Productivity:

A Bibliography

July 1966

Bulletin No. 1514

UNITED STATES DEPARTMENT OF LABOR
W. Willard Wirtz, Secretary

BUREAU OF LABOR STATISTICS
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PRODUCTIVITY: A SELECTED ANNOTATED BIBLIOGRAPHY

Introduction

The role of productivity as the means to higher levels of economic well-being and national strength has long been recognized. Within the United States Government, the Bureau of Labor Statistics, U.S. Department of Labor, has been engaged in conducting and publishing studies and analyses of productivity for nearly 70 years. Others too have studied and written about this vital subject so that the literature in the field has become quite extensive. To help government, labor and management officials, teachers, and students make use of the growing volume of material on productivity, the Bureau of Labor Statistics published in 1957 an annotated bibliography of productivity references through June 1957. (See Productivity: A Bibliography, BLS Bulletin 1226, 1957.) The present bibliography has been compiled for the period July 1957 through December 1964. The references are briefly annotated to indicate general content of the publication.

Productivity studies and research are conducted in the Bureau's Division of Productivity Measurement, Lloyd A. Prochnow, Chief, under the general direction of Leon Greenberg, Assistant Commissioner for Productiity and Technological Developments. Most of the work on this bibliography was prepared within the Division by Laura H. Spatz, assisted by Elmer S. Persigehl, under the supervision of Fritz Kafka. The study was brought to completion by Louise E. Cleary.

Scope and Limitations

Productivity is considered to be a measure of the efficiency with which resources are utilized in the creation of goods and services. It may be defined as a ratio of output to input in which one or many input factors are considered. The single input factor most often represented in these listings is labor.

The bibliography excludes literature related to time--and--motion studies at the job level, and to the field of psychology dealing with aptitudes and individual differences. Although it cannot be doubted that such factors influence productivity change, these studies belong in other scientific areas.

Books, articles, pamphlets, and speeches are listed in this bibliography. However, news items, very brief articles, and publications not available in the English language are excluded. Although an attempt was made to compile a comprehensive list of all substantial publications, it is possible that some important references may have been omitted. Neither the inclusion nor omission of a listing implies an evaluation of the publication.

Using the Bibliography

Effective use of the bibliography may be facilitated by the following features:

Classification by Subject. References are classified in six broad subdivisions. When a reference pertains to more than one subdivision, it is generally listed only once, in the division to which a major portion of the article, book, etc. relates. Occasionally a double listing has been made for references deemed necessary for inclusion in more than one section.

Section I, Concepts and Measurements, includes entries whose major contribution is in the field of methodology, even though confined to a particular industry. Section II, Factors Affecting Productivity, includes entries relating to factors which cause productivity change. Section III, Productivity Levels or Trends, consists of information on productivity levels or trends, including studies of the total economy, sectors of the economy, various industries, and particular plants or firms. Entries which compare productivity in the United States with that of other countries are classified in Section IV, International. Section V, Productivity and the Economy, includes studies dealing with the relationship of productivity to economic growth. Included in this section are publications pertaining to the significance of productivity change, collective bargaining and productivity, and the interrelationships of productivity, wages, and prices. Section VI, Bibliographies, lists some annotated bibliographies dealing with productivity and technological change.

Alphabetical Arrangement by Authors. The references are generally arranged and numbered alphabetically by author within each section.

Numerical Coding. The code to the left of the decimal represents the number of the section, and the number to the right of the decimal indicates the item number within the section.

Indexes. All references are indexed by author and by subject. Also included is the address of each periodical and publishing organization mentioned in the bibliography.

Index of Authors. Appendix A presents an alphabetical listing of authors with the numerical codes of all references cited. Authors included in collections are not listed unless designated in the reference.

Index of Subjects. Appendix B presents an alphabetical listing by title of all references regardless of section.

Periodical and Publisher List. Appendix C is an alphabetical listing of the addresses of periodicals and publishing organizations cited in the bibliography.

I. Concepts and Measurements

This chapter includes entries whose major contribution is in the field of methodology, even though confined to a particular industry.

1.001 Aganbegian, A. G. "Indexes and Methods of Comparing International Labor Productivity," Paper presented at the Conference on Labor Productivity, Cadenabbia, Lake Como, Italy, August 31 to September 8, 1961. Chapter 12, Labor Productivity (New York, McGraw-Hill, 1964). pp. 154-163.

Discusses methods of comparing labor outlays and the productivity of social labor in the national economy of different countries.

1.002 Altenkirch, Friedrich. "Methods of Productivity Measurement in Industry," Productivity Measurement Review, No. 9, May 1957, pp. 14-22.

Explains how the productivity of similar shops in different firms within the same industry may be measured and compared to show deviations from the general industry trend.

1.003 Amey. L. R. "Measuring Productivity in the Absence of Records," Bulletin of the Oxford University Institute of Economics and Statistics, February 1959, pp. 47-53.

Presents methods used to determine output and input for past years. Includes an explanation of the use of oral testimony, the problems of a heterogeneous product mix, and the analyses needed to determine certain data.

1.004 Arrowood, Arthur John. "Some Effects on Productivity of Justified and Unjustified Levels of Reward Under Public and Private Conditions," Microfilm Number 62-1765 listed and reviewed in Dissertation Abstracts, May 1962 (Ann Arbor, Mich., University Microfilms, Inc., 1961). 88 pp.

Unpublished doctoral dissertation, expanding a previous study by J. Stacy Adams to include an alternative "reinforcement-reward" theory as a possible explanation for the greater productivity of certain experimental groups tested.

1.005 Beaumont, Richard A. Productivity and Policy Decisions (New York, Industrial Relations Counselors, Inc., 1959). 59 pp.

The productivity concept, methods of measuring productivity, and the uses and limitations of such measurement are background material for a discussion of decision-making in reference to the national controversy of union-management relationships regarding wage determination.

1.006 Becker, Gary S. "Investment in Human Capital: A Theoretical Analysis," The Journal of Political Economy, Supplement: October 1962, pp. 9-49.

A theoretical analysis of the amount a firm would be willing to invest in human capital if it could benefit from the resulting increase in productivity.

1.007 Behrens, Friedrich. "Measuring Labor Productivity and Its Factors by the Time-Sum Method," Paper presented at the Conference on Labor Productivity, Cadenabbia, Lake Como, Italy, August 31 to September 8, 1961. Chapter 7, Labor Productivity (New York, McGraw-Hill, 1964). pp. 71-81.

Explains the time and cost summation formula for the measurement of labor productivity as recently computed for the overall measurement and planning of labor productivity in the German Democractic Republic.

1.008 Behrens, Friedrich. "The Concept of Labor Productivity," Paper presented at the Conference on Labor Productivity, Cadenabbia, Lake Como, Italy, August 31 to September 8, 1961. Chapter 7 (continued), Labor Productivity (New York, McGraw-Hill, 1964). pp. 82-92.

Reviews various theoretical concepts of labor productivity with special attention to its measurement independent of production relations.

1.009 Beri, G. C. Measurements of Production and Productivity in Indian Industry with Special Reference to Some Methodological Aspects (London, Asia Publishing House, 1962). 177 pp.

A Ph.D. dissertation containing chapters on statistical procedures used in constructing a production index, and a discussion of concepts and measurement of productivity.

1.010 Brems, Hans. "Growth, Distribution, Productivities, and Thrift in Cobb-Douglas Models," Southern Economic Journal, January 1963, pp. 181-188.

Discusses the Cobb-Douglas model and its implications for distribution, productivities, and thrift. Model is compared with the Harrod-Domar model.

1.011 Brems, Hans. "Growth Rates of Output, Labor Force, Hours, and Productivity," The Review of Economics and Statistics, November 1957, pp. 415-420.

A "slight disaggregation" of the Harrod-Domar model is used to investigate the relationships between the growth rates of output, labor force, output per man-hour, and hours.

1.012 Buzzell, Robert Dow. "Productivity in Marketing: With Special Reference to Drug and Hardware Wholesalers," Microfilm Number 58-511 listed and reviewed in Dissertation Abstracts, March 1958 (Ann Arbor, Mich., University Microfilms, Inc., 1961) 323 pp.

Unpublished doctoral dissertation which examines and evaluates basic methods of productivity measurement. One approach was tested by application to drug and hardware wholesalers' statistics for the period 1929-1954.

1.013 Clague, Ewan. Productivity--What It Is and How It Is Measured, U.S. Department of Labor, Bureau of Labor Statistics, 1959, 17 pp.

Explains the reasons for the development of productivity statistics; defines productivity; discusses various applications of productivity data. Also explains time series charts and comments on John Kendrick's method of weighting productivity components.

1.014 Clemhout, Simone. "The Ratio Method of Productivity Measurement," Economic Journal, June 1963, pp. 358-360.

A critical analysis of the ratio method of productivity measurement.

1.015 Dacy, Douglas C. "A Price and Productivity Index for a Nonhomogeneous Product," Journal of the American Statistical Association, June 1964, pp. 469-480.

Introduces price and productivity formulas in which known price and quantity data are substituted for unknown data. Examples from the construction industry illustrate the technique.

1.016 David, Paul A. "The Deflation of Value Added," The Review of Economics and Statistics, May 1962, pp. 148-155.

An econometric study in which variations in the prices of materials are compared in point of time with the prices of the fabricated goods sold at a later time. Attempts to explain a minus net output figure which may be obtained by conventional methods of deflation.

1.017 Denison, Edward F. Measurement of Labor Input: Some Questions of Definition and the Adequacy of Data, National Bureau of Economic Research, Studies in Income and Wealth, Volume 25 (Princeton, Princeton University Press, 1961). pp. 347-386.

Describes the relative merits of employment and man-hour data as measures of labor input in the measurement of productivity, and discusses the adequacy of the statistical sources of each.

1.018 Domar, Evsey D. "On the Measurement of Technological Change," Economic Journal, December 1961, pp. 709-729.

Discusses the conceptual and statistical problems connected with the computation of various labor productivity indexes, with special emphasis on the geometric index method and the treatment of inventory increments as final products.

1.019 Domar, Evsey D. "On Total Productivity and All That," Journal of Political Economy, December 1962, pp. 597-608.

An explanatory review of John Kendrick's study, Productivity Trends in the U.S. (See reference code 1.051.)

1.020 Domar, Evsey D. "Total Productivity and the Quality of Capital," Journal of Political Economy, December 1963, pp. 586-588.

Examines the effect of allowing for changes in the quality of capital upon Kendrick's measures of total factor productivity. A theoretical analysis using a two-sector model.

1.021 Emelianov, A., and Krasovskii, V. "Methods of Determining the Economic Effectiveness of Mechanization and Automation," Problems of Economics, March 1961, pp. 29-35. (Translation from original Soviet sources.)

A study of capital investments, production costs, the timing of capital outlay, and output per worker as the main criteria for assessing the economic effectiveness of mechanization and automation.

1.022 Fabricant, Solomon. Basic Facts on Productivity Change, Occasional Paper No. 63 (New York, National Bureau of Economic Research, 1959). 49 pp.

Summarizes the main results of NBER research and "states the findings in a minimum of technical language." Includes indexes of output per man-hour and per unit of tangible capital for the private domestic economy, 1889-1957.

1.023 Fabricant, Solomon. "Meaning and Measurement of Productivity," Paper presented at the Conference on Labor Productivity, Cadenabbia, Lake Como, Italy, August 31 to September 8, 1961, Chapter 2, Labor Productivity (New York, McGraw-Hill, 1964). pp. 12-26.

Analyzes and discusses various concepts and measurements of labor productivity.

1.024 Fabricant, Solomon. "Productivity: It Meaning and Trend," Research Series No. I, Challenge, October 1962, pp. 35-39.

A basic introduction to productivity concepts, including several charts illustrating gains in productivity since 1889.

1.025 Fabricant, Solomon. "Which Productivity? Perspective on a Current Question," Monthly Labor Review, June 1962, pp. 609-613.

Discusses various concepts of productivity and its measurement, and the relationships between purpose and the kind of measurement to be chosen.

1.026 Farrell, M. J. "The Measurement of Productive Efficiency," Journal of the Royal Statistical Society, March 1957, pp. 253-290.

Presents a unique measurement of productive efficiency based on the theory of the production function. This measurement, which avoids many index number problems, is illustrated by application to agricultural production in the U.S.

1.027 Fjosne, A., and Remery, R. Productivity Measurement in the Building Industry (Paris, Organization for Economic Cooperation and Development, Productivity Measurement Advisory Service, 1962). 72 pp. Issued as a special number of Productivity Measurement Review, February 1962.

Considers various possible productivity indicators; discusses three measures in some detail: elementary (technological) productivity ratios, relative productivity ratios, and cost ratios. The ratios form the basis of a general model which can be used for analytical purposes.

1.028 Fourastie, Jean. Productivity, Prices, and Wages, Project 235 (Paris, Organization for European Economic Cooperation, European Productivity Agency, 1957). 113 pp.

Presents an original method of measuring long-term productivity trends--an approach which by-passes the statistical problems of matching production and employment figures. Overall measurements of productivity based on data published for other purposes.

1.029 Fulton, Roger H., and Rogers, Bernard G. "The Measure of Productivity--a Challenge to Management," National Association of Manufacturers' report on the 32nd NAM Institute on Industrial Relations, March 14-18, 1960. pp. 73-77.

Brief description of productivity definitions and concepts, and a discussion of "total factor" productivity.

1.030 Greenberg, Leon. "Data Available for the Measurement of Output Per Man-Hour," Output, Input, and Productivity Measurement, National Bureau of Economic Research, Studies in Income and Wealth, Volume 25 (Princeton, Princeton University Press, 1961). pp. 147-199.

A survey of the data available for output per man-hour measures. Describes, by industry, the availability of output quantities, values, prices, employment, and man-hours.

1.031 Greenberg, Leon. Data for Measurement of Industrial Productivity (Prepared at the request of the Organization for Economic Cooperation and Development in connection with their Global Productivity Measurement Project) (U.S. Department of Labor, Bureau of Labor Statistics, March 1964--revised 1965). 38 pp.

Reviews the status of available statistical data. Discusses areas in which improvements in data availability must be made.

1.032 Greenberg, Leon. "Productivity Measurement for Economic Analysis," Paper presented at the Conference on Labor Productivity, Cadenabbia, Lake Como, Italy, August 31 to September 8, 1961. Chapter 5, Labor Productivity (New York, McGraw-Hill, 1964). pp. 45-56.

Describes the current productivity measurement program of the U.S. Department of Labor's Bureau of Labor Statistics. Includes recent productivity trends and a discussion of measurement problems.

1.033 Greenberg, Leon. "Productivity of Older Workers," Gerontologist, March 1961, pp. 38-41.

Presents the results of studies by the Bureau of Labor Statistics comparing actual on-the-job performance of older and younger workers, both as groups and as individuals. The studies covering factory and office workers are based on establishment records of output and hours in attendance.

1.034 Griliches, Zvi. "Agricultural Productivity: A Progress Report," Productivity Measurement Review, No. 32, February 1963, pp. 21-24.

Considers three important problems in productivity measurement: The role of changes in the level of formal education in explaining observed productivity increases, the possibilities of disequilibrium and the inappropriateness of the usual weighting schemes that rely on market prices, and economies of scale.

1.035 Griliches, Zvi. "Measuring Inputs in Agriculture: A Critical Survey," Journal of Farm Economics, December 1960, pp. 1411-1427 (Proceedings of the Annual Meeting of the American Farm Economic Association, August 10-13, 1960, at Iowa State University, Ames, Iowa).

Examines the measurement of agricultural inputs from the point of view of aggregate productivity analysis. The discussion is limited to conceptual problems.

1.036 Hapgood, R. L. "Productivity Guide for Manufacturing Management" (Rucker Plan Approach) The Controller, May 1960, pp. 207-213.

Discusses the application of Allen W. Rucker's productivity measurement technique to management control, incentive payments, product pricing, and labor-management negotiation.

1.037 Hardin, Einar. "Measuring the Rate of Productivity Growth," Productivity Measurement Review, No. 35, November 1963, pp. 5-13.

Compares rates of growth in productivity from 1909-1960 by three methods of calculation, measures of reliability and tests of significance.

1.038 Hodge, M. H., Jr. "Rate Your Company's Research Productivity," Harvard Business Review, November-December 1963, pp. 109-122.

Examines problems and possible techniques for the measurement of research output, such as patents, publications, scientific articles, types of research, diversification, and research expenditures.

1.039 Hoffman, Walther G. "On Forecasting Productivity Changes in an Expanding Economy," International Economic Papers, 1958, pp. 146-171. Translated from Zeitschrift fur die Gesamte Staatswissenchaft, 1958, by Elizabeth Henderson.

Discusses the advantages of studying productivity for different sectors of an economy, and within the sectors by branches, as a means of increasing the reliability of predictions of productivity changes.

