Hispanic males. Data on the number of Hispanics (only) in the labor force was not reported by the Bureau of Labor Statistics (BLS) for years prior to 1980. For the years after 1979, the number of Hispanics are reported, but the number represents Hispanics of any race.
In order to obtain a consistent time series of nonwhite minorities to compare minority representation in the labor force with the percentage of minority participation in apprenticeship, I create an estimated series of nonwhite males age 16 and older in the civilian labor force. The series is restricted to males because males represent at least 90 percent of registered apprentices. The procedure for creating the estimated series is presented in Appendix B.

**Number of Minority Apprentices**

Chapter 5 presented a conceptual framework to be used for assessing the equal opportunity performance of the National Apprenticeship Program. The structural model for minority apprenticeship participation, given in Equation 5-3, was derived from demand and supply equations.

To operationalize the model, a reduced form equation is specified below. The *number* of minority apprentices is used as the dependent variable, rather than the *percentage* of minority apprentices, in order to determine whether equal opportunity in apprenticeship has a significant numerical impact on minorities, independent of the effects of increases in the minority share of the labor force and changes in the volume of registered apprenticeship.

A semi-logarithmic, quadratic equation is specified, with the dependent variable defined as the natural logarithm of the number of registered minority apprentices in training on December 31 for the years 1973 through 1990. Logarithmic transformation of the model helps reduce autocorrelation. Regression coefficients indicate the percentage change in the dependent variable per unit change in the independent variable:

\[
(6-1) \quad \ln \text{MAPART}_t = \beta_0 + \beta_1 t + \beta_2 t^2 + \beta_3 \text{ADEMAND}_t + \beta_4 \text{MQUALITY}_t + \beta_5 \text{MLFSHARE}_t + \epsilon_t
\]
where $t$ is an indicator of time and $t = 0, 1, 2, ..., 17$;

$\ln \text{MAPART}_t =$ the natural logarithm of the number of registered civilian minority apprentices;

$\text{ADEMAND}_t =$ the number of total registered civilian apprentices

$\text{MQUALITY}_t =$ a measure of the qualifications of minority labor supply;

$\text{MLSHARE}_t =$ the minority share of the labor force; and,

$\varepsilon_t =$ random error term.

The reduced form model does not include outreach and recruitment efforts (OUTREACH), the expected returns to apprenticeship (RETURNS), and the geographic location of minority applicants (LOCATION). LOCATION is not included because of the lack of sufficient data for a complete time series of the location of applicants, apprentices, or programs. The omission of LOCATION from the estimated model should not effect the results substantially because affirmative action goals are established at the local level, based upon the minority representation in the local labor market area. Because the returns to apprenticeship are occupation-specific, but the dependent variable is not available disaggregated by occupation, RETURNS is not included in the estimated model. OUTREACH is assumed to be implied within the time trend.

Under the policy of affirmative action, the number of registered minority apprentices is expected to have a positive and significant time trend, holding constant other factors, including the volume of registered apprenticeship and the minority share of the labor force. In essence, the time trend serves as a proxy for structural changes in the National Apprenticeship Program that affect minority participation. The major structural change for minorities is presumed to be the change in apprenticeship recruitment and selection procedures. Therefore, time is viewed as a proxy for the changes in recruitment and selection procedures.
It is possible that the change in procedures is not the only structural change affecting the number of minority apprentices. The introduction of new apprenticeship occupations could affect the number of minority apprentices independent of their effect on the whole apprenticeship system. Limited occupational information prevents an index of occupational diversity from being constructed as a separate independent variable. As an alternative, I attempt to identify the contribution of new occupations to the change in minority apprenticeship participation through an analysis of occupation segregation (see next section).

The reduced form model is expressed as a quadratic equation by the inclusion of $t^2$ to determine whether the time trend exhibits a plateau effect. That is, does the trend continue to increase but at a decreasing rate in later years. It is expected that as the representation of minorities in apprenticeships approaches the representation of minorities in the labor force, the trend in the number of minority apprentices should reach a plateau, all else being equal.\textsuperscript{86} A \textit{plateau effect} might also occur as a result of allegedly lax enforcement of affirmative action in the 1980s. If enforcement impacts compliance and enforcement was weak, then equal opportunity progress should have slowed in the later years.

The number of minorities in apprenticeship is expected to be positively related to the minority share of the labor force (MLFSHARE). I use the estimated number of non-white males age 16 and older in the civilian labor force described earlier.

Improvements in the qualification level of the supply of minority labor (MQUALITY)\textsuperscript{87} is expected to have a positive relationship to the actual number of registered minority apprentices

\textsuperscript{86}The \textit{plateau effect} would be weak if there is limited progress in reducing the amount of occupational segregation in apprenticeship. Affirmative action goals are set at the program level, which tends to be occupation-specific.

\textsuperscript{87}Because data identifying minority applicants are not available, the qualification level of the minority labor supply is used instead in the regression model.
because more minorities would meet program requirements. However, because increases in the qualification level of minorities will also be associated with increases in alternative (non-apprenticeship) opportunities, the net effect on the number of minority apprentices is not obvious. In addition, programs differ in the qualifications required for admittance to apprenticeship. As a result, some programs will accept minority applicants without a high school diploma. Because the available data do not identify occupations (or programs), I cannot control for variations in program requirements.

The percentages of black and Hispanic males ages 14-24 who completed high school (BMHSG and HMHSG, respectively), and the percentages of black and Hispanic males age 14-24 who have enrolled in college (BMCE and HMCE, respectively), are used as measures of MQUALITY. 88 The coefficients for BMHSG and HMHSG, and for BMCE and HMCE, are expected to be positive if increases in the rate of minority high school graduation, and increases in minority general educational attainment, respectively, increase minority apprenticeship participation.

If, on the other hand, the coefficients on BMHSG or HMHSG are negative, the finding would suggest that perhaps minority apprenticeship participation increased primarily among minorities who do not complete high school. If the coefficients on BMCE or HMCE are negative, then the finding would suggest that perhaps minorities are exploring alternative career and training options. Whatever the situation, the results are only suggestive.

