

Utah State University

DigitalCommons@USU

All Graduate Theses and Dissertations, Spring
1920 to Summer 2023

Graduate Studies

5-1973

Labor Force Projections for the State of Utah, 1970-2000

Craig R. Lundahl
Utah State University

Follow this and additional works at: <https://digitalcommons.usu.edu/etd>



Part of the [Sociology Commons](#)

Recommended Citation

Lundahl, Craig R., "Labor Force Projections for the State of Utah, 1970-2000" (1973). *All Graduate Theses and Dissertations, Spring 1920 to Summer 2023*. 3157.

<https://digitalcommons.usu.edu/etd/3157>

This Dissertation is brought to you for free and open access by the Graduate Studies at DigitalCommons@USU. It has been accepted for inclusion in All Graduate Theses and Dissertations, Spring 1920 to Summer 2023 by an authorized administrator of DigitalCommons@USU. For more information, please contact digitalcommons@usu.edu.



LABOR FORCE PROJECTIONS FOR THE
STATE OF UTAH, 1970-2000

by
Craig R. Lundahl

A dissertation submitted in partial fulfillment
of the requirements for the degree

of
DOCTOR OF PHILOSOPHY

in
Sociology

UTAH STATE UNIVERSITY
Logan, Utah

1973

ACKNOWLEDGEMENTS

378.242
69712
c.2

The completion of this dissertation is the end of a long and difficult road. Faith and the encouragement of my parents were essential in my ability to complete this dissertation and degree program.

The Department of Sociology, Social Work and Anthropology has rendered invaluable support during my degree program, for which I am grateful.

I appreciate very much the advice and patience of Dr. Yun Kim, my major advisor throughout my graduate program in sociology. Although we experienced some disputes over this period of time, I believe they served a constructive purpose in my academic progression.

I thank the members of my doctoral supervisory committee for their guidance, support, and cooperation. The members are: Dr. Krishna Shetty of the Department of Business Administration; Dr. Gary B. Hansen of the Department of Economics; and Dr. Tharel R. Black, Dr. H. Bruce Bylund, and Dr. William A. DeHart of the Department of Sociology, Social Work and Anthropology.

I am especially indebted to Mr. S. S. Kharbas for providing me with the preliminary population projections.

A tremendous incentive for completing this study was the patience, understanding and support over the past few years of my present employer, Western New Mexico University. Special efforts which supported my doctoral program were made by Dr. Curtiss R. Hungerford, Dean of Academic Affairs, and Dr. Philip L. Cook, Chairman of the Department of History and Social Science, for which I am grateful.

Finally, I thank Mrs. Gretta Curless for listening to my grumbling and typing the final copy of this dissertation under a haphazard schedule.

May I always remember to seek truth and work for the betterment of all mankind.



Craig R. Lundahl

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	ii
LIST OF TABLES	vi
LIST OF FIGURES	x
ABSTRACT	xi
Chapter	
I. INTRODUCTION	1
Origin and nature of the problem	1
Objectives	5
Justification	7
Research procedure and organization of the dissertation	9
II. REVIEW OF THE CURRENT LITERATURE	11
The labor force	11
Long-term trends in the labor force	15
Industrial and occupational distribution of the labor force	19
Education and the labor force	21
Labor force projections for the United States	22
Major studies of Utah's labor force	30
Summary of the review of literature	35
III. UTAH POPULATION PROJECTIONS TO 2000	38
Introduction	38
Population projections	40
IV. UTAH LABOR FORCE PARTICIPATION RATES, 1960 TO 1970	62
Utah's labor force participation in 1960 and 1970	62
V. PROJECTIONS OF LABOR FORCE PARTICIPATION RATES AND LABOR FORCE FOR UTAH TO 2000	78
Method of labor force projection	79
Assumptions of labor force projections	90
Utah's labor force participation rates and labor force projections	92

TABLE OF CONTENTS (Continued)

	Page
VI. SOCIAL AND ECONOMIC IMPLICATIONS OF LABOR FORCE PROJECTIONS FOR UTAH	112
Changes in the labor force between 1970 and 1980 . .	115
Changes in the labor force between 1980 and 1990 . .	129
Changes in the labor force between 1990 and 2000 . .	132
VII. SUMMARY AND CONCLUSIONS	136
BIBLIOGRAPHY	146
APPENDIX	154
VITA	159

LIST OF TABLES

Table	Page
1. Percent of the population in the labor force, by age, male and female, United States 1940-1960	16
2. School enrollment, by age and percent, for conterminous United States: 1910 to 1960	23
3. United States population, total labor force, and labor force participation rates, by age and sex, enumerated 1968, and projected 1975, 1980, and 1985	24
4. Utah's population by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	46
5. Population of Cache County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	47
6. Population of Davis County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	48
7. Population of Salt Lake County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	49
8. Population of Utah County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	50
9. Population of Weber County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	51
10. Population of Multi-County Area 1 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	52
11. Population of Multi-County Area 2 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	53
12. Population of Multi-County Area 3 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	54
13. Population of Multi-County Area 4 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	55
14. Population of Multi-County Area 5 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	56
15. United States and Utah labor force participation rates by age and sex in 1960	64
16. United States and Utah labor force participation rates by age and sex in 1970	66

LIST OF TABLES (Continued)

Table	Page
17. United States labor force participation rates and changes by age and sex for 1960 and 1970	68
18. The State of Utah's labor force participation rates and changes by age and sex for 1960 and 1970	69
19. Utah's labor force participation rates and changes by age and sex, for counties and multi-county areas in 1960 and 1970	71
20. Labor force participation rates for the United States, by age and sex, observed 1970, and projected 1980, 1990, and 2000	89
21. Projected labor force participation rates by age and sex for the State of Utah, observed 1970, and projected 1980, 1990, and 2000	93
22. Projected labor force participation rates by age and sex for Utah counties and multi-county areas, observed 1970, and projected 1980, 1990, and 2000	94
23. Population and labor force of Utah by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	101
24. Population and labor force of Cache County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	102
25. Population and labor force of Davis County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	103
26. Population and labor force of Salt Lake County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	104
27. Population and labor force of Utah County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	105
28. Population and labor force of Weber County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	106
29. Population and labor force of Multi-County Area 1 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	107

LIST OF TABLES (Continued)

Table	Page
30. Population and labor force of Multi-County Area 2 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	108
31. Population and labor force of Multi-County Area 3 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	109
32. Population and labor force of Multi-County Area 4 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	110
33. Population and labor force of Multi-County Area 5 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000	111
34. Utah's labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000	117
35. Cache County labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000	118
36. Davis County labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000	119
37. Salt Lake County labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000	120
38. Utah County labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000	121
39. Weber County labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000	122
40. Multi-County Area 1 labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000	123
41. Multi-County Area 2 labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000	124
42. Multi-County Area 3 labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000	125

LIST OF TABLES (Continued)

Table	Page
43. Multi-County Area 4 labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000	126
44. Multi-County Area 5 labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000	127
45. Ratios between Utah and the United States labor force participation rates by age and sex, for 1970, 1980, and 1990	155
46. Ratios between Utah and the counties and multi- county areas labor force participation rates by age and sex for 1970	156
47. Ratios between Utah and the counties and multi- county areas labor force participation rates by age and sex for 1980	157
48. Ratios between Utah and the counties and multi- county areas labor force participation rates by age and sex for 1990	158

LIST OF FIGURES

Figure	Page
1. The shape of the United States labor force, enumerated 1968, and projected 1980	29
2. State of Utah map indicating counties and multi-county areas	41
3. Age-sex profile of the State of Utah's population, enumerated 1970 and projected 1980	57
4. Age-sex profile of the State of Utah's population, enumerated 1970 and projected 1980	58
5. Age-sex profile of the State of Utah's population, projected 1980 and 1990	59
6. Age-sex profile of the State of Utah's population, projected 1990 and 2000	60
7. Male participation rates by age for the United States and the State of Utah in 1960	82
8. Male participation rates by age for the United States and the State of Utah in 1970	83
9. Female participation rates by age for the United States and the State of Utah in 1960	84
10. Female participation rates by age for the United States and the State of Utah in 1970	85
11. Age-sex profile of the State of Utah's labor force, observed 1970, and projected 1980	116
12. Age-sex profile of the State of Utah's labor force, projected 1980 and 1990	130
13. Age-sex profile of the State of Utah's labor force, projected 1990 and 2000	133

ABSTRACT

Labor Force Projections for the
State of Utah, 1970-2000

by

Craig R. Lundahl, Doctor of Philosophy
Utah State University, 1973

Major Professor: Dr. Yun Kim
Department: Sociology

This study deals with labor force projections for the State of Utah, counties and multi-county areas, by age and sex for the years 1980, 1990, and 2000, using the technique of cohort analysis for long-range labor force projections. The study also examines some social and economic implications of labor force projections for Utah.

The labor force projections were derived from the age and sex population projections being prepared for the State of Utah and Utah counties by Yun Kim and Tharel R. Black, Utah State University.

In order to project the future labor force of Utah, an analysis of historic and prospective trends of labor force participation rates affecting various age and sex categories for Utah, Utah counties and multi-county areas between 1960 and 1970 was conducted.

Since the trends in labor force participation by age and sex of the United States and Utah in 1960 and 1970 so closely paralleled, it was decided to project the future participation rates for Utah to 2000 based on projected participation rates for the United States made by the Bureau of Labor Statistics. Using the year 1970 as the base period of projection, relative ratios calculated between the United States and

Utah's labor force participation rates by age and sex in 1970 made possible the estimation of Utah's projected labor force in 1980 by taking the ratios times the United States projected 1980 participation rates. Similarly, using the ratios between the counties and multi-county areas' projected participation rates in 1980 by multiplying the newly calculated ratios with the State of Utah's projected 1980 labor force participation rates. Then the labor force participation rates were applied to the projected 1980 population figures for the counties, multi-county areas, and the state, by age-sex categories to arrive at the projected labor force for 1980. The same procedure was repeated to obtain the projected labor force in 1990 and 2000.

Several basic assumptions were made concerning the labor force projections for Utah: (1) the trends in the relative differences of the labor force participation rates between the state and counties will continue as observed in 1970; (2) the unemployment rates for the State of Utah will average around 5.5 percent of the labor force; (3) the economic activity and development in Utah will continue at levels comparable to those found in 1970, avoiding any major recessions; (4) the direction of the past trend in labor force participation rates of the various age-sex groups in the United States and Utah will continue; (5) the Bureau of Labor Statistics' projected labor force participation rates for the United States in 1985 will remain basically the same in 1990, and (6) the trends in the projected labor force participation rates for the United States between 1980 and 1990 will continue to the year 2000.

The calculations of the labor force showed that, throughout the projection period of 1970 to 2000, the size of the total labor force of Utah increased by 361,242 workers or 89.2 percent as compared to the 1970 level of 404,798 workers. This represented an increase of 97,920

workers from 1970 to 1980, 100,823 workers from 1980 to 1990; and 162,499 workers from 1990 to 2000. From 1970 to the year 2000 the working age population increased by an estimated 590,036.

The projected labor force in the decade from 1970 to 1980 showed a dramatic increase in growth for both males and females: 34,727 workers for the age class of 25 to 34 years. Increases in the projected labor force were observed for all other age groups, except for males and females aged 16 to 17 years. The overall participation rates for those 16 years and over in the state declined for both males and females, although the state had labor force increases over the previous decade of about 25 percent for males and 22 percent for females.

Projected labor force growth between 1980 and 1990 was slower than during the previous decade and was more concentrated in a few age groups. The slowdown was due to the declines in the number of births in the 1960's. The age category of 25 to 34 years experienced heavy growth, and the combined age categories of 25 to 34 years and 35 to 44 years included over half of all workers in the state. Most of the remaining workers were concentrated in the age group 45 to 64 years. The state experienced smaller increases in projected labor force growth, 20 percent for both males and females. Similar trends were evident for the counties and multi-county areas.

By 2000, the projected labor force was less concentrated and its growth had increased considerably over the previous decade. The increase was due to substantial projected population growth, particularly of the age category 18 to 24, which contributed 54,144 workers to the projected labor force. Substantial projected labor force growth occurred in the age group of 45 to 64 years: 39,268 males and 25,866 females. Generally the same trends prevailed in the counties and multi-county areas.

Throughout the entire projection period, expected trends portrayed in labor force participation rates were the declining participation of younger males because of schooling and of older males because of earlier retirement. The most dramatic trend for females was the continuing movement of married women into paid employment. Generally, the participation rates showed stabilizing trends for males, while females showed increasing rates from 1970 through 2000.

A further need exists for projections of Utah's labor force using additional information and industrial and occupational categories.

(173 pages)

CHAPTER I

INTRODUCTION

Origin and nature of the problem

This study is concerned with labor force projections by age and sex, for counties and regional multi-county areas in the State of Utah for the period 1970 to 2000, using the technique of cohort analysis of long-range labor force projections. The study also examines some social and economic implications of the labor force projections for Utah.

Focus on work and on the labor force is of relatively recent origin although the importance of work and labor force have been emphasized by several earlier writers. This is particularly evident when the father of political economy, Adam Smith, begins his Wealth of Nations with the idea that the source of national income is labor.¹ Fundamental to Karl Marx's theory of the division of labor is the belief that work is man's basic form of self-realization. According to Marx, man cannot live without work; hence the way in which a man works in society is a clue to human nature.² Obviously, labor and the work process are basic in the understanding of societal social structure.

¹Adam Smith, An Inquiry into the Nature and Causes of the Wealth of Nations (London, England: George Routledge and Sons, 1890), p. 22-23.

²Reinhard Bendix and Seymour M. Lipset, "Karl Marx's Theory of Social Classes," in Class, Status, and Power, Reinhard Bendix and Seymour M. Lipset (eds.), (New York: The Free Press, 1966), p. 7.

The consideration of workers, as distinguished from the population in general, indicates a society where work is different from other activities. In a preindustrial society the household is likely to be the consuming and producing unit, whereas the household in an industrial society is the consuming unit and the factory, the producing unit. Thus, in the evolution of our society, the activities which are related to the production of goods and services have become increasingly important.

The days of transition to an industrial society are far behind the present-day United States; indeed the problem of more concern to Americans today is that of disposing of all the labor available.

During the two decades following the conclusion of World War II, the United States government has taken many steps which indicate an acceptance of increased responsibility for the economic stability and progress of this country. The concern about the economic and social future of the United States is well expressed in the Employment Act of 1946, which requires the Federal Government to analyze the current state and future prospects of the economy by examining employment, prices, and productivity. The Employment Act of 1946 and, later, the Manpower Development and Training Act of 1962 recognized through law the importance of manpower in the health of the economy. Other legislation, such as the Vocational Education Act of 1963, the Higher Education Facilities Act of 1963, the Economic Opportunity Act of 1964, the Civil Rights Act of 1964, the Higher Education Act of 1965, gave additional attention to the need for current information on future skill requirements.³

³Garth L. Mangum, Ed., The Manpower Revolution: Its Policy Consequences (Garden City, New York: Doubleday and Co., Inc., 1965).

The United States has been increasingly involved in the problem of utilizing the population of working age in useful pursuits and in the related problem of educating and training people for the activities which are likely to be vital to national growth. Hence, labor force projections have become increasingly important. The increasing responsibility of the federal and state governments with respect to manpower utilization and growth is a major cause of the increasing demand for more and better labor force projections.

Vital considerations for improved labor force projections are the growth of population of working ages and the differential changes occurring by age and sex since these factors determine to a great extent the changes in the labor force. For example, between 1970 and 1980 the labor force growth of the age class 25 to 34 in the United States should increase substantially because of the dramatic population growth of this group. The population growth of this group reflects the movement up the age scale of the large number of births after World War II. Similarly, the expected lack of further labor force increase in the ages 45 to 54 during the 1970's will occur primarily because of the smaller population born in the early 1930's.

Another element of importance in shaping the composition of the future labor force and its total size is the trend in labor force participation of persons in each age by sex. Over the past thirty years there have been declines in the labor force participation of younger men because of the greater numbers attending school and of older men because of increasing Social Security benefits in recent years. The decline in participation of younger and older men has been offset by the great increases in labor force participation of women, especially married women.

Increasingly, these considerations are important for labor force projections, not only at the national level, but at the state level too. Many states have few, if any, labor force projections of a long-range nature which consider labor force by age and sex. The State of Utah has no long-range labor force projections by age and sex.

There continues to be a demand for labor force study and projection in Utah, especially at the state and county level where long-range labor force study by age and sex is absent. A detailed and integrated study of Utah's population and labor force will help state and other agencies to better understand the labor force developments in Utah. This study is necessary in order that state agencies and business organizations will have some basis for the determination of policies and planning programs, in order that estimates of job requirements can be made, so that educational and training programs are adequately forecast for the demand of economic growth developments, to guide the selection of alternate manpower programs, to alert government and other concerned parties to emerging manpower problems, and to encourage an informed and responsible public concern for manpower information and problems.

Various terms are basic to understanding the following study. The term "labor force" includes persons sixteen years of age and over who are either working at a job or looking for work as defined by the United States Bureau of the Census.⁴ Further detailed discussion of the usage of this term for this study is found in Chapter II.

⁴U.S. Bureau of the Census, U.S. Census of Population: 1970, General Social and Economic Characteristics, Utah, PC(1)-C46, Appendix B.

"Labor force participation rate" is defined for this study as that percentage of working age population who are in the labor force at a particular time.

The term "projection" ranges into the future; it is an attempt at an estimation of a population in coming years and decades.⁵

Objectives

The major objectives of the present study are to prepare age and sex labor force projections for the State of Utah by counties for the period 1970 to 2000, and to study some social and economic implications of the projections.

The specific objectives of this study are:

1. To study the trends of Utah's labor force participation by age and sex, for counties, multi-county areas, and the state, from 1960 to 1970.
2. To project Utah's labor force for counties, multi-county areas, and the state, by age and sex for every ten-year period to the year 2000.
3. To study social and economic implications of the labor force projections for Utah.

The study will include, first, a detailed analysis of Utah's labor force participation rates by age and sex, for the age categories of 16 to 17, 18 to 24, 25 to 34, 35 to 44, 45 to 64, and 65 and over, by counties, multi-county areas, and the state in 1960 and 1970 since recent trends in labor force participation rates affecting various age-sex categories will provide a basis for further projections of labor force.

⁵Peter R. Cox, Demography (Cambridge, England: Published for the Institute of Actuaries and the Faculty of Actuaries at the University Press, 1966), p. 204.

After an examination of the changes in labor force participation by age and sex in different counties and multi-county areas in the State of Utah for the period 1960 to 1970, Utah's labor force is projected for counties, multi-county areas, and the state, by age and sex to the year 2000. These projections are based on the population projections by age and sex for each county in the state prepared by Kim and Black.⁶ All projections are based on specific assumptions about trends of population growth and labor force participation. Projections of labor force participation rates for Utah are based on the labor force participation rate projections for the United States as made by the Bureau of Labor Statistics.⁷

Following the projections, changes in the size of the labor force for various age and sex categories are examined. Other social and economic implications of the labor force projections for Utah, such as an estimation of the jobs needed in future years to ensure full employment, probable consequences for educational training, expected entrances of workers at younger ages and withdrawals at older ages, and female participation in the labor force, are also explored.

The study is limited to estimates of total labor supply by age and sex, for the State of Utah, counties and multi-county areas, according to basic assumptions, for 1980, 1990, and 2000. No attempts have been made to project employed and unemployed status separately, or industrial and occupational composition of the labor force.

⁶Yun Kim and Therel R. Black of the Department of Sociology at Utah State University are in the process of preparing population projections for Utah to be published at a later date. In this study some preliminary projections in their work have been utilized.

⁷Sophia C. Travis, "The United States Labor Force: Projections to 1985," Monthly Labor Review, XCIII, No. 5 (May, 1970), p. 9.

Several other limitations of this study include: the errors included in the data used, such as the possibility of under- or over-enumeration in the census; accuracy of the United States labor force figures as compiled by the Bureau of Labor Statistics for 1970; the problem of comparability of census data between different census years; the method used in the projections does not account for all factors which influence labor force growth, especially economic considerations; the population projections do not give consideration to the internal migration within the State of Utah; the labor force projections are limited by particular assumptions which may be incorrect; and unforeseen industrial developments, particularly in rural counties which may negate the labor force projections in those areas. However, these shortcomings and errors are not significant enough to invalidate the findings of the study.

Justification

The modern industrial nations have an acute awareness of the need for data on projections of future population and labor force. Studies of the future growth, composition, and distribution of manpower are of fundamental importance for the determination of policies and planning of programs aimed at full and effective utilization of a nation's human resources. Labor force projections are used for estimating the number of jobs needed in future years to ensure full employment; the net annual entrances at the younger ages and net withdrawals at the older ages; the magnitude of investments required in the development of land and in various kinds of working equipment in order to make effective use of the prospective labor force; the number of workers to be trained for various types of employment, and, further, as an aid in

evaluating the adequacy of educational and training programs in the light of economic growth and development.

In order for federal and state governments to meet more successfully future developments in the labor force, careful studies of labor force projections should be made continually. The importance of accurate and useful labor force projections to government policy formulation cannot be overstressed. Projections of population size and composition and the proportion of the various age-sex groups which enter the labor market are basic data for employment planning, whether on a community, state, or national level. Also, the changes in the size and composition of the working force are of interest as indicators of economic and social changes which will be occurring in a society.⁸ The close relationships between population and labor force change call for continuing investigation and analysis in order that the structure and dynamics of future population and labor force be better understood.⁹

Although some criticism has been leveled at the projections and supply of information about the labor force, most projections prepared in the past have served a useful purpose. Projection techniques in recent years have continued to improve.

The unwillingness of policy makers in the fifties and expectations of projection users, and the inability or failure to use the projections available are more to blame for the criticisms than are the inadequacies of the projections themselves. Projections do not provide a blueprint of the future, but they do, in most cases, point the directions and signal the warnings necessary for sound policy. Because birth rates and labor force participation rates change slowly, demographic projections can provide

⁸Davis McEntire, The Labor Force in California (Berkeley, California: University of California Press, 1952), p. 1-2.

⁹Philip M. Hauser, "The Labor Force as a Field of Interest for the Sociologist," American Sociological Review, XVI (August, 1951), p. 531.

adequate guidance for at least 10 to 15 years ahead on growth potential, employment needs, and quantitative educational requirements.¹⁰

The investigation of labor force phenomena by sociologists can be studied through the application of demographic techniques to various labor force data. Through a study of labor force projections using demographic techniques, the growth, composition and distribution of labor force can be estimated for future years based on previous historical trends. Studies of this type are obviously important in our society, particularly at the state level where there is a critical shortage of this information.

The study of the labor force is relatively limited in Utah and the need for examination of this area of concern is vital. The results of study on this subject will be of value in understanding future labor force developments, especially at the local or state level where a critical shortage of information exists. Some attention will be given to social policies, social attitudes, social behavior, and social roles, as they influence future labor force developments.

Research procedure and organization of the dissertation

Following this introduction, which outlines the origin and nature of the problem, objectives of the study, and the justification for the study, a review of the available literature relevant to the area of concern in this study is presented in Chapter II. The review of literature will give information of previous research in the area of concern. After a study of the representative research, Chapter II presents a

¹⁰Garth L. Mangum and Arnold L. Nemore, "The Nature and Functions of Manpower Projections," Industrial Relations, V, No. 3 (May, 1966), p. 11.

brief summary of population projections for Utah by age and sex, for counties, multi-county areas, and the state for 1980, 1990, and 2000. Chapter IV deals with an analysis of labor force participation rates and trends for Utah from 1960 and 1970. Chapter V presents labor force projections for Utah by age and sex, for counties, multi-county areas, and the state to the year 2000. The labor force projections are carried out by using cohort analysis techniques based on the population projections presented in Chapter III and projected labor force participation rates. Chapter VI provides examination and description of the findings of the labor force projections and some social and economic implications for the State of Utah. Chapter VIII contains a summary and conclusions, followed by an appendix and a bibliography.

CHAPTER II

REVIEW OF THE CURRENT LITERATURE

The labor force

Although the term "labor force" was briefly defined in Chapter I, the concept is still relatively new and merits further discussion in this review.

Basically, there are two concepts of the economically active population. According to the first, in order to determine the "gainfully employed," one asks the person what his usual occupation or gainful work is without requiring exactly when the work was done. Based on this approach the economically active portion of the population are those who report some usual occupation in the census.¹

The other concept, more recently developed, regards the economically active population as the "labor force." This is the term used in this study. It represents the number of people actually working or seeking work during the particular short period of time of the census. A category which may also be distinguished is the numbers of unemployed, or the people not actively working at the time of the census, but seeking work.²

The chief distinction between these interpretations of the economically active population is the way in which the time of employment

¹George W. Barclay, Techniques of Population Analysis (New York: Wiley, 1958), p. 264-66.

²Ibid.

is classified. Use of the term "labor force," calls for the date of employment being exactly specified, whereas the term "gainfully employed," is based on the usual occupation of the person during an indefinite period.

Both of these definitions are found throughout the world. If an occupation is fairly steady and changes are not frequent, the actual situation of the economically active population may be more accurately reflected by using the term "gainfully employed." Where wage labor is common and where changes of occupation are frequent, the term "labor force" best serves to indicate the fluctuations in the volume of employment. Both terms are based on the notion of an economically active population as a group to be counted and classified.³

"Labor force" is the term used by the United States Bureau of the Census to describe the economically active population. The labor force includes all persons classified in the civilian labor force plus members of the Armed Forces.⁴

The labor force is a portion of the population which consists primarily of two classes. The first class includes those who, except in temporary circumstances, have a principal normal activity of gainful work and are always in the labor force. This classification includes nearly all able-bodied males from 25 to 60 years of age. The second class includes those whose attachment to the labor force is usually temporary and who move in and out of the labor market with changing circumstances. This classification includes women whose

³Ibid.

⁴U.S. Bureau of the Census, U.S. Census of Population: 1970, General Social and Economic Characteristics, Utah, PC(1)-C46, Appendix B.

attachment to the labor force depends upon their marital status and the extent of their responsibilities in the home. It includes the majority of males under age 25 who have to choose between employment and education, and the handicapped and aged whose labor force participation may vary with personal need for income, the availability of employment opportunities, personal attitudes toward employment, and other factors of consideration.⁵

However, at any particular time the active population will be only a portion of the total of potential workers.

There will be those who are too young and fully occupied with their education; and those who will be too old to work; ill health and disability will prevent other employment; and seasonal factors, determining the demand for workers in some industries and areas, also will affect the number of economically active.⁶

The civilian labor force consists of persons classified as either employed or unemployed. In 1970:

Employed persons comprise all civilians 16 years old and over who were either (a) "at work" - those who did any work at all as paid employees or in their own business or profession, or on their farm, or who worked 15 hours or more as unpaid workers on a family farm or in a family business; or (b) were "with a job but not at work" - those who did not work during the reference week but had jobs or businesses from which they were temporarily absent due to illness, bad weather, industrial dispute, vacation, or other personal reasons. Excluded from the employed are persons whose only activity consisted of work around the house or volunteer work for religious, charitable, and similar organizations.⁷

Unemployed persons were civilians 16 years old and over who:

⁵McEntire, The Labor Force in California, p. 2.

⁶Gartrude Bancroft, The American Labor Force (New York: John Wiley & Sons, Inc., 1958), p. 2.

⁷U.S. Bureau of the Census, U.S. Census of Population: 1970, General Social and Economic Characteristics, Appendix B.

(a) were neither "at work" nor "with a job, but not at work" during the reference week, (b) were looking for work during the past 4 weeks, and (c) were available to accept a job. Examples of job seeking activities are: (1) registering at a public or private employment office, (2) meeting with prospective employers, (3) checking with friends or relatives, (4) placing or answering advertisements, (5) writing letters of application, and (6) being on a union or professional register. Also included as unemployed are persons who did not work at all during the reference week and were waiting to be called back to a job from which they had been laid off.⁸

All persons considered not in the labor force are mainly students, housewives, retired workers, seasonal workers in the off season, inmates of institutions, disabled persons, and those persons doing only incidental unpaid family work.

The 1970 Census differed in some respects from those of 1950 and 1960. Probably the major differences were these: (1) in the earlier censuses, employment status data were presented for persons 14 years old and over, but in 1970 census reports relate to persons 16 years old and over in order to conform with the official measurement of the labor force as revised in January, 1967, (2) a specific time period of the past four weeks was added to the "looking for work" question, whereas earlier censuses had an ambiguous time period for jobseeking activities, and (3) the requirement that a person be currently available for work in order to be counted as unemployed in 1970.

The labor force or the economically active population is not independent of influences from various demographic, economic, and social factors. Population growth partly determines the state of the economy, not only in size and composition of the labor force, but in the nature of economic development as well. For example, an increase in

⁸Ibid.

population creates demand for housing, for products of business and industry, for schools and service industries, as well as provides a larger potential labor market and labor force. Various studies have shown that the business cycle is related to fluctuations in marriage rates, which in turn have influenced birth rates and population growth, thereby affecting the labor force. The social attitudes toward active employment may substantially affect the labor force participation and size of certain groups in society, as well illustrated by the recent surge in labor force participation of women in the United States. Although far from completely understood, the complex interrelationships between the population and various economic and social conditions are primary factors for understanding developments in the labor force of a society.