1.040 Hogan, Warren P. "Technical Progress and Production Function," The Review of Economics and Statistics, November 1958, pp. 407-411. Reply by Robert M. Solow, pp. 411-413.

Discusses the distinction between gross and net depreciation estimates in an economic growth model. Includes a table on gross and net estimates of technical progress from 1909 to 1949.

1.041 Hogan, William T. "Influence of Capital on Productivity," Iron and Steel Engineer, December 1961, pp. 93-96.

Suggests that productivity measures should include as inputs both raw materials and capital, rather than considering labor alone.

1.042 Hollister, R. G. "The Economics of Manpower Forecasting," International Labour Review, April 1964, pp. 371-397.

Presents some problems involved in manpower forecasting: isolation of the sources of productivity change, estimation of future skill requirements for each product, cross-sectional differences among countries in efficiency, the degree of lag between known "best practice" techniques, rates of gross investment, and replacement of equipment.

1.043 Horner, F. B. "The Meaning of Production Indexes," Economic Record, March 1961, pp. 82-97.

Presents alternate methods of developing indexes of production for a national economy. Explains the use of each in the measurement of productivity.

1.044 James, J. V., and Rooney, A. G. "Outline of a Plan for Practical Productivity Accounting," National Association of Accountants Bulletin, December 1957, pp. 31-39.

Considers a method for measuring productivity at the plant level within a standard accounting framework.

1.045 Jehring, J. J., Editor. Solving Problem of Productivity in a Free Society (Madison, Wisc., University of Wisconsin, School of Commerce, Center for Productivity Motivation, 1962). 77 pp.

An introduction and seven papers presented at a symposium held in Racine, Wisc., November 1961. One group gives perspective to productivity problems, while another group discusses new approaches to the solution of these problems.

1.046 Johansen, L. "A Method for Separating the Effects of Capital Accumulation and Shifts in Production Functions Upon Growth in Labour Productivity," Economic Journal, December 1961, pp. 775-782.

A theoretical method for examining the relative effects of technical change and capital accumulation upon increases in labor productivity. The method is applied to United Kingdom industries for the change in productivity between 1924 and 1950.

1.047 Kaplan, Norman. "Some Methodological Notes on the Deflation of Construction," Journal of the American Statistical Association, September 1959, pp. 535-555.

Proposes a redefinition of output in terms of intermediate products. Presents two indirect methods for obtaining a measure of the change in the average price of intermediate products. One of the two methods combines an index of input prices and a measure of productivity changes.

1.048 Kendrick, John W., and Creamer, Daniel. Measuring Company Productivity: Handbook With Case Studies (New York, National Industrial Conference Board, 1961). 110 pp.

A handbook for the measurement of productivity at the company level, discussing uses, concepts, and measurement of productivity. Included are five case studies of company productivity measurement projects.

1.049 Kendrick, John W. "Productivity: Contributions of Capital and Labor," The Conference Board Business Record, June 1958, pp. 238-241.

Considers the measurement of "total factor productivity" and its relationship to costs and prices, 1948-1957. Includes concept and methodology.

1.050 Kendrick, John W. "Productivity, Costs and Prices: Concepts and and Measures," Chapter 2, Wages, Prices and Productivity (New York, Columbia University, The American Assembly, 1959). pp. 37-59.

Discusses productivity, factor costs, and price level concepts, the sources of data and methods of measurement, and the need for improved statistical measures.

1.051 Kendrick, John W. Productivity Trends in the United States, National Bureau of Economic Research, General Series No. 71 (Princeton, Princeton University Press, 1961). 630 pp.

Presents historical measures of output, input, and productivity for the U.S. economy and industry groups, including descriptions of concepts and methods of measurement. Includes a discussion of implications of productivity change for economic growth, incomes, and resource allocation.

1.052 Kendrick, John W. "What is Productivity?" Solving Problems of Productivity in a Free Society (Madison, Wisc., University of Wisconsin, School of Commerce, Center for Productivity Motivation, June 1962). pp. 5-25.

Defines productivity on four or five different levels.

1.053 Kerchoff, Alan C. "The Need for a Systemic Theory of Worker Productivity," Social Forces, December 1959 (Baltimore, The Williams and Wilkins Company). pp. 115-118.

Suggests the need for a different theoretical approach to the problem of predicting or explaining the level of worker productivity. Discusses the general difficulty encountered in sociological theory-building.

1.054 Klug, Raymond H. Design and Evaluation of a System for Raising Productivity Through Work Measurement (Ann Arbor, Mich., University Microfilms, Inc., 1962). (Thesis presented at Ohio State University).

A study by the Logistic Command of the U.S. Air Force on the development of a work measurement program to raise productivity in direct labor areas. The purpose of the study is to develop and apply techniques for evaluating results of this program over a period of ten years and to test results of this system for the further extension of work measurement.

1.055 Knowles, James W. "An Appraisal of Productivity Projections," American Statistical Association, Proceedings of the Business and Economic Statistics Section, 1957, pp. 279-287 (Paper presented at the 117th Annual Meeting of the American Statistical Association, Atlantic City, N.J., 1957).

Tests suggested in a previous paper are applied to the appraisal of productivity projections. Twenty-five of the projections are summarized in tabular form.

1.056 Levine, Herbert S. "A Small Problem in the Analysis of Growth," The Review of Economics and Statistics, May 1960, pp. 225-228.

Presents two methods of measuring the relative importance of the increase in the number of workers and the increase in the output per worker in the overall increase in industrial output.

1.057 Liebhafsky, E. E. "A 'New' Concept in Wage Determination: Disguised Productivity Analysis," The Southern Economic Journal, October 1959, pp. 141-146.

A criticism of John T. Dunlop's indictment of marginal productivity analysis. Believes his substitution of the new wage-cluster or wage-contour theory is incomplete.

1.058 Likert, Rensis. "How to Raise Productivity Twenty Percent," Nation's Business, August 1959, pp. 30-32 ff.

Presents a new theory of management constructed by social scientists and based on research conducted by the University of Michigan's Institute for Social Research.

1.059 Lytton, Henry D. "Measuring Output in the Public Administration Field," Productivity Measurement Review, No. 21, May 1960, pp. 59-73.

Discusses how a government bureau is forced to make the most appropriate assumptions it can about influences which might raise or lower its productivity.

1.060 Mansfield, Edwin, and Wein, Harold H. "A Study of Decision-Making Within the Firm," The Quarterly Journal of Economics, November 1958, pp. 515-536.

Attempts to explain how a yardmaster at a railroad freight yard can utilize tentative data, such as crew productivity, forecast of the switching traffic for the day, and the probable proportion of freight cars coming in too late to be moved in the same day, to obtain optimum efficiency and minimum backlog.

1.061 Mark, Jerome A. The Productivity Program of the Bureau of Labor Statistics, A report presented before the 18th Interstate Conference on Labor Statistics (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1960). Proceedings, pp. 81-88.

History and development of the Bureau of Labor Statistics productivity measurement program. Summarizes current activities.

1.062 Mark, Jerome A. "Technical Note: Industry Indexes of Output Per Man-Hour," Monthly Labor Review, November 1962, pp. 1269-1273.

Describes the methodology used in the construction of Bureau of Labor Statistics indexes of output per man-hour. Covers methods, sources, construction, and limitations of production and man-hour indexes.

1.063 Martin, Harold W. "Productivity Costing and Review," Productivity Measurement Review, No. 37, May 1964, pp. 12-86.

Describes research for the development of a common means of measuring productivity in industry and commerce which would be equally applicable to all types of work activities, thereby enabling valid comparison of the efficiencies of widely differing types of industrial and commercial systems and subsystems.

1.064 Martin, Harold W. "Productivity Measurement and Control," Productivity Measurement Review, No. 21, May 1960, pp. 5-31 (Originally presented at the 6th Annual International Meeting of the Institute of Management Sciences, Paris, September 1959).

Presents findings of recent research. Develops additional productivity indexes suitable for use in more detailed functional analysis of a firm's operations.

1.065 Martin, Harold W. "Towards a Common Measure of Productivity," Productivity Measurement Review, No. 19, November 1959, pp. 5-30 (Originally presented at the 1959 Annual Conference Textile Division, The American Society for Quality Control, Charlotte, N.C., January 30, 1959).

Suggests a statistical sampling method of measuring the productivity of an industrial plant.

1.066 Martin, Harold W., and Thomson, R. J. "Work Measurement and Productivity in Engineering Design," Transactions on Engineering Management, September 1960, pp. 83-95.

Describes methods by which reasonably accurate work-task time data, personnel work patterns, and productive efficiency indexes for engineering development and design work can be determined with the aid of routine supervisor samplings.

1.067 Massell, Benton F. "Determinants of Productivity Change in United States Manufacturing," Yale Economic Essays, Fall 1962, pp. 303-348.

Describes a method of apportioning past changes in productivity between technical change and capital deepening. This procedure was applied to the manufacturing sector of the U.S. economy for the period 1919-1958.

1.068 Maywald, K. "The Best and the Average in Productivity Studies and in Long-Term Forecasting," Productivity Measurement Review, No. 9, May 1957, pp. 37-49.

A theoretical discussion of the problems involved in basing long-term forecasting on technological changes.

1.069 McCallum, E. T., and Rosen, H. "Correlates of Productivity," Personnel Psychology, Winter 1962, pp. 429-439.

Attempts to relate attitudes of workers, as shown by attitude tests, to their individual productivity.

1.070 Meshchaninov, L. "The Relation Between the Rates of Increase of Labor Productivity and Wages," Problems of Economics, February 1960, pp. 32-35.

Presents some of the theoretical problems discussed in a dissertation on the ratio between growth rates and the mutual effects of labor productivity and wages.

1.071 Minc, Bronislaw. "Problems in the Measuring and Analysis of Labor Productivity," Paper presented at the Conference on Labor Productivity, Cadenabbia, Lake Como, Italy, August 31 to September 8, 1961. Chapter 3, Labor Productivity (New York, McGraw-Hill, 1964). pp. 27-35.

Discusses basic concepts of labor productivity and presents a new analytical method for its measurement, taking into consideration new products as well as savings in raw materials.

1.072 Moss, Milton. "Industrial Activity and Productivity," American Statistical Association, Proceedings of the Business and Economic Statistics Section, 1957, pp. 287-299.

Defends the use of man-hours adjusted for productivity for part of the Federal Reserve Board's estimates of output of manufacturing industries as better than the old "imputation" method in use prior to 1940.

1.073 Murphy, M. J. "What Every Operating Man Should Know About Productivity," Factory, April 1959, pp. 246-248.

Explains productivity concepts, indexes currently being published, and their application to collective bargaining. Briefly describes how to measure productivity at the plant level

1.074 National Bureau of Economic Research, Conference on Research in Income and Wealth. Output, Input, and Productivity Measurement (Princeton, Princeton University Press, 1961). 506 pp.

Collection of nine papers and commentaries prepared for the Conference in 1958 covering: Part I (5 chapters), "Productivity and the Measurement of Real Outputs and Inputs;" Part II (4 chapters), "The Estimation of Real Products in the Economy by Industries;" Part III (5 chapters), "The Estimation of Real Factor Inputs." (Articles are also listed separately by author under the appropriate headings.)

1.075 O'Connell, Daniel E. "Subproduct Measurement of Production and Productivity," Productivity Measurement Review, No. 17, May 1959, pp. 47-51.

A discourse on the origin of the subproduct concept and the conceptual framework of subproduct measurement.

1.076 O'Connell, Daniel E. "Why Measure Input Productivity?" Productivity Measurement Review, No. 27, November 1961, pp. 59-62.

Expresses view that the relative performance of different capital equipment and raw materials can be measured in the same way as labor productivity. The measurement of productivities of research and development and management are used effectively in planning and organizing for higher productivity levels.

1.077 Organization for Economic Cooperation and Development, Division for Social Affairs. Final Report: International Trade Union Seminar on Productivity Measurement, Rattvik, Sweden, May 23-26, 1961 (Paris, Organization for Economic Cooperation and Development, 1961). 209 pp.

Three general reports on productivity measurement and eight case studies by experts from participating countries.

1.078 Pasinetti, L. L. "On Concepts and Measures of Changes in Productivity," The Review of Economics and Statistics, August 1959, pp. 270-282; discussion, pp. 282-286.

An economic interpretation of technological change, with special emphasis on capital.

1.079 Persons, Robert H. "Productivity: Everybody's Contribution," The Conference Board Business Record, May 1958, pp. 186-189 ff.

Describes the Bureau of Labor Statistics measures of productivity which reflect the man-hours of all employees rather than just production workers, thereby making possible direct comparisons between manufacturing and the rest of the private economy, 1929-1957.

1.080 Productivity, Compensation, and Expense of Sales Personnel Employed by NSOEA Manufacturers, National Stationery and Office Equipment Association, Washington, 1959, 19 pp.

This report for the year 1959 enables a manufacturer to compare his sales, employees, costs and results with those of the industry.

1.081 "Productivity: What Does It Tell Us?" Monthly Review, December 1959, pp. 9-14.

Explains concepts, meanings, and measurement of productivity, with reference to wage-price issues.

1.082 Prudensky, G. A. "Labor Productivity: Concepts, Factors, and Growth Reserves," Paper presented at the Conference on Labor Productivity, Cadenabbia, Lake Como, Italy, August 31 to September 8, 1961. Chapter 1, Labor Productivity (New York, McGraw-Hill, 1964). pp. 3-11.

Examines the social concept of labor productivity.

1.083 Rasch, G. "A Method of Indirect Measurement in Productivity Studies," Productivity Measurement Review, No. 11, November 1957, pp. 42-68.

Gives an example and an appraisal of the calculation required for indirect measurement of productivity.

1.084 Reuther, Walter P. "Measuring the Accelerating Productivity Trend," Productivity Measurement Review, No. 18, August 1959, pp. 39-42. (Appendix to statement presented by Walter P. Reuther, Chairman of AFL-CIO Economic Policy Committee, to the Joint Economic Committee of the U.S. Congress, February 1959.)

Analyzes and summarizes productivity measures used by eminent statisticians.

1.085 Richman, Raymond L. "Measuring the Productivity of Office and Administrative Personnel," Productivity Measurement Review, No. 14, August 1958, pp. 21-27.

Suggests a method which might be used to measure the productivity of office and administrative personnel.

1.086 Roman, Zoltan. "Methods for International Comparisons of Productivity Levels," Paper presented at the Conference on Labor Productivity, Cadenabbia, Lake Como, Italy, August 31 to September 8, 1961. Chapter 8, Labor Productivity (New York, McGraw-Hill, 1964). pp. 95-108.

Presents newly developed "satisfactory" techniques for achieving international productivity comparisons without resorting to foreign exchange conversions.

1.087 Scheidell, John M. The Time Elasticity of Demand and Productivity (Ann Arbor, Mich., University Microfilms, Inc., 1960).

Examines the effect that an explicit consideration of time, via demand and productivity lags, might have upon the demand and cost concepts of micro-economic theory.

1.088 Schleusener, E. "Improving Productivity, Step 1: Work Measurement," Supervisory Management, March, pp. 27-34; April 1960, pp. 16-22.

Suggests a procedure for measuring the productivity of every worker.

1.089 Schultze, Charles L. "Uses of Capacity Measures for Short-Run Economic Analysis" (in Papers and Proceedings of the American Economic Association, 75th Annual Meeting, Pittsburgh, Pa., December 27-29, 1962), The American Economic Review, May 1963, pp. 293-308. Discussion by Solomon Fabricant and Morris Cohen, pp. 309-313.

Sets up models to measure the "implications of economic behavior" related to investment, prices, and productivity which are affected by changes in the rate of capacity utilization.

1.090 Sen, Amartya Kumar. "Choice of Capital Intensity Further Considered," The Quarterly Journal of Economics, August 1959, pp. 466-484.

Presents a model for productivity measurement of two sectors in a developing economy--the backward sector, usually rural with a surplus of labor, and the advanced sector, with areas of differing capital intensity and productivity of labor.

1.091 Sen, Amartya Kumar. Choice of Techniques: An Aspect of Planned Economic Development (Oxford, Basil Blackwell, 1962). 127 pp.

An econometric study of alternative techniques available for increasing output per unit of input under varying combinations of capital and labor costs. Considers both closed and open economies in underdeveloped countries.

1.092 Sen, Amartya Kumar. "Some Notes on the Choice of Capital-Intensity in Development Planning," The Quarterly Journal of Economics, November 1957, pp. 561-584.

Rate-of-turnover, social marginal productivity, and reinvestment criteria for three models of a developing economy.

1.093 Sewell, Charles. A Formula for Labor Productivity in Georgia (Atlanta, Ga., Engineering Experiment Station, Industrial Development Branch, 1961). 27 pp.