ADEMAND, is a critical control variable because it represents the total number of apprenticeship positions for a given time period, as affected by cyclical and structural changes in

---

the economy, and institutional factors. Economic expansions are expected to lead to increased in
the number of minority apprentices. Structural changes, such as the promotion of registered
apprenticeship, or the registering of more occupations, are also expected to increase the number
of minority apprentices. However, structural changes can also have a negative effect. For
example, apprenticeship occupations with relatively high minority participation may have large
employment losses over time.

Equation 6-1 looks very much like the demand function stated in Equation 5-2. However, the
dependent variable represents the actual number of minority apprentices. It is likely that the
ex ante desired demand for qualified minorities would be higher as program sponsors attempt to
meet their affirmative action goals.

**Occupational Distribution**

The trend in the occupational distribution of apprenticeship by race is examined using the
segregation index specified in Chapter 5, and restated below. The occupational segregation
literature relies almost exclusively on this measure to determine the degree of occupational
segregation.89

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89See Paula England, "Assessing Trends in Occupational Sex Segregation Among Young
Press 1981) for a review. Recently, Mary C. King used the occupational segregation index to
identify changes in occupational distributions which, in turn, would serve as an indicator of the
role of race and gender in the labor market. Considering occupations as indicative of the potential
for both advancement and unemployment in the labor market, King illustrated the evolution of
occupational differentiation along race and gender lines since 1940. King, Mary C.
30-37.
The segregation measure is:

\[
D_{i,j}^k = \frac{\sum_{k=1}^{K} |X_i^k - X_j^k|}{2}
\]

where \(X_i^k\) and \(X_j^k\) are the percentage distributions of groups i and j in occupation k and \(\sum_{i}^k = 100\).

Because of data limitations, a segregation index cannot be estimated for each year from 1973 through 1990. Therefore, an index is estimated for the years 1973, 1979, and 1990 to establish the trend. The year 1979 represents a midpoint between the two endpoint years of available occupational data. No occupational data are available for the first half of the 1980s.

The main difficulty associated with the use of the occupational segregation index for trend analysis comes when the number of occupations changes. The number of occupations might change because new occupations are recognized as apprenticeable by BAT, or existing occupations are defined more finely, or are no longer in use. Changes in the index could result from changes in the number of occupations, independent of changes in the distribution of workers across occupations.

The National Apprenticeship Program had a large increase in the number of apprenticeship occupations, from about 400 in the 1970s to over 800 by 1990. The increase occurred primarily because more occupations were recognized as apprenticeable.\(^{90}\) These new occupations can provide more opportunities for apprenticeship training.

Various approaches have been used to minimize the impact of potential biases, including the aggregation of job titles, creating subsets of occupations common to every sample, and

\(^{90}\)Some new apprenticeship occupations were created as some occupations were defined more finely. Because of the limited amount of apprenticeship occupations examined here, they were easy to identify and re-aggregate for the later years.
comparing the full set of occupations to a core of common occupations for years studied.\footnote{See Albelda, Randy. "Occupational Segregation by Race and Gender, 1958-1981." (Industrial and Labor Relations Review, Vol. 39, No. 3, April 1986), pp. 404-411; Blau, Francine C. and Wallace E. Hendricks. "Occupational Segregation by Sex: Trends and Prospects." (Journal of Human Resources, Vol. 12, No. 2, 1982), pp. 371-392; and King "Occupational Segregation."} Because the available data from BAT provides information only for those occupations with at least 250 apprentices per year, that limited set of apprenticeship occupations is used here. Many apprenticeship occupations have only a handful of apprentices each year. Since 1973, as few as 20 occupations have accounted for more than 75 percent of all registered apprentices. In fact, as few as 10 occupations accounted for more than 60 percent of the apprentices.

The set of all occupations with at least 250 apprentices in 1973, 1979, and 1990 is stipulated as the "full" set of occupations for this analysis. One subset of these occupations—those with at least 250 registered apprentices and observed in each of the three years (referred to as "common")—is used to isolate the effect of the introduction of new apprenticeship occupations, and the loss of previous occupations. Because the sample of occupations is limited to those with at least 250 registered apprentices, the number of occupations in the common set can be much less than among the full set as the number of apprentices in an occupation falls below 250 in later years. In addition, I took a rather conservative approach to defining common occupations. If occupations were quite similar, but not identical, they were treated as separate occupations.

Segregation index values are calculated for both the full set of occupations and the common set of occupations, using apprenticeship data obtained from BAT. The full set index will be affected by changes in the occupations of apprenticeship, but the common set index will not be affected. Therefore, changes in the degree of segregation for the common set can be attributed to affirmative action and occupational choice. Because the number of occupations affects the indexes, it is not appropriate to compare the magnitude of full set and common set indexes.
CHAPTER VII
EMPIRICAL FINDINGS

This chapter presents the empirical findings of the analysis of equal opportunity in the National Apprenticeship Program. The first section examines the trend in percent of minority apprenticeship participation. The second section presents the results of the time series regression on the number of minority apprentices, aggregating across occupations. The last section presents the results of the analysis of the occupation distribution of apprentices by race.

Percentage of Minority Apprenticeship Participation

Between 1973 and 1990, the percentage of minority participation in civilian registered apprenticeship training increased from 15.0 percent to 22.4 percent—see Table 19. The trend in the percentage of minority participation in apprenticeship is illustrated in Figure 3. A definite positive trend line is apparent, despite some volatility. There were small decreases in the percentage in 1979 and 1986 and a somewhat larger decrease in 1984. But overall the percentage of minority participation increased by nearly 50 percent between 1973-90.