Long-term trends in the labor force

The long-term trends in the United States labor force show that the proportion of the working age population in the labor force has varied only from 52.2 percent in 1890 to about 60 percent in 1970 or about an 8 percent change over the last eighty years. Even though the proportion of the working age population in the labor force has shown only limited change, within this proportion changes have been occurring among various demographic groups.

As can be seen from Table 1, one important development has been the decline in the labor force participation of men in certain ages. Men in the ages 25 through 54 have consistently maintained a high labor force participation rate, around 94 percent, throughout the years; but for older men, particularly those 65 and over, labor force participation has been declining. For older men, the decade of the 1940's brought a

Table 1. Percent of the population in the labor force, by age, male and female, United States 1940-1960

Age	Male			Female		
	1960	1950	1940	1960	1950	1940
14-17	26.5	25.5	18.6	14.0	11.4	7.7
18-24	80.1	77.8	81.2	45.3	43.3	43.6
25-34	94.9	92.1	95.2	35.3	31.8	32.9
35-44	95.6	94.5	94.7	42.7	35.0	26.9
45-64	89.0	88.2	88.7	41.6	28.8	19.8
65 and over	30.5	41.5	41.5	10.3	7.8	5.9
14 years and over	77.4	78.9	79.0	34.5	29.0	25.4

Source: U.S. Bureau of the Census, U.S. Census of Population: 1960, General Social and Economic Characteristics, United States Summary, PC(1)-1C, p. 1-214, Table 84.

halt in the downward trend in labor force participation, probably because of labor shortages during most of those years. The downward trend resumed after 1950, however, and has been accelerated by the liberalization of the Social Security programs in the 1950's and 1960's. The same trends in retirement can be expected to continue with the liberalization of Social Security benefits and coverage.⁹

Among the changes in the long-term trends, was an upturn in the labor force participation of teenage boys and a downturn for men 20 to 24 years old. Teenagers have developed a new and favorable attitude toward after-school and vacation employment, while 20 to 24 year olds seem to be continuing in school or college to a greater extent than

⁹Bancroft, The American Labor Force, p. 30-31.

formerly.¹⁰ With the accelerated trends toward longer schooling and earlier retirement has come a striking decline in the work life expectancy for males.

Probably the most important development in the labor force has been the great increase in the labor force participation of women, which has offset the decline in the participation of younger and older men. The labor force participation rate of married women in the United States more than doubled from 1900 to 1940 and then doubled again from 1940 to 1960. In recent years the principal change in the composition of the labor force and most important source of its growth has been the increased participation of married women.¹¹ Between 1950 and 1960 the category "married female, husband present," accounted for slightly more than 56 percent (8.1 million) of the labor force growth.¹²

Throughout the 1900 to 1940 period, the female labor force participation was primarily an activity of young women. But, as already indicated, the recent large increases are attributed to large numbers of married women aged over 35 who are returning to the labor force or even entering it for the first time. These women have usually completed their childbearing and have only school age children to look after.¹³

¹⁰Ibid., p. 29.

¹¹Glen C. Cain, Married Women in the Labor Force: An Economic Analysis, Studies in Economics of the Economic Research Center of the University of Chicago (Chicago, Illinois: University of Chicago, 1966), p. 1.

¹²U.S. Department of Labor, Bureau of Labor Statistics, "Special Labor Force Report, No. 13," Reprint No. 2364, p. 3.

¹³Valerie K. Oppenheimer, "The Interaction of Demand and Supply and its Effect on Female Labor Force in the United States," Population Studies, XXI (November, 1967), p. 239.

However, recent figures have shown sharp increases in the participation of young women, 20 to 34 years of age.¹⁴

The large increases in the labor force participation of women especially since World War II are accounted for by various reasons. World War II gave the first real emphasis to an increasing women labor force due to the severe shortage of manpower at the time. Other long run changes in the American social and economic structure have contributed to the labor force growth for women. For example:

The increasing urbanization of the population which opened up employment opportunities for women but reduced the labor force participation of young and old men, the long-term decline in the birth rate which permits some married women to spend time in paid employment, and the increasing proportion of married women in the population, contribute to the growing women labor force. Other developments include extension of high school and college education, which postpones the entrance of young people into the full-time labor force; reduction of the work week which permits married women to work; vast expansion in clerical and sales jobs for which women can be employed, and the commercialization of many housekeeping functions that women have traditionally performed at home.¹⁵

Men constituted 84 percent of the labor force in 1890, but this dropped to 79.2 percent in 1970. The ratio of women to men more than doubled in the 80 years. For every 100 men in the labor force there were 20 working women in 1890 and about 50 in 1970. Table 1 shows two trends concerning labor force participation by sex in the United States. We find that women participation rates have increased from 25 percent for all women 14 years of age and over in 1940 to nearly 35 percent in 1960. Generally, males still have a much higher participation rate than

¹⁴U.S. Department of Labor, Manpower Report of the President (Washington, D.C.: U.S. Government Printing Office, 1970), p. 46.

¹⁵Bancroft, The American Labor Force, p. 28-29.

females, but there has been a slight shift downward in the participation rate of males in the labor force.

Industrial and occupational distribution
of the labor force

Although this study does not examine or provide projections of industrial and occupational categories of the labor force, a brief review of the related trends of these classifications is presented because these trends influence the differential labor force participation of various groups, as illustrated by the large increase of labor force participation by women primarily due to the expansion of clerical and sales jobs.

Further breakdowns in the classification of the experienced members of the labor force may be according to major industries or major occupational groups in which workers are engaged. The 1960 Census of the United States made use of the following major industrial groups: (1) agriculture, (2) forestry and fisheries, (3) mining, (4) construction, (5) manufacturing, (6) transportation, communication, and other public utilities, (7) wholesale and retail trade, (8) finance, insurance, and real estate, (9) business and repair service, (10) personal services, (11) entertainment and recreation services, (12) professional and related services, (13) public administration, and (14) industry not reported.

The classification of occupation by the Bureau of the Census was based on twelve major occupational groups: (1) professional, technical and kindred workers, (2) farmers and farm managers, (3) managers, officials, and proprietors, except farm, (4) clerical and kindred workers, (5) sales workers, (6) craftsmen, foremen, and kindred workers, (7) operatives and kindred workers, (8) private household workers, (9)

service workers expect private household, (10) farm laborers and foremen, (11) laborers, except farm and mine, and (12) occupation not reported.

Generally, concerning industrial composition, the most dramatic change in industry employment in recent years has been the employment shift toward service-producing industries. Other significant shifts over the past twenty years have been the reductions in agriculture, forestry, fisheries, mining, and personal services, and the increases in professional and related services. Employment in government has grown faster than in any other sector of the economy. A great deal of this rapid expansion is due to the expanding employment opportunities of state and local governments.¹⁶

The structure of employment by occupation has changed radically, and principally because of the decline in farming occupations. Farming occupations have experienced large declines, while manual occupations have grown in importance, particularly for the semiskilled workers. White collar occupations have been increasing steadily. Substantial increases have been observed for professional and technical workers; managers, officials, and proprietors; and clerical workers. Sales workers and service workers have also had increases although smaller than the above mentioned categories.¹⁷

¹⁶United States Department of Labor, Handbook of Labor Statistics 1971 (Washington, D.C.: U.S. Government Printing Office, 1971), p. 80.

¹⁷Ibid., p. 36.

Education and the labor force

Recently, it has been well documented that education is closely related to a person's employment status and income. The well educated workers tend to have lower rates of unemployment and higher incomes. In some cases this is not always so. For example, between 1958 and 1961, education had less effect upon rising income for women than for men, and less for white women than for nonwhite women.¹⁸

The results of a 1959 Labor Department study showed that half of the labor force had at least a high school education. Twenty years ago the same proportion had completed little more than the first year of high school. Only 6 percent had completed college in 1940; in 1959, 10 percent had completed college. That proportion of men completing college has been greater than that of women, probably due to rising incomes and to the large number of veterans who took advantage of the GI Bill.¹⁹

In her study of the American labor force, Bancroft found that, in general, the more education a person has, the more likely he or she is to be in the labor force, except at the ages where formal education is still unfinished and labor force activity is curtailed by current school enrollment.²⁰

As the United States has become a mature industrial society with increasing education requirements, the outstanding effect has been a postponement of the age for entering the labor force. Our society has embarked on an era in which education requirements for workers have

¹⁸Robert C. Cook and Tadd Fisher, "The U.S. Labor Force: 1950-1960: Islands of Obsolete Capacity and Unwanted Skills," Population Bulletin, XX, No. 3 (May, 1964), p. 57-87.

¹⁹Ibid.

²⁰Bancroft, The American Labor Force, p. 65-67.

been mounting and future prospects are for more educational years for more people.

Table 2 shows school enrollment by age and percent for the United States from 1910 to 1960. The table shows primarily the increase in enrollment in schools for the total population of 5 to 25 year olds. There have been marked increases of those 20 to 24 years old, as well as those of other ages enrolled in school.

Labor force projections for the United States

If the Bureau of Labor Statistics' labor force projections materialize, by 1985 there will be 107 million Americans in the labor force as compared to the 82 million by 1968.²¹ Table 3 gives population, total labor force, and labor force participation rates, by age and sex, in 1968, and projected to 1985 by the Bureau of Labor Statistics.

The labor force projections were based on the Bureau of the Census projections of population. According to the Bureau of Labor Statistics, the working age population can be projected with more confidence than some of the other variables in economic projections since everyone who will be old enough to work during the 1970's has been born, and death rates and net immigration are fairly steady.²² In addition, a choice of birth rates was selected because it affects the estimates of the number of mothers with young children which influences their labor force participation. The series C population projection of the Census Bureau (an average of 2,775 children per thousand women completed

²¹"The United States Economy in 1980: A Preview of BLS Projections," Monthly Labor Review, XCIII, No. 4 (April, 1970), p. 5.

²²Ibid., p. 6.

Table 2. School enrollment, by age and percent, for conterminous United States: 1910 to 1960

Census year and school enrollment	Total, 5 to 24 years old	5 to 19 years old						20 to 24 years old
		Total	5 and 6	7 to 13	14 and 15	16 and 17	18 and 19	
1960, percent enrolled	71.8	84.4	63.7	97.5	94.1	80.9	42.2	14.6
1950, percent enrolled	62.5	78.7	55.6	95.7	92.9	74.4	32.2	12.9
1940, percent enrolled	57.7	74.8	43.0	95.0	90.0	68.7	28.9	6.6
1930, percent enrolled	58.2	73.4	43.2	95.3	88.8	57.3	25.4	7.4
1920, percent enrolled	(1)	67.4	41.0	90.6	79.9	42.9	17.8	(1)
1910, percent enrolled	(1)	62.6	34.6	86.1	75.0	43.1	18.7	(1)

(1) Not available.

Source: U.S. Bureau of the Census, U.S. Census of Population: 1960, General Social and Economic Characteristics, United States Summary, Table 74, p. 1-206.

Table 3. United States population, total labor force, and labor force participation rates, by age and sex, enumerated 1968, and projected 1975, 1980, and 1985

(Numbers in thousands)

Sex and age	Total population, July 1				Total labor force, annual averages				Labor force participation rates, annual averages (percent)			
	Actual		Projected		Actual		Projected		Actual		Projected	
	1968	1975	1980	1985	1968	1975	1980	1985	1968	1975	1980	1985
Both Sexes												
16 years and over	137,659	154,318	165,554	176,282	82,272	92,792	100,727	107,156	59.8	60.1	60.5	60.8
Men												
16 years and over	66,538	74,429	80,332	85,028	53,030	58,876	63,612	67,718	79.7	79.1	79.2	79.6
16 and 17 years	3,715	4,250	4,243	3,928	1,713	1,993	2,015	1,882	46.1	46.9	47.5	47.9
18 and 19 years	3,584	4,175	4,383	3,821	2,482	2,789	2,880	2,491	69.3	66.8	65.7	65.2
20 to 24 years	7,976	9,741	10,596	10,674	6,788	8,124	8,795	8,806	85.1	83.4	83.0	82.5
25 to 34 years	11,915	15,729	18,557	20,418	11,376	15,100	17,815	19,601	95.5	96.0	96.0	96.0
35 to 44 years	11,588	11,082	12,576	15,630	11,122	10,650	12,086	15,020	96.0	96.1	96.1	96.1
45 to 54 years	11,773	11,347	10,726	10,554	10,364	10,666	10,082	9,921	93.6	94.0	94.0	94.0
55 to 64 years	8,492	9,267	9,745	9,828	7,030	7,512	7,849	7,852	82.8	81.1	80.5	79.9
65 years and over	8,194	8,835	9,507	10,174	2,154	2,042	2,090	2,145	26.3	23.1	22.0	21.1
Women												
16 years and over	71,122	79,889	86,221	91,254	29,242	33,916	37,115	39,438	41.1	42.5	43.0	43.2
16 and 17 years	3,592	4,128	4,082	3,778	1,130	1,280	1,274	1,190	31.5	31.0	31.2	31.5
18 and 19 years	3,470	4,061	4,232	3,686	1,818	2,095	2,175	1,876	52.4	51.6	51.4	50.9
20 to 24 years	7,812	9,558	10,401	10,394	4,251	5,438	5,991	5,997	54.4	56.9	57.6	57.7
25 to 34 years	12,350	15,695	18,440	20,282	5,104	6,969	8,427	9,431	42.4	44.4	45.7	46.5
35 to 44 years	12,361	11,376	12,801	15,754	5,869	5,802	6,708	8,397	48.7	51.0	52.4	53.3
45 to 54 years	11,814	12,185	11,422	11,151	6,132	6,568	6,259	6,155	51.9	53.9	54.8	55.2
55 to 64 years	9,389	10,564	11,287	11,408	3,938	4,677	5,103	5,134	41.9	44.3	45.2	45.0
65 years and over	10,936	12,323	13,557	14,803	999	1,087	1,178	1,258	9.1	8.8	8.7	8.5

Source: Sophia C. Travis, "The United States Economy in 1985: A Preview of BLS Projections," *Monthly Labor Review*, Vol. 93, No. 5 (May, 1970), p. 3-34.

fertility) was selected for purposes of projecting the distribution of women by presence of young children.²³

The Bureau of Labor Statistics projections of labor force participation rates were projected on the basis of past trends in each of the age-sex groups and some subgroups for which specific factors were taken into account. Generally the various age-sex groups were classified into four broad groups of men, in the central working ages, older men, young persons, and adult women, for illustrating the procedures in arriving at the projected participation rates.²⁴

For men in the central working ages of 25 to 54, it was decided to project the rates of participation at the constant level of the average for 1964 to 1968, since the rates for these men who work or look for work are very high and have remained fairly constant in the past.

Although the labor force activity of older men, age 65 and over, has been declining for some time, a tighter labor market the last few years permitted many of these men to continue work after the retirement age, thereby providing the basis for the assumption that the average annual change in the rates from 1968 to 1985 would be one-half the average change from 1957 to 1968. A further refinement was made to take into account the relatively greater importance of agricultural employment for men 65 and over by calculating their rates using agricultural and nonagricultural components.²⁵

²³Travis, p. 9.

²⁴Ibid., p. 10.

²⁵Ibid., p. 10-11.

For men under age 25 and women 16 to 19, labor force participation rates were projected separately by detailed age groups for those enrolled in school and nonstudents because of the large difference in the labor force activity of each. The rising participation of students in the labor force in recent years was carried forward in future years, while the rates for nonstudents were held constant at the high level observed from 1965 to 1967.²⁶

For adult women, marital status is a primary factor in the extent of labor force activity, with women who are married having the lowest participation rates and those who have never been married with the highest rates. The projections took account of these influences as marital and child status were considered for those 20 to 44 years old and only marital status for those women 45 years and older. For married women from 20 to 44 years old, rates were assumed to increase to 1985 at one-half the average annual change in rate observed for the period 1951 to 1968. The constant trends for women over age 25 who had never been married and women 45 and over were a basis for the average of the rates for 1964 to 1968 being used as the projected constant rate.²⁷

After the estimate of future labor force participation rates for various age-sex groups, the rates were applied to the projected population in each group in order to obtain the total labor force.

Basic assumptions underlying these projections are that there will be no large-scale military conflicts and the size of the Armed Forces will be at the pre-Viet Nam level of 2.7 million; that economic

²⁶Ibid., p. 11.

²⁷Ibid., p. 11-12.

activity will continue at high levels; that the proportions of young men and women who complete high school education and go on to college will continue to increase, and that the needed facilities to accommodate the larger numbers will be available; and that the direction of past trends in labor force participation rates of the various age groups of men and women will continue.²⁸

According to these projections three kinds of workers are expected to increase the supply of labor by 41 million through the 1970's: 34 million new, young workers looking for their first jobs; nearly 6 million women who either delayed their entry into the labor force or picked up the threads of work again after an absence; and over one million immigrants who will become part of the United States. Three kinds of workers will leave the labor force during the 1970's, reducing the total by 26 million: workers who die, workers who retire, and workers who decide not to work any longer.²⁹

The net effect of inflow and outflow on the age composition of the labor force through the 1970's will see a slight decline of teenagers, from 8.7 percent in 1968 to 8.3 percent in 1980 and they will number 8.3 million by 1980. Young people, 20 to 24 years old, will be increasing in numbers during the 1970's but at a slower rate than during the preceding decade. The proportion of the total labor force which these young adults constitute will continue to rise from 13.4 percent, or 11 million, in 1968, to 14.7 percent, or 15 million, by 1980. The number of early career workers, 25 to 34 years old, will increase

²⁸Ibid., p. 7-8.

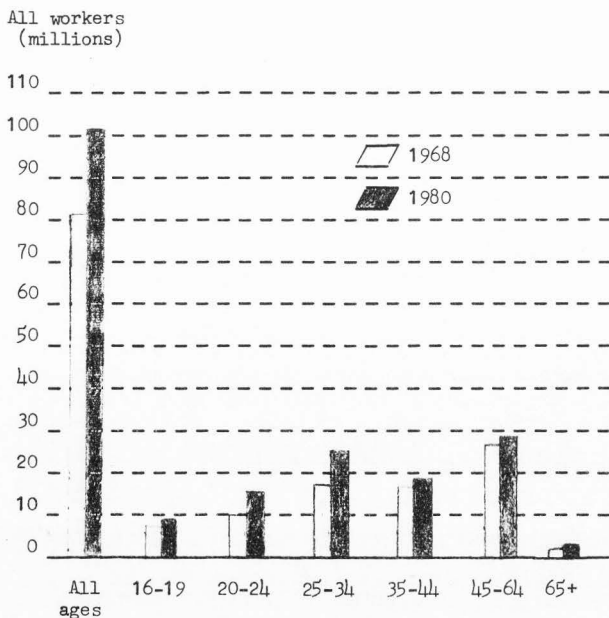
²⁹"The United States Economy in 1980: A Preview of BLS Projections," Monthly Labor Review, XCIII, No. 4 (April, 1970), p. 25.

tremendously. For this group this will mean an increase from 16.5 million in 1968 to over 26 million in 1980. The reason for the big expansion in young workers is the great surge in the fertility rate which occurred following World War II. The number of workers aged 35 to 44 will show a small increase of 2 million to 1980, but their proportion will decline 2 percent by 1980. A sharp slowdown will occur in the labor force growth rate among older workers 45 to 64 years of age. Their increase will be only one-third as great as that between 1960 and 1968, and their proportion of the total labor force will decline sharply from about 33 percent to about 29 percent. Finally, there will be no significant change for workers beyond the usual retirement age of 65 who will number just over three million through the 1970's.³⁰ Figure 1 shows the shape of the labor force in 1968 and 1980 as projected.

According to the Bureau of Labor Statistics projections, the labor force growth between 1980 and 1985 is expected to be slower than during the 1970's and will become even more concentrated in a few age groups. The decline in the annual number of births which began in 1962 assures a smaller teenage labor force in 1985 and little change for those 20 to 24 years old. The great growth evidenced by the 25 to 34 years old group in the 1970's will begin to shift to the next age group. The combined group 25 to 44 will account for all the labor force growth in this five-year period and will include almost one-half of all workers in 1985. Senior workers will show little change over 1980, but workers in ages 45 to 54 will begin to grow in the latter half of the decade.³¹

³⁰Ibid., p. 25-26.

³¹Travis, p. 5.



Source: "The United States Economy in 1980: A Preview of ELS Projections," Monthly Labor Review, XCIII, No. 4 (April, 1970), p. 3-34.

Figure 1. The shape of the United States labor force, enumerated 1968, and projected 1980

Concerning participation rates generally, six in every ten in the working age group are expected to be either working or seeking work in 1980, which is about the same as today. Any long-range increase in labor force participation reflects primarily the increasing proportion of women who work.³²

Expectations are that the United States labor force will have higher educational qualifications in 1980 with the proportion of workers with at least four years of high school rising among workers of all ages. Nearly one in six workers, 25 years and over, about 13 million, will have completed at least four years of college in 1980 as compared to about 8.5 million or one in seven in 1968.³³

Expectations are that industry employment will have continued to shift toward the service industries, including trade and government while occupational employment will have continued a long-term shift toward the white collar occupations and those requiring the most education and training.³⁴

Major studies of Utah's labor force

Four studies by members of the University of Utah Department of Economics deal with projections of Utah's labor force: (1) Employment and Population Analysis and Projections Salt Lake Metropolitan Area, Utah, and the United States, (2) Employment and Population Analysis and Projections Ogden Metropolitan Area, Utah, and the United States, (3) Employment and Population Analysis and Projections Provo Metropolitan

³²"The United States Economy in 1980: A Preview of BLS Projections," Monthly Labor Review, p. 27.

³³Ibid., p. 28.

³⁴Ibid., p. 3.

Area, Utah, and the United States, and (4) Employment, Population, Income and Automobiles in Salt Lake, Ogden, Provo Metropolitan Areas and State of Utah.³⁵

The primary purpose of the first three studies was to project the employment profile and estimate the population of Salt Lake, Ogden, and Provo metropolitan areas to the year 1980 by five-year intervals.

The fourth study provided a revision and coordination of the previous studies. In addition, the fourth study included projections of total and per capita income for Utah and the Wasatch Front metropolitan areas and the number of automobiles in use in the three metropolitan areas to 1985.

The studies followed three major steps. First, there was the collection, classification, and analysis of historical employment data in accordance with the Standard Industrial Classification Manual, 1945

³⁵Lawrence Nabers and Jewell J. Rasmussen, Employment and Population Analysis and Projections Salt Lake Metropolitan Area, Utah, and the United States (Salt Lake City, Utah: Bureau of Economic and Business Research, University of Utah, 1962).

Lawrence Nabers and Jewell J. Rasmussen, Employment and Population Analysis and Projections Ogden Metropolitan Area, Utah, and the United States (Salt Lake City, Utah: Bureau of Economic and Business Research, University of Utah, 1963).

Lawrence Nabers and Jewell J. Rasmussen, Employment and Population Analysis and Projections Provo Metropolitan Area, Utah, and the United States (Salt Lake City, Utah: Bureau of Economic and Business Research, University of Utah, 1964).

Lawrence Nabers, Jewell J. Rasmussen, and John W. Lord, Employment, Population, Income and Automobiles in Salt Lake, Ogden, Provo Metropolitan Areas and State of Utah (Salt Lake City, Utah: Bureau of Economic and Business Research, University of Utah, 1966).

and 1957 editions, for a particular period of years for the metropolitan areas, State of Utah, and the United States.³⁶ The time period selected for the studies of the existing patterns, trends, and relationships of economic activities in the Salt Lake and Ogden metropolitan area studies was 1952 to 1962; for the Provo metropolitan area study, 1952 to 1962; and the final study from 1952 to 1964.

The second major step included the determination of growth patterns by calculating annual percentage changes in employment by industrial classifications and then the making of employment projections to 1980 or 1985 on the basis of such trends. The procedure was justified in that a comparison of rates showed that the three levels of government displayed similar trends by major industrial groups. It appears that the employment projections were arrived at by multiplying the projected growth rates and the civilian labor force for each five-year period, although exact methodological procedures are vague.³⁷

A third and final step was the estimation of population for the three levels of government to 1980 or 1985 based on the relationship of total civilian labor force to civilian population. An examination of the ratios between the civilian population and the civilian labor force for the three levels of government in 1960 was the basis for determining a population multiplier for arriving at projected population.³⁸ Thus, the operating hypothesis in these studies was that the size of population is determined by the employment opportunities

³⁶Nabers and Rasmussen, Employment and Population Analysis and Projections Salt Lake Metropolitan Area, Utah, and the United States, p. 2-8.

³⁷Ibid.

³⁸Ibid.

available in any region. The quality of the population estimates depended primarily on the accuracy of the employment estimates.

Nabers and Rasmussen projected for Utah that the industrial areas of declining importance would be food and lumber, energy and fuels, primary metals, and transportation and communication. Employment was to significantly increase in nonmetallic minerals, metal fabrication, government, finance, and services was predicted to increase significantly.³⁹

For the Salt Lake metropolitan area, categories which were predicted to decline significantly were primary metals, construction, and transportation and communication. Areas of significant increase were nonmetallic minerals, metal fabrication, other manufacturing, government, finance, and services.⁴⁰

In the Ogden metropolitan area, categories predicted to decline were food and lumber, and transportation and communication. The areas of increase were manufacturing, government, distribution, finance, and services.⁴¹

Predicted to decline significantly in the Provo metropolitan area were agriculture and manufacturing. The areas of significant increase were government, finance, and services.⁴²

The authors indicated some limitations of the first three studies: (1) studies one and two were limited somewhat by the use of the

³⁹Ibid.

⁴⁰Ibid.

⁴¹Nabers and Rasmussen, Employment and Population Analysis and Projections Ogden Metropolitan Area, Utah, and the United States, p. 91.

⁴²Nabers and Rasmussen, Employment and Population Analysis and Projections Provo Metropolitan Area, Utah, and the United States, p. 73.

Standard Industrial Classification, (2) another limitation of the studies was reliance solely on employment data, (3) the base period of the studies was too short for revealing certain types of trends which may move in longer cycles, (4) there was the difficulty inherent in the study of a small region where one exogenous factor can completely change the underlying economic patterns, and (5) a special problem existed in the projection of employment and population in the Salt Lake and Ogden metropolitan areas and the State of Utah because of the relatively large and uncertain role of national defense activities in these areas.⁴³

The Department of Employment Security for the State of Utah is primarily concerned with furnishing up-to-date statistics and information on Utah's economy and employment; however, they do publish labor force projections ranging from one year to ten years in the future.⁴⁴ These forecasts are based on economic methods of projection, similar to those used by Nabers and Rasmussen, either by industrial categories for the state or labor force totals for each county and planning district in the state.

However, neither the Nabers and Rasmussen projections nor the Department of Employment Security have used the cohort analysis technique and therefore their studies do not provide labor force projections by age and sex. The work done by Nabers and Rasmussen is dated, uses employment projections by industry only, deals exclusively with the

⁴³Nabers and Rasmussen, Employment and Population Analysis and Projections Salt Lake Metropolitan Area, Utah, and the United States, p. 10-12.

⁴⁴Employment News Letter, State of Utah (Salt Lake City, Utah: Department of Employment Security, December, 1971).

Employment News Letter, State of Utah (Salt Lake City, Utah: Department of Employment Security, December, 1972).

metropolitan areas, and was based on vague non-component methods of civilian labor force projection. The Utah Department of Employment Security does labor force projections which are of a short-range nature by industrial categories in most cases, using non-component methods. The studies by Nabers and Rasmussen and the Department of Employment Security give information by industrial categories primarily and use non-component methods of labor force projection, which under the circumstances does not give proper consideration to various age-sex group factors such as the labor force participation of young and older men, married women, etc. There continues to be a demand for labor force study based on component methods of long-range projections at the state level in Utah.

Summary of the review of literature

The review of literature has pointed out that the concept of "labor force," as used by the United States Bureau of the Census, includes persons 16 years of age and over who are either working at a job or looking for work during the past four weeks. The labor force is that portion of the population which consists primarily of two classes of people. One class includes those who, except on occasional circumstances, have a principal normal activity of gainful work in the labor force. The other class includes those whose attachment to the labor force is usually temporary and who move in and out of the labor market with changing circumstances. There are always those in a society who for various reasons cannot be considered in the total of potential workers of a society.

The review indicated that various long-term trends of the labor force have been observed over the past years. One of the most important trends has been the decline in the labor force participation of younger

and older men. Another important long-term trend is the increasing participation of women in the labor force, particularly married women. Overall, women have generally increased their proportion of the total working force in the United States.

Research shows that the more education a person has the more likely he is to be in the labor force. As the United States has become an industrial society with increasing education requirements, the outstanding effect has been the postponement of the age for entering the labor force.

The Bureau of Labor Statistics projects 107 million Americans to be in the labor force by 1985. Projected increases in the labor force will mainly come from new young workers, immigrants to the United States, and women workers who come into the labor force. Increasing numbers in the projected United States labor force from 1970 to 1980 will include 20 to 24 year olds, but by far the greatest increase will come from 25 to 34 year olds. A slowdown will occur in the labor force growth rate among older workers. By 1985 the combined age groups of 25 to 44 year olds will account for all projected labor force growth and will include one-half of all workers in the United States.

The review indicates that a limited amount of work has been done concerning long-range labor force projections in Utah and that no labor force projections have used the cohort analysis technique. Studies by Nabers and Rasmussen and the Department of Employment Security give information by industrial categories and use economic methods of labor force projections; they give no consideration to various age-sex factors vital to an understanding of the labor force. There continues to be a demand for labor force study based on component methods of long-range projections at the state level in Utah.