A case study providing a useful "formula" for insuring a productive work force for firms locating manufacturing plants in Georgia.

1.094 Shen, Tsung Yuen. "Innovation, Diffusion, and Productivity Changes," The Review of Economics and Statistics, May 1961, pp. 175-181.

A diffusion model in which a capital-intensity criterion is used in forecasting productivity for New England manufacturing in 1970. Model serves as a basis for measuring changes in technology and productivity.

1.095 Shen, Tsung Yuen. "Job Analysis and Historical Productivities in the American Cotton Textile Industry: A Study in Methodology," The Review of Economics and Statistics, May 1958, pp. 149-158.

A study of productivity by the engineering data and job analysis approach, with the assumption of standard values and the use of input and output coefficients.

1.096 Siegel, Irving H. "On the Design of Consistent Output and Input Indexes for Productivity Measurement," Output, Input and Productivity Measurement, National Bureau of Economic Research, Studies in Income and Wealth, Volume 25 (Princeton, Princeton University Press, 1961). pp. 23-46.

Discusses the choice of index number formulas for measuring output, input, and productivity. Indicates that the component indexes should have the same coverage.

1.097 Siegel, Irving H. "Technology and Population as Factors in the Long-Term Outlook," American Statistical Association, Proceedings of the Business and Economic Statistics Section, 1957, pp. 163-166.

Enumerates possible changes in technology and population growth as the chief uncertainties encountered in the projection of output and employment. Other problems discussed are the defects of concept, data, and methodology which do not allow us to take into account fully the effect of shifts in the structure of production and the resulting productivity indexes.

1.098 Slesinger, Reuben. "Productivity: A Managerial Yardstick," Advanced Management, March 1959, pp. 14-16.

Examines the distinction between technical productivity and economic productivity and the many factors exerting interacting influences on changes for each type.

1.099 Solow, Robert M. "Comment" (on George J. Stigler, "Economic Problems in Measuring Changes in Productivity," reference code No. 1.102), Output, Input and Productivity Measurement, National Bureau of Economic Research, Studies in Income and Wealth, Volume 25 (Princeton, Princeton University Press, 1961). pp. 64.

Consists chiefly of a discussion on the question of increasing returns to scale.

1.100 Solow, Robert M. "Technical Change and the Aggregate Production Function," The Review of Economics and Statistics, August 1957, pp. 312-320.

Presents an "elementary" method of segregating output per person due to technical change from that due to changes in the availability of capital per employee.

1.101 Staley, John D., and Delloff, Irving A. Improving Individual Productivity (New York, American Management Association, 1963). 207 pp.

Outlines in a concise, nontechnical manner, some approaches to the problem of increasing productivity and suggests some ways of measuring its accomplishment.

1.102 Stigler, George Joseph. "Economic Problems in Measuring Changes in Productivity," Output, Input, and Productivity Measurement, National Bureau of Economic Research, Studies in Income and Wealth, Volume 25 (Princeton, Princeton University Press, 1961). pp. 47-77.

Describes the economic problems encountered in measuring and interpreting productivity change.

1.103 Strumilin, Stanislav G. "Social Productivity of Labor and Methods of Measuring It," Problems of Economics, October 1960, pp. 34-44.

Discusses an econometric model used for measuring "social productivity" in the Soviet Union. Makes a distinction between "local productivity" in individual sectors and the "productive power" of labor of average quality.

1.104 Terleckyj, Nestor E. "Factors Underlying Productivity Advance--Some Empirical Observations," American Statistical Association, Proceedings of the Business and Economic Statistics Section, 1957, pp. 300-310 (Paper presented at the 117th annual meeting of the American Statistical Association, Atlantic City, N.J., 1957).

Presents hypotheses regarding the relation between productivity and several other factors. Tests the hypotheses by means of simple rank correlation.

1.105 Tlusty, Zdenek. "The Concept of Social Productivity of Labor and Elementary Methods of Measuring It," Paper presented at the Conference on Labor Productivity, Cadenabbia, Lake Como, Italy, August 31 to September 8, 1961. Chapter 6, Labor Productivity (New York, McGraw-Hill, 1964). pp. 57-70.

Discusses the concepts and methodology for constructing "social labor productivity" indexes including "live" and "embodied" labor. Reference is made to Czechoslovakian statistics on labor productivity growth.

1.106 United Nations. Department of Economic and Social Affairs. Industrialization and Productivity, Bulletin Number 8 (New York, United Nations, 1964). 70 pp.

Four articles concerned with the evaluation of projects in planning and programming; capital intensity and scale of industrial production; size of plant and economies of scale; and the adaptation of technology to the needs of developing countries.

1.107 U.S. Bureau of the Budget. Executive Office of the President. Progress in Measuring Work (Washington, U.S. Government Printing Office, 1962). 67 pp.

Selections of seven papers and a panel discussion from the conference sponsored by the U.S. Bureau of the Budget, January 29-February 2, 1962. The first part deals with important concepts about productivity in Government and the possibilities of measuring changes in the productive efficiency of an agency as a whole. The second part presents case reports indicating various work measurement techniques.

1.108 U.S. Department of Labor, Bureau of Labor Statistics. Trends in Output Per Man-Hour in the Private Economy, 1909-1958, Bulletin 1249 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1959). 93 pp.

Estimates of output per man-hour in the private economy, methods and sources used, and factors affecting trends in these estimates.

1.109 Winsten, Christopher B., and Hall, Margaret. "The Ambiguous Notion of Efficiency," The Economic Journal, March 1959, pp. 71-86.

Contrasts different concepts of "efficiency" as applied to an industrial operation. Distinguishes between managerial, social, and technical efficiency.

II. Factors Affecting Productivity

This chapter includes entries which discuss factors causing productivity change. Included are studies of the relationship of productivity to a given factor or set of factors.

2.001 Adams, J. Stacy. "Wage Inequities, Productivity and Work Quality," Industrial and Labor Relations Review, October 1963, pp. 9-16.

Discusses three psychological experiments testing the behavior of people working on relatively highly paid jobs for which they feel underqualified. People working under both hourly and piecework conditions are tested.

2.002 Adams, J. Stacy, and Rosenbaum, W. B. "Relationship of Worker Productivity to Cognitive Dissonance about Wage Inequalities," Journal of Applied Psychology, June 1962, pp. 161-164.

A case study of two groups of workers, one paid on an hourly basis and the other on a piecework basis. Compares productivity of one group who felt they were overpaid with that of a control group who felt they were paid fairly.

2.003 Argyle, Michael, Gardner, Godfrey, and Cioffi, Frank. "Supervisory Methods Related to Productivity, Absenteeism, and Labour Turnover," Human Relations (London, Tavistock Publications, Limited, 1958). pp. 23-40.

Reports an investigation of ninety foremen in eight British factories which manufacture electric motors and switchgear. Matched departments were compared in such organizational effectiveness measures as output, voluntary absenteeism, and labor turnover.

2.004 Bakke, E. Wight. "Organizational Factors in Productivity," Paper presented at the Conference on Labor Productivity, Cadenabbia, Lake Como, Italy, August 31 to September 8, 1961. Chapter 26, Labor Productivity (New York, McGraw-Hill, 1964). pp. 350-363.

Studies the impact of organizational structure on productivity.

2.005 Becker, Gary S. Human Capital, National Bureau of Economic Research, General Series No. 80 (New York, Columbia University Press, 1964). 187 pp.

Theoretical and empirical analyses of the effects of schooling, on-the-job training, and other knowledge or skills on productive wage increases, rates of return, and social productivity gains. Includes age-earning profiles by years of schooling.

2.006 Behrend, H. "Financial Incentives as the Expression of a System of Beliefs," British Journal of Sociology, June 1959, pp. 137-147.

Evaluates productivity increases attributable to incentive schemes.

2.007 Bell, D. A. "What Makes Productivity Grow," Journal of Industrial Economics, October 1957, pp. 76-80.

A general criticism, from an engineer's point of view, of S. Melman's "Dynamic Factors in Industrial Productivity," Oxford, 1956. Bell suggests that a productivity-conscious management, trained in both production engineering and economics, encourages increased productivity in a plant.

2.008 Bello, Francis. "The Technology Behind Productivity," Monthly Labor Review, August 1962, pp. 865-867.

An excerpt from the book entitled, Automation and Technological Change. Includes suggestions for increasing productivity in the U. S.

2.009 Breev, M. "Distribution and Economy of Working Time," Problems of Economics, October 1962, pp. 18-25. (Translation from original Soviet sources.)

Discusses the share of surplus labor and its productivity as decisive factors in the intensive growth and productivity of the technical equipment used by labor.

2.010 Bureau of National Affairs. Raising Employee Productivity, Bureau of National Affairs' Personal Forum Survey No. 50 (Washington, Bureau of National Affairs, 1958).

Management comments on motivation, supervision, the tendency of employees to stick together, incentives, and objections to incentive systems. Discusses specific methods of raising productivity.

2.011 Chandler, Cleveland A. "The Relative Contribution of Capital Intensity and Productivity to Changes in Output and Income in the U.S. Economy, Farm and Nonfarm Sectors, 1946-58," Journal of Farm Economics, May 1962, pp. 335-348.

Explores an "operational technique" in which the impact of technological change is isolated from other influences which affect changes in the productivity ratio. Attempts to measure the effect of technological change embodied in physical capital and other intangible factors such as improvements in organization and administration.

2.012 Davison, J. P., and Ross, N. S. "Productivity and Earnings in Manufacturing," Chapter 2 in Productivity and Economic Incentives (London, George Allen & Unwin, 1958). pp. 38-97.

A study of five manufacturing firms comparing output and earnings before and after the introduction of piece-rates.

2.013 Davison, J. P., and Ross, N. S. "Attitudes and Reactions of Factory Workers," Chapter 3 in Productivity and Economic Incentives (London, George Allen & Unwin, 1958). pp. 98-137.

An analysis of interviews with workers who had had experience on the job before and after a change in payment method was made.

2.014 Davison, J. P., and others. Productivity and Economic Incentives (London, George Allen & Unwin, 1958). 306 pp. Chapters prepared by Faculty of Commerce and Social Science, Birmingham University, Birmingham, Engl.

A statistical study of manufacturing and nonmanufacturing incentive schemes and a survey of their effects on the attitudes and reactions of the employees involved.

2.015 Dusinberre, P. D., Jr. "Applying Pre-determined Time Standards in a Small Company," Systems and Procedures Journal, March 1962, pp. 22-24.

Outlines the steps taken by the author's firm to increase productivity and thereby decrease costs.

2.016 Eurich, Alvin C. "Increasing Productivity in Higher Education," The Review of Economics and Statistics, August 1960, Supplement, pp. 185-188.

Discusses possible economies in the management of higher educational institutions. Suggests greater utilization of plant; improved efficiency in the utilization of human resources, particularly faculty-student ratios; and the increased use of teaching devices.

2.017 Florence, P. Sargant. "Extension of Incentives to Services," Chapter 6, Productivity and Economic Incentives (London, George Allen & Unwin, 1958). pp. 194-218.

Considers the results of changes in economic incentives in a number of nonmanufacturing firms. Information was secured from output and earnings records, and from the opinions of managers, consultants, and trade union representatives.

2.018 Florence, P. Sargant. "The Scale of Organization: Capacities and Incentive," Chapter 4, Economics and Sociology of Industry (London, C. A. Watts and Company, Ltd., 1964). pp. 77-118.

Discusses motives for expanding the size of firms, limits to labor cohesion, and incentives for productivity. Includes data on percentage shifts in distribution of employees among plants of differing sizes in Great Britain and in the USA.

2.019 Foster, Charles. "Competition and Organization in Building," The Journal of Industrial Economics, July 1964, pp. 163-174.

Discusses the situation in which management might not try to achieve maximum productivity as long as prices can be kept ahead of costs.

2.020 Ganguli, Harish Chandra. Industrial Productivity and Motivation; a Psychological Analysis (London, Asia Publishing House, 1961). 92 pp.

Discusses the problem of motivating workers to greater productivity. Describes the psychological effects of incentives, and the effect that the type of organizational structure and leadership within the firm or plant have on the productivity of workers.

2.021 Gellerman, Saul W. Motivation and Productivity (New York, American Management Association, 1963). 304 pp.

Experiences and experiments of noted industrial psychologists. Discusses the motivating environment, the motivated individual, and motivation in perspective.

2.022 Goodeve, Sir Charles. "Productivity as a Science," National Provincial Bank Review (London, National Provincial Bank, Ltd., November 1962). pp. 9-16.

Discusses a scientific quantitative approach to the reduction of labor costs, and the role it can play in increasing productivity. Describes how an operations research worker can often help managers to clarify their objectives and obtain a balance among competing ones.

2.023 Gray, Barbara. "Incentives and Productivity in Laundries," Chapter 4, Productivity and Economic Incentives (London, George Allen & Unwin, 1958). pp. 138-169.

A comprehensive study of a laundry, analyzing changes in output and earnings after the introduction of piece-rates. Results of incentive schemes in other laundries are also quoted.

2.024 Gray, Barbara. "Incentives and Shop Productivity in Cooperative Societies," Chapter 5 in Productivity and Economic Incentives (London, George Allen & Unwin, 1958). pp. 170-193.

An analysis of output and earnings records and interviews of workers in cooperative societies where a group bonus was introduced to encourage increased sales.

2.025 Griliches, Zvi. "The Sources of Measured Productivity Growth: United States Agriculture, 1940-60," Journal of Political Economy, August 1963, pp. 331-346.

Discusses improvements in the quality of labor and machinery, underestimation of the contribution of capital, overestimation of the contribution of labor to output growth, and economies of scale.

2.026 Gustafson, W. E. "Research and Development, New Products, and Productivity Change," (with discussion) The American Economic Review, May 1962, pp. 177-187.

Examines the relationship between research and development expenditures and productivity change. Indicates that research and development is more often aimed at new product introduction than cost reduction of existing products.

2.027 Harbury, C. D. The Industrial Efficiency of Rural Labour (Cardiff, University of Wales Press, 1958). 228 pp.

Direct and indirect comparisons of unit time requirements, labor turnover, absenteeism, and other factors are used to measure the industrial efficiency of rural workers in eleven industries from 1952 through 1956.

2.028 Industrial Relations Counselors. Group Wage Incentives: Experience With the Scanlon Plan, Industrial Relations Memo No. 141 (New York, Industrial Relations Counselors, Inc., 1962). 48 pp.

Discusses union-management cooperation through use of suggestion systems, group incentive schemes, and profit sharing, as means of increasing productivity.

2.029 International Labour Office. Introduction to Work Study (Geneva, International Labour Office, 1957). 349 pp.

The first part, "Productivity and Work Study," contains a brief description of the causes of low productivity and suggests management techniques to eliminate them.

2.030 International Labour Office. Raising Productivity; Conclusions of Three International Meetings of Experts (Geneva, International Labour Office, 1959). 55 pp.

Discusses methods of raising productivity through national programs, establishment of national productivity centers, practical methods of increasing productivity in manufacturing industries, and the advantages and disadvantages of basing worker compensation on quantity produced.

2.031 Jehring, J. J. A Symposium on Profit Sharing and Productivity Motivation (Madison, Wisc., The University of Wisconsin, School of Commerce, Center for Productivity Motivation, February 1961). 60 pp.

A group of college professors and executives from profit sharing companies exchange ideas on the productivity aspects of sharing as it is practiced in American business.

2.032 Johnston, J. Statistical Cost Analysis (New York, McGraw-Hill, 1960). 197 pp.

Section 47 presents an empirical analysis of the relationship between labor productivity and firm size for the 20 major industry groupings classified in the 1939 Census of Manufactures.

2.033 Katzenson, Robert C. "Work Measurement and Wage Incentives," Chapter 5, Production Incentive Systems (Waterford, Conn., Prentice-Hall, Inc., 1964). pp. 71-93.

Contains sections on predetermined elemental time systems and an analysis of operator and departmental productivity. Includes a chart comparing average productivity with incentive potential productivity.

2.034 Khromov, P. "The Size of Industrial Enterprises and Labor Productivity," Problems of Economics, December 1963, pp. 14-24. (Translation from original Soviet Sources.)

Analyzes factors which contribute to greater growth in large factories.

2.035 Klemmer, E. T., and Lockhead, G. R. "Productivity and Errors in Two Keying Tasks," Journal of Applied Psychology, December 1962, pp. 401-408.

Studies productivity and errors rates for keypunch and bank proof machine operators. Productivity is correlated with job tenure and error rates.

2.036 Lewis, Robert W. The Productivity of Rural Workers in Industrial Jobs (Lawrence, Kansas, University of Kansas, Center for Research in Business, 1964). 40 pp.