Figure 3 also plots the trend in the representation of minority males in the civilian labor force for a comparison. The representation of minority males in the civilian labor force increased from 16.7 percent in 1973 to 21.5 percent in 1990, an increase of about 29 percent. From the graph it is clear that the two trends track each other very closely after 1983.
Table 19.--The number of total and minority registered civilian apprentices in training at year-end, and minority representation, 1973-1990

<table>
<thead>
<tr>
<th>Year*</th>
<th>Total Apprentices</th>
<th>Minority Apprentices</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973</td>
<td>283,774</td>
<td>42,502</td>
<td>15.0</td>
</tr>
<tr>
<td>1974</td>
<td>291,049</td>
<td>45,808</td>
<td>15.7</td>
</tr>
<tr>
<td>1975</td>
<td>266,477</td>
<td>44,318</td>
<td>16.6</td>
</tr>
<tr>
<td>1976</td>
<td>254,968</td>
<td>44,422</td>
<td>17.4</td>
</tr>
<tr>
<td>1977</td>
<td>263,586</td>
<td>46,501</td>
<td>17.7</td>
</tr>
<tr>
<td>1978</td>
<td>290,224</td>
<td>51,339</td>
<td>17.7</td>
</tr>
<tr>
<td>1979</td>
<td>323,866</td>
<td>55,323</td>
<td>17.1</td>
</tr>
<tr>
<td>1980</td>
<td>320,073</td>
<td>54,855</td>
<td>17.1</td>
</tr>
<tr>
<td>1981</td>
<td>315,887</td>
<td>58,123</td>
<td>18.4</td>
</tr>
<tr>
<td>1982</td>
<td>286,698</td>
<td>53,612</td>
<td>18.7</td>
</tr>
<tr>
<td>1983</td>
<td>253,187</td>
<td>51,144</td>
<td>20.2</td>
</tr>
<tr>
<td>1984</td>
<td>232,583</td>
<td>44,054</td>
<td>18.9</td>
</tr>
<tr>
<td>1985</td>
<td>222,591</td>
<td>44,292</td>
<td>19.9</td>
</tr>
<tr>
<td>1986</td>
<td>224,778</td>
<td>44,429</td>
<td>19.8</td>
</tr>
<tr>
<td>1987</td>
<td>243,261</td>
<td>48,801</td>
<td>20.1</td>
</tr>
<tr>
<td>1988</td>
<td>253,134</td>
<td>52,881</td>
<td>20.9</td>
</tr>
<tr>
<td>1989</td>
<td>263,023</td>
<td>56,983</td>
<td>21.7</td>
</tr>
<tr>
<td>1990</td>
<td>283,352</td>
<td>63,591</td>
<td>22.4</td>
</tr>
</tbody>
</table>

*Note: For 1973-1979, year-end is December 31; for 1980-1990, year-end is September 30.
Figure 3. Minority Representation in the Labor Force and in Apprenticeship: 1973-1990
Complete time series, of the representation of blacks and Hispanics (the two largest minority subgroups) in apprenticeship separately, were not available in the existing data from BAT. However, information was available for the years 1975 and 1990. Black representation in apprenticeship increased from 9.1 percent in 1975 to 12.7 percent in 1990. Hispanic representation in apprenticeship more than doubled, increasing from 3.6 percent in 1975 to 7.9 percent in 1990. The 1990 figures are based on AMS data supplemented with information from California. AMS data without California indicates that black representation would have been 13.1 percent and Hispanic representation would have been only 4.1 percent in 1990, clearly indicating the major impact of the state of California on the percentage of minority participation in the National Apprenticeship Program, particularly for Hispanics.

The evidence in this section suggests that the policy of affirmative action in the National Apprenticeship Program may have had a positive effect on minority apprenticeship participation. However, because the percentage of minority participation in apprenticeship is an aggregate measure, it is not clear how widespread increased minority participation has been across apprenticeship occupations. The percentage might have increased because of a large increase in the number of minorities in a few occupations for which minorities traditionally have had little or no problems gaining access.

**Trend in the Number of Minority Apprentices**

Between 1973 and 1990, the number of minority apprentices increased from 42,502 to 63,592, an increase of 21,090 or 49.6 percent—see Table 19. In contrast, the number of total civilian apprentices was virtually unchanged at the end of this period, although there were fluctuations. The total number of civilian apprentices increased dramatically, plummeted, and then recovered to the 1973 level by 1990.
Figure 4 plots the number of minority and total registered apprentices for the years 1973 through 1990. Although the decrease in the number of total apprentices appears to be much greater than the decrease for minorities during the 1981-85 period, the percentage decreases in the numbers are fairly close. The number of total apprentices decreased by 29.5 percent compared to 23.8 percent for the number of minorities.

The trend in the number of minority apprentices, unlike the trend in the percentage of minority participation, is not clear because of the effect of cyclical fluctuations. Shaded areas on the figure indicate periods of economic recession according to the National Bureau of Economic Research. The regression model specified in Chapter 6 is used to identify the time trend in the number of minority apprentices, holding constant cyclical changes and other factors.

Results of the time series regression are presented in Table 20. Six different models were estimated in an attempt to identify the affect of the qualification level of minority labor on apprenticeship. In all of the models, $t$ is positive and statistically significant at the 95 percent confidence level or higher. The change in the dependent variable with respect to $t$, $\beta_0 + \beta_1 t$, is positive because both $\beta_0$ and $\beta_1$ are positive. As time increases, the percentage change in the number of minority apprentices increases at an increasing rate, indicating the absence of a plateau effect. Because the data used here are aggregated across occupations, increases in the number of minority apprentices may have been limited to a few exceptionally large occupations. The increase in the percentage of minority apprenticeship participation beyond the minority representation in the labor force suggests that occupational segregation was constant or increasing during the 1973-90 period. The occupational analysis in the section will address this issue.
Note: Shaded areas represent periods of national economic recession.

Figure 4. Number of Total and Minority Registered Civilian Apprentices: 1973-1990
In each of the models, the volume of registered civilian apprenticeship (ADEMAND), is always positive and statistically significant at the 99 percent confidence level. This result is expected because the number of minority apprentices are affected by the same cyclical changes as the total number of apprentices. The coefficient on ADEMAND indicates that for every increase of 1,000 total registered apprentices, the number of minority apprentices increases by .2 to .3 percent.