The above summary of the review of literature has presented basic points concerning the phenomenon of the labor force which has been given in this chapter.

CHAPTER III

UTAH POPULATION PROJECTIONS TO 2000

Introduction

During the past forty years, Utah has experienced rapid population growth. From 1930 to 1970, Utah's population increased from 507,847 to 1,059,273 or about 108 percent, a much greater gain than the national average of about 65 percent. In the 1950 to 1960 decade, Utah's population increased from 688,862 to 890,627 or a gain of 29 percent compared with about a 19 percent gain for the United States. Between 1960 and 1970 Utah's population increased by about 18 percent, five points above the rate of the United States.

Major components of Utah's population growth were due to natural increase while only about 1.5 percent of Utah's population increase from 1950 to 1960 can be attributed to in-migration.¹ It is interesting to note that migration has made so small a contribution to the increase.

The average birth rate in Utah for 1960 was 29.8 compared with the average death rate of 6.7, resulting in a natural growth rate of 23.1, which was well above that of the nation.² The average birth rate declined from 29.8 in 1960 to 22.6 in 1970, while the death rate remained almost the same during the same period with a negligible

¹United States Bureau of the Census, Current Population Reports, Series P-25, No. 247 (April 2, 1962), p. 4.

²Utah State Department of Health, Vital Statistics Annual Report, (Salt Lake City, Utah: Bureau of Vital Statistics, 1960), p. 1.

reduction from 6.7 in 1960 to 6.6 in 1970.³ As a result, the natural growth rate of population in Utah declined from 23.1 in 1960 to 18.7 in 1970.

Utah's population is distributed very unevenly over its land area. In 1960, about 670,000 persons or 75 percent of the state's population lived in an urban environment as compared with 70 percent for the United States. In 1970, 851,472 persons or 80.3 percent of the population lived in urban areas in the State of Utah compared to only 73.5 percent for the nation. The four Wasatch Front counties (Salt Lake, Weber, Davis, and Utah), which account for less than 5 percent of Utah's land area, contain 74.7 percent and 77.5 percent of the state's population in 1960 and 1970 respectively. In 1970, the other twenty-five counties shared less than 23 percent of the population in varying proportions.

Information concerning population and labor force of an area is usually more useful if it is available for political subdivisions rather than for the whole area. However, in Utah, where about 80 percent of the population was found in the four Wasatch Front counties in 1970 and the remaining 20 percent of the population was scattered in 25 other counties, the size of the labor force in most counties was too small for meaningful analysis. All but the five most populated counties of the state were combined into five multi-county areas with the aim of obtaining more accurate projections of the future labor force in these areas. Because sparse numbers of individuals in the labor force in most of these rural counties are subject to sudden economic fluctuations,

³Utah State Department of Health, Vital Statistics Annual Report, (Salt Lake City, Utah: Bureau of Vital Statistics, 1970), p. 26.

larger numbers of individuals, arrived at by combining rural counties into multi-county areas, were used for better results. Basically, the selection of counties for each multi-county area was based on geographical location, and, to a much lesser extent, the economic characteristics of the county. Therefore, in this study the future labor force and population are projected for each of the four Wasatch Front counties, Cache County, and five multi-county areas covering the rest of the state, so that the study will be meaningful to geographical subdivisions and the state as a whole.

The State of Utah was thus divided into the five most heavily populated counties of Cache, Davis, Salt Lake, Utah, and Weber, and five multi-county areas as indicated in Figure 2. Multi-County area 1 consisted of Box Elder County and Tooele County, Multi-County Area 2 included Rich County, Morgan County, Summit County, Daggett County, Wasatch County, Duchesne County, and Uintah County. Multi-County Area 3 included Juab County, Millard County, Beaver County, Iron County, and Washington County. Multi-County Area 4 included Sanpete County, Carbon County, Sevier County, Emery County, and Grand County. Finally, Multi-County Area 5 consisted of Piute County, Wayne County, San Juan County, Garfield County, and Kane County.

Population projections

The future size of the labor force depends, to a large extent, upon the future changes in age-sex composition of the population since the number of workers available at any time depends mainly on the number of persons of working age population. When population projections are available, the future size of the labor force can be estimated by applying to separate age groups of males and females that proportion

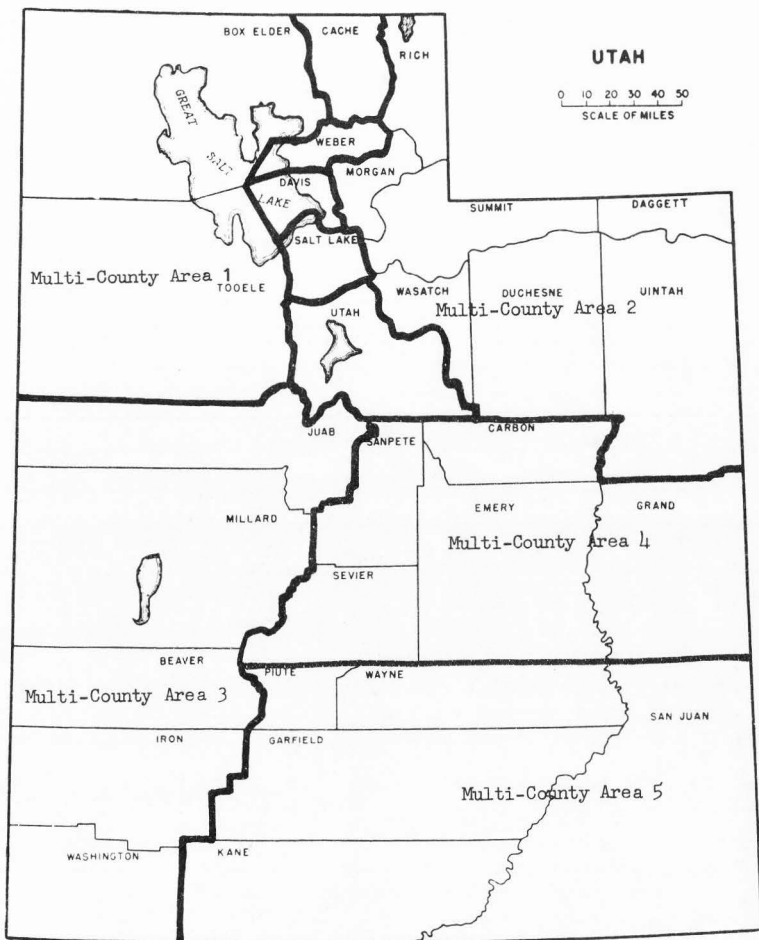


Figure 2. State of Utah map indicating counties and multi-county areas

which, on the basis of historical and other analysis, can be expected to be in the labor force. Thus, prior to the labor force projections, it is necessary to obtain population estimates by age and sex.

Incorporated into this study, for the purpose of projecting future labor force for Utah, are population projections being prepared for Utah counties by Yun Kim and Theres R. Black.⁴

The method of population projections used by Kim and Black is the so-called Component Method which usually involves projections of numbers of males and females in each age group of the population separately. This method deals with the population changes by components; births, deaths, and migration. Changes in these components occur because of changes in all social, economic, and other cultural factors. In other words, the method assumes that man is both a rational and emotional being, and the totality of his actions is reflected in changes in births, deaths, and migration.

The primary advantage of this method is that actual changes in population components are used in computing future population, which makes it possible to obtain age and sex composition of the population in addition to the total population. The future population is projected by each component because if there are errors in one of the basic assumptions, it is possible to identify the errors when additional information is made available. For example, if the assumptions on the future course of fertility are too high, then the errors in the projection are confined to the cohorts born during the projection period, and,

⁴Yun Kim and Theres R. Black of the Department of Sociology at Utah State University are in the process of preparing population projections for Utah to be published at a later date. In this study some preliminary projections in their work have been utilized.

therefore, the size of population in other ages still can be acceptable if the assumptions on mortality and migration are correct.

Disadvantages of this method include the following: the data from which rates are computed are data of the past and conditions which could change population radically cannot be foreseen, trends may or may not continue; and numerous calculations are involved.⁵ Nevertheless, the accuracy of the component method, as with other methods, is dependent upon the correctness of assumptions used.

The population of a given area or region at various points in the future depends upon the three components of births, deaths, and net migration into an area. Since future births, deaths, and net migrants can neither be counted nor determined at present, it is necessary to develop a way to estimate what they might be.

Reasonable estimates about the future numbers in each of the components is based upon knowledge of the past. One of the basic elements of knowledge concerning the past is the number of births, deaths, and net migrants in some specified recent period of time.

Population projections by age and sex by the component method require (1) the base year population by age and sex, (2) sex ratio at birth, (3) assumptions on the level and trend of mortality, (4) assumptions on the level and trend of fertility, and (5) assumptions on migration levels and trends.

Kim and Black utilized the age and sex population enumerated in the 1970 Census in various counties as the base population and the average registered sex ratio at birth of 105 males to 100 females

⁵Therel R. Black and James D. Tarver, Age and Sex Population Projections of Utah Counties, Utah State University, Agriculture Experiment Station, Bulletin 457 (December, 1965), p. 10.

during the 1960's as the prevailing sex ratio for the projection period.

In order to project the age specific death rates, the number of deaths for each age and sex group in the State of Utah during the years 1968 to 1970 were applied to the 1970 Census population for each age and sex group.⁶ These age specific death rates were converted into age group survival rates following the principles of life table construction. The age group survival rates were applied to each age and sex group to obtain the number of survivals at the end of each projection period.

Similarly, the annual births by age of mother in each county for the period 1960 to 1970 were applied to the average female population in the reproductive age groups enumerated in the 1960 and 1970 Censuses to obtain age specific fertility rates for every county. These rates were applied to the future populations to obtain projected births.⁷

Assumptions regarding the future trends in fertility, mortality, and migration relating to the projection series used in this study are these: (1) there will be no significant changes in the fertility of women, (2) no significant improvements in the medical sciences are expected and therefore changes in the death rates will be minor for the projection period, and (3) since migration accounts for so little increase in Utah's population, no calculations of interstate migration were made for the state. This projection series made no calculations

⁶The average yearly deaths is applied to the census population of April 1, 1970, rather than to the mid-year population of 1969 resulting in a slightly larger population and a somewhat underestimation of the mortality rates.

⁷Births given by mothers whose ages were not known or who were under age 15 are disregarded.

of internal state migration either. Based on these assumptions, the population of Utah enumerated in each county in the 1970 Census was projected by age and sex to 1980, 1990, and 2000.⁸ The projection results are presented in Tables 4 through 14.

According to these projections, the population of Utah will increase from 1,059,273 in 1970 to 1,315,326 in 1980; 1,611,867 in 1990; and 1,944,615 in the year 2000 or an increase of 24.1 percent, 22.5 percent, and 20.6 percent during the next 10, 20, and 30 years, respectively. More significantly, there will be considerable growth of the working age population during the next 30 years. For males, the population aged 15 to 64 will increase from 309,376 in 1970 to 384,394 in 1980; 461,751 in 1990; and 588,348 in 2000, while the female working age population for the same years will increase from 319,787 to 391,084; 462,913; and 578,852, respectively. The changes in the population of the working age groups are undoubtedly due to recent changes in fertility.

Figures 3 through 6 show the age-sex profiles of the State of Utah's population enumerated in 1970 and those based on the projections for the population growth in 1980, 1990, and 2000. The figures also indicate the differences in population growth between 1980 and 1970, 1990 and 1980, and 2000 and 1990.

The most outstanding population trend observed in Figure 3, is the possible trend of declining birth rate as represented by the size of the bar for those males and females under age five. Increases in the working age populations of those aged 16 through 30 in 1970 are particularly evident from the table.

⁸The original population projections done for Utah were by 5-year age groups of 1975, 1980, 1985, 1990, 1995, and 2000; but for the purposes of this study only figures for 1980, 1990, and 2000 were adopted.

Table 4. Utah's population by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Male				Female			
	Enumerated 1970	1980	Projected		Enumerated 1970	1980	Projected	
			1990	2000			1990	2000
0-4	57300	90550	100095	119205	54498	85763	95902	114218
5-9	59530	77506	97184	105708	57649	73823	91585	100678
10-14	63062	56898	89914	99394	60510	53853	84736	94752
15-19	58215	59219	77103	96676	58392	56870	72824	90275
20-24	46185	62444	56342	89064	51674	59618	53056	83477
25-29	35966	57306	58296	75903	36201	56500	56485	72328
30-34	28652	45412	61408	56385	29142	51277	59158	52651
35-39	26320	35365	56343	57312	27238	35882	56499	55985
40-44	26937	28071	44487	60099	27053	28804	50683	58469
45-49	25892	25550	34331	54699	26619	26771	35247	55532
50-54	23904	25752	26834	42527	24568	26418	28123	49483
55-59	20378	24036	23721	31841	20848	25701	25847	34049
60-64	16927	21239	22886	23842	18052	23243	24991	26603
65-69	12536	16926	19962	19702	14484	19087	23530	23662
70-74	9387	12690	14709	17154	11768	15689	20200	21723
75-79	6125	8116	10953	12918	8401	11641	15335	18904
80-84	3597	4862	6374	7620	5266	8111	10811	13926
85+	2352	1629	2165	2914	3645	2704	3748	4937
Total	523265	653571	803107	972963	536008	661755	808760	971652

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, General Population Characteristics, Utah, PC(1)-46B, p. 39.

Table 5. Population of Cache County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Male				Female			
	Enumerated		Projected		Enumerated		Projected	
	1970	1980	1990	2000	1970	1980	1990	2000
0-4	2170	3911	3864	4628	2011	3748	3702	4434
5-9	2101	3361	3951	4004	2025	3202	3764	3814
10-14	2176	2154	3884	3837	2184	1982	3703	3658
15-19	2600	2090	3343	3931	2710	1998	3158	3693
20-24	3170	2154	2133	3846	2924	2152	1953	3648
25-29	1613	2559	2057	3291	1308	2692	1984	3137
30-34	1102	3117	2118	2098	1045	2902	2136	1938
35-39	888	1586	2516	2022	815	1297	2668	1966
40-44	866	1079	3053	2075	866	1033	2869	2111
45-49	724	862	1539	2442	775	802	1274	2622
50-54	781	828	1031	2918	877	846	1008	2801
55-59	728	672	800	1429	771	749	774	1230
60-64	664	694	736	916	772	830	800	953
65-69	569	605	558	664	646	706	686	708
70-74	427	497	520	551	569	671	721	696
75-79	306	368	391	361	429	519	567	551
80-84	182	221	258	269	251	392	462	497
85+	127	81	98	104	159	138	167	182
Total	21194	26839	32850	39386	21137	26659	32396	38639

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, General Population Characteristics, Utah, PC(1)-46B, p. 73.

Table 6. Population of Davis County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Male				Female			
	Enumerated	Projected			Enumerated	Projected		
	1970	1980	1990	2000	1970	1980	1990	2000
0-4	5970	8888	11154	12909	5654	8517	10687	12368
5-9	6672	7205	10400	11634	6608	6863	9907	11083
10-14	7044	5929	8826	11075	6768	5586	8414	10559
15-19	6699	6637	7167	10346	4999	6519	6770	9723
20-24	3515	6975	5871	8770	3329	6668	5504	8289
25-29	3050	6595	6533	7056	3507	4965	6475	6724
30-34	3068	3456	6859	5773	3293	3303	6616	5462
35-39	3146	2999	6485	6423	3164	3476	4921	6418
40-44	2775	3006	3385	6720	2728	3255	3265	6539
45-49	2700	3054	2911	6296	2570	3110	3417	4837
50-54	2019	2653	2873	3236	1805	2663	3178	3188
55-59	1343	2506	2835	2703	1250	2482	3002	3298
60-64	998	1794	2357	2553	905	1707	2519	3007
65-69	576	1116	2082	2355	651	1144	2273	2748
70-74	415	748	134	1766	525	787	1484	2190
75-79	299	373	722	1348	360	523	919	1826
80-84	153	215	387	69	201	362	543	1023
85+	97	79	99	193	172	116	169	296
Total	50539	64228	81080	101225	48489	62046	80063	99578

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, General Population Characteristics, Utah, PC(1)-46B, p. 74.

Table 7. Population of Salt Lake County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Male				Female			
	Enumerated		Projected		Enumerated		Projected	
	1970	1980	1990	2000	1970	1980	1990	2000
0-4	24872	37360	41783	50227	23855	35796	40035	48126
5-9	25981	33190	39992	44654	25054	31613	38093	42534
10-14	26394	24698	37097	41490	25705	23569	35367	39554
15-19	22547	25845	33017	39783	23534	24715	31184	37577
20-24	18150	26136	24457	36734	21601	25326	23221	34844
25-29	16628	22196	25442	32503	17328	22381	24548	30973
30-34	13324	17847	25700	25032	13324	21434	25130	23042
35-39	11463	16349	21823	25014	12009	17174	22183	24331
40-44	11937	13053	17484	25176	11993	13169	21185	24837
45-49	11436	11128	15871	21187	11877	11803	16880	21803
50-54	10347	11412	12478	16714	10958	11708	12857	20683
55-59	8666	10616	10330	14733	9167	11467	11396	16297
60-64	7272	9193	10140	11087	8178	10367	11076	12164
65-69	5358	7198	8818	8581	6586	8394	10499	10434
70-74	4065	5451	6890	7600	5507	7108	9011	9627
75-79	2615	3469	4658	5707	3974	5292	6744	8435
80-84	1516	2105	2624	3569	2517	3796	4900	6212
85+	1067	695	922	1239	1802	1280	1704	2172
Total	223638	277941	339526	411030	234969	286392	346013	413645

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, General Population Characteristics, Utah, PC(1)-46B, p. 77.

Table 8. Population of Utah County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Male				Female			
	Enumerated		Projected		Enumerated		Projected	
	1970	1980	1990	2000	1970	1980	1990	2000
0-4	7735	13257	12456	14406	7332	11703	11934	13804
5-9	6879	11412	13053	12720	6526	10870	11444	12117
10-14	7442	7681	13164	12369	6933	7244	11563	11791
15-19	8508	6843	11352	12985	9837	6438	10723	11289
20-24	10152	7369	7606	13035	11468	6831	7137	11392
25-29	5362	8277	6736	11175	4527	9770	6394	10650
30-34	3180	9983	7247	7479	3118	11379	6778	7082
35-39	2837	5272	8138	6622	2975	4487	9684	6337
40-44	2908	3115	9780	7099	2956	3082	11247	6699
45-49	2662	2754	5119	7901	2769	2924	4410	9518
50-54	2537	2780	2978	9349	2669	2893	3009	10980
55-59	2229	2471	2557	4752	2370	2673	2822	4258
60-64	1848	2254	2470	2646	1954	2525	2737	2847
65-69	1405	1851	2052	2124	1556	2170	2447	2584
70-74	1016	1385	1689	1851	1215	1699	2194	2379
74-79	603	910	1198	1328	851	1250	1744	1966
80-84	350	526	718	875	576	838	1171	1513
85+	228	161	242	319	363	274	403	562
Total	67781	88301	108555	129035	69995	89050	107841	127768

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, General Population Characteristics, Utah, PC(1)-46B, p. 79.

Table 9. Population of Weber County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Male				Female			
	Enumerated		Projected		Enumerated		Projected	
	1970	1980	1990	2000	1970	1980	1990	2000
0-4	6424	10543	11286	13785	6124	10101	10815	13209
5-9	6721	9121	11081	12032	6496	8689	10555	11462
10-14	7530	6380	10469	11207	7180	6051	9980	10685
15-19	6933	6686	9073	11023	7005	6408	8571	10412
20-24	5369	7456	6317	10366	6093	7074	5961	9833
25-29	4017	6825	6582	8932	3920	6457	6365	8513
30-39	3115	5279	7332	6211	3279	6046	7019	5915
35-39	3125	3950	6711	6472	3233	3886	6896	6309
40-44	3329	3051	5171	7183	3445	3241	5976	6937
45-49	3408	3034	3835	6516	3673	3177	3820	6778
50-54	3208	3183	2916	4943	3154	3363	3164	5834
55-59	2612	3163	2816	3560	2689	3546	3068	3688
60-64	2079	2850	2829	2591	2298	2983	3182	2993
65-69	1572	2170	2627	2339	1862	2462	3246	2809
70-74	1115	1558	2136	2120	1489	1997	2593	2766
75-79	742	1017	1405	1700	1128	1496	1978	2608
80-84	501	578	807	1106	659	1026	1376	1788
85+	299	197	279	374	450	363	482	637
Total	62101	77041	93672	112460	64177	78366	95047	113176

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, General Population Characteristics, Utah, PC(1)-46B, p. 80.

Table 10. Population of Multi-County Area 1 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Male				Female			
	Enumerated		Projected		Enumerated		Projected	
	1970	1980	1990	2000	1970	1980	1990	2000
0-4	2796	4555	5498	6458	2562	4364	5268	6187
5-9	3056	3692	5185	5904	2988	3515	4939	5624
10-14	3323	2777	4522	5460	3162	2545	4312	5205
15-19	2594	3040	3674	5157	2427	2947	3468	4872
20-24	1600	3290	2750	4477	1665	3116	2508	4249
25-29	1499	2553	2993	3618	1591	2411	2926	3445
30-34	1413	1573	3236	2704	1469	1653	3092	2489
35-39	1420	1475	2510	2942	1408	1577	2390	2900
40-44	1418	1385	1541	3170	1325	1452	1634	3055
45-49	1295	1378	1431	2438	1268	1385	1549	2349
50-54	1307	1356	1323	1473	1230	1293	1418	1595
55-59	1024	1202	1280	1328	989	1224	1338	1496
60-64	852	1162	1206	1175	746	1163	1224	1341
65-69	565	850	998	1063	609	905	1120	1225
70-74	412	639	872	904	470	648	1012	1063
75-79	245	366	551	646	315	489	727	899
80-84	157	213	331	452	218	324	446	698
85+	119	65	97	147	137	102	157	234
Total	25095	31571	39998	49516	24579	31113	39528	48926

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, General Population Characteristics, Utah, PC(1)-46B, p. 73-8.

Table 11. Population of Multi-County Area 2 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Male				Female			
	Enumerated		Projected		Enumerated		Projected	
	1970	1980	1990	2000	1970	1980	1990	2000
0-4	2012	3267	4037	4857	2033	3131	3864	4654
5-9	2382	2605	3785	4275	2282	2481	3608	4065
10-14	2604	1998	3245	4009	2353	2009	3093	3818
15-19	2082	2370	2593	3766	1835	2252	2448	3560
20-24	915	2579	1977	3215	1133	2319	1978	3048
25-29	1066	2049	2333	2552	1181	1822	2238	2431
30-34	1076	899	2539	1945	1067	1125	2303	1964
35-39	1020	1049	2013	2293	1036	1169	1808	2219
40-44	1040	1056	880	2430	980	1054	1112	2277
45-49	970	989	1019	1954	920	1019	1149	1778
50-54	907	994	1010	841	907	958	1030	1087
55-59	926	900	919	917	851	889	984	1110
60-64	751	805	884	898	727	859	907	974
65-69	560	768	745	763	583	779	813	902
70-74	404	564	603	664	386	630	747	789
75-79	254	364	497	482	258	469	626	653
80-84	120	208	292	312	174	267	434	515
85+	73	69	97	131	121	84	151	202
Total	19162	23533	29468	36304	18827	23316	29293	36046

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, General Population Characteristics, Utah, PC(1)-46B, p. 74-9.

Table 12. Population of Multi-County Area 3 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Male				Female			
	Enumerated	Projected			Enumerated	Projected		
	1970	1980	1990	2000	1970	1980	1990	2000
0-4	2176	3498	3804	4607	1919	3350	3643	4414
5-9	2153	2810	3749	3997	2025	2676	3572	3807
10-14	2445	2161	3475	3777	2246	1896	3311	3599
15-19	2583	2139	2794	3727	2574	1998	2640	3524
20-24	1560	2420	2140	3442	1586	2212	1866	3261
25-29	1092	2541	2106	2751	1079	2555	1984	2619
30-34	892	1534	2379	2104	890	1572	2194	1852
35-39	882	1074	2498	2070	940	1069	2532	1966
40-44	982	873	1503	2330	1045	879	1553	2169
45-49	985	857	1043	2424	1001	923	1051	2487
50-54	991	939	835	1438	1044	1021	858	1517
55-59	924	914	795	967	937	965	891	1014
60-64	847	880	836	742	924	988	966	811
65-69	735	768	759	661	772	857	884	816
70-74	623	635	659	626	671	804	857	839
75-79	417	476	497	491	426	624	688	710
80-84	258	323	329	343	277	462	554	590
85+	130	112	126	132	177	137	201	222
Total	20675	24954	30327	36629	20433	24988	30245	36217

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, General Population Characteristics, Utah, PC(1)-46B, p. 73-9.

Table 13. Population of Multi-County Area 4 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

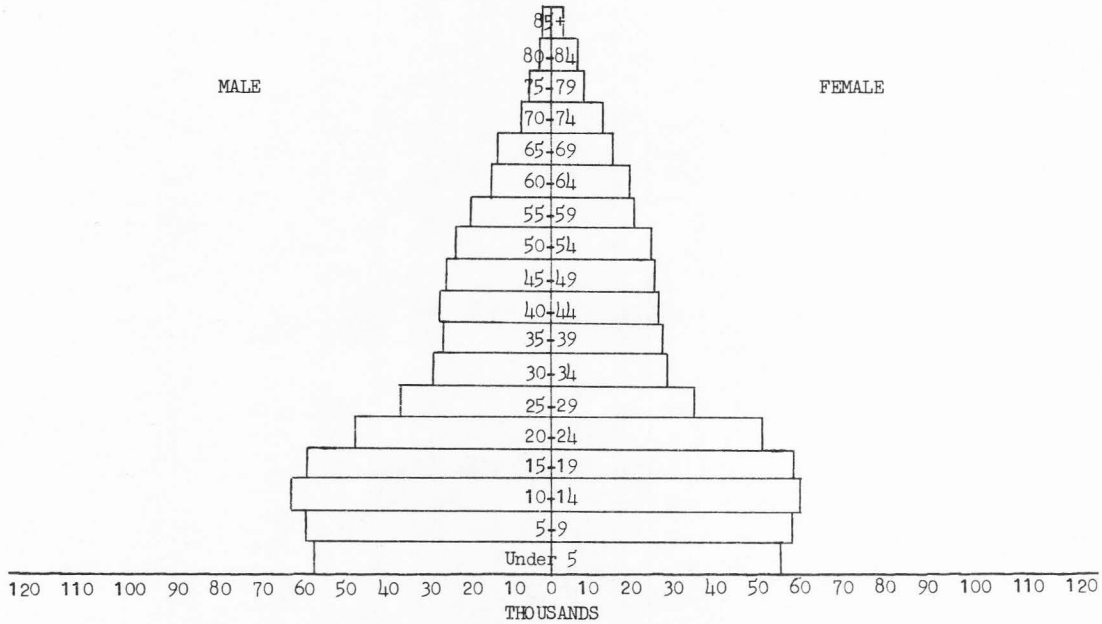
Age	Male				Female			
	<u>Enumerated</u>	Projected			<u>Enumerated</u>	Projected		
	1970	1980	1990	2000	1970	1980	1990	2000
0-4	2083	3540	3949	4521	2015	3392	3783	4331
5-9	2416	2757	3924	4035	2437	2625	3736	3840
10-14	2914	2067	3514	3921	2815	1989	3351	3737
15-19	2781	2404	2743	3904	2575	2403	2590	3685
20-24	1337	2886	2047	3479	1339	2773	1960	3302
25-29	1149	2738	2366	2699	1203	2556	2387	2572
30-34	1010	1313	2838	2012	1185	1329	2753	1944
35-39	1132	1129	2692	2326	1236	1193	2533	2366
40-44	1235	990	1286	2781	1286	1171	1313	2720
45-49	1303	1098	1096	2612	1363	1214	1172	2490
50-54	1361	1179	946	1230	1491	1254	1144	1282
55-59	1474	1211	1021	1018	1451	1317	1172	1132
60-64	1272	1210	1048	840	1211	1412	1184	1082
65-69	939	1224	1006	848	977	1328	1205	1072
70-74	721	955	908	786	795	1052	1227	1029
75-79	513	607	791	651	549	784	1067	969
80-84	302	374	495	471	330	526	724	845
85+	170	136	160	210	211	176	252	343
Total	24112	27818	32830	38344	24439	28494	33553	38741

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, General Population Characteristics, Utah, PC(1)-46B, p. 73-8.

Table 14. Population of Multi-County Area 5 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000


Age	Male				Female			
	Enumerated		Projected		Enumerated		Projected	
	1970	1980	1990	2000	1970	1980	1990	2000
0-4	1060	1731	2264	2807	993	1661	2171	2691
5-9	1169	1353	2064	2453	1208	1289	1967	2332
10-14	1190	1053	1718	2249	1164	982	1642	2146
15-19	988	1165	1347	2054	896	1192	1272	1940
20-24	417	1179	1044	1700	536	1147	968	1611
25-29	490	973	1148	1326	557	891	1184	1264
30-34	472	411	1160	1027	472	534	1137	963
35-39	407	482	957	1128	422	554	884	1173
40-44	447	463	404	1135	429	468	529	1125
45-49	409	396	467	929	403	414	525	870
50-54	446	428	444	385	433	419	457	516
55-59	452	381	368	434	373	389	400	526
60-64	344	397	380	394	337	409	396	431
65-69	257	376	317	304	242	342	357	364
70-74	189	258	298	286	171	293	354	345
75-79	131	166	243	204	111	195	275	287
80-84	58	99	133	154	63	118	201	245
85+	42	34	45	65	53	34	62	87
Total	8968	11345	14801	19034	8863	11331	14781	18916


Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, General Population Characteristics, Utah, PC(1)-46B, p. 75-9.