A comparative study based on the records of three Kansas manufacturing companies. Attempts to shed light on the relative merits of workers with rural or urban backgrounds, with reference to such "productivity indicators" as individuality, ingenuity, reliability, and worker potential.

2.037 Lincoln, James F. "Organizing Business for Increased Productivity," Solving Problems of Productivity in a Free Society (Madison, Wisc., The University of Wisconsin, School of Commerce, Center for Productivity Motivation, 1962). pp. 65-71.

The author discusses his company's twice yearly rated bonus plan paid to employees as an incentive toward increasing productivity on a competitive basis.

2.038 Marcson, Simon. "Motivation and Productivity in Industry," Behavioral Science Research in Industrial Relations, Industrial Relations Monograph No. 21 (New York, Industrial Relations Counselors, 1962). pp. 151-177.

Discusses how basic needs, work climate, and effective management shape employee attitudes.

2.039 Marcus, P. M. "Group Cohesion and Worker Productivity: A Dissenting View," Personnel Administration, May/June 1962, pp. 44-48.

Suggests that greater productivity or efficiency does not necessarily result from cohesive "team-oriented" groups, since some jobs require individual action and initiative.

2.040 Martucci, Nicholas L. A. "Productivity and Incentive Pay," Management Record, October 1957, pp. 346-349 ff.

Relates the experience of the Pfaudler Company in using the Scanlon incentive pay plan as a means of raising productivity.

2.041 McCaffree, Kenneth M. "Union Membership Policies and Labor Productivity Among Asbestos Workers," Industrial and Labor Relations Review, January 1961, pp. 227-234.

A study of the effects of union policies and work rules upon the productivity of asbestos workers in the construction industry. Concludes that policies of union locals have a restrictive effect on productivity.

2.042 McConkey, Dale D. "Productivity and the Annual Improvement Factor," Personnel, July/August 1958, pp. 61-66.

Describes pitfalls facing companies which use an annual improvement factor.

2.043 McMurry, R. N., and Sullivan, J. F. "How to Improve Productivity; Why Some Attempts Fail," The Iron Age, July 13, pp. 67-69; July 20, pp. 71-73; July 27, pp. 87-89, 1961.

Stresses the importance of strong management in raising productivity, since management must be able to overcome worker opposition and direct operations as efficiently as possible.

2.044 Melman, Seymour. Decision-Making and Productivity (New York, John Wiley & Sons, Inc., 1958). 260 pp.

Analyzes industrial decision-making from the standpoint of both unions and management. Shows that several alternate decision-making patterns exist, and that the pattern which is used affects the level of productivity.

2.045 Metaxas, T. "What's Wrong With Industrial Productivity?" Mill and Factory, April 1958, pp. 79-84.

Reveals results of a survey about the causes of low productivity on the part of both management and labor at the plant level. Suggests means of raising productivity.

2.046 Miller, Delbert C., and Form, William H. "Leadership, Morale, and Productivity," Chapter 16, Industrial Sociology, Second Edition (New York, Harper and Row, 1964). pp. 687-733.

A summary of studies by three research centers on the effect leadership practices have on individuals and group morale, and of their effect on the productivity of employees.

2.047 Millwitt, W., Hirsch, I., and Oakes, W. J. "Increasing the Productivity of Scientists," Harvard Business Review, March/April 1958, pp. 66-76.

Shows how scientific manpower can be more efficiently utilized by industry through better planning of research projects, better facilities, and greater concentration of scientists' efforts on non-trivial tasks.

2.048 Odiorne, George S. "Of Productivity and the Personnel Department," Personnel, March/April 1959, pp. 51-59.

Suggests what the personnel man can do to dispel some of the confusion surrounding the perennial problem of productivity.

2.049 O'Donnell, E. J. "Education's Role in Solving the Productivity Problem," Solving Problems of Productivity in a Free Society (Madison, Wisc., The University of Wisconsin, School of Commerce, Center for Productivity Motivation, June 1962). pp. 59-64.

Discusses the problem of educating future business and industrial leaders in the use of such factors of production as men, money, and machines, in the most efficient, humanistic, and socially responsible way.

2.050 Organization for European Economic Cooperation, European Productivity Agency. The Influence of Sales Taxes on Productivity, Project Number 315 (Paris, Organization for Economic Cooperation and Development, 1958). 268 pp.

A study in two stages: (1) a theory of the possible relations between the bases of change and mode of collecting sales taxes on one hand and increased business productivity on the other, (2) an analysis of the sales tax system of nine countries in order to determine directly the obstacles to increased productivity which might arise from each system.

2.051 Organization for Economic Cooperation and Development, Productivity Measurement Advisory Service. Standardization as an Aid to Productivity (Paris, Organization for Economic Cooperation and Development, 1962). 79 pp. Issued as a special supplement of Productivity Measurement Review, June 1962.

Case studies of an automobile accessory producer; The Bradford Dyers' Association, Ltd.; air frame manufacturer; clothing manufacturer; Sidney Bensken and Company, Ltd.; standardization of German locomotives; The Brush Electrical Engineering Company, Ltd., and associated companies.

2.052 "Raising Employee Productivity: A Survey of Company Practices," Management Review, February 1959, pp. 29-31.

Recommends methods of motivating employees to cooperate with management's efforts to raise productivity.

2.053 Roberts, J.W. "Take a Look at Indirect Labor Productivity," Plant Management and Engineering, January 1961, pp. 18-21.

Discusses cost improvement achieved by increasing productivity in the indirect labor phases of company operations, such as maintenance, production scheduling, and plant engineering.

2.054 Ross, N. S. "Trade Union and Labour Reactions to the Application of Incentives and the Industrial Relations Background in Factory C," Chapter 7 in Productivity and Economic Incentives (London, George Allen & Unwin, 1958). pp. 219-261.

A detailed case study of industrial relations before and during the application of economic incentives in a factory in which particularly favorable conditions existed. Reactions of employees to increased work loads are observed.

2.055 Rothe, Harold F. "Does Higher Pay Bring Higher Productivity?" Personnel, July/August 1960, pp. 20-27.

Suggests that many monetary incentives rate low as stimulators of productivity, although some score high.

2.056 Ryan, F. A. Efficiency for Small Manufacturers (New York, Asia Publishing House, 1962). 204 pp.

Twenty-six lectures to groups of small industrialists discussing aspects of better business management.

2.057 Schultz, Theodore W. "Investment in Human Capital," Economic Growth: An American Problem (Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 1964). pp. 125-142.

Considers investment in human education and training as a major factor in increasing productivity and economic growth.

2.058 Scott, Robert C. "Productivity and Extra Paydays," Rubber Age, May 1963, pp. 279-280.

Discusses a program of active cooperation between employers and management resulting in increased benefits and greater production efficiency.

2.059 Sreenivasan, Kasturiswami. Productivity and Social Environment (New York, Asia Publishing House, 1964). 181 pp.

Discusses a number of factors which inhibit increases in productivity. Emphasis is placed on the waste and futility of trying to increase productivity quickly when the social climate is resistant or antagonistic.

2.060 Taylor, George W. "Wages, Incentives and Productivity," Management Record, August 1957, pp. 280-282.

Evaluates the union-management relationship as a critical factor in determining changes in productivity.

2.061 U.S. Department of Labor, Bureau of Labor Statistics. Studies of Automatic Technology, A Case Study of a Modernized Petroleum Refinery, BLS Report No. 120 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1958). 44 pp.

Reviews industrywide trends in technology, describing changes and their implications for productivity, employment, occupational requirements and industrial relations from 1948 to 1956.

2.062 U.S. Department of Labor, Bureau of Labor Statistics. Trends in Output Per Man-Hour in the Private Economy, 1909-1958, Bulletin 1249, (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1959). 93 pp.

Estimates of output per man-hour in the private economy, methods and sources used, and factors affecting these estimates.

2.063 Van Auken, Kenneth G. Postwar Productivity Growth in the United States, Paper on Productivity presented at International Conference on Productivity, Paris, France. Sponsored by European Productivity Agency, Organization for European Economic Cooperation, April 1957. (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1957). 29 pp.

Examines past productivity growth, with a bibliography of nineteen studies which bear on postwar productivity development in the United States. Includes a discussion of factors affecting productivity changes.

2.064 Van de Water, John R. Industrial Productivity and the Law: A Study of Work Restrictions, Bureau of Business and Economic Research, Reprint No. 14. (Los Angeles, University of California, Bureau of Business and Economic Research, 1957). 42 pp. (Reprinted from the Virginia Law Review, Volume 43, Number 2, February 1957, pp. 155-196.)

Explores the legal aspects of work restrictions and other hindrances to productivity.

2.065 Walker, W. F. "Tools, Machines, and Processes," Volume I, Engineering Productivity (New York, Chemical Publishing Company, Inc., 1964). 257 pp.

Describes how output per man-hour can be increased through the use of good machine tools, giving explicit instructions on how they should be used to obtain the utmost in quality and productivity.

2.066 Wallis, D. "Experiments on the Use of Programmed Instruction to Increase the Productivity of Training," Occupational Psychology, July/October 1964, pp. 141-160.

Results of experiments at the British Royal Navy's Electrical School, HMS Collingwood, in which fully automated, partially automated, and normal instruction of control groups was used to qualify technicians for examination in DC and AC electrical theory, motors and generators, and electronics.

2.067 Weinberg, Edgar. Impact of Automation, Bulletin 1287 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, November 1960). 114 pp.

A compilation of 20 articles that have appeared in the Monthly Labor Review over the past 5 years. Describes various aspects of automation and technological change.

2.068 Wernick, Murray. Occupational Shifts in Manufacturing Employment: Some Implications for Productivity and Unit Labor Cost Measurements (Speech delivered before the Business Statistics Section of the Cleveland Chapter, American Statistical Association, March 4, 1958).

Describes the impact of the proportionate shift from production to nonproduction workers on productivity and unit labor costs in manufacturing industries, 1947-1957.

2.069 Zinch, C. "Foreman and Productivity," Advanced Management, January 1958, pp. 12-18.

Discusses the role of the foreman in the improvement of product design through his control over the methods used by the worker to achieve company-wide work simplification and increased productivity.

III. Productivity Levels and Trends

This section presents information on productivity levels or trends and includes studies for the total economy, sectors of the economy, various industries, or a particular plant or firm. (Some references on factors which affect productivity levels or trends in the sectors, industries, plants, or firms are also included.) Items are listed alphabetically by author within each section or industry group.

III - A. Total economy and sectors

3.001 Alterman, Jack, and Jacobs, Eva E. "Estimates of Real Product in the United States by Industrial Sector," Output, Input, and Productivity Measurement, National Bureau of Economic Research, Studies in Income and Wealth, Volume 25 (Princeton, Princeton University Press, 1961). pp. 275-313.

Results of exploratory work on annual indexes of national production for the period 1947 to 1955. Includes a general analysis of sector trends in output per man-hour.

3.002 Clague, Ewan. Postwar Trends in Productivity--Total Private Economy and Major Sectors. Material submitted to the Joint Economic Committee for Hearings on the January 1958 Economic Report of the President (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1958). 10 pp.

Methodology and analysis of productivity measures based on net output per man-hour for 1947-1957. The methods are also referred to as the value-added or gross national product approach to productivity measurement.

3.003 Clague, Ewan. Recent Changes in Output Per Man-Hour, Total Private Economy and Major Sectors (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1959). 20 pp.

Part of a presentation for inclusion in the Economic Report of the President for 1959.

3.004 Dhrymes, P. J. "Comparison of Productivity Behavior in Manufacturing and Service Industries," The Review of Economics and Statistics, February 1963, pp. 64-69.

On the basis of the Cobb-Douglas function, the author concludes that there is no sharp dichotomy in productivity behavior in the manufacturing and service components of the economy.

3.005 Fabricant, Solomon. "Historical and Comparative Rates of Production, Productivity and Prices," statement of Solomon Fabricant to The Joint Economic Committee of the 86th Congress, First Session, April 8-10, 1959, Employment, Growth, and Price Levels, Part 2 (Washington, U.S. Government Printing Office, 1959). pp. 281-377.

Reviews trends in productivity, production, and related economic developments. Includes estimates for the private domestic economy from 1889-1957.

3.006 Fuchs, Victor R. Productivity Trends in the Goods and Service Sectors, 1929-1961, National Bureau of Economic Research, Occasional Paper No. 89 (New York, Columbia University Press, 1964). 48 pp.

A study of productivity in the service industries, including an analysis of output and input measures for selected years from 1929-1961.

3.007 Greenberg, Leon. Productivity and Technological Trends in the Private Economy, 1947-1962. Statement presented to the Subcommittee on Employment and Manpower of the Committee on Labor and Public Welfare, United States Senate, September 26, 1963 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1963). 33 pp.

Statistics on trends in productivity in the U.S. economy and other related data on technological change.

3.008 Greenberg, Leon. Productivity in American Industry, Paper presented before the Society of Mining Engineers of the American Institute of Mining, Metallurgical and Petroleum Engineers, October 16, 1957 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1957). 12 pp.

Productivity trends in the American economy and in its major components, manufacturing and mining. These trends are related to automation and other technology, with comments on some economic implications of these trends.

3.009 Jaffe, A. J. "Labor Productivity, Consumption, and Employment, United States, 1950-70," Bureau of Applied Social Research, Columbia University, prepared statement at hearings on Nation's Manpower Revolution, September 26, 1963, before the United States Senate Subcommittee on Employment and Manpower of the Committee on Labor and Public Welfare, 88th Congress, First Session, Part 5 (Washington, U.S. Government Printing Office, 1963). pp. 1596-1603.

A summary of findings of a larger study on the relationship of technological change to the composition of the United States working force, average annual rates of change in productivity for some 60 industries, and an estimate of possible employment in 1970.

3.010 Kendrick, John W. "Productivity Trends in Agriculture and Industry," (with discussion by L. J. Atkinson) Journal of Farm Economics, December 1958, pp. 1554-1567.

Compares productivity movements in the farm and non-farm sectors of the economy from 1889-1957.

3.011 Kendrick, John W. Productivity Trends in the United States, National Bureau of Economic Research, General Series No. 71 (Princeton, Princeton University Press, 1961). 630 pp.

Historical measures of output, input, and productivity for the U.S. economy and industry groups, including descriptions of concepts and methods of measurement. Includes discussion of implications of productivity change for economic growth, prices, incomes, and allocation of resources.

3.012 Lytton, Henry D. Estimating Recent Federal Agency Productivity Trends (Washington, privately printed: Henry D. Lytton, Management Consulting, 1307 35th St. N.W., 1959). 46 pp.

An exploratory study for the fiscal years 1947-1958 of annual output per person in various nondefense activities of the Federal Government.

3.013 Lytton, Henry D. "Recent Productivity Trends in the Federal Government: An Exploratory Study." Condensed from the privately printed copyrighted report of the author, "Estimating Recent Federal Agency Productivity Trends," issued June 29, 1959. (See reference code No. 3.012.) The Review of Economics and Statistics, November 1959, pp. 341-359.

Describes the scope and size of each Federal agency for which a productivity study was made, the methods of numerical measurement available or required in each case, the method actually followed, and year-by-year productivity trends for 12 fiscal years through June 30, 1958.

3.014 Lytton, Henry D. "Public Sector Productivity in the Truman-Eisenhower Years: A Springboard for the Kennedy Administration," The Review of Economics and Statistics, May 1961, pp. 182-184.

Supplements the original data in the November 1959 issue of the The Review of Economics and Statistics (See reference code No. 3.013) and includes some revised observations and extensions of the productivity of the seven sectors of the U.S. Federal Government originally measured.

3.015 Massell, Benton F. "Capital Formation and Technological Change in United States Manufacturing," The Review of Economics and Statistics, May 1960, pp. 182-188 and "Erratum," August 1960. p. 345.

Examines the annual increases in output per man-hour in the manufacturing sector of the United States economy between 1919 and 1955. Attempts to determine what proportion of these annual increases is the result of increases in capital input per man-hour, attributing the residual to technical change.

3.016 National Planning Association. American Industry in 1976 and 1985: Projections of Output, Employment and Productivity, National Economic Projections Series: Report No. 64-1 (Washington, National Planning Association, 1964). 180 pp.

Data on postwar and prospective future growth of nearly sixty American industries. Includes output, employment and output per employee for each industry and major sectors of the economy.

3.017 Potter, Neal, and Christy, Francis T., Jr. "Employment and Output in the Natural Resource Industries, 1870-1955," Output, Input and Productivity Measurement, National Bureau of Economic Research, Studies in Income and Wealth, Volume 25 (Princeton, Princeton University Press, 1961). pp. 109-145.

Indexes of employment per unit of output for agriculture, timber, mining, and combined extractive and manufacturing industries.