In each of the models in which the black male and Hispanic male high school graduation rates (BMHSG and HMHSG) are included as explanatory variables, the coefficients are negative and statistically significant at the 95 percent confidence level or higher. The negative coefficients suggest that increases in the high school completion rates are correlated with a decrease, rather than an increase, in the number of registered minority apprentices.

In contrast, the coefficient on black male college enrollment (BCME) is always positive, and statistically significant at the 95 percent confidence level or higher in two of three models. The coefficient on Hispanic male college enrollment (HMCE), on the other hand, is negative in two of the three models, and not statistically significant. The difference in results for blacks and Hispanics might be explained by the much higher school dropout rate among Hispanics.

These results suggests that increased black male educational attainment, after controlling for high school graduation, leads to increases in the number of minority apprentices. It would appear that increases in the educational attainment of blacks beyond high school graduation increases the number of minority apprentices, but that the increase in high school graduation alone had a negative effect on the number of minority apprentices.

Several explanations may be offered for these results. One may be that enrollment in postsecondary education acts as a signal to program sponsors of the motivation and/or ability of black males. In this instance, high school graduation alone might act as the opposite signal.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERCEPT</td>
<td>10.9573**</td>
<td>11.0233**</td>
<td>10.3758**</td>
<td>10.3234**</td>
<td>13.3231**</td>
<td>11.3779**</td>
</tr>
<tr>
<td></td>
<td>(0.2832)</td>
<td>(0.2282)</td>
<td>(0.3491)</td>
<td>(0.2503)</td>
<td>(1.1836)</td>
<td>(1.3298)</td>
</tr>
<tr>
<td>t</td>
<td>0.0122*</td>
<td>0.0143**</td>
<td>0.0164*</td>
<td>0.0167*</td>
<td>0.0204**</td>
<td>0.0156**</td>
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<tr>
<td></td>
<td>(0.0044)</td>
<td>(0.0035)</td>
<td>(0.0062)</td>
<td>(0.0058)</td>
<td>(0.0068)</td>
<td>(0.0061)</td>
</tr>
<tr>
<td>t²</td>
<td>(0.0007)*</td>
<td>0.0004</td>
<td>0.0005</td>
<td>0.0002</td>
<td>0.0024*</td>
<td>0.0007</td>
</tr>
<tr>
<td></td>
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<td>(0.0002)</td>
<td>(0.0004)</td>
<td>(0.0003)</td>
<td>(0.0009)</td>
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<td>ADEMAND</td>
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<td>0.000003**</td>
<td>0.000003**</td>
<td>0.000003**</td>
<td>0.000002**</td>
<td>0.000003**</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>BMHSG</td>
<td>-0.0092*</td>
<td>-0.0098**</td>
<td>-0.0106*</td>
<td>-0.0097**</td>
<td>-0.0100**</td>
<td>-0.0100**</td>
</tr>
<tr>
<td></td>
<td>(0.0034)</td>
<td>(0.0026)</td>
<td>(0.0044)</td>
<td>(0.0031)</td>
<td>(0.0028)</td>
<td>(0.0028)</td>
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<tr>
<td>HMHSG</td>
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<td>-0.0100**</td>
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<td>-0.0100**</td>
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<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.0723)</td>
<td></td>
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<tr>
<td>BMCE</td>
<td>0.0113**</td>
<td>0.0043</td>
<td></td>
<td></td>
<td>0.0106*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0028)</td>
<td>(0.0046)</td>
<td></td>
<td></td>
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<tr>
<td>HMCE</td>
<td></td>
<td>-0.0058</td>
<td>0.0042</td>
<td></td>
<td>-0.0058</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>(0.0032)</td>
<td>(0.0042)</td>
<td></td>
<td>(0.0034)</td>
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</tr>
<tr>
<td>Adj. R²</td>
<td>.9571</td>
<td>0.9806</td>
<td>.9265</td>
<td>0.9358</td>
<td>0.9661</td>
<td>.9786</td>
</tr>
<tr>
<td>D-W Stat</td>
<td>1.720</td>
<td>1.977</td>
<td>1.795</td>
<td>1.631</td>
<td>2.132</td>
<td>1.986</td>
</tr>
</tbody>
</table>

*Statistically significant at the .05 level; **at the .01 level (two tail tests).
A second explanation is that the measures used are poor proxies to control for the increase in the qualification level of minority applicants.

An alternative explanation is that apprenticeship can offer two types of opportunities. One opportunity is for training in occupations that have very low entrance requirements, such as not requiring a high school diploma. A second opportunity is for training in occupations that require at least a high school diploma. Minorities who do not graduate from high school can turn to apprenticeship for job skills in occupations for which they qualify for training. Minorities with college experience may be the minority apprentices with a high school diploma who enter apprenticeship programs requiring it.

In this section the trend in the number of minority apprentices for the period 1973-1990 was identified as positive and statistically significant. The positive time trend line is interpreted as the impact of changes in recruitment and selection procedures of apprenticeship programs. Those changes are presumed to have arisen from the requirement for affirmative action specified in the equal opportunity standards issued by DOL. The trend might also reflect the influence of other structural changes in the apprenticeship system that impact on the number of minority apprentices, such as the introduction of new apprenticeship occupations.

**Trend in the Occupational Distribution of Apprentices**

This section presents results from the examination of changes in the occupational distribution of apprentices by race (minority versus white). Occupational segregation indexes were calculated for the years 1973, 1979, and 1990 in order to establish the trend in the distribution of apprentices across occupations. The index number, when multiplied by 100, indicates the percentage of whites (or minorities) that would have to change occupations in order to achieve the same race mix in each occupation as in all civilian apprenticeship. The increase in the
percentage of minority participation in apprenticeship during the 1973-90 period raises the percentage of minorities required per occupation to maintain a constant level of occupational segregation.

Because the samples of occupations are limited to those with at least 250 registered apprentices, the mix of occupations can change over time as the number of apprentices rises above 250, or falls below 250. In addition, new apprenticeship occupations may be introduced that offer new opportunities for apprenticeship training.