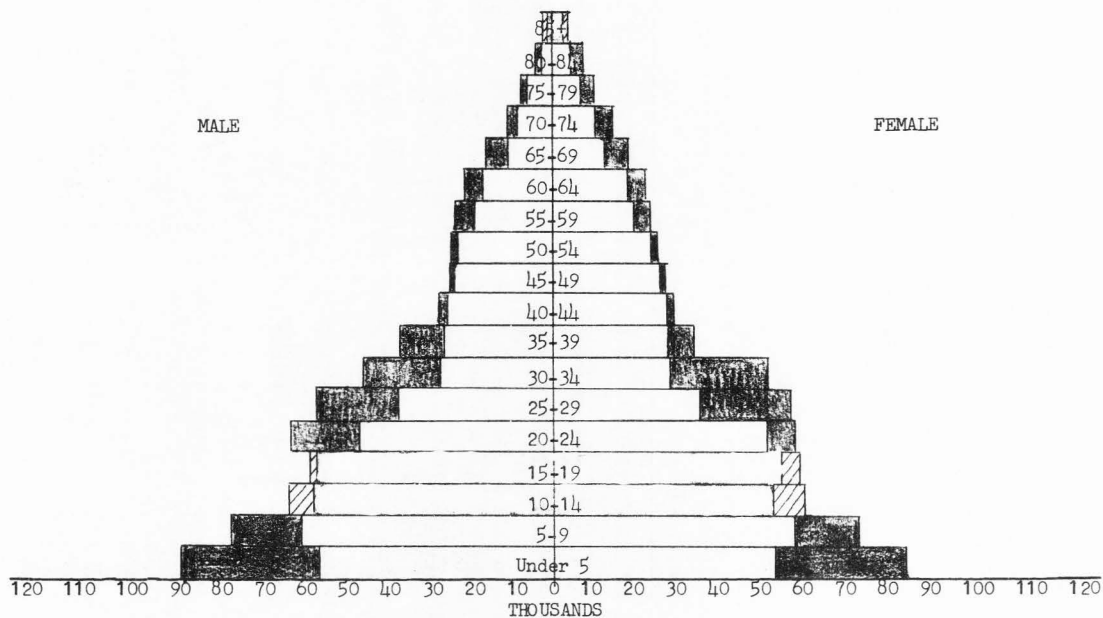


Source: Table 4

Figure 3. Age-sex profile of the State of Utah's population, enumerated 1970

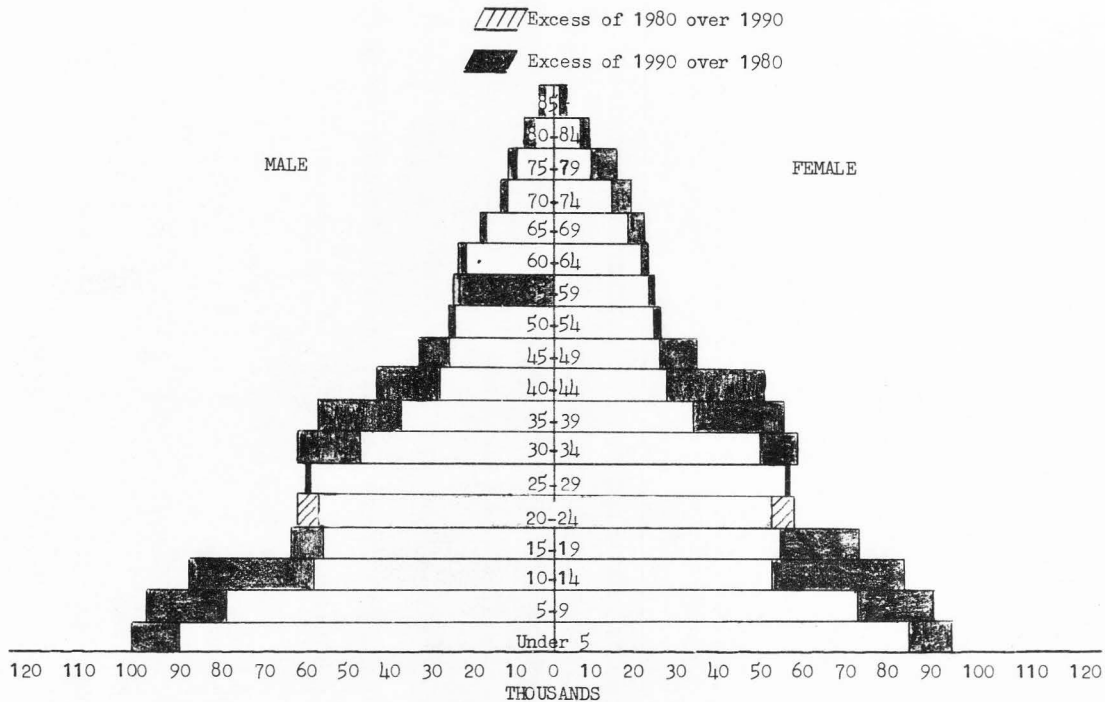
 Excess of 1970 over 1980

 Excess of 1980 over 1970



Source: Table 4

Figure 4. Age-sex profile of the State of Utah's population, enumerated 1970, and projected 1980

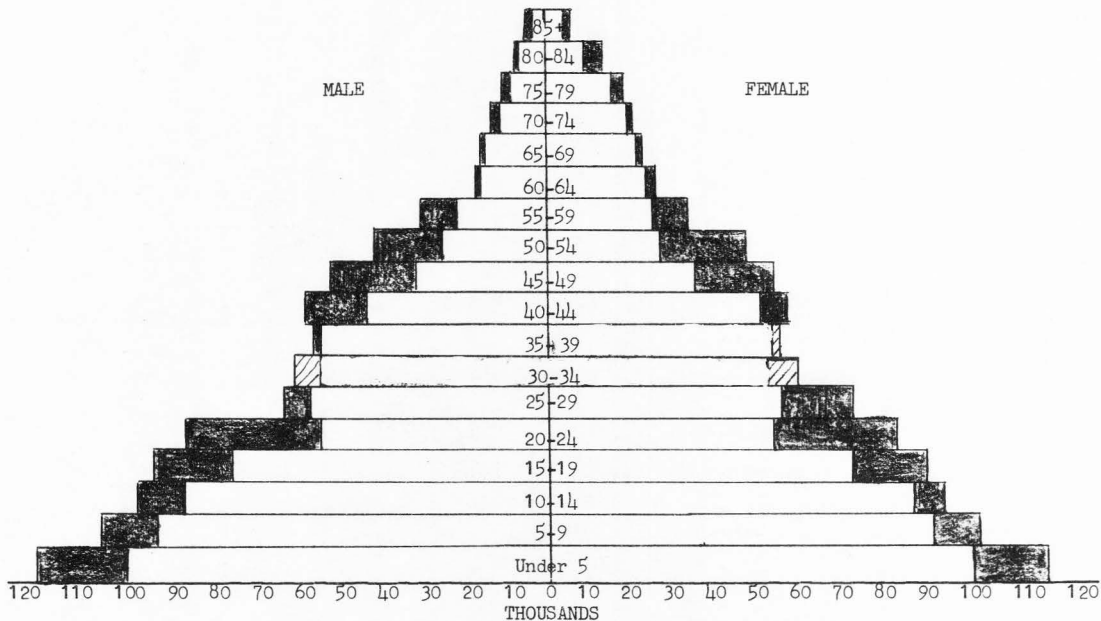


Source: Table 4

Figure 5. Age-sex profile of the State of Utah's population, projected 1980 and 1990

//// Excess of 1990 over 2000

■ Excess of 2000 over 1990



Source: Table 4

Figure 6. Age-sex profile of the State of Utah's population, projected 1990 and 2000

Figure 3 shows the population growth to 1980 and compares this growth to 1970's population. Most age groups show population increases, especially for the working age population of ages 20 through 40 for males and females.

In 1990, all age groups continue to show increases in population growth over the 1980 decade with the major exception being the age group 20 to 24. The decline of the working age group 20 to 24 represents the decline in birth rates of the late 1960's. Large increases in the working age population of ages 16 to 19 and 30 through 50 are shown for the decade in Figure 5.

Figure 6 presents the age-sex profile of Utah's projected population in the year 2000. As can be seen from the figure, the base of the population pyramid continues to expand with an ever larger number of people in the reproducing ages, although the birth rate remains essentially the same as in earlier projection periods. The groups of decline in the working age population of a decade ago have advanced ten years, while all others have shown increases as compared to the working age population groups of a decade earlier.

An examination of the population age-sex structure as projected is further explored for its implications for Utah's future labor force in later chapters.

CHAPTER IV

UTAH LABOR FORCE PARTICIPATION RATES,
1960 TO 1970

The objective of this chapter is to study the trends in labor force participation rates by age and sex for counties and multi-county areas in the State of Utah from 1960 to 1970. The changing patterns in the age-sex specific labor force participation rates between 1960 and 1970 will be the basis for projecting future labor force participation between 1970 and 2000 for every ten-year interval for each county and multi-county area. The projections of labor force participation rates and labor force are presented in Chapter V.

Utah's labor force participation
in 1960 and 1970

The census years of 1960 and 1970 are selected as the period for study of historical trends of labor force participation in the designated counties and multi-county areas. Although both censuses were taken on the same dates but ten years apart, different age groupings were used in 1960 and 1970 as far as the labor force statistics are concerned. Differences in age groupings were the 14 to 17 year old category in 1960 as compared to the 16 to 17 year old category in 1970, and the 18 to 24 age grouping in 1960 in contrast to 18 to 19, 20 to 21, and 22 to 24 years in 1970.

In order to accommodate the differences between the 1960's census age group 14 to 17 and 1970's 16 to 17, the participation rate for age group 16 to 17 in 1960 was estimated by graphic interpolation for all

counties and multi-county areas in the state. The age group of 16 to 17 was adopted in this study because the Bureau of the Census adopted this age category for classification of labor force data in 1967. The other adjustment was made by combining the 1970 Census age groupings of 18 through 24 into one grouping, 18 to 24, as found in 1960.

Table 15 indicates the labor force participation rates for the State of Utah in comparison to those of the United States in 1960. As can be seen from the table, Utah had a higher participation rate for both sexes for the age category of 14 to 17 as compared to the nation. However, the age group 18 to 24 had a participation rate in the state which was somewhat lower for both sexes than the national rate. Generally, for males age 25 through 64 the labor force participation rates were comparable to the national averages. The participation rates for those males 65 years of age and over were somewhat higher for Utah than were observed in the nation.

However, Utah's female participation rate for those females age 25 to 34 was well below that of the nation's females 25 to 34. All the females in Utah age 35 to 65 and over generally had lower participation rates than was observed for the same group in the nation.

The male participation rates for Utah in 1960 were somewhat higher than that observed for the nation. But the female participation rates on an average for the state were slightly lower than the national average for 14 years and over.

The labor force participation rates in 1960 pointed out some differences between Utah and the national pattern in certain detailed age-sex groups. In 1960 there was a higher participation rate among males in the teens than was evident in the nation. Also, there was a higher rate for males aged 45 years and over as compared to the national

Table 15. United States and Utah labor force participation rates by age and sex in 1960

Age	United States participation rate	Utah participation rate	Difference
Male			
14-17	26.5	36.3	-9.8
18-24	80.1	74.4	5.7
25-34	94.9	92.7	2.2
35-44	95.6	95.5	.1
45-64	89.0	92.0	-3.0
65+	30.5	35.9	-5.4
14 years and over	77.4	78.5	-1.1
Female			
14-17	14.0	19.2	-5.2
18-24	45.3	41.8	3.5
25-34	35.3	27.9	7.4
35-44	42.7	37.9	4.8
45-64	41.6	41.0	.6
65+	10.3	10.2	.1
14 years and over	34.5	32.4	2.1

Source: U.S. Bureau of the Census, U.S. Census of Population: 1960, General Social and Economic Characteristics, United States Summary, PC(1)-1C, p. 1-214.

U.S. Bureau of the Census, U.S. Census of Population: 1960, Vol. I, Detailed Characteristics, Part 46, Utah, p. 189.

averages. The data showed that females in the teens and early twenties had participation rates higher than those in the nation, although rates in Utah for females past age 25 were generally less in Utah than in the nation.

Table 16 shows the United States and Utah labor force participation rates by age and sex in 1970. As the table indicates, Utah males in the age group 16 to 17 had a lower participation rate than was found in the nation. Males in the age group 18 to 24 had a somewhat lower participation rate than males in this age group for the nation. The participation rates for males age 25 through 64 in Utah were comparable to the national averages, although there was a tendency for Utah's rates to be slightly higher, especially after age 34. The participation rates for those males 65 years of age and over were higher in Utah than the nation. The total participation rates for all males in the State of Utah were slightly lower than the national average which was probably due to the lower participation rates of males of college age in Utah.

Table 16 indicated that the labor force participation rates for females in Utah age 16 to 17 were lower than those of the nation. The rates of females 18 to 24 years of age continued to remain slightly below those of the nation in 1970. Utah's female participation rate for females age 25 to 34 was also below that of the nation's females 25 to 34. Generally, females in Utah age 44 to 65 and over had higher participation rates than was observed for the same group in the nation; the reverse of 1960. The overall total female labor force participation in Utah of 41.6 was lower than the United States average of 43.3.

Trends in labor force participation in 1970 showed some differences between Utah and the national pattern in certain age-sex groups in

Table 16. United States and Utah labor force participation rates by age and sex in 1970

Age	United States participation rate	Utah participation rate	Difference
Male			
16-17	47.0	42.8	4.2
18-24	77.9	71.1	6.8
25-34	96.6	92.7	3.9
35-44	96.6	96.0	.6
45-64	89.3	90.5	-1.2
65+	26.7	30.3	-3.6
16 years and over	79.7	78.1	1.6
Female			
16-17	34.9	25.6	9.3
18-24	56.4	51.7	4.7
25-34	47.9	39.5	8.4
35-44	47.9	48.9	-1.0
45-64	49.3	49.6	-.3
65+	9.7	9.7	.0
16 years and over	43.3	41.6	1.7

Source: Tables 17 and 18.

comparison to the relationships that existed in 1960. First, the higher participation rates of males in their teens in Utah for 1960 was reversed in 1970, with the nation having the higher participation rate. The higher participation rate for males aged 45 years and over as compared to the national averages continued in 1970. All age categories for females, except for the age category 45 to 64 were below the national averages in their labor force participation in 1970; this was a contrast to the 1960 rates when the teens were the only group to have a higher rate of participation. Table 16 shows a higher participation for Utah females in the age group of 35 to 44, but the accuracy of this comparison is questionable due to the means of arriving at the United States figure (refer to Table 17).

Tables 17 and 18 show the changes in the participation rates of Utah and the United States by age and sex from 1960 to 1970. As can be seen, the nation experienced an increase of 1.1 percentage points for males and 3.4 for females age 16 to 17, while Utah males increased .1 and females, 2.6. For other age groups of males, Utah experienced slightly smaller change increases for those 25 through 44 years of age and slightly larger change declines for those 45 through 65 and over years of age as compared to the nation. The total male labor force participation in Utah experienced a small decline in participation between 1960 and 1970, while the national average showed a decline of 2.7, although the 1960 overall rates for Utah include the consideration of the labor force participation of those in the ages of 14 and 15 because of a discrepancy in the Census Reports between 1960 and 1970. The discrepancy results in some underreporting of the total labor force participation in the state for males and females in 1960.

Table 17. United States labor force participation rates and changes by age and sex for 1960 and 1970

Age	1960 participation rate	1970 participation rate	Difference
Male			
16-17	45.9	47.0	1.1
18-24	80.1	77.9	-2.2
25-34	94.9	96.6	1.7
35-44	95.6	96.6 ⁺	1.0
45-64	89.0	89.3	.3
65+	30.5	26.7	-3.8
16 and over	82.4	79.7	-2.7
Female			
16-17	31.5	34.9	3.4
28-24	45.3	56.4	11.1
25-34	35.3	47.9	12.6
35-44	42.7	47.9 ⁺	5.2
45-64	41.6	49.3	7.7
65+	10.3	9.7	-.6
16 and over	37.1	43.3	6.2

⁺In 1970 the Department of Labor listed 25 to 44 as one category, thus the same participation rate is listed for both 25-34 and 35-44.

Source: Table 15.

United States Department of Labor, Bureau of Labor Statistics, Labor Force Annual Averages, 1970.

Sophia C. Travis, "The United States Economy in 1985: A Preview of BLS Projections," Monthly Labor Review, Vol. 93, No. 5 (May, 1970), p. 3-34.

Table 18. The State of Utah's labor force participation rates and changes by age and sex in 1960 and 1970

Age	State of Utah		
	Labor force participation rates (percent)		
	1960	1970	Difference
Male			
16-17*	42.7	42.8	.1
18-24	74.4	71.1	-3.3
25-34	92.7	92.7	.0
35-44	95.5	96.0	.5
45-64	92.0	90.5	-1.5
65+	35.9	30.3	-5.6
16 years and over	78.5 [†]	78.1	-.4
Female			
16-17*	23.0	25.6	2.6
18-24	41.8	51.7	9.9
25-34	27.9	39.5	11.6
35-44	37.9	48.9	11.0
45-64	41.0	49.6	8.6
65+	10.2	9.7	-.5
16 years and over	32.4 [†]	41.6	9.2

*This age category is estimated by graphic interpolation for 1960.

[†]This rate includes those in labor force for ages 14 and 15.

Source: U.S. Bureau of the Census, U.S. Census of Population: 1960, Vol. I, Detailed Characteristics, Part 46, Utah.

U.S. Bureau of the Census, U.S. Census of Population: 1970, Advance Report, General Population Characteristics, Utah.

U. S. Bureau of the Census, U.S. Census of Population: 1970, General Social and Economic Characteristics, Utah, PC(1)-C46.

All female age groups for both Utah and the nation showed substantial increases in participation with the exception of the age group of 65 and over which showed a decline in participation in Utah of -.5 and the United States of -.6. The overall labor force participation of females in both Utah and the nation showed increases between 1960 and 1970.

The labor force participation rates for counties and multi-county areas in Utah by age and sex in 1960 and 1970 are shown in Table 19. The table also gives the changes which resulted in the given rates between 1960 and 1970.

As can be seen from Table 19, in Cache County the participation rates of males in 1960 were rather high in the teen ages of 16 to 17 as compared to the state rate. However, the college ages of 18 to 24 were only 54.1 and 57.1 in 1960 and 1970 respectively as compared to the state average of 74.4 and 71.1. In most other age groups male participation rates were lower in Cache County as compared to the state averages, although they had comparable trends between 1960 and 1970. The total male labor force participation rate was lower in Cache County for both 1960 and 1970 in relation to the state average. By 1970, the county experienced declines in every age category for males, a pattern dissimilar to that of the state to some extent.

The female participation rates in Cache County were substantially the same as those of the state in 1960 and 1970. Although county and state patterns were almost the same in the changes between 1960 and 1970, some age groups had larger increases in the county than in the state and others were smaller.

Davis County, as shown by Table 19, experienced higher participation rates for males in all categories in 1960 than was evidenced in

Table 19. Utah's labor force participation rates and changes by age and sex, for counties and multi-county areas in 1960 and 1970

Age	Cache County			Davis County			Salt Lake County		
	Labor force partici- pation rates (%)		Differ- ence	Labor force partici- pation rates (%)		Differ- ence	Labor force partici- pation rates (%)		Differ- ence
	1960	1970		1960	1970		1960	1970	
Male									
16-17*	52.1	44.1	-8.0	45.2	32.2	-13.0	44.0	48.3	4.3
18-24	54.1	57.1	3.0	85.4	72.5	-12.9	81.3	78.1	-3.2
25-34	83.1	76.8	-6.3	97.3	97.8	.5	96.1	93.1	-3.0
35-44	97.4	94.8	-2.6	98.9	98.4	-.4	95.7	95.8	.0
45-64	96.0	93.3	-2.7	97.0	94.4	-2.6	93.3	90.4	-2.8
65+	33.1	27.0	-6.1	40.0	32.6	-7.4	34.2	31.1	-3.0
16 years & over	71.7 ⁺	68.6	-3.1	86.0 ⁺	81.6	-4.4	80.9 ⁺	80.6	-.3
Female									
16-17*	25.2	23.5	-1.7	22.5	25.6	3.1	23.4	25.7	2.3
18-24	44.4	47.0	2.6	35.2	52.9	17.7	49.0	57.3	8.3
25-34	28.7	35.3	6.6	21.7	36.0	14.3	31.3	42.3	10.9
35-44	32.2	48.5	16.3	38.3	51.1	12.8	40.3	49.0	8.7
45-64	35.3	49.2	13.9	45.6	50.3	4.7	44.4	51.1	6.7
65+	12.0	8.6	-3.4	9.0	9.8	.8	11.3	10.7	-.6
16 years & over	31.4 ⁺	38.9	7.5	30.8 ⁺	42.7	11.9	35.5 ⁺	43.4	7.9

Table 19. Continued

Age	Utah County			Weber County			Multi-County Area 1		
	Labor force partici- pation rates (%)		Differ- ence	Labor force partici- pation rates (%)		Differ- ence	Labor force partici- pation rates (%)		Differ- ence
	1960	1970		1960	1970		1960	1970	
Male									
16-17*	35.4	39.5	4.1	46.0	44.9	-1.1	47.1	37.0	-10.1
18-24	61.9	56.5	-5.4	86.4	78.3	-8.1	86.4	82.2	-4.2
25-34	84.9	85.7	.8	97.1	95.6	-1.5	97.7	98.8	1.1
35-44	96.9	95.7	-1.2	99.2	96.4	-2.8	99.9	97.6	-2.3
45-64	91.0	89.6	-1.4	93.0	90.0	-3.0	96.1	93.6	-2.5
65+	30.0	26.1	-3.9	33.0	27.8	-5.2	36.2	34.9	-1.3
16 years & over	72.7 ⁺	70.6	-2.1	81.4 ⁺	79.7	-1.7	80.9 ⁺	83.3	2.4
Female									
16-17*	18.3	24.8	6.5	25.2	25.8	.6	25.0	24.1	-.9
18-24	36.2	42.2	6.0	47.4	60.9	13.5	37.9	47.9	10.0
25-34	23.7	34.1	10.4	33.0	45.4	12.4	24.4	41.8	17.4
35-44	32.2	40.7	8.5	44.2	56.0	11.8	35.9	52.9	17.0
45-64	35.1	43.2	8.1	45.2	54.1	8.9	42.0	50.9	8.9
65+	8.1	9.4	1.3	10.7	9.5	-1.2	7.7	11.3	3.6
16 years & over	28.1 ⁺	36.8	8.7	36.5 ⁺	46.7	10.2	30.8 ⁺	42.4	11.6

Table 19. Continued

Age	Multi-County Area 2			Multi-County Area 3			Multi-County Area 4		
	Labor force partici- pation rates (%)		Differ- ence	Labor force partici- pation rates (%)		Differ- ence	Labor force partici- pation rates (%)		Differ- ence
	1960	1970		1960	1970		1960	1970	
Male									
16-17*	43.1	37.4	-5.7	47.3	46.1	-1.2	44.7	40.4	-4.3
18-24	83.4	74.8	-8.6	79.4	73.1	-6.3	75.4	68.1	-7.3
25-34	95.9	95.1	-.8	85.8	95.4	9.6	99.9	94.8	-5.1
35-44	97.3	91.6	-5.7	97.3	96.4	-.9	94.6	93.7	-.9
45-64	91.2	90.2	-1.0	93.2	88.3	-4.9	95.1	89.4	-5.7
65+	42.7	40.6	-2.1	40.9	28.2	-12.7	28.8	30.2	1.4
16 years & over	79.5 ⁺	78.9	-.6	77.2 ⁺	74.5	-2.7	77.6 ⁺	74.3	-3.3
Female									
16-17*	19.1	25.4	6.3	24.2	31.0	6.8	18.0	25.4	7.4
18-24	26.7	34.4	7.7	27.2	47.5	20.3	23.9	39.9	16.0
25-34	17.6	31.3	13.7	23.4	34.4	11.0	20.1	32.7	12.6
35-44	31.2	43.2	12.0	34.9	52.7	17.8	32.9	45.5	12.6
46-64	34.8	47.6	12.8	36.3	45.5	9.2	35.1	44.0	8.9
65+	6.7	9.3	2.6	7.9	5.6	-2.3	6.8	7.3	.5
16 years & over	24.6 ⁺	35.3	10.7	27.3 ⁺	37.5	10.2	25.1 ⁺	34.6	9.5

Table 19. Continued

Age	Multi-County Area 5		
	Labor force participation rates (%)		Difference
	1960	1970	
Male			
16-17*	36.1	27.5	-8.6
18-24	74.9	48.8	-26.1
25-34	92.3	94.6	2.3
35-44	95.0	87.1	-7.9
45-64	92.5	82.9	-9.6
65+	40.0	28.4	-11.6
16 years and over	77.9 ⁺	69.4	-8.5
Female			
16-17*	24.4	21.5	2.9
18-24	26.4	33.1	6.7
25-34	21.3	28.2	6.9
35-44	32.3	36.6	4.3
45-64	39.8	43.9	4.1
65+	5.8	9.8	4.0
16 years and over	27.6 ⁺	32.1	4.5

*This age category is estimated by graphic interpolation for 1960.

⁺This rate includes those in labor force for ages 14 and 15.

Source: U.S. Bureau of the Census, U.S. Census of Population: 1960, General Population Characteristics, Utah, Final Report PC(1)-46B.

U.S. Bureau of the Census, U.S. Census of Population: 1960, Vol. I, General Social and Economic Characteristics, Utah.

U.S. Bureau of the Census, U.S. Census of Population: 1970, Advance Report, General Population Characteristics, Utah.

U.S. Bureau of the Census, U.S. Census of Population: 1970, General Social and Economic Characteristics, Utah, PC(1)-C46.

state averages, although in 1970 the county showed lower participation rates in the age categories of 16 to 17 and 18 to 24. Besides the age categories of 16 to 17 and 18 to 24, Davis County experienced almost the same trends in changes of its participation rates between 1960 and 1970 as did the state.

In 1960 and 1970 the participation rates of females in Davis County were essentially the same as the state averages and the changes of both were very similar. The total county averages for females had a change of 11.9 points in percent which was somewhat higher than the state's 9.2. The county also showed slightly greater changes in percent for females in the age groups of 18 to 24 and 25 to 34 than the state.

Salt Lake County had participation rates similar to those of the state in both 1960 and 1970, also changes in percent were similar to the state's. The most outstanding difference was the increase in the participation rates of males 16 to 17, a 4.3 point percent increase as compared to the state's .1. Also, the county experienced a decline in participation of those 25 to 34, whereas the state remained the same in the participation of this age group.

The females in Salt Lake County had similar patterns as those of the state in participation rates, although the females in this county tended to have slightly higher participation rates in all but one of the age groups as compared to the state's. The point percent changes in participation between 1960 and 1970 were much the same as the state's.

For Utah County, Table 19 indicated that the participation rates for males and females for all age groups in 1960 and 1970 had lower participation rates than the rates for the state. Generally, the trends in the changes of the participation rates between 1960 and 1970 for males and females were comparable to the changes for the state.

The male labor force in Weber County tended to have higher participation in 1960 and 1970 than in the state for most age groups, although the changes between 1960 and 1970 for the county showed declines in participation in all age groups. The female's participation showed the same pattern as the males in relation to the state in 1960 and 1970, but the changes in participation had trends similar to those of the state.

As can be seen from Table 19, the five multi-county areas displayed certain definite trends. Probably the most outstanding is the almost universal lower participation rates of females in all age groups as compared to the state averages in 1960 and 1970. However, the changes in the participation rates of women in the multi-county areas between 1960 and 1970 were usually larger than those of the state, although the trends were the same.

For males in these multi-county areas, usually the first age categories of 16 to 17 and 18 to 24 show less participation in 1960 and 1970 than was observed in the state. The males from 25 to 64 years old tended to have higher participation rates, especially in 1960, than the state, but there was considerable variation in 1970. The changes in participation followed the same trends of the state generally, but declines were usually larger for the multi-county areas.

Table 19 reveals some general trends in the counties and multi-county areas labor force participation by age and sex. For males in the age group of 16 to 17, most counties and multi-county areas showed declines in labor force participation, but females had mostly increases. While males experienced slight decreases in participation of the age group 18 to 24, females had substantial increases. The males age 25 through 45 showed both increases and decreases in participation, while

there were slight declines for the age group 45 to 64 and substantial declines for those 65 and over. Females experienced large increases in the participation of women age 25 to 34, as well as increases in all counties and multi-county areas for the 35 through 64 age. Some slight declines showed for females in the age group of 65 years and over.

Generally, as compared to 1960, there was a decline in the participation of males in all counties and multi-county areas by 1970. The labor force participation had increased substantially in all counties and multi-county areas for females by 1970.