3.018 Raines, Frederic Q. "An Econometric Study of Labor Productivity in Manufacturing and The Total Private Nonfarm Economy," American Statistical Association, Proceedings of the Business and Economic Statistics Section, 1963, pp. 182-199.

An econometric study of productivity changes from 1947 to 1962 incorporated into a model based on cyclical capacity utilization trends, the lag and lead tendencies of actual change in the size of the work force, and the resulting uneven year to year productivity increases.

3.019 Ruttan, V. W. "Agricultural and Nonagricultural Growth in Output per Unit of Input," (with discussion by K. L. Robinson) Journal of Farm Economics, December 1957, pp. 1566-1578.

Compares the labor and capital productivity of the agricultural, manufacturing, and mining sectors of the U.S. economy. Includes an interpretation of capital-saving innovations.

3.020 Terleckyj, Nestor E. "Recent Trends in Output and Input of the Federal Government," American Statistical Association, Proceedings of the Business and Economic Statistics Section, 1964, pp. 76-78.

Discusses post-World War II trends in the productive activity of the Federal Government.

3.021 U.S. Department of Labor, Bureau of Labor Statistics. Indexes of Output Per Man-Hour for Selected Industries, 1939 and 1947-61 (Annual Industry Series, October, 1962). 44 pp. (Supplement, September 1964, 1939, and 1947-62, 43 pp.) (Supplement, June 1964, 1962-63, 4 pp.)

Output per man-hour, unit labor requirements, and related data for selected industries.

3.022 U.S. Department of Labor, Bureau of Labor Statistics, Division of Technological Studies. Technological Trends in 36 Major American Industries (Out of print, available in libraries) 1964, 105 pp.

Review of significant technological developments in American industries, with charts on employment, production, and productivity. Prepared for the President's Advisory Committee on Labor-Management Policy.

3.023 U.S. Department of Labor, Bureau of Labor Statistics. Trends in Output Per Man-Hour in the Private Economy, 1909-1958, Bulletin 1249 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1959). 93 pp.

Estimates of output per man-hour in the private economy, methods and sources used, and factors affecting these trends.

3.024 Wilson, Thomas A. "Productivity and Output in the Postwar Period," U.S. Congress Joint Economic Committee, Study Paper No. 21, Postwar Movement of Prices and Wages in Manufacturing Industries (Washington, U.S. Government Printing Office, 1960). pp. 129-139.

Analysis of the relationship between output and productivity within the manufacturing sector of the economy.

3.025 Wolman, William. "The Relative Productivity of Washington Manufacturing Industry," Chapter 6, The Development of Manufacturing Industry in the State of Washington, Bulletin Number 31 (Pullman, Wash., State College of Washington, School of Economics and Business, Bureau of Economic and Business Research, 1958). pp. 93-107.

State of Washington and national value added per production worker comparisons for paper and allied products, food and kindred products, transportation equipment, and primary metal products industries for the year 1947. Includes state to national productivity ratios for all manufacturing from 1899-1947.

III. B. Agriculture

3.026 Barton, Glen T., and Loomis, Ralph A. "Differential Rates of Change in Output Per Unit of Input," Journal of Farm Economics, December 1957, pp. 1551-1565.

A study of the effect of changes in input factors and innovations in production techniques used for crops and livestock on output obtained per unit of input from 1910 through 1955.

3.027 Barton, Glen T., and Loomis, Ralph A. Productivity of Agriculture, United States, 1870-1958 (Washington, U.S. Department of Agriculture, 1961). 63 pp.

A measurement and analysis of farm productivity, emphasizing the increased production which has resulted in decreasing real farm income.

3.028 Bressler, Raymond George, Jr. "Farm Technology and the Race With Population," Journal of Farm Economics, November 1957, pp. 849-864.

Includes a table of indexes and analysis of data on net agricultural production, man-hours of farm labor, output per acre, and output per man-hour, 1925-55, with projections through 1960.

3.029 Gavett, Earle Edward. Labor Used to Produce Vegetables: Estimates by States, 1959, U.S. Department of Agriculture, Statistical Bulletin No. 341 (Washington, U.S. Government Printing Office, 1964). 37 pp.

Tables and summaries of tables on labor used for vegetables by region and by type of market, in the preharvest and harvest stage for all vegetables for 1939 and 1959, and for specific vegetables for 1959.

3.030 Heady, E. O. "Output in Relation to Input for the Agricultural Industry," Journal of Farm Economics, May 1958, pp. 393-405.

An analysis of the relation between input and output, with particular emphasis on changes in the output/input ratio, the causes of these changes, and the effect of farm consolidations on increasing productivity.

3.031 Hecht, Reuben William. Labor Used to Produce Livestock: Estimates by States, 1959, Statistical Bulletin No. 336 (Washington, U.S. Department of Agriculture, Economic Research Service, 1963). 21 pp.

A statistical study with eight tables and explanatory material on labor requirements in livestock farming by region and state for milk cows, other cattle, hogs, sheep, laying chickens, broilers, and turkeys

3.032 Lave, Lester B. "Technological Change in United States Agriculture, 1850-1958," Journal of Farm Economics, November 1962, pp. 941-952; and February 1964, pp. 200-217.

An econometric study of growth in real output and real capital per man-year for selected years from 1850-1958, including a diagram showing differentiation between capital changes and technological change in the growth of real per capita income and an application of the Solow model to agriculture data.

3.033 McElroy, Robert C., Hecht, Reuben W., and Gavett, Earle E. Labor Used to Produce Field Crops: Estimates by States, U.S. Department of Agriculture, Statistical Bulletin No. 346 (Washington, U.S. Government Printing Office, 1964). 43 pp.

The estimates of labor requirements in this report cover the 48 contiguous states from 1910 through 1963 for 20 major field crops. Includes a detailed breakdown of labor used and yield per acre for 27 crops grown in the year 1959.

3.034 Meiburg, Charles O., and Brandt, Karl. "Nonfarm Inputs as a Source of Agricultural Productivity," Stanford University, Food Research Institute Studies, November 1962, pp. 217-221. Also, Journal of Farm Economics, December 1962, pp. 1433-1438.

Part of a study of changes in agricultural productivity in the United States with comparisons of nonfarm inputs, net farm inputs, and net farm productivity for selected years from 1869 through 1957.

3.035 Morris, Wilford H. M., and Cadlec, John E. "An Evaluation and Projection of Output per Man in Agriculture," Journal of Farm Economics, December 1963, pp. 1007-1011.

A "labor requirement" approach to the problems of assessing output per man and projecting the requirements of agricultural labor.

3.036 Tweeten, Luther G., and Tyner, Fred H. "Toward an Optimum Rate of Technological Change," (Proceedings of the American Farm Economic Association Annual Meeting, Purdue University, August 16-19, 1964). Journal of Farm Economics, December 1964), pp. 1075-1084. Discussion by Walker, Francis E., pp. 1084-1086.

Discusses sources of rising agricultural productivity and returns from investment in farm technology. Includes a table on Federal Government expenditures for all research and agricultural scientific research and development from 1940 to 1963.

3.037 U.S. Department of Agriculture, Farm Production Economics Division, Economic Research Service. Changes in Farm Production and Efficiency, Statistical Bulletin No. 233 (Washington, U.S. Department of Agriculture, 1964). 50 pp. (A summary report -- revised annually.)

Gives highlights of changes in farm inputs and practices, improvements in labor productivity, and progress of farm mechanization. Includes indexes of farm output per man-hour by region from 1939 to 1963 and of total U.S. farm output, inputs, and productivity for selected periods and years, 1870-1963.

III. C. Construction

3.038 Kaplan, Lawrence J. Productivity in the Homebuilding Industry, Microfilm No. 1574 listed and reviewed in Dissertation Abstracts, May 1958 (Ann Arbor, Mich., University Microfilms, Inc., 1958). 295 pp.

Unpublished doctoral dissertation in which a series on output per man-hour in contract construction from 1929-1956 is presented, analyzed, and compared with productivity changes in manufacturing. Includes an account of technological advances in a number of building operations.

3.039 Murray, Roland V. Labor Requirements for Federal Office Building Construction, Bulletin 1331 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1962). 43 pp.

A statistical study of on-site and off-site labor requirements for constructing 22 Federal office building projects in various localities of the United States over a 3-year period from the fall of 1957 to 1960.

3.040 Murray, Roland V., and Wakefield, Joseph C. Labor and Material Requirements for Civil Works Construction by the Corps of Engineers, Bulletin 1390 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1964). 28 pp.

A statistical study of on-site and off-site man-hour and wage requirements for dredging and land-type projects in the U.S. Corps of Engineers' civil works program from 1959-1960.

3.041 Rothberg, Herman J. Labor and Material Requirements for Private One-Family House Construction, Bulletin 1404 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1964). 37 pp.

A statistical study of on-site and off-site labor requirements for constructing a sample of one-family houses built in 1962 in various localities of the United States.

3.042 Rothberg, Herman J. Labor Requirements for Hospital Construction, Bulletin 1340 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1962). 46 pp.

A statistical study of on-site and off-site labor requirements for construction of selected public and private, profit and non-profit, general hospitals in various localities of the United States between mid-1958 and mid-1959.

3.043 Thompson, Stephen G. "The Rise of Building Productivity: Since World War II, Output Per Building Construction Worker in the United States Has Risen a Surprising 13 Percent," Architectural Forum, May 1958, pp. 103-105, and 204-205.

Discusses annual output increases per worker and how these changes came about from 1948 through 1957. Charts compare changes in productivity in the construction of new buildings with productivity changes in the total economy.

3.044 Walker, James F. Labor Requirements for School Construction, Bulletin 1299 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1961). 50 pp.

A study of primary and secondary man-hours required per $1000 of new, whole school construction project contracts awarded throughout the United States for 85 elementary and 43 junior and senior high schools.

III. D. Manufacturing

1. All manufacturing or combinations of industries

3.045 Anderson, Theodore A. "Trends in Wages, Productivity, Prices, and Profits in Selected Major Industries," American Statistical Association, Proceedings of the Business and Economic Statistics Section, 1959, pp. 126-136.

Analyzes causes of inflation and the slow economic growth in the U.S. during the 1955-1959 period. Tables and charts show how industry price increases were proportionate to the excess of wage rate increases over productivity gains in eleven industries.

3.046 Bry, Gerhard. Wages and Productivity in Manufacturing by Industry and State with a Special Consideration of New Jersey (New Brunswick, N.J., Rutgers, School of Business Administration, Institute of Management and Labor Relations, 1962). 38 pp.

A statistical study of productivity in terms of value added compared to wages in dollars per man-hour for 20 industries in the United States for the year 1956, by state for the year 1954, and for 18 industries in New Jersey for the year 1956.

3.047 Bry, Gerhard, Boschan, Charlotte, and Kilgore, Richard. A Monthly Index of Manufacturing Production in New Jersey (New Brunswick, N.J., Rutgers, The State University, Bureau of Economic Research, 1963). 133 pp.

Comparisons of output trends of New Jersey, New York, Massachusetts, Texas and the United States for all manufacturing, durable and nondurable categories, and for some industries from 1929 through 1958.

3.048 Gitlow, Abraham L. "Technological Change, Automation, and Unemployment," Chapter 25, Labor and Industrial Society, Revised Edition (Homewood, Ill. Richard D. Irwin, Inc., 1963). pp. 623-641.

Includes charts on percentage change in output per man-hour, production, and man-hours, for thirty-four manufacturing industries from 1919 through 1926, and averages of man-hours per unit of output for four industries (men's work shirts, mixed fertilizers, melting department of gray iron foundries, and men's dress shoes) by quartiles for 1949.

3.049 Johnston, J. Statistical Cost Analysis (New York, McGraw-Hill, 1960). 197 pp.

Section 47 presents an empirical analysis of the relationships between labor productivity and firm size for the 20 major manufacturing industry groupings classified in the 1939 Census of Manufactures.

3.050 Macdonald, Wendell D. "The Use of Plant Level Measures of Productivity," 18th Interstate Conference on Labor Statistics, June 13-16, 1960 (Washington, U.S. Government Printing Office, 1960). pp. 110-115.

A summary of the purposes and uses of the plant level studies program of the U.S. Bureau of Labor Statistics begun in 1947, and of the publications made available under the auspices of the Office of European Economic Cooperation from 1951 to 1955.

3.051 Mark, Jerome A., Rein, Bernard N., Miller, Stanley F., Moeller, Margaret. Comparative Job Performance by Age: Large Plants in the Men's Footwear and Household Furniture Industries, Bulletin 1223 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1957). 60 pp. Summarized in Monthly Labor Review, December 1957, pp. 1467-1471.

Compares the output per man-hour, attendance, and continuity of service rates of various age groups. Findings cover 26 establishments in the two industries. Extension of an earlier work issued in 1956 under title: Job Performance and Age.

III. D-2. Food and Kindred Products

3.052 Albrecht, Oscar. Resource Productivity in Kansas-Nebraska Butter Plants (Manhattan, Kansas, Kansas State University, 1959).

Master's thesis on productivity in Kansas and Nebraska butter plants.

3.053 Angus, R. C., and Brandow, G. E. Changes of Productivity in Milk Distribution in Two Pennsylvania Markets, 1940-57, Report No. 221 (State College, Pa., Pennsylvania State University, Agricultural Experimental Station, June 1960). 14 pp.

Determines changes in labor and capital productivity during the 17-year period, using milk receipts as measures of changes in output in Philadelphia and Pittsburgh.

3.054 Mitchell, Julia A., Jackson, Donald, and Gilliland, C. B. Labor and Power Utilization at Cottonseed Oil Mills, Marketing Research Report No. 218 (Washington, United States Department of Agriculture, 1958). 68 pp.

A survey of labor and power utilization at 123 cottonseed oil mills. Wide variations in unit cost were observed among the different mills.

3.055 Schneidau, R. E., and Havlicek, Joseph, Jr. Labor Productivity in Selected Indiana Meat Packing Plants, Research Bulletin No. 769 (Lafayette, Ind., Purdue University, 1963).

Investigates labor productivity in killing and dressing operations, with an attempt to identify factors responsible for differences in productivity levels among individual plants.

3.056 Waldorf, William Harold. Output Per Man-Hour in Factories Processing Farm Food Products, U.S. Department of Agriculture, Technical Bulletin No. 1243 (Washington, U.S. Government Printing Office, 1961). 36 pp.

Gauges trends since 1919 in output per man-hour in factories processing domestic farm products; analyzes factors underlying these trends. Compares developments in output per man-hour in factory processing with those in farming, and reviews implications of these developments for changes in unit labor cost in factory production of food products.

III. D-3. Textile mill products

3.057 Barkin, Solomon. "The Effect of Increased Productivity on the Labor Force and Its Deployment in the United States Cotton Textile Industry," Productivity Measurement Review, No. 39, November 1964, pp. 39-57.

An analysis of basic data to determine their comparative usefulness and their effect on productivity.

3.058 Olsen, B. M., and Clark, Clifford D. "Technological Change in the Textile Industry," Southern Economic Journal, October 1959, pp. 125-133.

An empirical study of a segment of the U.S. textile industry based on six textile mills and comparisons of the long-term rate of technical change in other industries.

III. D-4. Lumber and wood products (except furniture)

3.059 Goddard, Everett Earl. An Analysis of the Problem of Industrial Productivity Measurement As Applied to the Douglas Fir Plywood Industry (Thesis presented at the University of Washington, 1956). 361 pp. Microfilm Number 57-1592 listed and reviewed in Dissertation Abstracts, May 1957, Vol. 17, No. 5, p. 1000 (Ann Arbor, Mich., University Microfilms, Inc., 1957).

Examines the problems of applying currently accepted productivity measurement techniques to the Douglas Fir Plywood Industry. Includes measures of physical and value added productivity between 1946 and 1954 and during 1951 to 1955, respectively.

3.060 U.S. Department of Labor, United States Employment Service, Research and Statistics Division. The Effects of Technological Change on Employment in the Lumber Industry: Phase I, Economic Analysis, Automation Program Report No. 7, Part I (Washington, U.S. Department of Labor, Bureau of Employment Security, April 1965). 37 pp.

First section of a study covering the effects of technological change on employment in Oregon's lumber and wood industry. Contains productivity data from 1950 through 1963 for the Oregon lumber industry in board feet per production worker-hour and straight line projections through 1975 for logging, sawmills, and plywood and veneer.

III. D-5. Paper, printing and allied products

3.061 Phillips, Paul L. "Productivity Gains in the Paper Industry," Daily Labor Report, August 2, 1957, pp. B1-B5.

Detailed narrative of the reasons for, and results of, significant productivity advances in the pulp and paper industry. Suggests that potential supply may be too great for current demand.

3.062 Riche, Richard W. Impact of Technological Change and Automation in the Pulp and Paper Industry, Bulletin 1347 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1962). 92 pp.