The changes in the occupations of apprenticeship can alter the degree of racial segregation, depending upon the concentration level of minorities in each apprenticeship occupation and the number of total apprentices in the occupation. Occupations with either a very high or very low concentration of minority apprentices will increase the degree of occupational segregation. The magnitude of the increase will depend on the number of apprentices in the occupation relative to other occupations. For example, the occupation "corrections officer" has the third largest number of registered apprentices, and 46 percent of corrections officer apprentices are minorities.

Segregation indexes were estimated for two set of occupations. The first "full" set includes all the occupations that have at least 250 registered apprentices. The number of occupations in each year differs. There are more for 1990 (65 occupations) than for 1973 and 1979 (51 and 53 occupations, respectively). The second "common" set of occupations includes only those occupations that appear in each of the years 1973, 1979, and 1990. There are 34 occupations included in the common group. Comparing 1973 and 1990 full and common occupations samples, there are 13 new occupations in 1990, and 18 occupations from 1973 that are not among the sample of occupations in 1990 (with at least 250 registered apprentices).

Although the samples of occupations are restricted, they still represent a large majority of registered apprentices. Table 21 provides the number of apprentices considered for the two
sample sets considered in this study. The samples for 1990 are smaller, in part, because the data used does not include information from five SAC states that did not participate in the AMS.

<table>
<thead>
<tr>
<th>Occupation Set</th>
<th>Number of Registered Apprentices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1973</td>
</tr>
<tr>
<td>Full</td>
<td>272,207</td>
</tr>
<tr>
<td>Common</td>
<td>240,716</td>
</tr>
</tbody>
</table>

Table 22 presents the estimated segregation indexes for the two sets of occupations. The index values for the full set of occupations increased from .166 in 1973 to .234 in 1990, a 41.0 percent increase. The indexes indicate that in 1990, 23.4 percent of whites (or minorities), compared to 16.6 percent in 1973, would have had to change occupations in order to achieve the same race mix in each occupation as in all civilian apprenticeship. Despite the increase in the index, the absolute value of the index is not very high.

Because index values for the full set of occupations are sensitive to the effect of new occupations being introduced in later years, and to the loss or gain of pre-existing occupations as the number of apprentices in an occupation rises above, or falls below, 250, a segregation index is also calculated for the set of common occupations. The segregation index for the common set of occupations decreased between 1973 and 1979, then increased between 1979 and 1990. From 1973 to 1990, the index increased by 30.6 percent. The increase in the index for the 1973-90 period confirms that occupational segregation in apprenticeship increased. The fact that the full set index rose between 1973 and 1979, but the common set index decreased, suggests that the change in apprenticeship occupations was responsible for the increase in the index for that period.
The decrease in the common set index during the 1970s indicates that the policy of affirmative action had a positive impact on reducing the degree of occupational segregation in apprenticeship.

The reversal of the index for the 1979-90 period suggests that affirmative action did not reduce the degree of segregation. However, it may be that affirmative action prevented segregation from increasing more quickly than it did in the 1980s. Changes in the composition of minority apprentices during the period may have affected minority qualification levels and occupational choices in such a manner as to increase occupational segregation in apprenticeship. This conclusion is consistent with the observed negative relationship between high school graduation rates for minorities and the number of registered minorities observed in the times series.
regression. Self selection\textsuperscript{92} is likely a major factor for explaining the increase in occupational segregation in apprenticeship. Program sponsors might have actively recruited minorities for their programs, but unless minorities were qualified, and applied, the attainment of affirmative action goals would be limited.

The index values of the full set of occupations cannot be directly compared to the common set to isolate the impact of the change in apprenticeship occupations because the indexes are based on different numbers of occupations. The degree of occupational segregation will be higher for larger sets of occupations. For example, a subsample of common occupations, those found in the construction industry, have lower dissimilarity index values (.149, .139, and .188, respectively for 1973, 1979, and 1990) than for the common set. The subsample contains 18 of the 34 occupations used in the common set. The construction trades account for more than half of all registered apprentices.

The findings of the occupational analysis are contrary to the findings obtained in the occupational segregation literature for minority males. For example, King (1992) obtained segregation index values that decreased from .362 in 1970 to .293 in 1988, for a common set of 159 occupations, when comparing black and white men in the national labor force. The findings from the present study demonstrate that occupational segregation index values are sensitive to groups of occupations considered. In this study, the occupations were skilled manual and mechanical trades for apprenticeship training. In addition, a small group of occupations dominated the distribution because of the large number of apprentices in those occupations.

\textsuperscript{92}We should recognize that dropping out of school is another individual choice. An individual could return for a high school diploma or its equivalent in order to qualify for other occupations.
Summary

In this chapter, evidence has been presented indicating the equal opportunity progress of the national apprenticeship system between 1973 and 1990. Over this period, the percentage of minority apprenticeship participation increased from 15.0 percent to 22.4 percent. The number of minority apprentices also increased, from approximately 43,000 to 64,000.

A positive trend in the number of minorities was identified after controlling for cyclical changes in the economy and the number of apprenticeship positions. The trend was interpreted as reflecting the impact of affirmative action in apprenticeship compliance, a major structural change in apprenticeship affecting the number of minorities. However, another substantial structural change affecting minority participation was the introduction of new occupations for apprenticeship training.