CHAPTER V
PROJECTIONS OF LABOR FORCE PARTICIPATION RATES
AND LABOR FORCE FOR UTAH TO 2000

The main objective of this chapter is to project future labor force participation rates and labor force in Utah by age and sex for counties and multi-county areas to the year 2000. These projections will be based on population projections presented in Chapter III and the analysis of the trends in labor force participation of Utah's labor force between 1960 and 1970 as described in Chapter IV.

Although the basic forces accounting for secular trends in labor force participation are not as clearly established as hoped, it is possible to make projections of observed trends to obtain some notions of future labor force size and composition. It would be a mistake to regard such projections as predictions of what the future will bring, but the projections do provide some feel for the potential size and composition of the state's work force.¹

As Black and Tarver state:

In projections, two ideas must be kept in mind. First, no one has a crystal ball by which he can foretell the future. Second, the nature of social living requires that estimates of the future be made, whether they turn out to be good or bad.²

¹Hauser, "Labor Force," in Handbook of Modern Sociology, p. 171.

²Black and Tarver, Age and Sex Population Projections of Utah Counties, p. 4.

Though projections have not always accurately estimated the future, they are and have been valuable guides to planners.³ The labor force projections in this study can be a guide only if the users understand that the projections are not forecasts of what will actually take place. They are presumed to be accurate only under specified conditions previously discussed and the assumptions about the future labor force developments, to be given later.

Method of labor force projection

Although few authors have given much discussion on the subject, there are several techniques for making long-range projections of labor force.

Denis F. Johnston of the Bureau of Labor Statistics has given considerable attention to the subject and discusses several techniques which may be used to make long-range labor force projections.⁴

A simple projection technique is to assume no change over the projection period. Since some change is surely to be expected, this technique results in extremely poor projections.

Another type of projection is obtained by assuming that a change which occurred in a period in the past will also occur in the projection period. Using this technique, then, if a labor force increased by 6 million between 1960 and 1970, the labor force between 1970 and 1980 are projected to increase by 6 million. The technique does recognize

³Ibid.

⁴Denis F. Johnston, Long-Range Projections of Labor Force, U.S. Department of Labor, Bureau of Labor Statistics, Preliminary Draft (September, 1967), p. 21-27.

a time trend, although it fails to take into account the changing size of the base.

Extrapolative techniques involve superimposing some curve on a time series. Thus a forecast can be arrived at by the intersection of the curve and the time axis at a particular period in time. A major problem is that of fluctuations in a given time series which may produce absurd results. Probably the main advantage of this technique is that of being quick and easy to employ.

Cohort analysis of labor force projections, which is used in this study, is a technique which has the advantage of examining the actual historical experience of a group of people or cohort. Using this method provides greater justification for the assumption that past trends will continue into the future. The principle disadvantage is the requirement of a great deal of historical data of comparable quality. Johnston feels this technique offers the greatest potential for the development of improved projections of the labor force.

Finally, econometric techniques have been used in the preparation of labor force projections. One of the major problems in using this technique is the exclusive consideration of economic factors while ignoring those social and psychological factors which may affect labor force activity. Econometric techniques may be of value in providing useful answers to questions relating to the sensitivity of the labor force to changes in the economic situation.

Some promise in the long-range projection of labor force is seen in the recent development of simulation models.

However, the growth of the population of working age and the differential changes by age determines in large measure the changes in the labor force. Thus, the age and sex composition of the population is

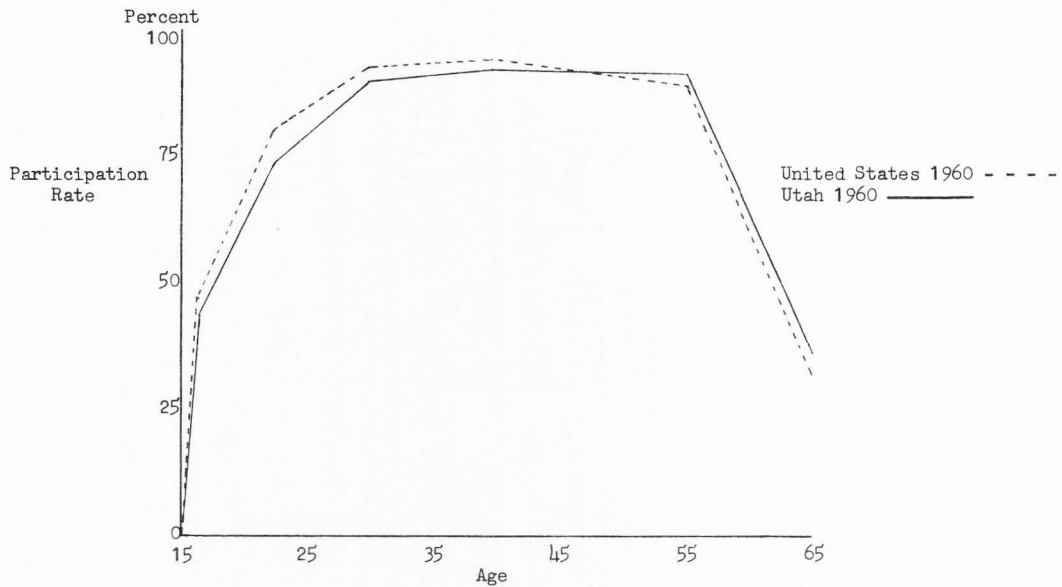
important for making labor force projections, because the extent of labor force activity varies with age and by sex. Another element in shaping the composition of the future labor force and its total size is the level and trend in the proportion of persons in each age by sex who are in the labor force or, in other words, the labor force participation rate.⁵

Considering these elements, in this study the general approach in making projections of labor force is to estimate the future labor force participation rate for each group of men and women. Then these rates are applied to the projected population in each group, thereby deriving total labor force. Thus, the technique of cohort analysis of long-range labor force projection is used in this study.

The study of the trends of participation rates in Chapter IV showed that trends in labor force participation rates between 1960 and 1970 for both sexes in Utah were similar to those for the United States. This is graphically illustrated in Figures 7, 8, 9, and 10. Since the trends in labor force participation by age and sex of the United States and Utah in 1960 and 1970 so closely followed each other, it was decided to project the future participation rates for Utah up to the year 2000, basing the state rates on projected participation rates for the United States made by the Bureau of Labor Statistics.

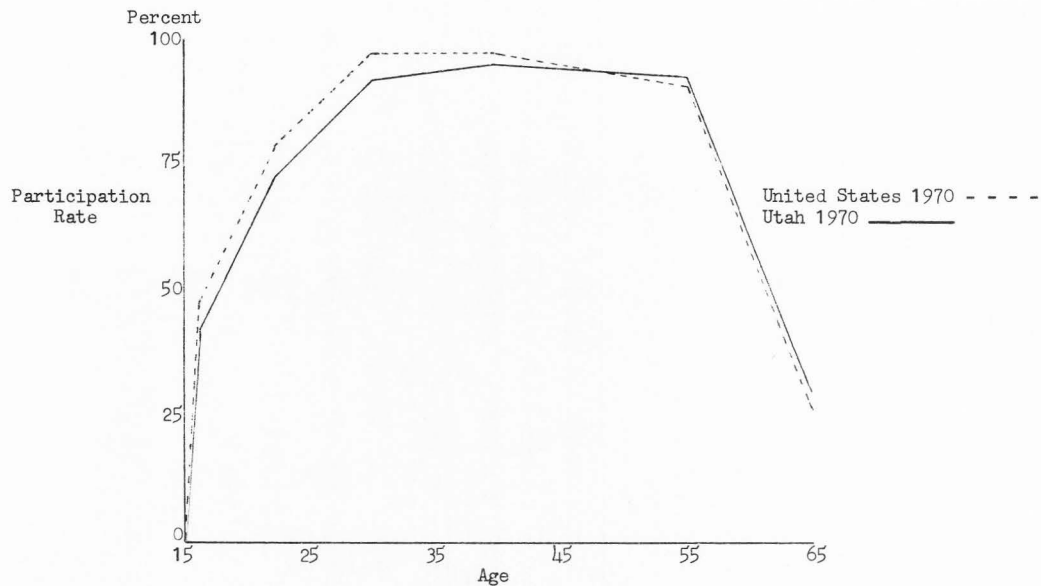
A procedure of calculating the numerical differences which existed between the United States and Utah's labor force participation rates by each age and sex group in 1970 made possible the estimation of Utah's projected 1980 labor force participation rates. This was done by

⁵Travis, "The United States Labor Force: Projections to 1985," Monthly Labor Review, p. 8-9.



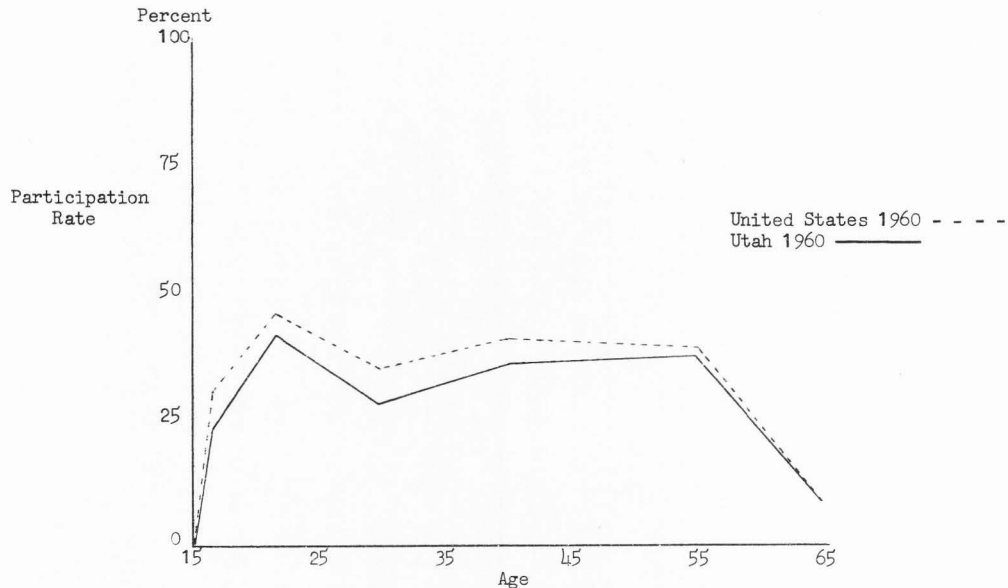
Source: Tables 17 and 18

Figure 7. Male participation rates by age for the United States and the State of Utah in 1960



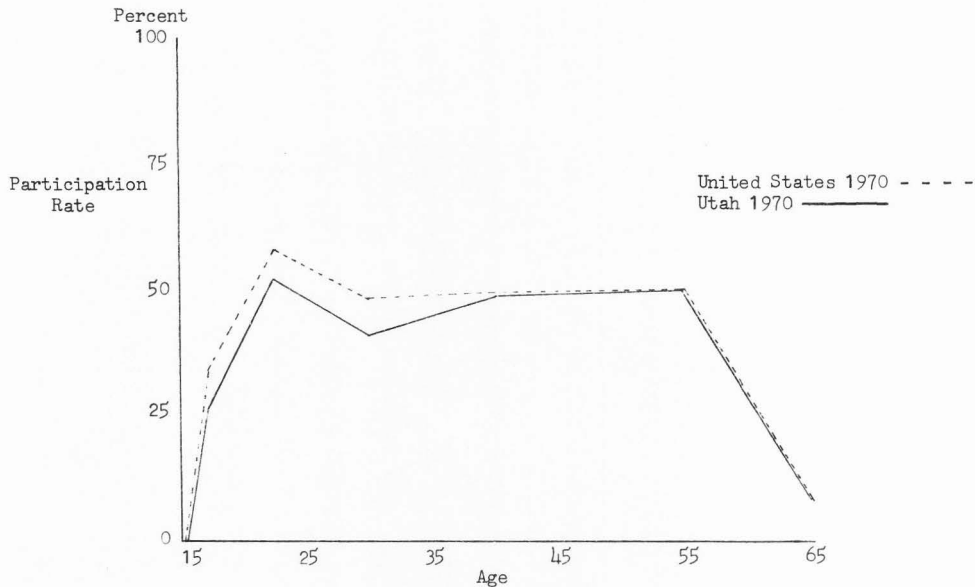
Source: Tables 17 and 18

Figure 8. Male participation rates by age for the United States and the State of Utah in 1970



Source: Tables 17 and 18

Figure 9. Female participation rates by age for the United States and the State of Utah in 1960



Source: Tables 17 and 18

Figure 10. Female participation rates by age for the United States and the State of Utah in 1970

finding the relative ratios (refer to the Appendix) between Utah's 1970 labor force participation rates by age and sex and the United States' rates. These relative ratios were then applied to the projected United States 1980 labor force participation rates (refer to Table 20) in order that Utah's projected 1980 labor force participation rates could be estimated.

Similarly, trends of labor force participation rates for the counties and multi-county areas showed similar patterns to those observed for the state; therefore, the estimation of the future labor force participation rates by age and sex for those areas were based on the projected participation rates for the state. In order to calculate projected labor force participation by age and sex for counties and multi-county areas in 1980, it was necessary to calculate the relative ratios (refer to the Appendix) between the counties and multi-county areas and the state in 1970. These ratios were used to multiply the Utah projected 1980 participation rates by age and sex in order to arrive at the projected participation rates for counties and multi-county areas in 1980. Then the projected participation rates for 1980 in the counties, multi-county areas, and the state were applied to the total projected populations of the respective divisions by age and sex, to arrive at the projected labor force figures for 1980. The projected population figures of the respective divisions by age and sex were calculated in Chapter III.

In order to complete the projections to 1980, two further measures were necessary. First, since the population projections were made by five year age groups, it was necessary to find the projected populations of the age categories 16, 17, 18, and 19. This was required so that populations could be estimated for the age categories 16 to 17 and 18

to 24 for the labor force. This task was accomplished by using the Karup-King Formula, which split the five year age grouped data (15 to 19 age group) into single year values.⁶ Using this procedure, it was possible through addition to obtain the populations for the age categories for the labor force projection purposes of this study.

Second, to insure that the labor force totals by age and sex for counties and multi-county areas summed to the labor force totals for the State of Utah, a smoothing procedure was used for those few categories where the counties and multi-county areas labor force totals were not within .5 percent of the state's. The smoothing procedure consisted of dividing the state's total for the particular age and sex category by the total for the counties and multi-county areas to obtain the ratio difference. This ratio was then multiplied with each county and multi-county area total so that the sum of labor force projected for all counties and multi-county areas equals to within .5 percent of the State of Utah's labor force total.

⁶The Karup-King Formula multipliers are:

	$G_x - 5$	G_x	$G_x + 5$
P_x	.064	.152	-.016
$P_x + 1$.008	.224	-.032
$P_x + 2$	-.024	.248	-.024
$P_x + 3$	-.032	.224	.008
$P_x + 4$	-.016	.152	.064

Where G_x - refers to the population in 5 year age group x and

P_x - refers to the population aged x.

For example, if you have a population aged 15 to 19 years (G_{15-19}), the population of age 15 through 19 years can be obtained by:

$$\begin{aligned}
 P_{15} &= .064 G_{10-14} + .152 G_{15-19} - .016 G_{20-24} \\
 P_{16} &= .008 G_{10-14} + .224 G_{15-19} - .032 G_{20-24} \\
 P_{17} &= -.024 G_{10-14} + .248 G_{15-19} - .024 G_{20-24} \\
 P_{18} &= -.032 G_{10-14} + .224 G_{15-19} + .008 G_{20-24} \\
 P_{19} &= -.016 G_{10-14} + .152 G_{15-19} + .064 G_{20-24}
 \end{aligned}$$

The same procedures were repeated in order to obtain the 1990 and 2000 projection periods. However, two assumptions were made in order that projections for Utah's labor force in 1990 and 2000 could be completed. First, it was assumed that the projections of the United States labor force participation rates for 1985, as provided by the Bureau of Labor Statistics, would remain the same in 1990. This is a feasible assumption because for certain categories, especially males in the middle ages, no changes in participation were projected to 1985 by the Bureau of Labor Statistics, and other male and female categories have only the slightest differences in the changes of projected labor force participation between a five-year and ten-year period. Second, in order to estimate the labor force participation rates for the United States in the year 2000, it was assumed that the trends of the labor force participation rates by age and sex for 1980 and 1990 would continue to the year 2000. Thus, the absolute differences between the projected United States labor force participation rates of 1980 and 1990 were calculated and the results were added to the projected 1990 participation rates to arrive at the projected United States participation rates for year 2000. This procedure is supported by the changes in labor force participation being consistent with past observed and projected trends for males and females. Also, the degree of change is similar, although slightly under-estimated, to the projected ten-year period changes by the Bureau of Labor Statistics for the United States. Since participation rates are very stable and change very slowly, if at all, the United States' estimated participation rates for the year 2000 are very reasonable. The projected labor force participation rates for the United States are shown in Table 20.

Table 20. Labor force participation rates for the United States, by age and sex, observed 1970, and projected 1980, 1990, and 2000

United States					
Age	Observed	Projected			2000 ^d
	1970 ^b	1980	1990 ^c	Percent Difference	
Male					
16-17	47.0	47.5	47.9	.4	48.3
18-24 ^a	77.9	77.9	77.9	.0	77.9
25-34	96.6	96.0	96.0	.0	96.0
35-44	96.6	96.1	96.1	.0	96.1
45-64 ^a	89.3	87.6	87.2	-.4	86.8
65+	26.7	22.0	21.1	-.9	20.2
Female					
16-17	34.9	31.2	31.5	.3	31.8
18-24 ^a	56.4	55.8	55.9	.1	60.0
25-34	47.9	46.5	46.5	.8	47.3
35-44	47.9	52.4	53.3	.9	54.2
45-64 ^a	49.3	50.0	50.0	.0	50.0
65+	9.7	8.7	8.5	-.2	8.3

^aThese age categories were totaled from BLS projection figures and participation rates figured accordingly.

^bBased on the United States Civilian Labor Force.

^cThese figures were obtained by assuming that the BLS projections for 1985 will be the same in 1990.

^dThese figures were obtained by adding the difference between 1980 and 1990 labor force participation rates to the 1990 labor force participation rates. The basic assumption implied by this procedure is that the trends in the labor force participation rates from 1980 to 1990 will continue in the year 2000.

Source: Sophia C. Travis, "The United States Labor Force: Projections to 1985," Monthly Labor Review, Vol. 93, No. 5 (May, 1970), 3-12. (Refer to Table 3.)

U.S. Department of Labor, Bureau of Labor Statistics, Labor Force Annual Averages, 1970.

Assumptions of labor force projections

As previously stated, the labor force projections in this study are presumed to be accurate only under specified assumptions for the United States labor force projections and the population projections for Utah. Consideration should be given to the limitations of this study, as mentioned earlier, before using any of the labor force projections for the state. The following assumptions regarding the state labor force projections are stated so that those using the projections can understand how they were developed, and thus use them appropriately. Major assumptions used in this study are as follows:

1. The trends in the relative differences of the labor force participation rates between the state and counties will continue as observed in 1970.
2. The unemployment rates for the State of Utah will average around 5.5 percent of the labor force.
3. The economic activity and development in Utah will continue at levels comparable to those found in 1970, avoiding any major recessions.
4. The direction of past trends in labor force participation rates of the various age-sex groups in Utah will continue.
5. The Bureau of Labor Statistics projected labor force participation rates for the United States in 1985 will remain basically the same in 1990.
6. The trends in the projected labor force participation rates for the United States between 1980 and 1985 will continue to the year 2000.

The assumptions of the state labor force projections assume that the relative differences between state participation rates and county and multi-county area participation rates by age and sex in 1970 should continue to exist throughout the projection period of this study. The study of earlier trends of participation rates by age and sex between state figures and county and multi-county area figures show that in most instances both figures continued to retain their relative differences throughout the 1960's. The same relationship is expected to continue to year 2000, with only relatively small deviations.

Roughly, the Utah unemployment rate at the time of collection of the labor force data in the state was about 5.5 percent. Unemployment in the United States has been below 4 percent only in war booms; this is also found to be the case for the State of Utah. As a matter of fact, Utah's unemployment rates have generally been between 5 and 6 percent over the last decade and correspond very closely with the national rates. Considering an ending to the United States involvement in the Vietnam War and continued governmental policies of inflation control, it can be assumed that unemployment rates for the United States and Utah will probably follow historical trends, which show roughly 5 to 6 percent unemployment since 1948, excluding the Korean and Vietnam war years. On this basis, the state projections of labor force include an assumed unemployment rate of roughly 5.5 percent.

The projections assume that the economic activity and development in Utah in the future will remain at levels comparable to those found in 1970, and that any major recession comparable to that of the 1930's will not occur throughout the projection period of this study.

The study further assumes that the trends in the labor force participation rates of each age and sex group will generally continue to

follow the trends as observed to 1970. Exceptional variations in the trends in labor force participation rates for various age and sex groups are not expected to occur, but the gradual development of trends of the past century are expected to continue in this state as well as in the nation.

Finally, it is assumed that the Bureau of Labor Statistics projected labor force participation rates for the United States in 1985 will remain basically the same in 1990 and that the trends in the projected rates between 1980 and 1985 will continue to the year 2000. Since the projected labor force participation rates for Utah in 1990 and 2000 are based on these assumptions, their importance becomes obvious. The reasoning for these assumptions was discussed in the previous section of this chapter.

Utah's labor force participation rates and labor force projections

Tables 21 and 22 show the observed participation rates for 1970, which is the base period for the projections, and the projected participation rates for the state, counties, and multi-county areas for 1980, 1990, and 2000, using the projection methods explained in a previous section of this chapter. All the projections are by male and female, using the age groups 16 to 17, 18 to 24, 25 to 34, 35 to 44, 45 to 64, and 65 and over, and the total category of 16 years and over.

Generally, Tables 21 and 22 show that the overall participation of males and females declined somewhat between 1970 and 1980, as did the national projections of participation. For males 16 to 17 years old most counties, multi-county areas, and the state showed an increase in participation. Due to educational considerations, males 18 to 24 years old experienced a decline in participation in most county and

Table 21. Projected labor force participation rates by age and sex for the State of Utah, observed 1970, and projected 1980, 1990, and 2000

Age	State of Utah			
	Observed	Projected		
	1970	1980	1990	2000
Male				
16-17	42.8	43.2	43.6	43.9
18-24	71.1	71.1	71.1	71.1
25-34	92.7	92.1	92.1	92.1
35-44	96.0	95.5	95.5	95.5
45-64	90.5	88.7	88.3	87.9
65+	30.3	24.9	23.9	22.9
16 years and over	78.1	77.6	77.9	77.9
Female				
16-17	25.6	22.8	23.1	23.3
18-24	51.7	51.1	51.2	55.0
25-34	39.5	37.6	38.3	39.0
35-44	48.9	53.4	54.4	55.3
45-64	49.6	50.3	50.3	50.3
65+	9.7	8.7	8.5	8.3
16 years and over	41.6	40.9	41.2	42.9

Source: Table 18.

Table 22. Projected labor force participation rates by age and sex for Utah counties and multi-county areas, observed 1970, and projected 1980, 1990, and 2000

Age	Cache County				Davis County			
	Observed 1970	1980	Projected 1990	2000	Observed 1970	1980	Projected 1990	2000
Male								
16-17	44.1	44.2	44.5	44.9	32.2	32.2	32.5	32.8
18-24	57.1	55.5	55.8	55.8	72.5	70.4	70.8	70.8
25-34	76.8	76.8	76.0	76.0	97.8	97.8	96.8	96.8
35-44	94.8	94.3	94.3	94.3	98.4	97.8	97.8	97.8
45-64	93.3	91.5	91.1	90.6	94.4	92.6	92.1	91.7
65+	27.0	22.2	21.3	20.2	32.6	26.8	25.7	24.4
16 years and over	68.6	71.1	73.7	73.0	81.6	81.4	82.7	79.8
Female								
16-17	23.5	21.0	21.2	21.4	25.6	22.8	23.1	23.3
18-24	47.0	46.1	46.2	49.5	52.9	51.9	52.0	55.8
25-34	35.3	34.0	34.4	35.0	36.0	34.7	35.1	35.7
35-44	48.5	53.0	54.7	55.0	51.1	55.9	57.6	57.9
45-64	49.2	49.8	49.8	50.1	50.3	51.0	51.0	51.3
65+	8.6	7.7	7.4	7.2	9.8	8.7	8.5	8.2
16 years and over	38.9	37.3	40.3	41.9	42.7	43.7	41.9	43.3

Table 22. Continued

Age	Salt Lake County				Utah County			
	Observed	Projected			Observed	Projected		
	1970	1980	1990	2000	1970	1980	1990	2000
Male								
16-17	48.3	48.4	48.8	49.2	39.5	39.6	39.9	40.2
18-24	78.1	75.9	76.3	76.3	56.5	54.9	55.2	55.2
25-34	93.1	93.1	92.1	92.1	85.7	85.7	84.8	84.8
35-44	95.8	95.3	95.3	95.3	95.7	95.2	95.2	95.2
45-64	90.4	88.6	88.2	87.8	89.6	87.8	87.4	87.0
65+	31.1	25.6	24.5	23.3	26.1	21.5	20.6	19.5
16 years and over	80.6	79.1	78.8	79.1	70.6	73.9	74.2	73.3
Female								
16-17	25.7	22.9	23.1	23.4	24.8	22.1	22.3	22.5
18-24	57.3	56.2	56.3	60.4	42.2	41.4	41.4	44.5
25-34	42.3	40.8	41.2	41.9	34.1	32.9	33.2	33.8
35-44	49.0	53.6	55.3	55.5	40.7	44.5	45.9	46.1
45-64	51.1	51.8	51.8	52.1	43.2	43.8	43.8	44.0
65+	10.7	9.5	9.2	9.0	9.4	8.4	8.1	7.9
16 years and over	43.4	43.2	43.0	44.9	36.8	34.8	36.7	37.6

Table 22. Continued

Age	Weber County				Multi-County Area 1			
	Observed	Projected			Observed	Projected		
	1970	1980	1990	2000	1970	1980	1990	2000
Male								
16-17	44.9	45.0	45.4	45.7	37.0	37.1	37.4	37.7
18-24	78.3	76.1	76.5	76.5	82.2	79.9	80.3	80.3
25-34	95.6	95.6	94.6	94.6	98.8	98.8	97.8	97.8
35-44	96.4	95.9	95.9	95.9	97.6	97.0	97.0	97.0
45-64	90.0	88.2	87.8	87.4	93.6	91.8	91.3	90.9
65+	27.8	22.9	21.9	20.8	34.9	28.7	27.5	26.2
16 years and over	79.7	79.1	78.4	78.8	83.3	81.2	81.1	80.9
Female								
16-17	25.8	23.0	23.2	23.5	24.1	21.5	21.7	21.9
18-24	60.9	59.7	59.8	64.2	47.9	47.0	47.0	50.5
25-34	45.4	43.8	44.2	45.0	41.8	40.3	40.7	41.4
35-44	56.0	61.2	63.2	63.5	52.9	57.8	59.7	59.9
45-64	54.1	54.8	54.8	55.1	50.9	51.6	51.6	51.9
65+	9.5	8.5	8.2	8.0	11.3	10.1	9.8	9.5
16 years and over	46.7	45.9	45.9	48.0	42.4	42.4	41.8	43.6

Table 22. Continued

Age	Multi-County Area 2				Multi-County Area 3			
	<u>Observed</u>	<u>Projected</u>			<u>Observed</u>	<u>Projected</u>		
	1970	1980	1990	2000	1970	1980	1990	2000
Male								
16-17	37.4	37.5	37.8	38.1	46.1	46.2	46.6	47.0
18-24	74.8	72.7	73.1	73.1	73.1	71.0	71.4	71.4
25-34	95.1	95.1	94.1	94.1	95.4	95.4	94.4	94.4
35-44	91.6	91.1	91.1	91.1	96.4	95.9	95.9	95.9
45-64	90.2	88.4	88.0	87.6	88.3	86.6	86.2	85.8
65+	40.6	33.4	32.0	30.4	28.2	23.2	22.2	21.1
16 years and over	78.9	76.1	77.7	77.2	74.5	75.5	77.2	77.8
Female								
16-17	25.4	22.7	22.9	23.1	31.0	27.7	27.9	28.2
18-24	34.4	33.7	33.8	36.2	47.5	46.6	46.6	50.1
25-34	31.3	30.2	30.5	31.0	34.4	33.1	33.5	34.1
35-44	43.2	47.2	48.7	48.9	52.7	57.6	59.4	59.7
45-64	47.6	48.2	48.2	48.5	45.5	46.1	46.1	46.4
65+	9.3	8.3	8.0	7.8	5.6	5.0	4.8	4.7
16 years and over	35.3	34.2	34.1	35.8	37.5	36.4	38.4	40.4

Table 22. Continued

Age	Multi-County Area 4				Multi-County Area 5			
	Observed	Projected			Observed	Projected		
	1970	1980	1990	2000	1970	1980	1990	2000
Male								
16-17	40.4	40.5	40.8	41.1	27.5	27.5	27.8	28.0
18-24	68.1	66.2	66.5	66.5	48.8	47.4	47.6	47.6
25-34	94.8	94.8	93.8	93.8	94.6	94.6	93.6	93.6
35-44	93.7	93.2	93.2	93.2	87.1	86.6	86.6	86.6
45-64	89.4	87.6	87.2	86.8	82.9	81.3	80.9	80.5
65+	30.2	24.8	23.8	22.6	28.4	23.4	22.4	21.3
16 years and over	74.3	72.1	74.3	74.9	69.4	65.3	68.6	67.8
Female								
16-17	25.4	22.7	22.9	23.1	21.5	19.2	19.4	19.5
18-24	39.9	39.1	39.2	42.1	33.1	32.4	32.5	34.9
25-34	32.7	31.5	31.8	32.4	28.2	27.2	27.5	27.9
35-44	45.5	49.7	51.3	51.6	36.6	40.0	41.3	41.5
45-64	44.0	44.6	44.6	44.8	43.9	44.5	44.5	44.7
65+	7.3	6.5	6.3	6.1	9.8	8.7	8.5	8.2
16 years and over	34.6	33.3	33.3	36.0	32.1	31.1	30.8	32.7

Source: Table 19.

multi-county areas. The high labor force activity for men in the central working ages showed little change over the period. Slight declines are shown for men aged 45 to 64 and 65 years and over, primarily because of the effects of increased retirement benefits.