General industry survey and three case studies highlighting implications of technological change for productivity, employment, and industrial relations.

3.063 Slatin, Benjamin. "Measures of Productivity in the Paper and Pulp Industry," Productivity Measurement Review, No. 36, February 1964, pp. 51-61.

A review of the American Paper and Pulp Association's work in the field of productivity since 1934.

3.064 U.S. Department of Commerce, Business and Defense Services Administration. Productivity in the Commercial Printing Industries (Washington, U.S. Department of Commerce, October 1961). 14 pp.

Measures productivity by relating value added by manufacture to number of employees and to wages paid for the two largest commercial printing industries: letterpress printing (including gravure and screen process) and lithographic printing.

III. D-6. Metal industries

3.065 American Iron and Steel Institute. Economic Trends in the Iron and Steel Industry: Inflation, Wages, Productivity, Profits, Competition (New York, American Iron and Steel Institute, 1959). 35 pp.

A fact book for steel company management containing factual reference material on inflation and its effects on wages, productivity, profits and competition in the iron and steel industry.

3.066 Cleaver, Joe M. Indexes of Output Per Man-Hour: Primary Aluminum Industry, 1947-62 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1964). 15 pp.

Indexes of output per man-hour and per employee for production workers, nonproduction workers, and all employees. Also contains a general characteristics table, analysis of trends, trend charts, and a technical note on concepts and methods used to compute the indexes.

3.067 Livernash, Robert E. "Employment Costs, Prices, and Competition," Chapter 10, Collective Bargaining in the Basic Steel Industry (Washington, U.S. Government Printing Office, 1961). pp. 155-178.

Covers costs, prices, and the productivity concept in a discussion of competition in the steel industry. Steel output per wage-employee and per all-employee man-hour indexes are compared with those in the nonfarm sector and the total private economy from 1940-59.

3.068 Spatz, Laura H., and White, Jack. Indexes of Output Per Man-Hour in the Steel Industry, 1957-63 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, Division of Productivity Measurement, 1964). 17 pp.

Provides new measures of output per man-hour and unit labor requirements in the steel industry for the period 1957-63.

3.069 Steineback, Frank G. "Cast Metals--An Industry in Transition," Foundry, May 1963, pp. 86-101.

Describes some changes in the cast metals industry since 1942: shifting markets; new casting methods; improved equipment, processes, and quality; and declining manpower needs.

III. D-7. Petroleum products

3.070 Johnston, Myron E., Jr. Indexes of Output Per Man-Hour in the Petroleum Refining Industry, 1919-59 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1962). 20 pp.

Indexes of output per man-hour and per employee for production workers and all employees. Also contains a general characteristics table, analysis of trends, trend charts, and a technical note on general concepts and methods used to compute the indexes.

3.071 Mark, Jerome A., and Moss, Bennett R. "Trends in Output Per Man-Hour in Selected Industries: Petroleum Refining," Monthly Labor Review, November 1962, pp. 1241-1245.

Indexes of output per man-hour and analysis of trends in productivity for the petroleum refining industry for the years 1919-1960.

III. D-8. Rubber products

3.072 Hilgert, Ronald J. Indexes of Output Per Man-Hour in the Tires and Inner-Tubes Industry, 1947-60 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, October 1962). 19 pp.

Indexes of output per man-hour and per employee for production workers and all employees. Also contains a general characteristics table, analysis of trends, trend charts, and a technical note on general concepts and methods used to compute the indexes.

3.073 Moss, Bennett R., and Hilgert, Ronald J. "Trends in Output Per Man-Hour in Selected Industries: Tires and Inner Tubes," Monthly Labor Review, November 1962, pp. 1245-1248.

Indexes of output per man-hour and trends in productivity for the tires and inner tubes industry for the years 1921-60.

III. D-9. Other manufacturing

3.074 Backman, Jules. Chemical Prices, Wages and Profits (Washington, Manufacturing Chemists Association, Inc., 1964). 92 pp.

Analysis of pricing policies followed in the chemical industry, trends in prices from 1890-1964, productivity trends, and other factors affecting costs and profits.

3.075 Cole, Humphrey John, Holland, David George, and Posner, Michael Vivian. "Factory Productivity and Efficiency," Oxford University Institute Statistics Bulletin, August 1960, pp. 151-187; May 1961, pp. 105-134; August 1961, pp. 197-270; November 1961, pp. 305-342.

Results of a comparative study of productivity and efficiency in three factories in the electric motor industry.

3.076 Ernst, Harry. "Functional Analysis, Plant Productivity and Efficiency, Productivity Measurement Review, No. 9, May 1957, pp. 23-32.

A study based on a large U.S. machine-tool plant that attempts to indicate how cost data such as indirect labor payroll and kilowatt hours can be included with production worker man-hours to evaluate plant efficiency.

3.077 Kurz, Mordecai, and Manne, Alan S. "Engineering Estimates of Capital-Labor Substitution in Metal Machining," The American Economic Review, September 1963, pp. 662-681.

Statistical analysis of estimates of metal-machining productivity based on Markowitz-Rowe data, the Cobb-Douglas production function, and an alternate constant-elasticity-of-substitution function. Relative shares for capital and labor were computed from 1954 and 1958 Census data for SIC 35, Machinery, Excluding Electrical, and compared with results obtained from Markowitz-Rowe data.

III. E. Mining

3.078 Duesenberry, James S., and Preston, Lee E. "Unions, Wages, and Employment," Chapter 6, Cases and Problems in Economics (Englewood Cliffs, N.J., Prentice-Hall, Inc., 1960). pp. 91-104.

Discusses real wage income and compares indexes of output per man-hour, unit labor costs, and average hourly earnings in the bituminous coal industry with employment costs and material costs per ton in the steel industry.

3.079 Henderson, B. R. "How to Boost Open-Pit Productivity," Engineering and Mining Journal, November 1963, pp. 72-88.

An explanation of how pit operators can increase mine output through improved techniques in materials handling, materials scheduling, and engineering.

3.080 Wearly, W. L. "What's Ahead in Productivity and the Capital Problem," Coal Age, November 1961, pp. 56-59. (Abstract of a paper entitled "Increased Productivity Through Technology," presented at the Conference on "Coal's New Horizons," sponsored by the Southern Research Institute, October 3-4, 1961.)

Discusses problems of financing research and development leading to increased productivity in the bituminous coal industry.

3.081 Weinberg, Edgar, Malakoff, Robert E., and Adams, Robert T. Technological Change and Productivity in the Bituminous Coal Industry, 1920-1960 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1961).

Reviews recent developments in the industry, presenting the salient points in text and charts. The productivity measures consist of output per man-day, and tons per man-month.

III. F. Transportation and public utilities

3.082 Barzel, Yoram. "Productivity in the Electric Power Industry, 1929-1955," The Review of Economics and Statistics, November 1963, pp. 395-408.

Investigates the output per unit of input technique as a measure of productivity and discusses the effects of a shifting production function and implicit economies of scale. A comparison is made of annually-chained to fixed-weighted indexes.

3.083 Dragonette, Joseph E. Indexes of Output Per Man-Hour: Gas and Electric Utilities Industry, 1932-1962 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1964). 19 pp.

Includes indexes of output per man-hour and per employee for non-supervisory workers and all-employees. Also contains a characteristics table, analysis of trends, trend charts, and a technical note on general concepts and methods used to compute the indexes.

3.084 Jakubauskas, Edward B. "Technological Change and Recent Trends in the Composition of Railroad Employment," The Quarterly Review of Economics and Business, November 1962, pp. 81-94.

Analyzes general trends in composition of railroad employment within specific occupational groups, particularly in relation to changes in output, productivity, and technology that have taken place in response to growing competition in transportation. Includes detailed tables of changes in composition of employment from 1953 to 1959.

3.085 Komiya, Ryutaro. "Technological Progress and the Production Function in the United States Steam Power Industry," The Review of Economics and Statistics, May 1962, pp. 156-166.

A study of the United States steam power industry attempting to determine the effects of labor productivity upon economies of scale, factor substitution, and the shift in the production function.

3.086 Mansfield, Edwin, and Wein, Harold H. "Notes on Railroad Productivity and Efficiency Measures," Land Economics, February 1958, pp. 87-91.

An evaluation of productivity and efficiency measures used by railroads. Concludes that such measures are seriously inadequate and proposes alternate measures.

3.087 Miller, Ronald E. Domestic Airline Efficiency: An Application of Linear Programming (Cambridge, Massachusetts, The M.I.T. Press, 1963).

Results of a 1957-63 comparison study on efficiency in airline operations.

3.088 Rosen, Robert W. "The Productivity of Electricity," Public Utilities Fortnightly, April 10, 1958, pp. 505-510.

Discusses the situation from 1947 to 1955, in which steady increases in the productivity of electricity plants were caused by continuous shifts in workload from labor to electric power. This in turn raised the level of labor productivity, resulting in a strong restraint on advances in unit cost.

3.089 Wilson, G. W. "Wages and Productivity of Railway Labor," The Quarterly Review of Economics and Business, Spring 1963, pp. 87-99.

Examines one productivity indicator in the railway industry as a criterion of "excessive" or "deficient" rates of remuneration.

III. G. Trade

3.090 Beckman, Theodore N. "Measuring Productivity in Marketing," American Statistical Association, Proceedings of the Business and Economic Statistics Section, 1960, pp. 308-318.

Discusses concepts of output measurement and the productivity of merchant wholesalers, manufacturers' sales offices and branches, and retail trade, excluding eating and drinking places. Tangible capital is employed as an input, in addition to man-hours. Covers years between 1935 and 1958 during which a Census of Business was conducted.

3.091 Buzzell, Robert Dow. "Productivity in Marketing: With Special References to Drug and Hardware Wholesalers," Microfilm Number 58-511 listed and reviewed in Dissertation Abstracts, March 1958 (Ann Arbor, Mich., University Microfilms, Inc., 1961). 323 pp.

Unpublished doctoral dissertation which examines and evaluates basic methods of productivity measurement. One approach was tested by application to drug and hardware wholesalers' statistics for the period 1929-54.

3.092 Cox, Reavis. "Productivity in Marketing--Prospects for Improvements in the Sixites," American Statistical Association, Proceeding of the Business and Economic Statistics Section, 1960, pp. 319-322.

A brief summary of available information on output and input in distribution and the problems involved in ascertaining future developments in marketing.

3.093 McNair, M. P., and May, E. G. The American Department Store, 1920-1960 (Cambridge, Mass., Harvard School of Business, 1963). 156 pp.

General statistics collected by the Harvard Bureau of Business Research on the performance of American department stores during the period 1920-1960. Includes a discussion of productivity increases after 1953 and how they were achieved.

3.094 Moore, Charles North. Productivity and Efficiency in the Automotive Trade (Thesis presented at the University of Michigan, 1962). 291 pp. Microfilm Number 62-1322 listed and reviewed in Dissertation Abstracts, January 1963, Volume 23, No. 7, p. 2360 (Ann Arbor, Mich., University Microfilms, Inc., 1962).

A study undertaken for the purpose of exploring some problems of measuring and evaluating marketing productivity and efficiency in the automotive trade.

3.095 Seligman, Ben B. "Productivity in Retailing," Productivity Measurement Review, No. 20, February 1960, pp. 11-13.

Summarizes the work and research in this field and points out the sparseness of data available for deriving productivity measures in retailing.

III. H. Other nonmanufacturing

3.096 Garbarino, Joseph William. "Price Behavior and Productivity in the Medical Market," Industrial and Labor Relations Review, October 1959, pp. 3-15.

Analyzes the behavior of physicians' and surgeons' fees from 1935 through 1958 and compares them with estimates of output per physician from 1935 through 1951.

3.097 Gray, Barbara. "Incentives and Productivity in Laundries," Chapter 4, Productivity and Economic Incentives (London, George Allen and Unwin, 1958). pp. 138-169.

A comprehensive study of a laundry, analyzing changes in output and earnings after the introduction of piece-rates. Results of incentive schemes in other laundries are also quoted.

3.098 Kendrick, John W. "Speed Up in Service," Challenge, January 1958, pp. 29-33.

An analysis of long-term and recent productivity trends in the service industries.

3.099 Speagle, Richard E., and Kohn, Ernest. "Employment and Output in Banking, 1919-1955," The Review of Economics and Statistics, February 1958, pp. 22-35.

Discusses the relationship between labor input and output in the banking field over a substantial time period.

3.100 U.S. Bureau of the Budget. Measuring Productivity of Federal Government Organizations (Washington, U.S. Government Printing Office, 1964). 370 pp.

Detailed statistical case studies of productivity in five U.S. governmental agencies: Division of Disbursement, Bureau of Accounts and Fiscal Service, in the Treasury Department; Department of Insurance, in the Veterans Administration; Post Office Department; Systems Maintenance Service, Federal Aviation Agency; and Bureau of Land Management, Department of Interior. Much of the data covers the years 1949-1962.

3.101 Walker, James F. The Job Performance of Federal Mail Sorters by Age, Reprint No. 2436 from the Monthly Labor Review, March 1964. pp. 296-300.

A study of work performance of Federal mail sorters by age group, sex, and seniority in 12 selected cities in May and June of 1961.

III. I. Office workers

3.102 Strong, E. P. Increasing Office Productivity (New York, McGraw-Hill, 1964). 287 pp.

Discusses methods of increasing office productivity, taking into account the increased volume of office work and the consequent increase in specialization.

3.103 Walker, James F., and Kutscher, Ronald E. "Comparative Job Performance of Office Workers by Age," Monthly Labor Review, January 1960, pp. 39-43.

A statistical study of the relationship of job performance by office workers, in selected classifications by age group, to experience on the job.

IV. International

This chapter includes entries which compare productivity of other countries with that of the United States.

4.001 Aganbegian, A. G. "Overtake and Surpass the USA in the Productivity of Labor," Problems of Economics (New York, International Arts and Science Press, December 1959). pp. 43-49.

Examines possible causes of the higher level of labor productivity in US industries compared to that in the USSR, with 1957 comparisons in manufacturing, construction, transportation, and agriculture.

4.002 Balassa, Bela. "The Dynamic Efficiency of the Soviet Economy" (in Papers and Proceedings of the American Economic Association, 76th Annual Meeting, Boston, Mass., December 27-29 1963). The American Economic Review, May 1964, pp. 490-505. Discussion by Judith Thornton, Evsey D. Domar, and Frederick L. Pryor, pp. 516-522.

A comparison of net national product, selected inputs, total factor productivity, and average annual rates of growth in the Soviet Union, United States, Canada, United Kingdom, Germany, and Japan for selected periods between 1948 and 1960.

4.003 Balassa, Bela. "An Empirical Demonstration of Classical Cost Theory," The Review of Economics and Statistics, August 1963, pp. 231-238.

A statistical inquiry into the validity of the classical model often used for determining the comparative advantage between nations in foreign trade. The model is based on relative productivity differentials and other factors affecting unit costs, and is applied here to the United States and the United Kingdom for the years 1950 and 1951.

4.004 Berliner, Joseph S. "The Static Efficiency of the Soviet Economy" (in Papers and Proceedings of the American Economic Association, 76th Annual Meeting, Boston, Mass., December 27-29, 1963). The American Economic Review, May 1964, pp. 480-489. Discussion by Judith Thornton, Evsey D. Domar, and Frederick L. Pryor, pp. 516-522.

Introduces a specially designed model and uses it for computing the comparative productive efficiency or relative productivity of the Soviet Union and the United States for the year 1960.

4.005 Blyth, C. A. "An International Comparison of Trend, Acceleration and Variation of Rate of Growth of Productivity," Productivity Measurement Review, No. 39, November 1964, pp. 5-19.

Compares rates of growth of real domestic product per employee in countries of Western Europe, North America, and in New Zealand.

4.006 Borch, Karl. "Productivity in Flour Milling--An Attempt at a Franco-American Comparison," Productivity Measurement Review, No. 10, August 1957, pp. 9-13.

A report prepared by the Wolf Management Engineering Company of Chicago describing the technical aspects of flour milling and the equipment needed in mill processing.

4.007 Braginskii, B. I., and Dumnov, D. "Labor Productivity in Agriculture in the USSR and the USA" (translated from Vestnik Statistiki Number 2, 1961), Problems of Economics, May 1961, pp. 3-9.

Attempts to show how "more realistic" comparisons of labor inputs per unit by size of operation, similarity of area, and climatic conditions can be obtained by adjusting employment and output data for comparability of definition.

4.008 Braginskii, B. I., and Karpukhin, D. N. "Using Economic-Statistical Methods of Analysis for Computing the Prospective Growth of Labor Productivity," Problems of Economics, May 1962, pp. 46-53.

Argues for the increased use of electric power to improve labor productivity in Soviet industry. Includes tables on Soviet and U.S. manufacturing industry use of electricity per unit of labor.