The occupation-level analysis indicated that the degree of occupational segregation increased between 1973 and 1990. The percentage of whites (or minorities) who would have to change occupations to attain the same race mix in each occupation as in all civilian apprenticeship increased from 16.6 percent in 1973 to 23.4 percent in 1990. A second set of index values was obtained for a common set of apprenticeship occupations so that a trend could be identified independent of the affect of changes in apprenticeship occupations. Those index values also indicated an increase in segregation for the 1973-90 period, but a decrease for the period 1973-79. These results suggest that the policy of affirmative action helped reduce segregation in apprenticeship during the 1970s. The increase for the 1979-90 period, however, suggests that affirmative action did not reduce occupational segregation in apprenticeship. It may be that affirmative action prevented the segregation from being much greater, and/or changes in the composition of the minority labor force might have limited the occupations of apprenticeship considered by minorities.
CHAPTER VIII
CONCLUSION AND IMPLICATIONS

Beginning in 1964, the U.S. Department of Labor prohibited all registered programs in the National Apprenticeship Program from discriminating in all phases of apprenticeship on the basis of race, creed, color, or national origin. In addition Title VII of the Civil Rights Act of 1964, prohibited discrimination in employment, including apprenticeship training. In 1972, that policy of equal opportunity was broadened to require positive affirmative action in recruitment and selection of minorities for apprenticeship. In addition, Federal government contractors were required to take affirmative action in employment.

This study examined data maintained by the Bureau of Apprenticeship and Training to determine the extent of progress made toward equal apprenticeship opportunity for minorities since the implementation of affirmative action in the National Apprenticeship Program. The data obtained from BAT, although intended only for tracking apprentices, proved to be somewhat useful in assessing the equal opportunity performance of the National Apprenticeship Program.

To assess the impact of affirmative action policy, this study examined (1) the trend in the percentage of minority apprenticeship participation, (2) the trend in the number of minority apprentices, and (3) the trend in occupational segregation of apprentices. Between 1973 and 1990, the percentage of minority participation in apprenticeship increased from 15.0 percent to 22.4 percent. At the same time, the percentage of minority representation in the labor force increased from 16.7 percent to 21.5 percent.
A positive and statistically significant time trend was identified for the natural logarithm of the number of minority apprentices after holding constant the volume of registered apprenticeship, the increase in the minority share of the labor force, and changes in the educational attainment of minorities. Results from the regression indicated that the time trend increased at an increasing rate (but the coefficient on $t^2$ was significant in only two of the six models). This is contrary to expectations that the trend would grow at a decreasing rate, thereby demonstrating a plateau effect as the percentage of minority apprenticeship participation approaches the minority representation rate in the national labor force or, to demonstrating weak affirmative action compliance and enforcement. This finding must be interpreted cautiously because it is based on data aggregated across occupations. The absence of a plateau effect appears to be the result of the increase in occupational segregation.

The results of the regression are limited because the data permitted only an analysis of minorities as a group, and not separate analyses of individual minority groups such as blacks or Hispanics. It would have been preferable to estimate separate regressions for each racial/ethnic minority group and for each occupation. Then the progress made toward providing equal opportunity for specific minority groups and the performance of programs grouped by occupation could have been assessed.

Another limitation is that I was not able to control for the qualifications of minority applicants to apprenticeship. Educational attainment was measured using the percentages of blacks and Hispanics graduating from high school and the percentages enrolled in college. It was anticipated that positive and significant effects on the number of minority apprentices would occur with increases in educational attainment (qualification levels). College enrollment would have a negative effect if college served as an alternative method of preparing for a career.
The results for Hispanics showed that educational attainment had a negative effect. However, only the coefficient for high school graduation was significant. For blacks, it appeared that high school graduation had a negative effect, but college enrollment had a positive effect. Because I was not able to control for actual qualifications, the unexpected results might have resulted from poor proxies. But if the proxies are accurate, then interpreting the results becomes more speculative in nature. I would suggest that perhaps a large number of black, and most Hispanic, apprentices without a high school diploma obtained apprenticeship positions in occupations that had relatively low qualification standards. And, some blacks with postsecondary education also obtained apprenticeship positions, perhaps in occupations with higher qualification standards. Results from the 1992 GAO study seem to be consistent with this explanation. Minorities were participating in some occupations with very high relative earnings, but minority apprentices tended to be concentrated in occupations in the lower two quartiles of the earnings distribution. Without more complete information about applicants and apprentices, however, this explanation cannot be fully tested.

The analysis of the occupational distribution in apprenticeship indicates that the degree of occupational segregation in the National Apprenticeship Program increased during the 1973-90 period. In 1990, 23.4 percent of white (or minority) apprentices would have had to switch occupations in order to obtain the same race mix in each occupation as in civilian registered apprenticeship, compared to 16.6 percent in 1973.

Part of the increase in segregation can be attributed to change in the apprenticeship occupations during the 1973-90 period. New occupations can provide more opportunities for training, however, they can also increase the degree of segregation if the percentage of minority apprenticeship participation in those new occupations is very high or very low relative to other occupations. In order to eliminate the influence of the change in the occupations, a second
segregation index was calculated for a set of occupations common across the three years considered.

Using the common set of occupations, it was observed that occupational segregation in apprenticeship decreased between 1973 and 1979, but increased between 1979 and 1990. For the 1973-79 period, it appears that affirmative action helped reduce occupational segregation. However, for the 1979-90 period, affirmative action appears to have had little or no effect. It would be premature to conclude that the increase in segregation is due to weak compliance and/or enforcement of affirmative action. Changes in the composition of minority apprentices might have altered the occupational choices of those minorities in such a manner as to increase occupational segregation.

Affirmative action addresses only the demand for minority apprentices. Sponsors establish goals and timetables to increase minority representation in their apprenticeship programs, which are occupation-based. To increase the supply of minorities, sponsors participate in positive outreach and recruitment.

Outreach programs have been established to increase the supply of minority applicants to apprenticeship. The success of individual affirmative action plans, however, will be limited by the decisions of minorities with respect to occupations and apprenticeship training. Hence, occupational segregation in apprenticeship may be determined in large part by the individual decisions of minority and non-minority apprentices about an occupation.

Further Reducing Occupational Segregation in Apprenticeship

Further reducing the degree of occupational segregation in apprenticeship will require more than relying on affirmative action. It will be necessary to increase the number of qualified minority applicants to occupations with low minority participation, and to develop an
understanding of the process by which apprenticeship applicants decide upon an occupation for training. One important factor in that process is the information available to the applicants.