The participation rates projected for females for the age groups 18 to 24 and 25 to 34 showed slight declines between 1970 and 1980, mainly because of increased family responsibilities. Increased participation in the labor force, especially of married women, resulted in the increased participation of women 35 to 44 years old. Only very slight increases in participation are shown for women ages 45 to 64, while ages 65 years and over realized declines for the same reason as for men.

Between 1980 and 1990 the State of Utah's projected labor force participation rates increased overall by .3 percent for males and .3 for females. Similar past trends of the participation rates continued, with participation increases shown for the 16 to 17 age group and declines for the 45 to 64 and 65 years and over age groups for both sexes. Most of the other age categories had a tendency to stabilize their participation rates, especially for the males. These patterns were generally true for the counties and multi-county areas, although there were some which experienced slight declines in participation for 1990 as compared to the slight increases in the participation of the state.

Tables 21 and 22 showed projected overall participation rates of the males as stabilized by 2000 in the counties, multi-county areas, and the state. Except for the increases in participation for males aged 16 to 17, and the continued decline for men 55 through 65 years old and over, other male groups show no changes in participation.

Females in the counties, multi-county areas, and the state show increases in the participation rates for all age groups except for those women 65 years old and over in the year 2000.

Tables 23 through 33 show the estimated 1970 population and labor force by age and sex, and the projected population and labor force figures in 1980, 1990, and 2000, for counties, multi-county areas, and the state. Discussion of the trends and results of these calculations for Utah will be presented in Chapter VI.

Table 23. Population and labor force of Utah by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Population				Labor Force			
	Enumerated	Projected			Enumerated	Projected		
	1970	1980	1990	2000	1970	1980	1990	2000
Male								
16-17	24621	23543	31799	39053	10538	10183	13870	17177
18-24	67402	86476	85074	127056	47908	61484	60487	90336
25-34	64618	102718	119704	132288	59901	94628	110276	121869
35-44	53257	63436	100830	117411	51127	60583	96295	112131
45-64	87101	96577	107772	152909	78826	85738	95240	134508
65+	33997	44223	54163	60308	10301	11040	12969	13824
16 years and over	330996	416973	499342	629025	258601	323656	389137	489845
Female								
16-17	22499	22643	30047	36419	5760	5182	6942	8495
18-24	75763	82709	80190	118883	39170	42305	41090	65385
25-34	65343	107777	115643	124979	25810	40616	44343	48748
35-44	54291	64686	107182	114454	26548	34603	58320	63329
45-64	90087	102133	114208	165667	44683	51377	57451	83337
65+	43564	57232	73624	83152	4226	4979	6258	6901
16 years and over	351547	437180	520894	643554	146197	179062	214404	276195

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, Advance Report, General Population Characteristics, Utah.

U.S. Bureau of the Census, U.S. Census of Population: 1970, General Social and Economic Characteristics, Utah, PC(1)-C46.

Table 24. Population and labor force of Cache County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Population				Labor Force			
	<u>Enumerated</u>	<u>Projected</u>			<u>Enumerated</u>	<u>Projected</u>		
	1970	1980	1990	2000	1970	1980	1990	2000
Male								
16-17	846	831	1396	1579	373	368	622	710
18-24	4512	2992	3357	5417	2575	1661	1873	3023
25-34	2715	5676	4175	5389	2085	4360	3174	4097
35-44	1754	2665	5569	4097	1663	2513	5252	3863
45-64	2897	3056	4106	7705	2703	2797	3740	6987
65+	1611	1772	1825	1949	435	394	389	395
16 years and over	14335	16992	20428	26136	9834	12093	15050	19075
Female								
16-17	832	791	1322	1480	196	166	280	316
18-24	4392	2963	3103	5124	2064	1366	1433	2541
25-34	2353	5594	4120	5075	831	1905	1418	1777
35-44	1681	2330	5537	4077	815	1236	3031	2242
45-64	3195	3227	3856	7606	1572	1610	1924	3817
65+	2054	2426	2603	2634	177	187	194	190
16 years and over	14507	17331	20541	25996	5655	6470	8280	10883

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, Advance Report, General Population Characteristics, Utah.

U.S. Bureau of the Census, U.S. Census of Population: 1970, General Social and Economic Characteristics, Utah, PC(1)-C46.

Table 25. Population and labor force of Davis County by age and sex, enumerated 1970, and projected, 1980, 1990, and 2000

Age	Population				Labor Force			
	<u>Enumerated</u>	<u>Projected</u>			<u>Enumerated</u>	<u>Projected</u>		
	1970	1980	1990	2000	1970	1980	1990	2000
Male								
16-17	3273	2647	2913	4215	1054	854	948	1384
18-24	5641	9688	8565	12760	4091	6829	6069	9041
25-34	6118	10051	13392	12829	5983	9832	12966	12421
35-44	5921	6005	9870	13143	5826	5878	9661	12865
45-64	7060	10007	10976	14788	6665	9266	10117	13569
65+	1540	2531	3424	5731	502	679	882	1402
16 years and over	29553	40929	49140	63466	24121	33338	40643	50682
Female								
16-17	2237	2614	2753	3956	573	598	636	922
18-24	4822	9331	8042	12035	2549	4844	4182	6718
25-34	6800	8268	13091	12186	2448	2872	4597	4353
35-44	5892	6731	8186	12957	3011	3762	4722	7508
45-64	6530	9962	12116	14330	3284	5082	6180	7353
65+	1909	2932	5388	8083	187	257	458	667
16 years and over	28190	39838	49576	63547	12052	17415	20775	27521

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, Advance Report, General Population Characteristics, Utah.

U.S. Bureau of the Census, U.S. Census of Population: 1970, General Social and Economic Characteristics, Utah, PC(1)-C46.

Table 26. Population and labor force of Salt Lake County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Population				Labor Force			
	Enumerated		Projected		Enumerated		Projected	
	1970	1980	1990	2000	1970	1980	1990	2000
Male								
16-17	9653	10340	13621	16057	4662	5008	6653	7908
18-24	26024	36550	36852	52346	20326	27755	28131	39958
25-34	29952	40043	51142	57535	27885	37288	47139	53031
35-44	23400	29402	39307	50190	22417	28021	37461	47833
45-64	37721	42349	48819	63721	34100	37554	43094	55991
65+	14621	18918	23912	26696	4547	4847	5876	6234
16 years and over	141371	177602	213653	266545	113937	140473	168354	210955
Female								
16-17	9413	9870	12853	15152	2419	2267	2981	3548
18-24	30824	35311	34920	49583	17665	19855	19671	29979
25-34	30652	43815	49678	54015	12966	17886	20498	22671
35-44	24002	30343	43368	49168	11761	16264	23992	27323
45-64	40180	45345	52209	70947	20532	23500	27057	36986
65+	20386	25870	32858	36880	2181	2482	3051	3326
16 years and over	155457	190554	225886	275745	67524	82254	97250	123833

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, Advance Report, General Population Characteristics, Utah.

U.S. Bureau of the Census, U.S. Census of Population: 1970, General Social and Economic Characteristics, Utah, PC(1)-046.

Table 27. Population and labor force of Utah County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Population				Labor Force			
	Enumerated 1970	1980	Projected 1990	2000	Enumerated 1970	1980	Projected 1990	2000
Male								
16-17	2882	2694	4722	5201	1138	1067	1886	2094
18-24	14158	10104	11790	18262	8001	5550	6510	10084
25-34	8542	18260	13983	18654	7320	15652	11864	15827
35-44	5745	8387	17918	13721	5498	7984	17058	13063
45-64	9276	10259	13124	24648	8311	9017	11482	21466
65+	3602	4833	5899	6497	940	1039	1216	1273
16 years and over	44205	54537	67436	86983	31208	40309	50016	63807
Female								
16-17	2723	2540	4477	4502	675	563	1002	1017
18-24	17184	9396	11128	15891	7253	3891	4616	7076
25-34	7645	21149	13172	17732	2607	6959	4381	5999
35-44	5931	7569	20931	13036	2414	3369	9618	6017
45-64	9762	11015	12978	27603	4217	4826	5686	12165
65+	4561	6231	7959	9004	429	525	649	713
16 years and over	47806	57900	70645	87768	17595	20133	25952	32987

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, Advance Report, General Population Characteristics, Utah.

U.S. Bureau of the Census, U.S. Census of Population: 1970, General Social and Economic Characteristics, Utah, PC(1)-C46.

Table 28. Population and labor force of Weber County by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Population				Labor Force			
	Enumerated	Projected			Enumerated	Projected		
	1970	1980	1990	2000	1970	1980	1990	2000
Male								
16-17	3014	2636	3761	4443	1353	1186	1707	2034
18-24	7690	10201	9681	14719	6022	7766	7408	11264
25-34	7132	12104	13914	15143	6818	11574	13169	14332
35-44	6454	7001	11882	13655	6222	6714	11394	13095
45-64	11307	12230	12396	17610	10176	10797	10894	15405
65+	4229	5520	7254	7639	1176	1264	1593	1594
16 years and over	39826	49692	58888	73209	31767	39301	46165	57724
Female								
16-17	2785	2532	3552	4193	719	583	827	985
18-24	8858	9702	9134	13943	5394	5798	5468	8960
25-34	7199	12503	13384	14428	3268	5478	5927	6499
35-44	6678	7127	12872	13246	3740	4366	8138	8412
45-64	11814	13069	13234	19293	6391	7170	7261	10648
65+	5588	7344	9675	10608	531	625	797	849
16 years and over	42922	52277	61851	75711	20043	24020	28418	36353

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, Advance Report, General Population Characteristics, Utah.

U.S. Bureau of the Census, U.S. Census of Population: 1970, General Social and Economic Characteristics, Utah, PC(1)-C46.

Table 29. Population and labor force of Multi-County Area 1 by age and sex, enumerated 1970, projected 1980, 1990, and 2000

Age	Population				Labor Force			
	<u>Enumerated</u>	<u>Projected</u>			<u>Enumerated</u>	<u>Projected</u>		
	1970	1980	1990	2000	1970	1980	1990	2000
Male								
16-17	1214	1206	1508	2096	449	447	564	790
18-24	2336	4537	4112	6476	1920	3626	3303	5203
25-34	2912	4126	6229	6322	2876	4077	6092	6183
35-44	2838	2860	4051	6112	2770	2776	3933	5934
45-64	4478	5098	5240	6414	4192	4680	4789	5835
65+	1498	2133	2849	3212	523	613	785	841
16 years and over	15276	19960	23989	30632	12730	16219	19466	24786
Female								
16-17	1139	1176	1427	1978	274	253	310	434
18-24	2355	4326	3786	6137	1128	2033	1782	3101
25-34	3060	4064	6018	5934	1278	1639	2453	2461
35-44	2733	3029	4024	5955	1445	1752	2403	3572
45-64	4233	5065	5529	6781	2155	2614	2854	3521
65+	1749	2468	3462	4119	198	250	339	392
16 years and over	15269	20128	24246	30904	6478	8541	10141	13481

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, Advance Report, General Population Characteristics, Utah.

U.S. Bureau of the Census, U.S. Census of Population: 1970, General Social and Economic Characteristics, Utah, PC(1)-C46.

Table 30. Population and labor force of Multi-County Area 2 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Population				Labor Force			
	Enumerated 1970	Projected 1980	Projected 1990	Projected 2000	Enumerated 1970	Projected 1980	Projected 1990	Projected 2000
Male								
16-17	997	942	1061	1533	373	353	401	584
18-24	1468	3560	2939	4670	1099	2589	2148	3414
25-34	2142	2948	4872	4497	2038	2804	4587	4234
35-44	2060	2105	2893	4723	1886	1918	2636	4303
45-64	3554	3688	3832	4610	3206	3263	3375	4041
65+	1411	1973	2234	2352	573	660	716	717
16 years and over	11632	15216	17831	22385	9175	11587	13863	17293
Female								
16-17	843	901	995	1449	214	204	228	335
18-24	1653	3236	2892	4423	569	1092	978	1605
25-34	2248	2947	4541	4395	703	890	1386	1364
35-44	2016	2223	2920	4496	872	1050	1424	2202
45-64	3405	3725	4070	4949	1622	1798	1964	2403
65+	1522	2229	2771	3061	142	185	223	239
16 years and over	11687	15261	18189	22773	4122	5219	6203	8148

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, Advance Report, General Population Characteristics, Utah.

U.S. Bureau of the Census, U.S. Census of Population: 1970, General Social and Economic Characteristics, Utah, PC(1)-046.

Table 31. Population and labor force of Multi-County Area 3 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Population				Labor Force			
	Enumerated 1970	1980	Projected 1990	2000	Enumerated 1970	1980	Projected 1990	2000
Male								
16-17	1065	840	1143	1506	491	388	532	707
18-24	2616	3295	3178	4910	1913	2341	2270	3508
25-34	1984	4075	4485	4855	1893	3888	4236	4585
35-44	1864	1947	4001	4400	1798	1867	3837	4219
45-64	3747	3590	3509	5571	3310	3109	3025	4781
65+	2163	2314	2370	2253	610	537	528	477
16 years and over	13439	16061	18686	23495	10015	12130	14428	18277
Female								
16-17	999	789	1089	1423	309	218	304	401
18-24	2645	3032	2834	4648	1257	1413	1323	2329
25-34	1989	4127	4178	4471	676	1370	1401	1526
35-44	1985	1948	4085	4135	1046	1123	2430	2471
45-64	3906	3897	3766	5829	1776	1798	1737	2705
65+	2323	2884	3184	3177	130	144	154	149
16 years and over	13847	16677	19136	23683	5194	6066	7349	9581

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, Advance Report, General Population Characteristics, Utah.

U.S. Bureau of the Census, U.S. Census of Population: 1970, General Social and Economic Characteristics, Utah, PC(1)-C16.

Table 32. Population and labor force of Multi-County Area 4 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Population				Labor Force			
	Enumerated 1970	1980	Projected 1990	2000	Enumerated 1970	1980	Projected 1990	2000
Male								
16-17	1217	940	1124	1585	492	380	459	652
18-24	2259	3898	3057	5009	1539	2581	2034	3334
25-34	2159	4051	5204	4711	2046	3841	4884	4421
35-44	2367	2119	3978	5107	2218	1975	3708	4760
45-64	5410	4698	4111	5700	4838	4120	3588	4953
65+	2645	3296	3360	2966	799	820	801	672
16 years and over	16057	19002	20834	25078	11932	13717	15474	18792
Female								
16-17	1101	947	1059	1495	280	215	242	346
18-24	2252	3781	2914	4746	899	1480	1143	1998
25-34	2388	3885	5140	4516	781	1226	1639	1465
35-44	2522	2364	3846	5086	1147	1176	1975	2624
45-64	5516	5197	4672	5986	2428	2319	2084	2687
65+	2832	3866	4475	4258	206	253	283	262
16 years and over	16611	20040	22106	26087	5741	6669	7366	9382

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, Advance Report, General Population Characteristics, Utah.

U.S. Bureau of the Census, U.S. Census of Population: 1970, General Social and Economic Characteristics, Utah, PC(1)-C46.

Table 33. Population and labor force of Multi-County Area 5 by age and sex, enumerated 1970, and projected 1980, 1990, and 2000

Age	Population				Labor Force			
	<u>Enumerated</u>	<u>Projected</u>			<u>Enumerated</u>	<u>Projected</u>		
	1970	1980	1990	2000	1970	1980	1990	2000
Male								
16-17	460	467	550	838	126	128	152	234
18-24	698	1651	1543	2487	340	783	735	1186
25-34	962	1384	2308	2353	910	1309	2161	2203
35-44	854	945	1361	2263	744	818	1179	1960
45-64	1651	1602	1659	2142	1369	1302	1342	1726
65+	677	933	1036	1013	192	218	232	216
16 years and over	5302	6982	8457	11096	3681	4558	5801	7525
Female								
16-17	427	483	520	791	92	92	100	154
18-24	778	1631	1437	2353	258	529	467	821
25-34	1029	1425	2321	2227	290	387	638	623
35-44	851	1022	1413	2298	312	409	583	953
45-64	1546	1631	1778	2343	679	726	791	1049
65+	640	982	1249	1328	63	86	106	109
16 years and over	5271	7174	8718	11340	1694	2229	2685	3709

Source: U.S. Bureau of the Census, U.S. Census of Population: 1970, Advance Report, General Population Characteristics, Utah.

U.S. Bureau of the Census, U.S. Census of Population: 1970, General Social and Economic Characteristics, Utah, PC(1)-C46.

CHAPTER VI
SOCIAL AND ECONOMIC IMPLICATIONS OF LABOR
FORCE PROJECTIONS FOR UTAH

In recent years, manpower projections have been receiving the increased attention of policymakers, manpower and education planners, research organizations, and other users and developers of forecasts or projections. The focus of this scrutiny is on the reliability, adequacy, and usefulness of projections. In this study, efforts have been made to provide potential users with detailed projections of the labor force growth according to the assumed future trends of population growth and labor force participation rates. The projections are intended to provide an exploration of possible future labor force for counties, multi-county areas, and the State of Utah in 1980, 1990, and 2000. In this chapter an attempt is made to examine some social and economic implications of the projections of labor force.

According to the projections, the size of the total labor force for Utah will increase by 361,242 workers from 404,798 workers in 1970 to 766,040 in the year 2000. This represents projected increases of 97,920 workers from 1970 to 1980; 100,823 workers from 1980 to 1990, and 162,499 workers from 1990 to 2000, or percent increases of 24.1, 20.0, and 26.9, respectively. During the 30-year period between 1970 and the year 2000 the working age population of Utah will increase by about 590,000 persons. The projected labor force figures indicate that over the next 30 years, the State of Utah will need to provide at least 320,000 new jobs in order to maintain the same level of unemployment as in

1970 (i.e., 5.5 percent). By the year 2000, if the unemployment rate in Utah remains at the 5.5 percent level, there will be about 42,000 unemployed people compared with 22,000 in 1970.

Between 1970 and 2000, the male labor force will experience an increase of 89.4 percent, while the female labor force growth will be 88.9 percent. The growth of total labor force in the state will increase about 89.2 percent by the year 2000.

Throughout the projection period, 1970 to 2000, Utah's labor force growth will be highest for the age groups 25 to 34 years and 35 to 44 years for both males and females. For males the increase in labor force will be as much as 103.4 and 119.3 percent for 25 to 34 years and 35 to 44 years while the increase for females will be 88.8 and 183.5 percent, respectively.

During the projection periods the proportion of women in the Utah labor force will remain at 36.1 percent, while the male proportion will remain constant at 63.9 percent. Although the female participation rates will increase over the projection periods, the proportion of females to the total labor force will not increase because the number of females in the working age population will be smaller than males by six thousand by the year 2000.

The projected changes with respect to the number of men and women in the labor force represent a continuation of the 1970 labor force structure, although there will be slight modifications depending primarily upon age structure of the population.

Results of the labor force projections for Utah are based on various patterns of human behavior in regard to labor force participation. The labor force participation rates for males between 25 and 54 years of age are expected to have uniform and stable participation

patterns, as most of these men are married and responsible for economic relationships in the outside world.

A nationwide trend toward earlier retirement seems to have been established. Retirement before the traditional age of 65 is becoming increasingly easier in recent years. This possibility is due to more private industry pension plans which provide the option of retiring early without major loss of benefits, as well as the fact that pensions are being liberalized and the eligibility rules are becoming more lenient. Also, Social Security benefits are rising substantially and are available at ages under 65. These turns of events point to increasing earlier retirement of older men from the labor force, although in our society retirement is a contradiction of the work ethic. There are some signs that the work ethic is losing its once pervasive importance and future years of earlier retirement patterns should provide time to overcome the work ethic.

The American belief that education is essential to achievement of upward social mobility and the expectation of employers of a high school diploma as a requirement for many occupations have influenced both jobseekers and workers to stay in school longer. The labor force participation among students has increased in the past decade perhaps because of the rise in tuition and other school related expenses, as well as the number of available jobs. Thus, the labor force projections indicate increased participation by younger persons.

The changing role of women in society due to their growing work aspirations, the greater willingness of mothers and employers to use child-care facilities, the need for supplementary income, and the

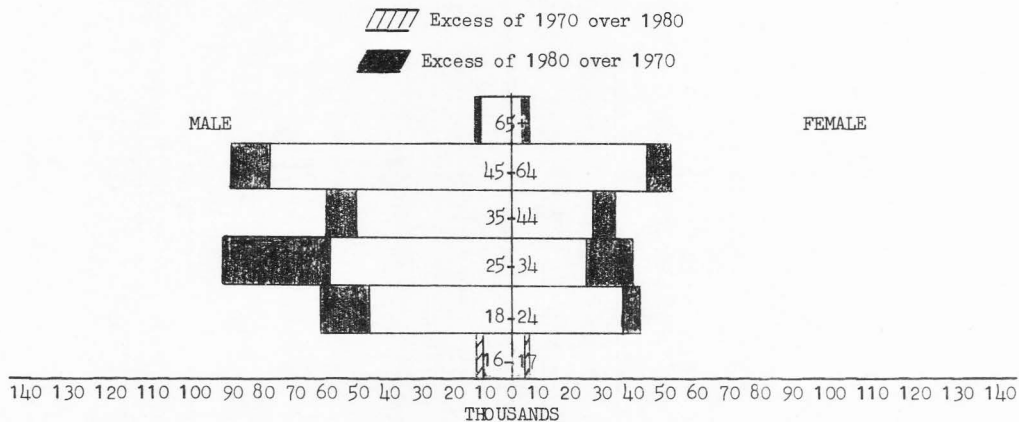
postponing or foregoing of traditional family and childbearing responsibilities by many young women point to continued increases in labor force participation of women, married and single.¹ The results of these projections reflect the increasing participation of females, taking into consideration their marital status and childbearing status. Although the subcultural influence of the Mormon Church in Utah and its doctrine which emphasizes the woman's place as in the home and encourages large family size, the labor force participation of Utah's women is following the trends of the nation and is expected to continue with increasing outside influences, industrialization, and urbanization.

Other implications of these labor force projections for Utah would be the consideration for the rapid rise of the young adult population during the 1970's and 1990's which should increase the demand for housing and other material requirements which accompany family formation, as well as schooling and schooling facilities. Although not as significant, there will be demands in the economic requirements for retired workers who will increase their proportion of the population.

Changes in the labor force between 1970 and 1980

Changes in Utah's labor force participation and population increases will alter the shape of the labor force for 1980 from 1970, as shown in Figure 11. Tables 34 through 44 show changes between enumerated and projected labor force figures and percentage increases or declines for the counties, multi-county areas, and the state, by age and sex between 1970 and 2000 for ten year intervals.

¹Marc Rosenblum, "On the Accuracy of Labor Force Projections," Monthly Labor Review, XCV (October, 1972), p. 24.



Source: Table 23

Figure 11. Age-sex profile of the State of Utah's labor force, observed 1970, and projected 1980

Table 34. Utah's labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000

Age	Labor Force				Percent Change			
	1970	1980	1990	2000	1970-1980	1980-1990	1990-2000	1970-2000
Male								
16-17	10538	10183	13870	17177	-3.3	36.2	23.8	63.0
18-24	47908	61484	60487	90336	28.3	-1.6	49.3	88.5
25-34	59901	94628	110276	121869	57.9	16.5	10.5	103.4
35-44	41127	60583	96295	112131	18.4	58.9	16.4	119.3
45-64	78826	85738	95240	134508	8.7	11.0	41.2	70.6
65+	10301	11040	12969	13824	7.1	17.4	6.5	34.2
16 years and over	258601	323656	389137	489845	25.1	20.2	25.8	89.4
Female								
16-17	5760	5182	6942	8495	-10.0	33.9	22.3	47.4
18-24	39170	42305	41090	65385	8.0	-2.8	59.1	66.9
25-34	25810	40616	44343	48748	57.3	9.1	9.9	88.8
35-44	26548	34603	58320	63329	30.3	68.5	18.5	138.5
45-64	44683	51377	57451	83337	14.9	11.8	45.0	86.5
65+	4226	4979	6258	6901	17.8	25.6	10.2	63.2
16 years and over	146197	179062	214404	276195	22.4	19.7	28.8	88.9
Total	404798	502718	603541	766040	24.1	20.0	26.9	89.2

Source: Table 23.

Table 35. Cache County labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000

Age	Labor Force				Percent Change			
	1970	1980	1990	2000	1970-1980	1980-1990	1990-2000	1970-2000
Male								
16-17	373	368	622	710	-1.6	69.4	14.1	90.3
18-24	2575	1661	1873	3023	-35.4	12.7	61.3	17.3
25-34	2085	4360	3174	4087	109.1	-27.2	29.0	96.4
35-44	1663	2513	5252	3863	51.1	108.9	-26.4	132.2
45-64	2703	2797	3740	6987	3.4	33.7	86.8	158.4
65+	435	394	389	395	-9.4	-1.2	1.5	-9.1
16 years and over	9834	12093	15050	19075	22.9	24.4	26.7	93.9
Female								
16-17	196	166	280	316	-15.3	68.6	12.8	61.2
18-24	2064	1366	1433	2541	-33.8	4.9	77.3	23.1
25-34	831	1905	1418	1777	129.2	-25.5	25.3	113.8
35-44	815	1236	3031	2242	51.6	145.2	-26.0	175.0
45-64	1572	1610	1924	3817	2.4	19.5	98.3	142.8
65+	177	187	194	190	5.6	3.7	-2.0	7.3
16 years and over	5655	6470	8280	10883	30.3	12.3	31.4	92.4
Total	15489	19461	23330	29958	25.6	19.8	28.4	93.4

Source: Table 24.

Table 36. Davis County labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000

Age	Labor Force				Percent Change			
	1970	1980	1990	2000	1970-1980	1980-1990	1990-2000	1970-2000
Male								
16-17	1054	854	948	1384	-18.9	11.0	45.9	31.3
18-24	4091	6829	6069	9041	66.8	-11.1	48.9	120.9
25-34	5983	9832	12966	12421	64.3	31.8	-4.2	107.6
35-44	5826	5878	9661	12865	.8	64.3	33.1	120.8
45-64	6665	9266	10117	13569	39.0	9.1	34.1	103.5
65+	502	679	882	1402	35.2	29.8	58.9	179.2
16 years and over	24121	33338	40643	50682	38.2	21.9	24.7	110.1
Female								
16-17	573	598	636	922	4.3	6.3	44.9	60.9
18-24	2549	4844	4182	6718	90.0	-13.6	60.6	163.5
25-34	2448	2872	4597	4353	17.3	60.0	-5.3	77.8
35-44	3011	3762	4722	7508	24.9	25.5	59.0	149.3
45-64	3284	5082	6180	7352	54.7	21.6	18.9	123.9
65+	187	257	458	667	37.4	78.2	45.6	256.6
16 years and over	12052	17415	20775	27521	44.4	19.2	32.4	128.3
Total	36173	50753	61418	78203	40.3	21.0	27.3	116.1

Source: Table 25

Table 37. Salt Lake County labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000

Age	Labor Force				Percent Change			
	1970	1980	1990	2000	1970-1980	1980-1990	1990-2000	1970-2000
Male								
16-17	4662	5008	6653	7908	7.4	32.8	18.8	69.6
18-24	20326	27755	28131	39958	36.5	1.3	42.0	96.5
25-34	27885	37288	47139	53031	33.7	26.4	12.4	90.1
35-44	22417	28021	37461	47833	24.9	33.6	27.6	113.3
45-64	34100	37554	43094	55991	10.1	14.7	29.9	64.1
65+	4547	4847	5876	6234	6.5	21.2	6.0	37.1
16 years and over	113937	140473	168354	210955	23.2	19.8	25.3	85.1
Female								
16-17	2419	2267	2981	3548	-6.2	31.4	19.0	46.6
18-24	17665	19855	19671	29979	12.3	-.9	52.4	69.7
25-34	12966	17886	20498	22671	37.9	14.6	16.6	74.8
35-44	11761	16264	23992	27323	38.2	47.5	13.8	132.3
45-64	20532	23500	27057	36986	14.4	15.1	36.6	80.1
65+	2181	2482	3051	3326	13.8	22.9	9.0	52.4
16 years and over	67524	82254	97250	123833	21.8	18.2	27.3	83.3
Total	181461	222727	265604	334788	22.7	19.2	26.0	84.4

Source: Table 26

Table 38. Utah County labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000

Age	Labor Force				Percent Change			
	1970	1980	1990	2000	1970-1980	1980-1990	1990-2000	1970-2000
Male								
16-17	1138	1067	1886	2094	-6.2	76.7	11.0	84.0
18-24	8001	5550	6510	10084	-30.6	17.2	54.9	26.0
25-34	7320	15652	11864	15827	113.8	-24.2	33.4	116.2
35-44	5498	7984	17058	13063	45.2	113.6	-23.4	137.5
45-64	8311	9017	11482	21466	8.4	27.3	86.9	158.2
65+	940	1039	1216	1273	10.5	17.0	4.6	35.4
16 years and over	31208	40309	50016	63807	29.1	24.0	27.5	104.4
Female								
16-17	675	563	1002	1017	-16.5	77.9	1.4	50.6
18-24	7253	3891	4616	7076	-46.3	18.6	53.2	-2.4
25-34	2607	6959	4381	5999	66.9	-37.0	36.9	130.1
35-44	2414	3369	9618	6017	39.5	185.4	-37.4	149.2
45-64	4217	4826	5686	12165	14.4	17.8	113.9	188.4
65+	429	525	649	713	22.3	23.6	9.8	66.2
16 years and over	17595	20133	25952	32987	14.4	28.9	27.1	87.4
Total	48803	60442	75968	96794	23.8	25.6	27.4	98.3

Source: Table 27

Table 39. Weber County labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000.