4.009 Brakel, L. "A Comparison of Productivity and Recent Productivity Trends in Various Countries," The Review of Economics and Statistics, May 1962, pp. 123-133.

Compares the average productivity of eight OEEC countries and the United States. Previously published OEEC relatives are adjusted in several ways to achieve "more realistic" comparisons.

4.010 Brozen, Yale. "The New Competition--International Markets: How Should We Adapt?" The Journal of Business, October 1960, pp. 322-326.

Compares United States wage costs with those of eight Western European countries, with a breakdown of U.S. plants engaged in the manufacture of work shirts, fertilizers, castings, and men's dress shoes in 1949 into four categories according to man-hours per unit.

4.011 Cahen, Lucienne. "Measurement and Comparison of Productivity at Industrial Branch-Level," Productivity Measurement Review, No. 35, November 1963, pp. 14-36.

Reviews the major available productivity measurements at the industry level which are likely to be useful for international comparisons.

4.012 Clark, Colin. "International Comparison of Productivity Trends," Journal of Business, October 1958, pp. 267-279.

Attempts to show long-run trends of productivity by comparing amount of real product per man-hour worked, rather than by comparing per capita incomes expressed in U.S. dollars.

4.013 Dean, Joel. "International Productivity Comparisons for Managerial Decisions," Paper presented at the Conference on Labor Productivity, Cadenabbia, Lake Como, Italy, August 31 to September 8, 1961. Chapter 14, Labor Productivity (New York, McGraw-Hill, 1964). pp. 176-185.

Computations of hourly unit labor costs of the United Kingdom and West Germany as a percentage of that for the same industry in the United States, both before and after adjustment by relative productivity data, to get a better indication of U.S. competitive positions from 1950 through 1959.

4.014 Domar, Evsey D., Eddie, Scott M., and others. "Economic Growth and Productivity in the United States, Canada, United Kingdom, Germany, and Japan in the Post-War Period," The Review of Economics and Statistics, February 1964, pp. 33-40.

Brief summary of a report on the rates of growth of outputs, inputs, and factor productivities in the post-war period in the above countries. Rates are shown for the countries as a whole and for major economic sectors.

4.015 Ellsworth, P. T. "International Trade in Relation to Productivity," Solving Problems of Productivity in a Free Society (Madison, Wisc., The University of Wisconsin, School of Commerce, Center for Productivity Motivation, June 1962). pp. 26-33.

Attempts to relate maximization of productivity in manufacturing to the foreign trade advantages which some countries have over others in particular lines of products and which lead to specialization and elimination of the less efficient firms.

4.016 Fourastie, Jean. The Causes of Wealth (Translated and edited by Theodore Caplow from "Machinisme et bienetre; niveau de vie et genre de vie en France de 1700 a nos jours") (Glencoe, Ill., The Free Press of Glencoe, Illinois, 1960). 251 pp.

Discusses the appreciable rise in the level of living made possible by technical progress in France during the past two centuries; the level of living of some countries, including the United States, since 1819; the relationship of the level of living to the productivity of work; and the relationship of occupational factors, duration of work, and individual and family factors to wealth.

4.017 Frankel, Marvin. British and American Manufacturing Productivity, University of Illinois, Bulletin Series Number 81 (Urbana, Ill., University of Illinois, Bureau of Economic and Business Research, 1957). 130 pp.

A statistical research study which compares output per worker and output per man-hour for 34 industries in the United Kingdom and the United States in an attempt to determine the causes of differences in productivity.

4.018 Frankel, Marvin. "Some Implications of International Postwar Productivity Trends," American Statistical Association, Proceedings of the Business and Economic Statistics Section, 1958, pp. 264-272.

Compares trends in output and productivity for several developed and underdeveloped countries, primarily for the years from 1948-1957. Attempts to analyze factors responsible for differences in growth rates between developed and underdeveloped countries.

4.019 Gilbert, Milton, and Beckerman, Wilfred. "International Comparisons of Real Product and Productivity by Final Expenditures and by Industry," Output, Input, and Productivity Measurement, National Bureau of Economic Research, Studies in Income and Wealth, Volume 25 (Princeton, Princeton University Press, 1961). pp. 251-273.

Discusses theoretical problems involved in productivity measurement and makes international comparisons in terms of absolute levels of real gross national product per capita or per unit of labor input.

4.020 Hall, Margaret, Knapp, Joseph, and Winsten, Christopher B. Distribution in Great Britain and North America (New York, London, Oxford University Press, 1961). 231 pp.

Compares the structure of distribution in the United States, Great Britain and Canada. Includes discussion on variations in the number and size of distributive outlets and on differences in productivity.

4.021 Inter-American Economic and Social Council. Inter-American Meeting of Advisers on Productivity, Final Report (Washington, Pan American Union, 1960). 21 pp.

Gives an evaluation of the needs for and possibilities of Inter-American cooperation in productivity measurement programs.

4.022 Ioffe, Iakov. "The Level of Labor Productivity in the U.S.S.R. and the U.S.A.," Problems of Economics, July 1960, pp. 25-32.

Compares labor productivity of the Soviet Union and the United States in industry, agriculture, and construction. U.S. data are adjusted to conform to Soviet economic concepts and definitions.

4.023 Karpukhin, D. N. "Labor Productivity in the U.S.S.R. and the U.S.A.," Problems of Economics, September 1962, pp. 54-62.

Compares industry labor productivity increases of the USSR and the USA for six periods from 1929 through 1960. Includes discussion, with tables, of prospects for a rise in "annual" and "hourly" labor productivity from 1960 through 1980.

4.024 Kats, A. A Comparison of the U.S.S.R. Industrial Labor Productivity Levels with Those of the Principal Capitalist Countries (New York, U.S. Joint Publications Research Service, 1959). 24 pp. (Distributed by the Office of Technical Services, U.S. Department of Commerce, Washington).

Compares productivity levels of USSR with those of capitalist countries for selected industries. Analysis of productivity differences is conducted in terms of Marxist ideology.

4.025 Kheinman, S. "Some Economic Problems in Industrial Engineering," Problems of Economics, May 1960, pp. 35-42.

Compares levels of productivity in Soviet and American industry and takes special note of the contribution of industrial engineering in raising Soviet productivity through better work organization and more efficient use of technical equipment.

4.026 MacDougall, Sir Donald, Dowley, Monica, Fox, Pauline, and Pugh, Senta. "British and American Productivity, Prices, and Exports: An Addendum," Oxford Economic Papers, October 1962, pp. 297-304.

An addendum to the article (see reference code no. 4.040) by Robert M. Stern on "British and American Productivity and Comparative Costs in International Trade," supplementing his attempt to update Mr. MacDougall's study of comparative costs published in 1951 and 1952.

4.027 Maddison, Angus. "Comparative Levels and Movement of Labor Productivity in Western Europe," Paper presented at the Conference on Labor Productivity, Cadenabbia, Lake Como, Italy, August 31 to September 8, 1961. Chapter 10, Labor Productivity (New York, McGraw-Hill, 1964). pp. 126-239.

Discusses problems of productivity measurement, level of productivity, rates of growth, and causes of postwar acceleration of seven European countries. Includes comparisons with United States data.

4.028 Maddison, Angus. Economic Growth in the West--Comparative Experience in Europe and North America (New York, Twentieth Century Fund, 1964). 246 pp.

Attempts to explain why and how the European economy accelerated its growth in the 1950's, why the United States did not share this acceleration, and why the performance in some European countries was better than in others.

4.029 Maizels, Alfred. "Industrial Growth, Productivity, and Real Income," Chapter 1, Industrial Growth and World Trade (New York, The Syndics of the Cambridge University Press, The National Institute of Economic and Social Research, 1963). pp. 21-40.

Relates the growth of manufacturing in industrialized and less developed countries directly to productivity gains in manufacturing and inversely to the percentage of population devoted to agriculture. Compares such countries as France, Norway, West Germany, United Kingdom, Austria, Belgium, Canada, Netherlands, and the United States.

4.030 Mikesell, Raymond F., and Kleinsorge, Paul L. "Foreign Trade and U.S. Labor Costs," Industrial and Labor Relations Review, May 1962, pp. 1-29.

Part of a symposium on industrial relations and world trade. Includes indexes of employment, production, productivity, wages, and unit labor costs for six European countries, Japan, and the United States for all manufacturing industries, chemicals and related products, electrical machinery, other than electrical machinery, transport equipment, and textiles for the years 1955 through 1959.

4.031 National Productivity Council, India. Productivity in Industries of U.S.A., West Germany, and United Kingdom (New Delhi, National Productivity Council, 1959). 110 pp.

Report of an Indian productivity team which visited industrial establishments in the above mentioned countries. Analyzes reasons for high levels of productivity in these developed countries and makes recommendations for raising productivity in India.

4.032 Organization for European Economic Cooperation, European Productivity Agency. Activities and Achievements (Paris, Organization for Economic Cooperation and Development, 1958). 113 pp.

A summary of work completed by the European Productivity Agency during four years of operational activities.

4.033 Paige, Deborah, and Bombach, Gottfried. A Comparison of National Output and Productivity of the United Kingdom and the United States (Paris, Organization for Economic Cooperation and Development, 1959). 245 pp. (Joint study of the Organization for European Economic Cooperation and the Department of Applied Economics, University of Cambridge.)

Statistical comparisons of the national products and productivity of the United Kingdom and the United States for the two economies as a whole, and for various industries.

4.034 Reynolds, Lloyd G. "Wage Behavior and Inflation: An International View," Chapter 5, Wages, Prices, and Productivity (New York, Columbia University, The American Assembly, 1959). pp. 109-136.

An examination of the increases in prices, wages, and productivity of ten industrialized nations to determine if a "wage-push" type of inflation is responsible for price increases.

4.035 Salter, W. E. G. Productivity and Technical Change (London, Cambridge University Press, 1960). 198 pp.

Deals comprehensively with the relationship between productivity and technical change and examines the actual relationship between these factors in a number of British and American industries.

4.036 Saunders, Christopher T. "International Comparisons of Productivity Growth in the 1950's," Journal of the Royal Statistical Society, Series A, Part 2, 1963, pp. 227-235.

Includes two hypotheses about productivity growth and makes comparisons of growth rates of output and productivity of 16 industries in the United Kingdom, United States, West Germany, and France, including overall output per man-hour comparisons for eight additional countries.

4.037 Schroeder, Gertrude. "Some Measurement Problems in Comparing United States and Soviet Industrial Labor Productivity," Paper presented at the Conference on Labor Productivity, Cadenabbia, Lake Como, Italy, August 31 to September 8, 1961. Chapter 9, Labor Productivity (New York, McGraw-Hill, 1964). pp. 109-125.

Discusses physical, weighting, and value problems in achieving comparability of USSR and U.S. output per production worker data for 25 branches of industry. Special emphasis is placed on the difficulty of obtaining comparable measures of employment on the overall industry level.

4.038 Shelton, W. C., and Chandler, J. H. "Role of Labor Cost in Foreign Trade," Monthly Labor Review, May 1963, pp. 485-490.

Discusses causes of trade flows, labor cost and total cost, hourly and unit labor cost, labor cost and GNP per capita, and intercountry differences in productivity.

4.039 Silberston, Aubrey. "Problems Involved in International Comparisons of Labor Productivity in the Automobile Industry," Paper presented at the Conference on Labor Productivity, Cadenabbia, Lake Como, Italy, August 31 to September 8, 1961. Chapter 15, Labor Productivity (New York, McGraw-Hill, 1964). pp. 186-211.

Compares the "adjusted" number of automobiles produced per employee per year for seven countries, including the United States, from 1950 through 1959.

4.040 Stern, Robert M. "British and American Productivity and Comparative Costs in International Trade," Oxford Economic Papers, October 1962, pp. 274-296.

By using 1950 and 1959 data, attempts to update G. D. A. MacDougall's "British and American Exports: A Study Suggested by the Theory of Comparative Costs" which appeared in the Economic Journal of December 1951. Focuses upon the extent to which differences in the relative labor productivity and production costs in selected manufacturing industries are reflected in differences in the relative export performance of the two countries.

4.041 "Trends in National Productivity, 1950-1957," International Labour Review, March 1959, pp. 315-324.

Discusses the computation of national productivity indexes for ten industrialized countries on the basis of real gross domestic product per worker and compares these indexes, from 1950 to 1956, with the combined manufacturing indexes of these countries.

4.042 United Nations, Department of Economic and Social Affairs. "Use of Models in Programming," Industrialization and Productivity, Bulletin No. 4, (New York, United Nations, April 1961). pp. 7-17.

Reviews representative types of development proposed, and, in some cases, applied in the elaboration of national plans for economic and industrial development, in the light of experience gained under the United Nations technical assistance program.

4.043 U.S. Department of Labor, Bureau of Labor Statistics, Office of Productivity and Technological Developments. "Output Per Worker in American and Soviet Industry," Monthly Labor Review, September 1959, pp. 992-994.

A spot check of individual industry ratios obtained by A. Kats in "A Comparison of the USSR Industrial Labor Productivity Levels with Those of the Principal Capitalistic Countries" (in Sotsialisticheskiy Trud, Moscow, January 1959, pp. 42-55. Translation coordinated and distributed by the Office of Technical Services, U.S. Department of Commerce, OTS: 59-13,374, March 27, 1959). (See reference code No. 4.024.)

4.044 U.S. Department of State, Agency for International Development, Communications Resources Division. Productivity Centers, Industry Institutes, and Industrial Development Centers (Washington, U.S. Department of State, Agency for International Development, November 1961). 12 pp.

Lists by area the names and addresses of national organizations concerned with productivity. The state, regional, or local centers are not listed but may be obtained from the national information centers of countries listed under the AID program.

4.045 U.S. Department of State, International Cooperation Administration, Office of Industrial Resources. Institutions of the Industrial Technical Cooperation Program, Productivity Center Manual IB-17, revised May 1959, (Washington, U.S. Department of State, Agency for International Development, 1959). 136 pp.

Describes layout and activities of productivity centers in Europe, the Near East, South Asia, Far East, and Latin America. Introduction gives general concepts and objectives of the program. Lists ten other documents with related information.

4.046 Voice, E. W., and Dixon, K. G. "Ironmaking Productivity," Journal of the Iron and Steel Institute, June 1962.

Devises a blast furnace productivity index as a function of actual output, furnace size, and burden weight and is used to compare 4-week period outputs in 1960 of thirteen furnaces in U.K., USA, Canada, Australia, India, South Africa, USSR, European Coal and Steel Community, and Japan.

V. Productivity and the Economy

This chapter includes references dealing with the relationship of productivity to economic growth. Also included are entries pertaining to the significance of productivity change, collective bargaining and productivity, and the relationship of productivity to prices.

5.001 Abramovitz, Moses. "Economic Growth in the United States," The American Economic Review, September 1962, pp. 762-782.

Analyzes and explains the role of productivity in the nation's economic growth, and comments on current trends and factors which influence changes in productivity.

5.002 Alterman, Jack. "Productivity and Economic Growth," 18th Interstate Conference of Labor Statistics, Proceedings, 1960 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1960). pp. 89-95.

Discusses the relationship between productivity trends and economic growth, and emphasizes the purposes for which productivity data are published.

5.003 American Assembly. Wages, Prices, Profits, and Productivity, Background papers and the final report of the Fifteenth American Assembly, Harriman, New York, April 30-May 3, 1959 (New York, Columbia University, American Assembly, 1959). 193 pp.

Examines productivity measures and their limitations; discusses wages, prices, and profits as factors in the postwar inflation; considers the compatibility of national economic goals; and studies some policy proposals. (Articles listed separately by author.)

5.004 American Iron and Steel Institute. "Costs, Productivity and Prices," Steel's Competitive Challenge (New York, American Iron and Steel Institute, December 1961). pp. 18-24.

Discusses employment, material, depreciation, interest, and tax costs of the steel industry and the relationship of each to output per man-hour in the total private economy from 1940-1960.

5.005 American Management Association, Personnel Division. Meeting the Productivity Challenge: The Nature of the Challenge and Some Practical Approaches (New York, American Management Association, 1960). 102 pp.

Reviews the concept of productivity and how it should be measured, the causes and consequences of "anti-productivity" factors, and the effects on our national productivity of current labor relations practices and union policies.

5.006 Arrow, K. J., Chenery, H. B., Minhas, B. S., and Solow, Robert M. "Capital-Labor Substitution and Economic Efficiency," The Review of Economics and Statistics, August 1961, pp. 225-250.

Examines the pure theory of production, the functional distribution of income, technological progress, international differences in efficiency, and the sources of comparative advantage. Suggests the fundamental economic significance of the degree of substitutability between capital and labor. Introduces a generalization of the Cobb-Douglas function.