Potential minority applicants need to learn about apprenticeship and apprenticeship occupations while they receive their primary and secondary education, so they can consider apprenticeship as a viable opportunity to make the transition from school to work. Information about apprenticeship should be precise, comprehensive, and describe the nature of work, the training process, the qualifications for training—including specific coursework, grades, attitude, and motivation—and the importance of completing school. The information should be delivered as a regular part of counseling students about career preparation and be provided without prejudice as to a student’s desire and ability to prepare for college.

Recently, much interest has been directed, by both researchers and practitioners, toward helping youths make the transition from school to work. Programs have been developed that link secondary education to postsecondary education and training (such as Tech Prep, Youth Apprenticeship, and School-to-Apprenticeship (STA)). STA is designed to prepare a high school student to enter a registered apprenticeship program after completing high school. It was started in the late 1970s as a series of demonstration projects, and has continued since then under BAT.

One shortcoming with most of the transition programs is the small number of training positions available because relatively few employers participate, and among those who do, they only provide a few positions. As a result, program sponsors could be very selective if many youths show an interest in these programs. Therefore, it will be important to continuously stress, as early as possible, that selection is competitive, and that grades, motivation, and character are critical. Youth must be ready to compete, and be prepared for alternative careers or training in the event they are not selected to the apprenticeship, or other programs.
To further increase minority access to registered apprenticeship, it is essential that minorities be able to compete equally with whites as applicants. Thirty years after the Civil Rights Act of 1964, substantial qualitative inequities in the education received by minority youths continue, in spite of the increases made in educational attainment. For example, Table 23 provides a comparison of test scores for black, Hispanic, and white 17-years old youths. Blacks and Hispanics continue to score substantially lower on reading, mathematics, and science proficiency tests. The results are limited to youths enrolled in school. Because blacks and Hispanics have relatively higher rates of dropping out of school, these scores probably provide a conservative estimate of the actual differences between white and black and Hispanic 17-year old youths. Before affirmative action in apprenticeship can be expected to further reduce occupational segregation among apprentices, greater progress must be made toward providing minorities with the necessary basic skills to compete as applicants, and with sufficient information to make career decisions.

In recognition of the difficulty of recruiting qualified minorities, some sponsors have established pre-apprenticeship programs or, sponsored existing community-based programs. Under affirmative action regulations, sponsors are expected to engage in programs of outreach for positive recruitment and preparation of potential applicants for apprenticeship. Sponsors typically work with these and other programs with established links to the apprenticeship community. For example, the Job Corps program is a popular recruiting source in the construction industry. Job Corps sites provide training to disadvantaged youth in a variety of skills, including some construction trades.

Links have also been established between the apprenticeship community and many Federal education and retraining programs in order to promote and expand apprenticeship. For example, in 1984 the Carl Perkins Vocational Education Act required the Departments of Education and
Table 23.—Reading, mathematics, and science proficiency test scores for 17-year-old youths by race, various years.

<table>
<thead>
<tr>
<th></th>
<th>White</th>
<th>Black</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1979-80</td>
<td>293</td>
<td>243</td>
<td>261</td>
</tr>
<tr>
<td>1983-84</td>
<td>296</td>
<td>264</td>
<td>268</td>
</tr>
<tr>
<td>1989-90</td>
<td>297</td>
<td>267</td>
<td>275</td>
</tr>
<tr>
<td>Mathematics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1977-78</td>
<td>306</td>
<td>268</td>
<td>276</td>
</tr>
<tr>
<td>1981-82</td>
<td>304</td>
<td>272</td>
<td>277</td>
</tr>
<tr>
<td>1989-90</td>
<td>310</td>
<td>289</td>
<td>284</td>
</tr>
<tr>
<td>Science</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1976-77</td>
<td>298</td>
<td>262</td>
<td>240</td>
</tr>
<tr>
<td>1981-82</td>
<td>293</td>
<td>249</td>
<td>235</td>
</tr>
<tr>
<td>1989-90</td>
<td>301</td>
<td>253</td>
<td>262</td>
</tr>
</tbody>
</table>


Labor to establish an interagency agreement to promote linkages between apprenticeship and vocational education.

**Increasing Minority Apprenticeship Opportunities**

To further increase apprenticeship opportunities for minorities (as well as expand youth apprenticeship programs and other school-to-work programs), it will be necessary to increase employers’ willingness to provide training opportunities. Perhaps as employers adopt high-performance work organization structures, as opposed to the more common low-wage strategy, they will understand the need to train workers. In the interim, a vigorous campaign by the
Secretary of Labor to formally and publicly endorse, promote, and expand registered apprenticeship is needed. The existence of the National Apprenticeship Program seems to be a well kept secret from employers (and the public). Yet, the system of registered apprenticeship is well-suited for providing employment and training for the large number of young adults who are beyond high school age but have yet to establish permanent full-time participation in the labor market.

This study suggests that the introduction of apprenticeship training in new occupations provides additional apprenticeship opportunities for minorities. Despite the large increase in the size of the labor force since the 1970s, the number of registered apprentices was virtually unchanged between 1973 and 1990. Without the large cuts in BAT’s budget and staffing during the early 1980s, registered apprenticeship might have been promoted more extensively to meet skill needs in manual, mechanical, and technical occupations that were not already using apprenticeship, or used it on a very limited basis. That lack of apprenticeship expansion may have limited the progress toward greater apprenticeship opportunities for minorities. But this is only speculation because during that same period there were substantial structural changes in employment, including the loss of many manufacturing jobs (which tend to be manual and mechanical) and an increase in service employment. In addition, there was a substantial decrease in the share of the private sector labor force that was unionized.

**Future Research**

The focus of this study was restricted to assessing the progress towards equal opportunity in the National Apprenticeship Program. It did not consider the impact of equal apprenticeship opportunity on the employment of minorities by occupation, nor the completion rate of minorities in apprenticeship relative to whites. Future research should examine the completion rates of
minorities and minority occupational attainment in employment. If minorities have a substantially higher rate of non-completion, then the reasons for non-completion should be explored, including the possibility of discrimination.