Age	Labor Force				Percent Change			
	1970	1980	1990	2000	1970-1980	1980-1990	1990-2000	1970-2000
Male								
16-17	1353	1186	1707	2034	-12.3	43.9	19.1	50.3
18-24	6022	7766	7408	11264	28.9	-4.6	52.0	87.0
25-34	6818	11574	13169	14332	69.7	13.7	8.8	110.2
35-44	6222	6714	11394	13095	7.9	69.7	14.9	110.4
45-64	10176	10797	10894	15405	6.1	.8	41.4	51.3
65+	1176	1264	1593	1594	7.4	26.0	.6	35.5
16 years and over	31767	39301	46165	57724	23.7	17.4	25.0	81.7
Female								
16-17	719	583	827	985	-18.9	41.8	19.1	36.9
18-24	5394	5798	5468	8960	7.4	-5.6	63.8	66.1
25-34	3268	5478	5927	6499	67.6	8.1	9.6	98.8
35-44	3740	4366	8138	8412	16.7	86.3	3.3	124.9
45-64	6391	7170	7261	10648	12.1	1.2	46.6	66.6
65+	531	625	797	849	17.7	27.5	6.5	59.8
16 years and over	20043	24020	28418	36353	19.8	18.3	27.9	81.3
Total	51810	63321	74583	94077	22.2	17.7	26.1	81.5

Source: Table 28

Table 40. Multi-County Area 1 labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000

Age	Labor Force				Percent Change			
	1970	1980	1990	2000	1970-1980	1980-1990	1990-2000	1970-2000
Male								
16-17	449	447	564	790	-.4	26.1	40.0	75.9
18-24	1920	3626	3303	5203	68.0	-8.9	57.5	170.9
25-34	2876	4077	6092	6183	41.7	49.4	1.4	114.9
35-44	2770	2776	3933	5934	.2	41.6	50.8	114.2
45-64	4192	4680	4789	5835	11.6	2.3	21.8	39.1
65+	523	613	785	841	17.2	28.0	7.1	60.8
16 years and over	12730	16219	19466	24786	27.4	20.0	27.3	94.7
Female								
16-17	274	253	310	434	-7.6	22.5	40.0	58.3
18-24	1128	2033	1782	3101	80.2	-12.3	74.0	174.9
25-34	1278	1639	2453	2461	28.2	49.6	.3	92.5
35-44	1445	1752	2403	3572	21.2	37.1	48.6	147.1
45-64	2155	2614	2854	3521	21.2	9.1	23.3	63.3
65+	198	250	339	392	26.2	35.6	15.6	97.9
16 years and over	6478	8541	10141	13481	31.8	18.7	32.9	108.1
Total	19208	24760	29607	38267	28.9	19.5	29.2	99.2

Source: Table 29

Table 41. Multi-County Area 2 labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000

Age	Labor Force				Percent Change			
	1970	1980	1990	2000	1970-1980	1980-1990	1990-2000	1970-2000
Male								
16-17	373	353	401	584	-5.3	13.5	45.6	56.5
18-24	1099	2589	2148	3414	135.5	-17.0	58.9	210.6
25-34	2038	2804	4587	4234	37.5	63.5	-7.6	107.7
35-44	1886	1918	2636	4303	1.6	37.4	63.2	128.1
45-64	3206	3263	3375	4041	1.7	3.4	19.7	26.0
65+	573	660	716	717	15.1	8.4	.1	25.1
16 years and over	9175	11587	13863	17293	26.2	19.6	24.7	88.4
Female								
16-17	214	204	228	335	-4.6	11.7	46.9	56.5
18-24	569	1092	978	1605	91.9	-10.4	64.1	182.0
25-34	703	890	1386	1364	26.6	55.7	-1.5	94.0
35-44	872	1050	1424	2202	20.4	35.6	54.6	152.5
45-64	1622	1798	1964	2403	10.8	9.2	22.3	48.1
65+	142	185	223	239	30.2	20.5	7.1	68.3
16 years and over	4122	5219	6203	8148	26.6	18.8	31.3	97.6
Total	13297	16806	20066	25441	26.3	19.3	26.7	91.3

Source: Table 30

Table 42. Multi-County Area 3 labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000

Age	Labor Force				Percent Change			
	1970	1980	1990	2000	1970-1980	1980-1990	1990-2000	1970-2000
Male								
16-17	491	388	532	707	-20.9	37.1	32.8	43.9
18-24	1913	2341	2270	3508	22.3	-3.0	54.5	83.3
25-34	1893	3888	4236	4585	105.3	8.9	8.2	142.2
35-44	1798	1867	3837	4219	3.8	105.5	9.9	134.6
45-64	3310	3109	3025	4781	-6.0	-2.7	58.0	44.4
65+	610	537	528	477	-11.9	-1.6	-9.6	-21.8
16 years and over	10015	12130	14428	18277	21.1	18.9	26.6	82.4
Female								
16-17	309	218	304	401	-29.4	39.4	31.9	29.7
18-24	1257	1413	1323	2329	12.4	-6.3	76.0	85.2
25-34	676	1370	1401	1526	102.6	2.2	8.9	125.7
35-44	1046	1123	2430	2471	7.3	116.3	1.6	136.2
45-64	1776	1798	1737	2705	1.2	-3.3	55.7	52.3
65+	130	144	154	149	10.7	6.9	-3.2	14.6
16 years and over	5194	6066	7349	9581	16.7	21.1	30.3	84.4
Total	15209	18196	21777	27858	19.6	19.6	27.9	83.1

Source: Table 31.

Table 43. Multi-County Area 4 labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000

Age	Labor Force				Percent Change			
	1970	1980	1990	2000	1970-1980	1980-1990	1990-2000	1970-2000
Male								
16-17	492	380	459	652	-22.7	20.7	42.0	32.5
18-24	1539	2581	2034	3334	67.7	-21.1	63.9	116.6
25-34	2046	3841	4884	4421	87.7	27.1	-9.4	116.0
35-44	2218	1975	3708	4760	-10.9	87.7	28.3	114.6
45-64	4838	4120	3588	4953	-14.8	-12.9	38.0	2.3
65+	799	820	801	672	2.6	-2.3	-16.1	-15.8
16 years and over	11932	13717	15474	18792	14.9	12.8	21.4	57.4
Female								
16-17	280	215	242	346	-23.2	12.5	42.9	23.5
18-24	899	1480	1143	1998	64.6	-22.7	74.8	22.2
25-34	781	1226	1639	1465	56.9	33.6	-10.6	87.5
35-44	1147	1176	1975	2624	2.5	67.9	32.8	128.7
45-64	2428	2319	2084	2687	-4.4	-10.1	28.9	10.6
65+	206	253	283	262	22.8	11.8	-7.4	27.1
16 years and over	5741	6669	7366	9382	16.1	10.4	27.3	63.4
Total	17673	20386	22840	28174	15.3	12.0	23.3	59.4

Source: Table 32

Table 44. Multi-County Area 5 labor force by age and sex, and percent change, enumerated 1970, and projected 1980, 1990, and 2000

Age	Labor Force				Percent Change			
	1970	1980	1990	2000	1970-1980	1980-1990	1990-2000	1970-2000
Male								
16-17	126	128	152	234	1.5	18.7	53.9	85.7
18-24	340	783	735	1186	130.2	-6.1	61.3	248.8
25-34	910	1309	2161	2203	43.8	65.0	1.9	142.0
35-44	744	818	1179	1960	9.9	44.1	66.2	163.4
45-64	1369	1302	1342	1726	-4.8	3.0	28.6	26.0
65+	192	218	232	216	13.5	6.4	-6.8	12.5
16 years and over	3681	4558	5801	7525	23.8	27.2	29.7	104.4
Female								
16-17	92	92	100	154	0	8.6	54.0	67.3
18-24	258	529	467	821	105.0	-11.7	75.8	218.2
25-34	290	387	638	623	33.4	641.8	-2.3	114.8
35-44	312	409	583	953	31.0	42.5	63.4	205.4
45-64	679	726	791	1049	6.9	8.9	32.6	54.4
65+	63	86	106	109	36.5	23.2	2.8	73.0
16 years and over	1694	2229	2685	3709	31.5	20.4	38.1	118.9
Total	5375	6787	8486	11234	26.2	25.0	32.3	109.0

Source: Table 33

Table 34 and Figure 11 indicate that Utah's males and females in the age group 16 to 27 years will experience a decline in labor force by 3.3 percent or 355 workers for males and 10.0 percent or 578 workers for females by 1980. Males in the age group 25 to 34 will increase by 57.9 percent, an additional 34,727 workers over the ten-year period. The male age categories of 35 to 44 years and 45 to 64 years will show percent increases of 18.4 and 8.7 or about 9,456 and 6,912 workers, respectively. An increase of 7.1 percent or 739 workers is expected in the projected labor force for males aged 65 years and over.

Utah's females in the decade 1970 to 1980 will experience an increase in labor force by 32,865 workers or 22.4 percent; however, this increase will be lower than the increase of 65,055 workers or 25.1 percent for males. Females, 18 to 24 years, showed a projected 8.0 percent increase or 3,135 workers by 1980, while those 25 to 34 years will experience the largest percent increase of 57.3 or 14,806 workers as compared to all other categories. The female age group of 35 to 44 years will increase by 30.3 percent, a projected increase of 8,055 workers, while those 45 to 64 years will increase by 14.9 percent or 5,694 workers, and the age group of 65 years and over will increase 17.8 percent or 753 workers.

Among the counties, Cache County will experience an increase of 22.9 percent or 2,259 workers among males and an increase of 1,715 workers for females, a 30.3 percent increase for the projection period. Davis County will have large increases of males and females joining the labor force, 9,217 or 38.2 percent and 5,363 or 44.4 percent, respectively. Salt Lake County will gain an additional 26,536 males joining the projected labor force in this decade and 14,730 new female members, for 23.2 and 31.8 percent increases. During the decade Utah County

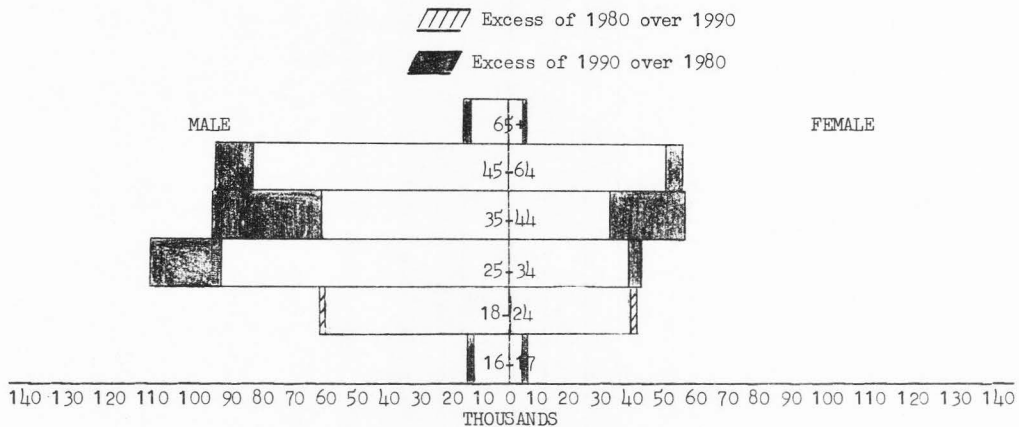
will experience an increase of 29.1 percent or 9,101 new male workers, while females will have a 14.4 percent increase or 2,538 workers. There will be an increase of 23.7 percent or 7,534 male workers and 19.8 percent or 3,977 female workers in Weber County.

The multi-county areas will experience the following increases in labor force for the decade: Multi-County Area 1, 27.4 percent increase or 3,489 males and 31.8 percent or 2,063 females; Multi-County Area 2, 26.2 percent increase or 2,412 males and 26.6 percent or 1,097 females; Multi-County Area 3, 21.1 percent increase or 2,115 males and 16.7 percent or 872 females; Multi-County Area 4, 14.9 percent increase or 1,785 males and 16.1 percent or 928 females; and Multi-County Area 5, 23.8 percent increase or 877 males and 31.5 percent or 535 females.

Changes in the labor force between 1980 and 1990

Between 1980 and 1990, projected labor force growth is expected to be slower than during the previous decade and will become even more concentrated in the age groups 25 to 34 years and 35 to 44 years. The total labor force for both sexes is projected at 603,541 workers in 1990: 323,656 males and 179,062 females. The slowdown in Utah's projected labor force growth will be a population phenomenon resulting from the decline in the number of births which began in the 1960's. Figure 12 shows the age-sex profile of the state's labor force as projected in 1990.

In addition to Figure 12, Tables 34 through 44 indicate that males and females in the age group of 16 to 17 will experience projected labor force increases of 36.2 percent or 3,687 male and 33.9 or 1,760 female workers. Both sexes will experience declines of projected labor force growth for the age group 18 to 24 years, 1.6 percent for



Source: Table 23

Figure 12. Age-sex profile of the State of Utah's labor force, projected 1980 and 1990

males and 2.8 percent for females, 997 and 1,215 workers respectively. For males, moderate labor force growth is expected in the projected labor force for men in the ages of 25 to 34 years and 45 to 64 years, a 16.5 percent increase or 15,648 workers, and 11.0 percent or 9,502 workers, respectively. Substantial projected labor force growth is shown for males 35 to 44 years old: 58.9 percent or 35,712 additional workers.

The growth patterns for females were similar in all age categories during the decade. Females in the ages of 25 to 34 years, 35 to 44 years, 45 to 64 years, and 65 years and over will experience the respective percent increases of 9.1, 68.5, 11.8, and 25.6. Obviously, substantial growth in the projected labor force will be for the age group of 35 to 44 years, 68.5 percent or 23,727 workers, similar to the growth increase for males.

Most counties and multi-county areas will experience the same slowdowns in projected labor force growth as the state. Cache County indicates an increase in projected labor force over the previous decade of 24.4 percent or 2,957 new male workers and 910 or 12.3 percent female workers. Davis County will have projected labor force increases of 7,305 males, or 21.9 percent, and 3,360 females, or 19.2 percent. In Salt Lake County, there will be an additional 27,881 males and 14,996 females by 1990, 21.2 and 18.2 percent increases respectively. Utah County shows projected increases of 24.0 percent for males and 28.9 percent for females, or 9,707 and 5,819 workers respectively. Finally, Weber County will experience an additional 6,864 males and 4,398 females in the projected labor force by 1990.

The multi-county areas will experience the following projected increases in labor force for the decade: Multi-County Area 1, 20.0

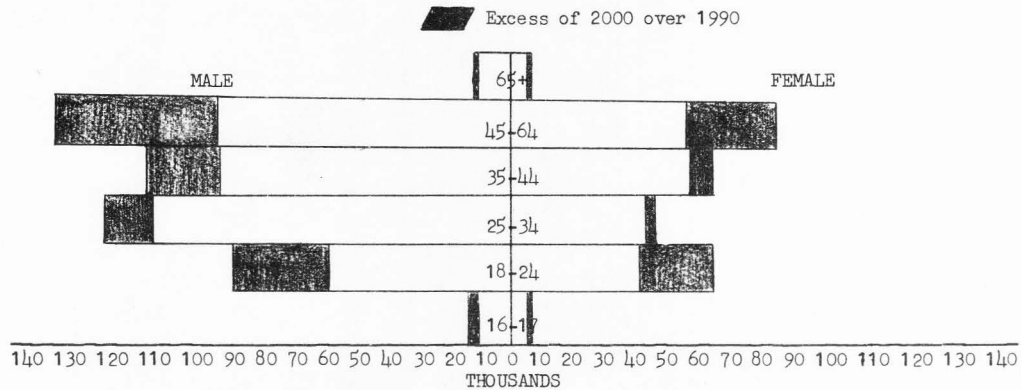
percent increase or 3,247 males and 18.7 percent or 1,600 females; Multi-County Area 2, 19.6 percent increase or 2,276 males and 18.8 percent or 984 females; Multi-County Area 3, 18.9 percent increase or 2,298 males and 21.1 percent or 1,283 females; Multi-County Area 4, 12.8 percent increase or 1,757 males and 10.4 percent or 697 females; and Multi-County Area 5, 27.2 percent increase or 1,243 males and 20.4 percent or 456 females.

Changes in the labor force between
1990 and 2000

The projection period of 1990 to 2000 is perhaps the least reliable of the projection periods, since projections for those in the labor force from age 16 to 30 are based entirely on assumed birth rates. The projections of labor force to 1986 are more reliable because the labor factor is determined from population which has been born, and death rates and migration rates are quite stable.

However, between 1990 and 2000, labor force growth in Utah is expected to increase by 25.8 percent for males and 26.9 percent for females, resulting in an additional 100,708 male and 61,791 female workers. Similarly, the projected labor force in 2000 will become less concentrated as compared to the projected labor force structure in 1990, as shown in Figure 13. The total of the labor force is projected at 766,040 workers, explained by the substantial projected population growth for the decade. This is particularly well illustrated by the substantial projected labor force growth in the age group 18 to 24 years, which observed increases of 49.3 percent of 29,849 males and 59.1 percent or 24,295 females.

As can be seen from Tables 34 through 44, substantial projected labor force growth will occur for both sexes in the age group of 45 to



Source: Table 23

Figure 13. Age-sex profile of the State of Utah's labor force, projected 1990 and 2000

64, 39,268 males and 25,886 females, due to the large numbers born in the first ten years after World War II which have moved up the age scale. Male workers 16 to 17 years old show a 23.8 percent increase for the period, resulting in an addition of 3,307 workers to the labor force. Modest gains in the projected labor force will occur in the age groups of 25 to 34 years and 35 to 44 years, as compared to the increases of males in the 18 to 24 and 45 to 64 year olds, primarily due to a slow-down in population growth for these age groups. Only very slight increases in projected labor force growth will be observed for male workers in the age group 65 years and over: 855 males or a 6.5 percent increase.

By the year 2000 females will experience similar trends as those of the males, with projected labor force increases modest for women in the age groups of 16 to 17, 25 to 34, 35 to 44, and 65 years and over, or percent increases of 22.3, 9.9, 8.5, and 10.2 respectively. However, during the decade for the first time the female labor force 16 years and over will increase more than the male's, 26.9 percent to 25.8 percent.

The counties and multi-county areas indicate the same trends in their projected labor force increases as the state. Cache County will experience a 26.7 percent increase of males and 31.4 percent for females, or 4,025 male and 2,603 female workers. Davis County will gain 10,039 additional males and 6,746 additional females in the labor force by 2000, increases of 24.7 and 32.4 percent. Salt Lake County's projected labor force will increase 25.3 percent or 42,601 males and 27.3 percent or 26,583 females by the year 2000 as compared to 1990. Utah County will have similar increases in projected labor force growth of about 27 percent for both sexes; however, the males numbered 13,791

and the females, 7,035. Weber County shows a 25.0 percent increase of males and a 27.9 percent increase in females, or 11,559 and 7,935 workers, respectively.

The multi-county areas will experience the following increases in projected labor force growth for the decade: Multi-County Area 1, 27.3 percent males and 32.9 percent females, or 5,320 and 3,340 workers; Multi-County Area 2, 24.7 percent males and 31.1 percent females, or 3,430 and 1,945 workers; Multi-County Area 3, 26.6 percent males and 30.3 percent females, or 3,849 and 2,232 workers; Multi-County Area 4, 21.4 percent males and 27.3 percent females, or 3,318 and 2,016 workers; and Multi-County Area 5, 29.7 percent males and 38.1 percent females, or 1,724 and 1,024 new workers respectively.

In relation to the work done in this study, a further need remains for periodic revisions of projections of Utah's labor force using additional information. Detailed projections can be also carried out by industrial and occupational classification categories.

Nevertheless, it is hoped that some insight has been provided about some of the implications of these projections for the labor force in the State of Utah. Finally, to the projection user, those who would look into the future would do well to heed the admonishments of Mangum and Nemore:

Accept the fact that even with the best techniques, the future will remain opaque; use projections with patience and wisdom; and have faith in the far from perfect but reasonable flexibility of the labor market and the adaptability of human beings.²

²Mangum and Nemore, "The Nature and Functions of Manpower Projections," Industrial Relations, V, No. 3 (May, 1966), p. 16.

CHAPTER VII

SUMMARY AND CONCLUSIONS

The primary objectives of this study were (1) to study the trend of Utah's labor force participation by age and sex, for counties, multi-county areas, and the state, from 1960 to 1970, (2) to project Utah's labor force for counties, multi-county areas, and the state by age and sex to the year 2000, and (3) to study some social and economic implications of the labor force projections for Utah. The study was limited to estimates of total labor force supply by age and sex, for the State of Utah by counties, multi-county areas, and the state, according to basic assumptions, for 1980, 1990, and 2000. No attempts were made to project employed and unemployed status separately, or industrial and occupational composition of the labor force. Several other limitations of this study include: the errors included in the data used, such as the possibility of under- or over-enumeration in the census; accuracy of the United States labor force figures as compiled by the Bureau of Labor Statistics for 1970; the problem of comparability of census data between different census years; the method used in the projections does not account for all factors which influence labor force growth, especially economic considerations; the population projections do not give consideration to the internal migration within the State of Utah; the labor force projections are limited by particular assumptions which may be incorrect; and unforeseen industrial developments, particularly in rural counties, which may negate the labor force projections in those

areas. However, these shortcomings and errors are not significant enough to invalidate the findings of the study.

A demand exists for labor force study and projection, especially at the state level in Utah where little study has been attempted in this area and long-range labor force study by age and sex is absent. This study was necessary in order that various state agencies and business organizations will have the materials for the determination of policies and planning programs, that estimates of job requirements can be made, so that educational and training programs are adequately forecast for the demand of economic growth developments, to guide the selection of alternate manpower programs, to alert government and other concerned parties to emerging manpower problems, and to encourage an informed and responsible public concern for manpower information and problems.

A study of population changes was a necessary starting point for projecting the future size of the labor force, since the number of workers available at any time depends mainly on the number of persons of working age in the population. After population projections were completed, the size of the future labor force was estimated by applying to separate age groups of males and females that proportion which, on the basis of historical and other analyses, can be expected to be in the labor force.

Incorporated into this study, for the final purpose of projecting future labor force for Utah, are population projections being prepared for the State of Utah by Yun Kim and Therel R. Black of the Department of Sociology at Utah State University. They used the method of population projection called the "component method." This method of population projection involves projections of numbers of males and females in each age group of the population separately and deals with

population changes by the components of births, deaths, and migration. Reasonable estimates about the future numbers of population in each of the components is based upon knowledge of the past. One of the basic elements of knowledge concerning the past is the number of births, deaths, and net migrants in some specified recent period of time.

Based on past trends, the future births were estimated from the number of women in the reproductive age groups and age specific fertility rates, while the number of deaths for each age and sex group were obtained by applying assumed age and sex specific survival rates following principles of life table construction. Similarly, the volume of net migration was also estimated separately for each age and sex group.

The study of population was a guide for the assumptions regarding the future trends in fertility, mortality, and migration, relating to the population series used in this study. It was assumed that there will be no significant changes in the fertility of women, that no significant improvements in the medical sciences are expected and therefore changes in the death rates will be minor for the projection period, and migration will not affect population growth because it accounts for so little increase in Utah's population. Based on these assumptions, the population of Utah enumerated in each county in the 1970 Census was projected by age and sex to 1980, 1990, and 2000.

In order to project the future labor force of Utah by using the cohort analysis technique of long-range labor force projection, the labor force participation rates of the past were studied for each age and sex group from 1960 and 1970. Accordingly, the State of Utah was divided into the five most heavily populated counties--Cache, Davis, Salt Lake, Utah, and Weber--and five multi-county areas for purposes of analysis and projection.

With few exceptions, the trends in the labor force participation rates between 1960 and 1970 in Utah showed declines in the participation of males and females in the age group of 16 to 17. For males 18 to 24 there was a slight decrease in labor force participation, while ages 25 to 45 showed both increases and decreases in participation according to county and multi-county areas, and ages 45 to 64 had slight declines in participation. Females had substantial increases for the age category 18 to 24, and the ages 25 through 64 years showed small increases in participation. A comparison of trends in labor force participation rates between Utah and the United States by age and sex showed similar patterns of participation in 1960 and 1970.

Since the trends in labor force participation by age and sex of the United States and Utah in 1960 and 1970 so closely paralleled, it was decided to project the future participation rates for Utah up to 2000, using the projected participation rates for the United States made by the Bureau of Labor Statistics. The procedure used for calculation of the projected labor force in Utah for 1970 depended upon the relationship which existed between the participation rates for the United States and for Utah in the base year of 1970. By finding the ratios between Utah's 1970 labor force participation rates by age and sex and the 1970 United States rates, it was possible to apply these ratios to the projected United States 1980 labor force participation rates and thereby arrive at projected labor force participation rates for the State of Utah in 1980.

Similarly, trends of labor force participation rates for the counties and multi-county areas showed patterns similar to those observed for the state. Therefore, the projection of the future labor force participation rates by age and sex for those areas were based on

the projected participation rates for the state. Thus, the labor force participation rates for Utah's counties and multi-county areas by age and sex were divided by the State of Utah's participation rates in 1970 in order to obtain ratios for calculating the projected participation rates for those counties and multi-county areas in 1980. These ratios were used to multiply Utah's projected 1980 participation rates by age and sex in order to arrive at the projected participation rates for counties and multi-county areas in 1980. Then, the estimated participation rates for 1980 in the counties, multi-county areas, and the state were applied to the total projected populations of the respective categories of age and sex, resulting in the projected labor force figures for 1980. The same procedure was repeated in order to obtain the 1990 and 2000 projection periods.

In order to insure that the labor force totals by age and sex for counties and multi-county areas were calculated to the labor force totals for the State of Utah, a smoothing procedure was used for those few categories where labor force totals of the counties and multi-county areas were not within .5 percent of the state's. The smoothing procedure consisted of dividing the state's total for the particular age and sex category by the total of the counties and multi-county areas to obtain the ratio difference. This ratio was then multiplied with each county and multi-county area total so that the sum of labor force projected for all counties and multi-county areas equaled to within .5 percent of the State of Utah's labor force total.

Since the population projections were made by five year age groups, it was necessary to find the projected populations of the age categories of 16, 17, 18, and 19. This was required so that populations could be estimated for the age categories of 16 to 17 and 18 to 24 for

labor force projections. This task was accomplished by using the Karup-King Formula, which split the five year age grouped data (15 to 19 age group) into single year values.

Several basic assumptions were made concerning the labor force projections for Utah. Major assumptions used in the study are as follows: (1) the trends in the relative differences of the labor force participation rates between the state and counties will continue as observed in 1970, (2) the unemployment rates for the State of Utah will average around 5.5 percent of the labor force, (3) the economic activity and development in Utah will continue at comparable levels found in 1970, avoiding any major recessions, (4) the direction of past trends in labor force participation rates of the various age-sex groups in the United States and Utah will continue, (5) the Bureau of Labor Statistics projected labor force participation rates for the United States in 1985 will remain basically the same in 1990, and (6) the trends in the projected labor force participation rates for the United States between 1980 and 1990 will continue to the year 2000.

The calculations of projected labor force in Utah showed that throughout the projection period of this study the size of the total labor force would increase by 361,242 workers by the year 2000, as compared to the 1970 level of 404,798 workers. This represents an increase of 97,920 workers from 1970 to 1980; 100,823 workers from 1980 to 1990, and 162,499 workers from 1990 to 2000, or percent increases of 24.1, 20.0, and 26.9, respectively. At the same time, the working age population of Utah will increase by an estimated 590,036 persons by 2000. The labor force figures indicate that over the next thirty years the state will need to provide at least 320,000 new jobs. An additional 20,000 new jobs would be desirable in order that high levels of employment

would be possible when considering unemployment and projected labor force increases.