Also, BAT should consider evaluating the STA program. The evaluation should determine the number of youths who enter and complete apprenticeship training, determine to what extent the programs serve minority youths, and determine how the programs are operated. Which programs serve more youths and minorities, and which have greater apprenticeship completion rates? What are the reasons for those differences across programs? Can programs be improved or expanded to provide more youths with apprenticeship opportunities?

Future research should also examine the occupational choice decision process of registered apprentices. A survey of registered apprentices, linked with AIMS data on those apprentices and their programs, could provide useful insight as to the importance of self selectivity in explaining the degree of occupational segregation in apprenticeship.
APPENDIX A
DATA USED IN THE ANALYSIS

State and National Apprenticeship System (SNAPS)

The Bureau of Apprenticeship and Training (BAT) provided SNAPS data in hard copy. The summary reports provided total numbers of apprentices registered by BAT and SACs combined, by occupation, by industry, by region, and by state for the years 1973 through 1979. Information for specific race/ethnic groups was available only for 1975 and January 1979 through June 1979.

California Summary Reports

The State of California’s Department of Industrial Relations, Division of Apprenticeship Standards made available its report on the characteristics of registered apprentices in the State as of December 1990. The report provides the number and percentage of apprentices that are minorities, Blacks, Asians, American Indians, Filipinos, and Hispanics, by occupation, but not by industry or program type.

Apprenticeship Management System (AMS)

The AMS was not intended to be used for evaluating equal opportunity. Rather, it was designed as a regional tracking system for registered apprentices and programs. The AMS tapes consist of a Detail file and a Master file, as they existed as of the second quarter of fiscal year 1991 (January through March 1991). The Detail file provides information on individual registered
apprentices, including archived (historical) data. The Master file contains information by program sponsor, but only for the second quarter of fiscal year 1991, because master file records were not archived.

In the AMS Detail file, some of the variables had a very high rate of missing values. Invalid responses were also prevalent, but generally concentrated among registration dates for the years prior to 1986.

Quarterly reports were generated from AMS data. Although the reports date back to 1984, they appear to be reliable only for 1987 and later years, judging from the quality of the Detail file. In addition, reports were not generated for several quarters between 1987 and 1990.

Two types of quarterly reports were produced. One type of report presents apprentice and apprenticeship program statistics straight from the AMS. These reports did not include information for the states that did not participate in the AMS --California, District of Columbia, Puerto Rico, Hawaii, Rhode Island, and the Virgin Islands. These reports provide statistics by occupation, industry, state, and region.

The second type of quarterly report is a summary management report generated for distribution to regional directors of BAT. These reports were based on AMS data supplemented with information provided by states that were not AMS participants. The reports were intended to be used for planning and promoting apprenticeship, as well as for management purposes. The report provides a summary of various statistics for all regions combined, as well as comparisons across regions. However, occupation specific information is not provided.

The AMS is undergoing a complete revision, begun in March 1991, and is now called the Apprenticeship Information Management System (AIMS). The transition involves a substantial upgrade of computer hardware and software.
The operation of the computerized Apprenticeship Information Management System (AIMS) was transferred from BAT to the Employment and Training Administration’s computer systems group. That group also has responsibility for the Unemployment Compensation and Job Corps computer systems at DOL. In December of 1993, a full-time computer programmer was assigned to rewrite the programming in order to make the system more accessible to users in field offices, and to reduce or eliminate various errors in the system, such as the duplicative counts of apprentices. The revised system is designed to be more interactive, provide greater speed and accountability, and make it easier to produce reports. The improved accuracy and reliability of the data resulted in a somewhat smaller total number of registered apprentices, however specific values are not yet available. BAT expects to be able to produce reports from the new system by September 1, 1994.

To determine what would be required from AIMS, BAT established a policy team that consists of BAT staff from all regions, as well as representatives from labor and management. The team identified what the system should provide in terms of specific measures and the type of reports to be produced, as well as the degree of reliability and accuracy to be expected. A subcommittee consisting of BAT staff put together a manual for the AIMS and acts as computer liaison group to all field staff who need assistance.

The system is well-supported with modern computer hardware, including many lines for greater access by the large number of field offices, and large memory and storage capabilities. A few large employers have expressed interest in being able to participate in the AIMS. The employers have apprentices located in several states. Their participation would help provide accurate information at the program level, and help BAT in its growing interest in monitoring apprentice retention by industry.
APPENDIX B

ESTIMATING NON-WHITE MALE SERIES

If data on the number of Hispanic males in the labor force were available for 1973 through 1979, as well as for 1980 through 1990, a series of white non-Hispanic males could be produced by subtracting the number of Hispanic males in the labor force from the number of white males in the labor force. Then, the number of minority males in the labor force would be derived by subtracting the number of white-non Hispanic males from the total number of males.

Unfortunately, data on the number of Hispanics for 1973 through 1979 does not exist from the Bureau of Labor Statistics (BLS). To estimate a series on nonwhite males 16 years or older in the civilian labor force, I use existing BLS labor force data\(^9\) to calculate the ratio of white males in 1973 to white males in 1980. For \(i = 1973, 1974, ..., 1990\), let:

\[
\begin{align*}
T_i &= \text{total male civilian employment (age 16+)}, \\
W_i &= \text{total white male civilian employment (age 16+)}, \\
H_i &= \text{total Hispanic male civilian employment (age 16+)}, \\
\text{and } WNH_i &= W_i - H_i.
\end{align*}
\]

Then, the number of white-not Hispanic males in year \(i\) (EWNH\(_i\)) is estimated as:

\[
\text{EWNH}_i = \left( \frac{W_i}{W_{1980}} \right) \times WNH_{80}.
\]

and the estimated number of non-white males is estimated as:

\[
\text{ESTNW}_i = (T_i - \text{EWNH}_i).
\]

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Title 29 CFR Part 29

Title 29 CFR Part 30

Title 29 CFR Part 1607

Title 41 CFR Part 60.1
Title 41 CFR Part 60.2