Projected labor force in the decade from 1970 to 1980 showed that males in the age group of 16 to 17 actually declined by 3.3 percent or 355 workers as compared to 1970. Males in the age class 25 to 34 years increased at a dramatic rate, growing by 34,727 workers in the ten-year period. Increases of 16,368 workers were observed for other males, 35 to 65 years and over. Females showed the same trends in projected labor force growth as the males, except the increases in numbers were not as large. Females age 16 to 17 saw a decline of 10.0 percent or 578 workers, while those 18 to 24 years old increased 8 percent or 3,135 workers. Females in the age group 25 to 34 experienced a large increase in projected labor force growth of 57.3 percent or 14,806 workers, and those 45 to 64 years increased 14.9 percent or 5,694 new additional workers. A small increase of 753 workers was seen for females aged 65 years and over. The projected total participation rates for those 16 years and over in the state declined for both males and females, primarily due to the national projections of labor force participation which experienced these trends. The counties and multi-county areas had much the same trends.

Projected labor force growth between 1980 and 1990 will be slower than during the previous decade and will become more concentrated in the age groups of 25 to 34 years and 35 to 44 years. The total labor force is projected to be 603,541 workers; 323,656 males and 179,062 females. The slowdown in Utah's projected labor force growth was due to the decline in the birth rates in the 1960's. The members in the projected labor force for the age group 16 to 17 had an increase of 36.2 percent or 3,687 males and 33.9 or 1,760 females, while those 18 to 24 years

old had declines of 1.6 percent or 997 males and 2.8 percent or 1,215 females. The age group of 25 to 34 years experienced a projected growth of 16.5 percent for males and 9.1 percent for females in the 1980's and the combined age groups of 25 to 34 and 35 to 44 included over half of all workers in the state for 1990. Most of the rest of the workers in the state were concentrated in the age category of 45 to 64 years. The State of Utah experienced smaller increases in its projected labor force growth, as did most of the counties and multi-county areas compared to the previous decade's growth. The state did show about a 20 percent increase for both males and females, or 65,481 and 35,342 additional workers respectively.

The projected period 1990 to 2000 is the least reliable due to the labor force 16 to 30 years old being based entirely on assumptions of births for the population in these ages. However, projected labor force growth is expected to increase by 25.8 percent or 100,708 males and 26.9 percent or 61,791 females. The total of the labor force is projected to be 766,040 workers by 2000 and will become less concentrated than in the previous decade. The large projected labor force increase will be due to the substantial population growth, particularly in the age category of 18 to 24 years, which will see an increase of 54,144 male and female workers. Similarly, substantial labor force growth will occur in the age group of 45 to 64 years, of 39,268 males and 25,866 females. Only very slight increases in projected labor force growth can be seen for workers in the age groups of 16 to 17 years and 65 years and over. Modest gains in projected labor force will occur in the age categories of 25 to 34 years and 35 to 44 years. This is primarily due to the population growth slowdown for these age groups. Generally, the

same trends were true for the projected labor force increases of the counties and multi-county areas.

Throughout the projection period of 1970 to 2000, Utah's labor force growth has been highest for both males and females in the age groups of 25 to 34 years and 35 to 44 years, as indicated by the 103.4 and 119.3 percent increases for males of the respective age groups, and 88.8 and 138.5 percent increases for females. Generally, the younger ages, 16 through 24 years, experienced greater projected labor force increases for males, while the females showed greater increases for the older ages 45 through 65 years and over. Between 1970 and 2000, males observed a percent increase in the projected labor force of 89.4, while and female projected labor force growth was 88.9 percent. The total projected labor force growth in the state had an 89.2 percent increase to the year 2000.

Throughout the projection period, expected trends in labor force participation rates have included a declining participation of males in the younger ages due to increased schooling, while continued high participation rates were expected for men in the central ages. The participation rates for older men show a declining trend due to earlier retirement benefits. The participation rates for younger women are expected to be somewhat affected by schooling activities, although not to the extent for males. The most dramatic trend will be the continuing movement of married women into paid employment. Older women will also have a declining labor force participation trend because of earlier retirement programs. Generally, the overall participation rates for males will show a stabilizing trend, while females will show increasing rates for the state from 1980 to 2000. Although the female participation rates increased over the projection period, the female proportion

of the labor force did not increase because of the decline in the differential between males and females in the working age population by about six thousand females to the year 2000.

In relation to the work done in this study, a further need remains for projections of Utah's labor force using additional information. Detailed projections can also be carried out by industrial and occupational classification categories.

BIBLIOGRAPHY

- Baer, Roger K. "Male Labor Force Participation Revisited," Demography, IX, No. 4 (November, 1972), 635-653.
- Bancroft, Gertrude. The American Labor Force, Its Growth and Changing Composition. New York: John Wiley and Sons, Inc., 1958.
- Barclay, George W. Techniques of Population Analysis. New York: John Wiley and Sons, Inc., 1958.
- Barth, Peter S. "Unemployment and Labor Force Participation," Southern Economic Journal (January, 1968), 375-382.
- Bendix, Reinhard, and Seymour M. Lipset. "Karl Marx's Theory of Social Classes." In Reinhard Bendix and Seymour M. Lipset (Eds.), Class, Status, and Power. New York: The Free Press, 1966.
- Black, Tharel R., and James D. Tarver. Age and Sex Population Projections of Utah Counties. Utah State University: Agriculture Experiment Station, Bulletin 457, 1965.
- Bowen, William G., and T. Aldrich Finegan. "Educational Attainment and Labor Force Participation," American Economic Review, LVI (May, 1966), 567-582.
- _____, and T. Aldrich Finegan. The Economics of Labor Force Participation. Princeton, N. J.: Princeton University Press, 1969.
- Cain, Glen G. Married Women in the Labor Force: An Economic Analysis. Chicago, Illinois: University of Chicago Press, 1966.
- Cook, Robert C., and Tadd Fisher. "The U.S. Labor Force: 1950-1960: Islands of Obsolete Capacity and Unwanted Skills," Population Bulletin, XX, No. 3 (May, 1964), 57-87.
- Cooper, Sophia, and Denis F. Johnston. "Labor Force Projections by Color, 1970-80," Monthly Labor Review, LXXXIX (September, 1966), 965-972.
- Cox, Peter R. Demography. Cambridge, England: Published for the Institute of Actuaries and the Faculty of Actuaries at the University Press, 1966.
- Darmstadter, Joel. "Manpower in a Long-Term Economic Projection Model," Industrial Relations, V, No. 3 (May, 1966), 28-58.

- Dernburg, Thomas, and Kenneth Strand. "Hidden Unemployment 1953-62: A Quantitative Analysis by Age and Sex," American Economic Review, LVI (March, 1966), 71-95.
- Deutermann, William V. "Educational Attainment of Workers, March, 1972," Monthly Labor Review, XCV, No. 11 (November, 1972), 38-42.
- Durand, John D. The Labor Force in the United States, 1890 to 1960. New York: Social Science Research Council, 1948.
- Durkheim, Emile. The Division of Labor in Society. George Simpson (Trans.). Glencoe, Illinois: Free Press, 1947.
- Employment News Letter. State of Utah. Salt Lake City, Utah: Department of Employment Security, December, 1971.
- Employment News Letter. State of Utah. Salt Lake City, Utah: Department of Employment Security, March, 1972.
- Finegan, T. Aldrich. "Labor Force Growth and the Return to Full Employment," Monthly Labor Review, XCV (February, 1972), 29-39.
- Flaim, Paul O. "Persons Not in the Labor Force: Who They Are and Why They Don't Work," Monthly Labor Review (July, 1969), 3-14.
- Fleisher, Belton M., and Richard D. Porter. "Assets, Nonemployment Income, and Alternative Models of Labor Supply," United States Department of Labor Special Report, April, 1971.
- Galloway, Lowell E. "Age and Labor Mobility Pattern," Southern Economic Journal, XXXVI, No. 2 (October, 1969), 171-180.
- _____. "Industry Variations in Geographic Labor Mobility Patterns," Journal of Human Resources, II (Fall, 1967), 461-474.
- _____. "Labor Mobility, Resource Allocation and Structural Unemployment," American Economic Review, LIII (1963), 694-716.
- Gastwirth, Joseph P. "On the Decline of Male Labor Force Participation," Monthly Labor Review, XCV, No. 10 (October, 1972), 44-46.
- Goldstein, Harold. "Projections of Manpower Requirements and Supply," Industrial Relations, V, No. 3 (May, 1966), 17-27.
- _____, and Sol Swerdloff. Methods of Long-Term Projection of Requirements for and Supply of Qualified Manpower. Paris, France: UNESCO Publication, 1967.
- Haase, Peter E. "Technological Change and Manpower Forecasts," Industrial Relations, V, No. 3 (May, 1966), 59-71.
- Harbison, F. H., and C. Myers. (Eds.) Education, Manpower and Economic Growth. New York: McGraw-Hill, 1964.

- Hauser, Philip M. "Labor Force," in Robert E. L. Faris (ed.). Handbook of Modern Sociology. Chicago, Illinois: Rand McNally and Company, 1964.
- _____. "The Labor Force as a Field of Interest for the Sociologist," American Sociological Review, XVI, No. 4 (1951), 530-538.
- _____, and Otis D. Duncan. The Study of Population: An Inventory and Appraisal. Chicago, Illinois: University of Chicago Press, 1959.
- Hill, C. Russell. "Education, Health and Family Size as Determinants of Labor Market Activity for the Poor and Nonpoor," Demography, VIII, No. 3 (August, 1971), 379-388.
- Holland, S. S. "Adult Men not in the Labor Force: Special Labor Force Report," Monthly Labor Review, XC, No. 3 (March, 1967), 5-15.
- Hollister, G. "Economics of Manpower Forecasting," International Labour Review, LXXXIX (April, 1965), 371-397.
- Iden, G. "Unemployment Classification of Major Labor Areas 1950-1965," Journal of Human Resources, II (Summer, 1967), 375-391.
- Jaffe, A. J. People, Jobs and Economic Development. Glencoe, Illinois: Free Press, 1959.
- _____, and J. Froomkin. Technology and Jobs: Automation in Perspective. New York: Praeger, 1968.
- _____, and C. D. Stewart. Manpower Resources and Utilization: Principles of Working Force Analysis. New York: John Wiley and Sons, 1951.
- Janowitz, Barbara S. "An Empirical Study of the Effects of Socio-economic Development on Fertility Rates," Demography, VIII, No. 3 (August, 1971), 319-330.
- Johnston, Denis F. "Education and the Labor Force," Monthly Labor Review, XCI (September, 1968), 1-11.
- _____. Long-Range Projections of Labor Force. U.S. Department of Labor, Bureau of Labor Statistics, Preliminary Draft, 1967.
- _____, and James R. Wetzel. "Effect of the Census Undercount on Labor Force Estimates," Monthly Labor Review (July, 1969), 3-14.
- Kasarda, John D. "Economic Structure and Fertility: A Comparative Analysis," Demography, VIII, No. 3 (August, 1971), 307-317.
- Kuznets, S. Economic Growth and Structure. New York: W. W. Norton, 1965.
- Ladinsky, J. "The Geographic Mobility of Professional and Technical Manpower," Journal of Human Resources, II (Fall, 1967), 475-494.

- Lebergott, S. Manpower in Economic Growth, The United States Record Since 1800. New York: McGraw-Hill, 1964.
- _____. "Population Changes and the Supply of Labor," in National Bureau of Economic Research, Demographic and Economic Changes in Developed Countries. Princeton, N. J.: Princeton University Press, 1960.
- Long, C. D. The Labor Force Under Changing Income and Employment. Princeton, N.J.: Princeton University Press, 1958.
- Lundahl, Craig R. "Recent Research Concerning Short-Run Cyclical Change and Labor Force Participation," Sociological Focus, II (Utah State University, 1971), 27-35.
- Mangum, Garth L. (Ed.). The Manpower Revolution: Its Policy Consequences. Garden City, New York: Doubleday and Company, Inc., 1965.
- _____, and Arnold L. Nemore. "The Nature and Functions of Manpower Projections," Industrial Relations, V, No. 3 (May, 1966), 2-11.
- "Manpower Implications of Technological Change," Monthly Labor Review, LXXXVIII (February, 1965), 3-4.
- McEntire, Davis. The Labor Force in California. Berkeley, California: University of California Press, 1952.
- McNally, Gertrude Bancroft. "Labor Force," Monthly Labor Review, XC, No. 2 (February, 1967), 5-8.
- Mincer, J. "Labor Force Participation and Unemployment," in R. A. Gordon and M. S. Gordon (Eds.), Prosperity and Unemployment. New York: Wiley and Sons, 1966.
- Moore, Wilbert E. Economy and Society. New York: Random House, 1955.
- Nabers, Lawrence, and Jewell J. Rasmussen. Employment and Population Analysis and Projections Ogden Metropolitan Area, Utah, and the United States. Salt Lake City, Utah: Bureau of Economic and Business Research, University of Utah, 1962.
- _____, and Jewell J. Rasmussen. Employment and Population Analysis and Projections Provo Metropolitan Area, Utah, and the United States. Salt Lake City, Utah: Bureau of Economic and Business Research, University of Utah, 1964.
- _____, and Jewell J. Rasmussen. Employment and Population Analysis and Projections Salt Lake Metropolitan Area, Utah, and the United States. Salt Lake City, Utah: Bureau of Economic and Business Research, University of Utah, 1962.

- _____, Jewell J. Rasmussen, and John W. Lord. Employment, Population, Income and Automobiles in Salt Lake, Ogden, Provo Metropolitan Areas and State of Utah. Salt Lake City, Utah: Bureau of Economic and Business Research, University of Utah, 1966.
- Nam, Charles B. (Ed.). Population and Society. Boston, Massachusetts: Houghton-Mifflin Company, 1968.
- National Planning Association, "Women in the Labor Force," Projection Highlights (May, 1972), 1-4.
- Oppenheimer, Valerie K. "The Interaction of Demand and Supply and its Effect on Female Labor Force in the United States," Population Studies, XXI (November, 1967), 239-259.
- Parnes, Herbert S. Research on Labor Mobility. New York: Social Science Research Council, Bulletin No. 65, 1954.
- _____, and Jack A. Meyer. "Retirement Expectations of Middle-Aged Men," United States Department of Labor Special Report, September, 1971.
- _____, and Jack A. Meyer. "Withdrawal from the Labor Force of Middle-Aged Men, 1966-1967," United States Department of Labor Special Report, January, 1971.
- Perrella, Vera C. "Woman and the Labor Force," Monthly Labor Review, XC (February, 1968), 1-12.
- Pursell, Donald E. "Determinants of Male Labor Mobility," Demography, IX, No. 2 (May, 1972), 257-261.
- Rosenblum, Marc. "On the Accuracy of Labor Force Projections," Monthly Labor Review, XCV, No. 10 (October, 1972), 22-29.
- Rosenburg, J. M. Automation, Manpower and Education. New York: Random House, 1966.
- Rosenfeld, Carl, and Kathryn R. Gover. "Employment of School-Age Youth," Monthly Labor Review, XCV, No. 8 (August, 1972), 25-30.
- Smith, Adam. An Inquiry into the Nature and Causes of the Wealth of Nations. London, England: George Routledge and Sons, 1890.
- Spengler, Joseph J. "Population and Economic Growth," in Ronald Freedman (Ed.). Population: The Vital Revolution. German City, New York: Anchor Books, 1964.
- Stein, R. L. "Reasons for Non-participation in the Labor Force," Monthly Labor Review, XC (July, 1967), 22-27.
- Strand, Kenneth, and Thomas Dernburg. "Cyclical Variation in Civilian Labor Force Participation," The Review of Economics and Statistics, XLVI (November, 1964), 378-391.

- Swerdloff, Sol. "How Good Were Manpower Projections for the 1960's," Monthly Labor Review, XCI, No. 2 (November, 1969), 17-22.
- Tella, Alfred. "Labor Force Sensitivity to Employment by Age, Sex," Industrial Relations, IV (February, 1965), 69-83.
- _____. "The Relation of Labor Force to Employment," Industrial and Labor Relations Review, XVII (April, 1964), 454-469.
- "The United States Economy in 1980: A Preview of BLS Projections," Monthly Labor Review, XCIII, No. 4 (April, 1970), 3-34.
- Travis, Sophia C. "The United States Labor Force: Projections to 1985," Monthly Labor Review, XCIII, No. 5 (May, 1970), 3-12.
- United Nations. "Demographic Aspects of Manpower, Report 1, Sex and Age Patterns of Participation in Economic Activities," Population Studies, No. 33. New York: Department of Economic and Social Affairs, 1962.
- U.S. Bureau of the Census. Current Population Reports. Series P-57. No. 204. Washington, D.C.: U.S. Government Printing Office.
- U.S. Bureau of the Census. Current Population Reports. Series P-25. No. 247. Washington, D.C.: U.S. Government Printing Office.
- U.S. Bureau of the Census. U.S. Census of Population: 1940. Vol. II, Characteristics of the Population, Utah. Washington, D.C.: U.S. Government Printing Office.
- U.S. Bureau of the Census. U.S. Census of Population: 1950. Vol. II, Characteristics of the Population, Part 1, United States Summary. Washington, D.C.: U.S. Government Printing Office.
- U.S. Bureau of the Census. U.S. Census of Population: 1950. Vol. II, Characteristics of the Population, Part 44, Utah. Washington, D.C.: U.S. Government Printing Office.
- U.S. Bureau of the Census. U.S. Census of Population: 1950. General Social and Economic Characteristics, United States Summary. Washington, D.C.: U.S. Government Printing Office.
- U.S. Bureau of the Census. U.S. Census of Population: 1960. General Population Characteristics, Utah Final Report, PC(1)-46B. Washington, D.C.: U.S. Government Printing Office.
- U.S. Bureau of the Census. U.S. Census of Population: 1960. General Social and Economic Characteristics, Part 46, Utah. Washington, D.C.: U.S. Government Printing Office.
- U.S. Bureau of the Census. U.S. Census of Population: 1960. General Social and Economic Characteristics, United States Summary. Washington, D.C.: U.S. Government Printing Office.

- U.S. Bureau of the Census. U.S. Census of Population: 1970. Advance Report. General Population Characteristics, Utah, PC(V2)-46. Washington, D.C.: U.S. Government Printing Office.
- U.S. Bureau of the Census. U.S. Census of Population: 1970. General Population Characteristics, Utah, PC(1)-46B. Washington, D.C.: U.S. Government Printing Office.
- U.S. Bureau of the Census. U.S. Census of Population: 1970. General Social and Economic Characteristics, Utah, PC(1)-C46. Washington, D.C.: U.S. Government Printing Office.
- U.S. Department of Labor. Bureau of Labor Statistics. Labor Force Annual Averages, 1970.
- U.S. Department of Labor. Bureau of Labor Statistics. "Special Labor Force Report, No. 13," Reprint No. 2364. Washington, D.C.: U.S. Government Printing Office.
- U.S. Department of Labor. Bureau of Labor Statistics. Tomorrow's Manpower Needs. Volume I, Development Area Manpower Projections, Bulletin No. 1606. Washington, D.C.: U.S. Government Printing Office, 1969.
- U.S. Department of Labor. Bureau of Labor Statistics. Tomorrow's Manpower Needs. Volume II, National Trends and Outlook: Industry Employment and Occupational Structure, Bulletin No. 1606. Washington, D.C.; U.S. Government Printing Office, 1969.
- U.S. Department of Labor. Bureau of Labor Statistics. Tomorrow's Manpower Needs. Volume III, National Trends and Outlook: Occupational Employment, Bulletin No. 1606. Washington, D.C.: U.S. Government Printing Office, 1969.
- U.S. Department of Labor. Bureau of Labor Statistics. Tomorrow's Manpower Needs. Volume IV, The National Industry-Occupational Matrix and Other Manpower Data, Bulletin No. 1606. Washington, D.C.: U.S. Government Printing Office, 1969.
- U.S. Department of Labor. Career Thresholds. Volume 1, Manpower Research Monograph No. 16. Washington, D.C.: U.S. Government Printing Office.
- U.S. Department of Labor. Career Thresholds. Volume 2, Manpower Research Monograph No. 16. Washington, D.C.: U.S. Government Printing Office.
- U.S. Department of Labor. Career Thresholds. Volume 3, Manpower Research Monograph No. 16. Washington, D.C.: U.S. Government Printing Office.
- U.S. Department of Labor. Dual Careers. Volume 1, Manpower Research Monograph No. 21. Washington, D.C.: U.S. Government Printing Office.

- U.S. Department of Labor. Handbook of Labor Statistics 1971. Washington, D.C.: U.S. Government Printing Office, 1971.
- U.S. Department of Labor. Manpower Report of the President. Washington, D.C.: U.S. Government Printing Office, 1970.
- U.S. Department of Labor. The Pre-Retirement Years. Volume I, Manpower Research Monograph No. 15. Washington, D.C.: U.S. Government Printing Office.
- U.S. Department of Labor. Years for Decision. Volume 1, Manpower Research Monograph No. 24. Washington, D.C.: U.S. Government Printing Office.
- Utah State Department of Health. Vital Statistics Annual Report. Salt Lake City, Utah: Bureau of Vital Statistics, 1960.
- Utah State Department of Health. Vital Statistics Annual Report. Salt Lake City, Utah: Bureau of Vital Statistics, 1970.
- Vaizey, J. "Labor Market and the Manpower Forecaster: Some Problems," International Labour Review, LXXXIX (April, 1964), 353-370.
- Waldman, Elizabeth. "Marital and Family Characteristics of the U.S. Labor Force," Monthly Labor Review, XCIII (May, 1970), 18-27.
- _____. "Marital and Family Status of Workers," Monthly Labor Review, XCI, No. 4 (April, 1968), 14-22.
- Walker, J. W. "Forecasting Manpower Needs," Harvard Business Review, XLVII (March, 1969), 152-154.
- Wilson, Thomas F. Labor Force Participation and Business Fluctuations: An Analysis by Cyclical States. U.S. Department of Commerce (PB 191699). Springfield, Virginia: Clearinghouse for Federal Scientific and Technical Information, 1970.
- Wolfbein, Seymour L. Employment and Unemployment in the United States. Chicago, Illinois: Science Research Associates, Inc., 1964.
- _____, and A. J. Jaffe. "Demographic Factors in Labor Force Growth," American Sociological Review, II (August, 1946), 392-396.
- Woytinsky, W. S. Additional Workers and the Volume of Unemployment in the Depression. Washington, D.C.: Social Science Research Council, 1940.

APPENDIX

Table 45. Ratios between Utah and the United States labor force participation rates by age and sex, for 1970, 1980, and 1990

Age	Ratios		
	1970	1980	1990
Male			
16-17	.9106	.9106	.9106
18-24	.9127	.9127	.9127
25-34	.9596	.9596	.9596
35-44	.9937	.9937	.9937
45-64	1.0134	1.0134	1.0134
65+	1.1348	1.1348	1.1348
Female			
16-17	.7335	.7335	.7335
18-24	.9166	.9166	.9166
25-34	.8246	.8246	.8246
35-44	1.0208	1.0208	1.0208
45-64	1.0060	1.0060	1.0060
65+	1.0000	1.0000	1.0000

Table 46. Ratios between Utah and the counties and multi-county areas labor force participation rates by age and sex for 1970

Age	Ratios					Multi-County Area 1	Multi-County Area 2	Multi-County Area 3	Multi-County Area 4	Multi-County Area 5
	Cache	Davis	Salt Lake	Utah	Weber					
Male										
16-17	1.0303	.7523	1.1285	.9228	1.0490	.8644	.8738	1.0771	.9439	.6425
18-24	.8030	1.0196	1.0984	.7946	1.1012	1.1561	1.0529	1.0281	.9578	.6863
25-34	.8284	1.0550	1.0043	.9244	1.0312	1.0658	1.0258	1.0291	1.0226	1.0204
35-44	.9875	1.0250	.9979	.9968	1.0041	1.0166	.9541	1.0041	.9760	.9072
45-64	1.0309	1.0430	.9988	.9900	.9944	1.0342	.9966	.9756	.9878	.9160
65+	.8910	1.0759	1.0264	.8613	.9174	1.1518	1.3399	.9306	.9966	.9372
Female										
16-17	.9179	1.0000	1.0039	.9687	1.0078	.9414	.9921	1.2109	.9921	.8398
18-24	.9090	1.0232	1.1083	.8162	1.1779	.9264	.6653	.9187	.7717	.6402
25-34	.8936	.9113	1.0708	.8632	1.1493	1.0582	.7924	.8708	.8278	.7139
35-44	.9918	1.0449	1.0020	.8323	1.1451	1.0817	.8834	1.0777	.9304	.7484
45-64	.9919	1.0141	1.0302	.8709	1.0907	1.0262	.9596	.9173	.8870	.8850
65+	.8865	1.0103	1.1030	.9690	.9793	1.1649	.9587	.5773	.7525	1.0103

Table 47. Ratios between Utah and the counties and multi-county areas labor force participation rates by age and sex for 1980

Age	Ratios									
	Cache	Davis	Salt Lake	Utah	Weber	Multi-County Area 1	Multi-County Area 2	Multi-County Area 3	Multi-County Area 4	Multi-County Area 5
Male										
16-17	1.0224	.7465	1.1198	.9157	1.0409	.8578	.8670	1.0688	.9366	.6375
18-24	.7808	.9914	1.0680	.7726	1.0707	1.1241	1.0229	.9996	.9312	.6673
25-34	.8338	1.0618	1.0108	.9304	1.0379	1.0727	1.0325	1.0357	1.0292	1.0271
35-44	.9875	1.0250	.9979	.9968	1.0041	1.0166	.9541	1.0041	.9760	.9072
45-64	1.0309	1.0430	.9988	.9900	.9944	1.0342	.9966	.9756	.9878	.9160
65+	.8910	1.0759	1.0264	.8613	.9174	1.1518	1.3399	.9306	.9966	.9372
Female										
16-17	.9179	1.0000	1.0039	.9687	1.0078	.9414	.9921	1.2109	.9921	.8398
18-24	.9017	1.0149	1.0993	.8096	1.1684	.9189	.6599	.9113	.7655	.6350
25-34	.9039	.9219	1.0832	.8732	1.1626	1.0704	.8015	.8809	.8373	.7221
35-44	.9918	1.0449	1.0020	.8323	1.1451	1.0817	.8834	1.0777	.9304	.7484
45-64	.9919	1.0141	1.0302	.8709	1.0907	1.0262	.9596	.9173	.8870	.8850
65+	.8865	1.0103	1.1030	.9690	.9793	1.1649	.9587	.5773	.7525	1.0103

Table 48. Ratios between Utah and the counties and multi-county areas labor force participation rates by age and sex for 1990

Age	Weber					Multi-County Area 1	Multi-County Area 2	Multi-County Area 3	Multi-County Area 4	Multi-County Area 5
	Cachs	Davis	Salt Lake	Utah	Weber					
Male										
16-17	1.0224	.7465	1.1198	.9157	1.0409	.8578	.8670	1.0688	.9366	.6375
18-24	.7849	.9966	1.0736	.7767	1.0763	1.1299	1.0282	1.0049	.9361	.6708
25-34	.8253	1.0510	1.0005	.9210	1.0273	1.0617	1.0220	1.0252	1.0188	1.0166
35-44	.9875	1.0250	.9979	.9968	1.0041	1.0166	.9541	1.0041	.9760	.9072
45-64	1.0309	1.0430	.9988	.9900	.9944	1.0342	.9966	.9756	.9878	.9160
65+	.8910	1.0759	1.0264	.8613	.9174	1.1518	1.3399	.9306	.9966	.9372
Female										
16-17	.9179	1.0000	1.0039	.9687	1.0078	.9414	.9921	1.2109	.9921	.8398
18-24	.9017	1.0149	1.0993	.8096	1.1684	.9189	.6599	.9113	.7655	.6350
25-34	.8980	.9158	1.0760	.8674	1.1549	1.0633	.7962	.8751	.8318	.7173
35-44	1.0063	1.0602	1.0167	.8444	1.1619	1.0976	.8963	1.0934	.9440	.7594
45-64	.9919	1.0141	1.0302	.8709	1.0907	1.0262	.9596	.9173	.8870	.8850
65+	.8780	1.0005	1.0924	.9597	.9699	1.1536	.9494	.5717	.7453	1.0005

VITA

Craig R. Lundahl

Candidate for the Degree of

Doctor of Philosophy

Dissertation: Labor Force Projections for the State of Utah, 1970-2000

Major Field: Sociology

Biographical Information:

Personal Data: Born at Logan, Utah, June 19, 1943, son of Ray Eugene and Jerry Morgan Lundahl.

Education: Attended elementary schools in Idaho Falls, Idaho; graduated from Idaho Falls High School in 1961; received Associate of Science degree from Ricks College, with major areas of study in sociology and business, in 1964; received Bachelor of Science degree from Brigham Young University, with a major in sociology and a minor area in history, in 1966; completed requirements for the Master of Science degree, specializing in industrial sociology and personnel administration, at Utah State University in 1968; and completed requirements for the Doctor of Philosophy degree in sociology, specializing in demography with minor emphasis in industrial sociology, at Utah State University in 1973.

Academic Experience: Research Assistant at Utah State University in Logan, Utah, from January, 1967, to May, 1967; September, 1967, to December, 1967; Research Analyst under research grant from Rogers Brothers Company of Idaho Falls, Idaho; Teaching Assistant at Utah State University, January, 1968, to August, 1970; and Lecturer in Sociology at Western New Mexico University in Silver City, New Mexico, September, 1971, to August, 1973.