5.007 Babb, Phillip S. "Factors Influencing Employment and Some Specific Measures to Combat Unemployment," Prepared for the Senate Subcommittee on Employment and Manpower, Senate Committee on Labor and Public Welfare, December 27, 1963, Exploring the Dimensions of the Manpower Revolution, Selected Readings in Employment and Manpower, Volume 1 (Washington, U.S. Government Printing Office, 1964). pp. 495-511.

Maintains that expansion, modernization and increased productivity are factors which reduce the jobs available in an ever increasing labor supply situation. Also presents fourteen government sponsored proposals to alleviate the manpower shortage.

5.008 Backman, Jules. Wage Determination--An Analysis of Wage Criteria (Princeton, D. Van Nostrand, Inc., 1959). 316 pp.

Discusses annual improvement factors, productivity measurements, wage inflation, ability to pay, and cost-price relationships as factors which relate to wage determination.

5.009 Barkin, Solomon. "Labor Productivity and Prices," Challenge, December 1957, pp. 27-31.

Analyzes the interrelationships of wages, productivity, and prices, and proposes a program for maintaining economic stability.

5.010 Bator, F. M. "On Capital Productivity, Input Allocation and Growth," Quarterly Journal of Economics, February 1957, pp. 86-106.

Suggests a theoretical link between capital productivity and the interest rate, thus providing the basis for a discussion of growth in countries where capital is scarce relative to labor.

5.011 Beckman, Theodore N., and Buzzell, Robert Dow. "Productivity: Facts and Fiction," Business Horizons, Winter 1958, pp. 24-38.

Discusses productivity, its meaning and measurement, and common misconceptions of the term. Includes a discussion of the relationship between wages and productivity, and the benefits to be derived from increased productivity.

5.012 Beirne, Joseph A. Union's Role in Helping Productivity, Miscellaneous Pamphlet Number 32 (Washington, Communications Workers of America, 1958). 14 pp.

States that unions can encourage productivity by improving worker morale and attitude, by explaining the need for change in the work process, and by providing the worker with a sense of security and participation in the benefits of increased productivity.

5.013 Bergstrom, A. R. "A Model of Technical Progress, the Production Function and Cyclical Growth," Economica, November 1962, pp. 257-270.

An economic model which attempts to incorporate a technical relationship between output and factor inputs "that is realistic and yet can be fitted into a manageable dynamic system."

5.014 Berman, Barbara R. "Public Information in the Operation of Wage-Price Guideposts: The Productivity Statistics," American Statistical Association, Proceedings of the Business and Economic Statistics Section, 1962, pp. 58-60.

Comments on the 1962 Economic Report of the President and its inclusion of numerical data on productivity trends in the American economy in relation to the wage-price question. Discusses problems encountered in giving the guideposts quantitative content and standardized meaning.

5.015 Blum, Albert A., and Bambrick, James J. "Productivity and Wage Negotiations," Management Record, October 1957, pp. 352-359.

Stresses the importance of productivity data as they are used by unions and management in wage negotiations.

5.016 Brinker, Paul A. "The One-Dollar Minimum Wage Impact in 15 Oklahoma Industries," Monthly Labor Review, September 1957, pp. 1092-1095.

Studies the impact of minimum wage increases on 110 firms in Oklahoma, and how they reacted by increasing production, prices, mechanization, and/or efficiency.

5.017 Brown, E. H. Phelps. "Wage Drift," Economica, November 1962, pp. 339-355.

Attempts to explain that part of increased wage payments which results from "wage drift," a situation in which total labor costs increase more than productivity under conditions of full employment.

5.018 Browne, H. H., and Brown, E. H. Phelps. "Distribution and Productivity Under Inflation, 1947-1957," The Economic Journal, December 1960, pp. 725-756.

Discusses whether the rapid rise in national money incomes has been associated systematically with any change in its distribution.

5.019 Caplan, Benjamin. "Does Inflation Stifle Productivity?" Challenge, October 1959, pp. 58-63.

A brief consideration of the effects of relatively high, continuous employment and chronic inflation on productivity. Discusses changes in output per man-hour from 1890-1957.

5.020 Chamber of Commerce of the United States of America. Report of the Economic Advisory Council: Productivity and Wage Settlement, Miscellaneous Pamphlet Number 147 (Washington, Chamber of Commerce of the United States, 1961). 14 pp.

Describes the role of productivity change in wage settlement and fringe benefit negotiations.

5.021 Chamberlain, Neil W. "The Productivity Dogma," Challenge, June 1964, pp. 3-6.

The President's wage-price guidelines, which would limit wage increases to national increases in productivity, are criticized as being unrealistic.

5.022 Christensen, Raymond P., and Yee, Harold T. "The Role of Agricultural Productivity in Economic Development" (Proceedings of the American Farm Economic Association, Annual Meeting, Purdue University, August 16-19, 1964). Journal of Farm Economics, December 1964, pp. 1051-1061. Discussion by Hillman, Jimmye S., pp. 1061-1064.

Data from the Agency for International Development are used to demonstrate the contribution of the agricultural sector to national economic growth in a developing country through improved agricultural productivity.

5.023 Clague, Ewan. "Conference Highlights and Summary," 18th Interstate Conference on Labor Statistics, Proceedings of, June 13-16, 1960 (Washington, U.S. Government Printing Office, 1961). pp. 243-251.

Summarizes the relationship of productivity to the standard of living and the role that productivity plays in labor-management negotiations.

5.024 Clague, Ewan. The Interest of the Federal Government in Automation, Paper presented before the 1958 Conference on Automation, Phoenix, Ariz., January 23, 1958 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1958). 13 pp.

Includes a discussion of the role of productivity in the technological advancement of Government supported projects.

5.025 Clague, Ewan. "Interrelationship of Prices, Wages, and Productivity, 1946-1957," Monthly Labor Review, January 1958, pp. 14-22.

Analyzes movements of prices, wages, and productivity in the postwar decade and interprets them in terms of the present and the future.

5.026 Clague, Ewan. "The Labor Market," The Emerging Environment of Industrial Relations, Proceedings of a Conference for Industrial Relations Executives, Mackinac Island, June 20-22, 1957 (East Lansing, Mich., Michigan State University, Labor and Industrial Relations Center, 1958). pp. 106-112.

A panel discussion concerning the implications of the "wage, price, and productivity spiral." Includes an explanation, based partly on differences in productivity changes, for the inconsistent price increases of durable and nondurable goods.

5.027 Clague, Ewan. Prices, Wages, and Productivity, Address before the Labor Relations and Arbitration Conference, University of California, San Francisco, Calif., May 25, 1959 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1959). 21 pp.

Explains the meaning of statistics on wages, productivity, and prices, and discusses the methods used in deriving the statistics.

5.028 Clague, Ewan. "Social and Economic Aspects of Automation," Monthly Labor Review, September 1961, pp. 957-960.

Discusses automation in relation to its inevitable displacement of employees and potential unemployment. Measuring automation as changes in productivity, a relationship is drawn between increased productivity and unemployment. Mobility seems to be the key to the relationship.

5.029 Clague, Ewan. Statistics for Collective Bargaining, Paper presented to the American Statistical Association, Chicago, Ill., December 27-30, 1958 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1958). 19 pp. (Also printed in American Statistical Association, Proceedings of the Business and Economic Statistics Section, 1958). pp. 112-116.

Reviews BLS statistics on wage rates, cost of living, productivity, and surveys of contract provisions, and explains how they are applied in collective bargaining situations.

5.030 Clague, Ewan, and Greenberg, Leon. "Technological Change and Employment," Monthly Labor Review, July 1962, pp. 742-746.

Provides estimates of declines in manufacturing employment associated with productivity increases. These estimates are used as an approximation of the total unemployment due to technological change.

5.031 Clark, Colin. The Conditions of Economic Progress (New York, Macmillan Company, St. Martins Press, 1957). 720 pp.

A study of industrial organization and the effect of foreign trade on domestic and foreign industries, including a discussion of the comparative productivities of primary, manufacturing, and tertiary industries.

5.032 Colm, Gerhard, and Geiger, Theodore. The Economy of the American People--Progress, Problems, Prospects, Planning Pamphlet Number 102 (Washington, D.C., National Planning Association, March 1958). 167 pp.

Analyzes the roles of natural resources, labor, management, technology, capital, and government in an economy characterized by high productivity and high consumption.

5.033 Committee for Economic Development, Research and Policy Committee. Economic Growth in the United States--Its Past and Future, Miscellaneous Pamphlet Number 10 (New York, Committee for Economic Development, 1958). 61 pp.

Includes statement on national policy which recognizes productivity as a measure of economic growth. Also considers technological change and educational progress.

5.034 Conrad, Alfred H. "Productivity, Prices, and Income," The Review of Economics and Statistics, May 1958, pp. 169-172.

Includes time series on productivity, prices, outputs, and incomes over the past four or five decades.

5.035 Cornwall, John. "Three Paths to Full Employment Growth," The Quarterly Journal of Economics, February 1963, pp. 1-25.

Presents alternate methods of regulating aggregate demand, and develops models incorporating alternative fiscal policies, long-run tax multipliers, government spending multipliers, and differing rates of productivity increase.

5.036 Craig, Paul G. "Wages, Prices and Productivity," Bulletin of Business Research, Volume 32, Number 12, December 1957, pp. 1-8; Volume 33, Number 1, January 1958.

Discusses wages, prices, and productivity in their relationship to cost-push and demand-pull inflation. Emphasizes the continuing importance of the money supply and monetary relationships.

5.037 Dean, Joel. "Marketing Productivity and Profitability," Productivity Measurement Review, No. 20, February 1960, pp. 47-55.

States that economic efficiency should be the primary goal in marketing, and this efficiency can best be achieved by concentrating on profitability rather than on physical productivity measures.

5.038 Dempsey, Bernard William. "The Wage Frontier," Review of Social Economy, September 1960, pp. 100-109.

Considers the possibility of developing a modern wage theory somewhat related to VonThunen's premise, in his theory of the isolated state, which says that workers receive a wage which allows some savings over subsistence and that this increment should be a function of the production increment.

5.039 Doty, A. M. "Soaring Labor Costs vs. Greater Efficiency and Productivity," National Association of Manufactures of the United States of America, 32nd NAM Institute on Industrial Relations, March 14-18, 1960, pp. 18-22.

Introductory remarks for discussion of twelve major points relating to the importance of increasing individual worker productivity to offset increasing labor costs.

5.040 Duesenberry, James S. "Underlying Factors in the Postwar Inflation," Chapter 3, Wages, Prices, Profits, and Productivity (New York, Columbia University, The American Assembly, 1959). pp. 61-89.

Attempts to show that inflation is due in part to both demand-pull and trade union pressure on wages when the rate of wage increase is greater than productivity increases.

5.041 Dunlop, John T., and Diatchenko, Vasilu P. (Editors). Labor Productivity, Papers presented at the Conference on Labor Productivity, Cadenabbia, Lake Como, Italy, August 31 to September 8, 1961 (New York, McGraw-Hill, 1964). 409 pp.

Seven papers discuss concepts and measurements of productivity; eight include international comparisons of productivity; seven are on wages and productivity; and eight discuss the technical, managerial and organizational factors affecting productivity. (For individual chapter listings and annotations see reference code numbers 1.001, 1.007, 1.008, 1.023, 1.032, 1.071, 1.082, 1.086, 1.105, 4.013, 4.027, 4.037, 4.039, 5.083).

5.042 Dunlop, John T. "Policy Problems: Choices and Proposals," Chapter 6, Wages, Prices, Profits, and Productivity (New York, Columbia University, The American Assembly, 1959). pp. 137-160.

Describes the diverse areas in which structural adaptations may be made to raise the inflation threshold. These areas include a leveling of productivity increases among sectors, a "balancing" of production to increasing demand, more favorable terms of trade, improved fiscal and monetary policy measures, and the favorable response of labor and management to current economic conditions.

5.043 Dunlop, John T. "Productivity and the Wage Structure," Chapter VI, Income, Employment, and Public Policy (New York, W. W. Norton, 1958). pp. 341-379.

Examines some implications and problems which arise when wage and salary rates cannot be adjusted fully to productivity changes.

5.044 Dunlop, John T. The Secular Outlook: Wages and Prices (Berkeley, Calif., Institute of Industrial Relations, 1957). 17 pp.

Considers factors influencing productivity changes and the relationship of these changes to wages and prices.

5.045 Ehrlich, Werner. "Wages and Economic Growth," Productivity Measurement Review, No. 37, May 1964, pp. 5-8.

Examines the relationship between the rate of economic growth and the income increases which result from gains in productivity.

5.046 Fabricant, Solomon, and others. "Economic Growth: A Discussion by Economists," A symposium, in Selected Readings in Economics, Second Edition, edited by Harriss, C. Lowell, Columbia University (Englewood Cliffs, N.J., Prentice-Hall, Inc., 1962). pp. 423-441.

Suggests that increased overall productivity is more conducive to economic growth than are savings which result from increased tangible capital.

5.047 Fabricant, Solomon. "Productivity and Economic Growth," Technology and Social Change (New York, Columbia University Press, 1964). pp. 108-135.

Deals with the increased demand for goods and services, the reduced rate of unemployment, the role of government, and the interaction of technology and society as factors related to productivity, technological change, and automation.

5.048 Fabricant, Solomon. "Productivity and Prices," Challenge, December 1962, pp. 35-39.

A comparison of productivity and prices within industries, and an explanation of the results within the context of productivity "Guideposts" for prices and technological unemployment.

5.049 Fabricant, Solomon. "Productivity and Wages," Challenge, November 1962, pp. 35-39.

Suggests that the trend in output per man-hour has the closet fit to the trend in real hourly earnings. Also shows that the national trend in output per man-hour more closely parallels the individual industry's wage trend than does the industry's output per man-hour.

5.050 Fei, John C. H., and Ranis, Gustav. Development of the Labor Surplus Economy: Theory and Policy (Homewood, Ill., Richard D. Irwin, Inc., 1964). 319 pp.

Presents a theory of development applicable to an underdeveloped economy with a labor surplus. Discusses capital accumulation, technological change, balanced growth, and trade, with emphasis on the industrial and agricultural sectors of the economy.

5.051 Foley, James J. "How Not to Handle Productivity Disputes," Harvard Business Review, September/October 1959, pp. 68-80.

Reviews critically some outmoded ideas about productivity, earnings, and administration.

5.052 Fox, E. G. "Productivity, Progress, and Problems," Coal Age, March 1961, pp. 68-71.

Suggests that labor productivity indexes should not be considered criteria for raising wages, since changes in other factor inputs are not reflected in the indexes.

5.053 Gallaway, Lowell E. "The Wage-Push Inflation Thesis, 1950-1957," The American Economic Review, December 1958, pp. 967-972.

A wage-push inflation thesis, discussing the situation in which money wage rates increase faster than physical productivity.

5.054 Garbarino, Joseph William. Wage Policy and Long-Term Contracts (Washington, Brookings Institution, 1962). 145 pp.

Discusses wage policy for industrial firms, including the relationship between increases in productivity and wage rates.

5.055 Garbarino, Joseph William. "Wages, Productivity and Inflation," Management Record, August 1957, pp. 266-268.

Analyzes the relationship between wages and productivity, and compares changes in wages with changes in productivity for several preceding years.

5.056 Gitlow, Abraham L. "Wages, Productivity, Inflation, and Foreign Trade," Chapter 16, Labor and Industrial Society, Revised Edition (Homewood Ill., Richard D. Irwin, Inc., 1963). pp. 333-354.

Suggests that unions must accept real wage increases consistent with productivity growth in order to avoid inflation and enable United States products to compete in foreign markets.

5.057 Gold, Bela. "When Productivity Rises," Challenge, June-July 1957, pp. 46-49.

Discusses the distribution of productivity gains in the past and how the pattern for the future might be changed.

5.058 Goldy, D. L. "Manufacturing Efficiency; a National Resource," Automation, September 1964, pp. 143-144.

Discusses the need for manufacturing efficiency in order to make the United States more competitive in foreign trade.

5.059 Graney, Robert A. "Wage Negotiation and Productivity," Proceedings of the Eleventh Annual Union-Management Conference on Some Vital Issues Before The Parties (Notre Dame, Ind., The University of Notre Dame, Department of Economics, 1963). pp. 61-64.

Part of a panel discussion on "Wage Negotiation and Productivity" in which the experience of the Inland Steel Company with wage negotiations and their relation to productivity guideposts are described from management's point of view.

5.060 Greenberg, Leon. "Automation and Some Needs of the American Economy," Paper presented before the Third Conference on Manufacturing Automation, Purdue University, March 25, 1959 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1959). 20 pp.

Reviews the effects of technological developments on various phases of our economy, and stresses the importance of productivity in our economic competition with other countries.

5.061 Harbison, Frederick H. "High-Level Manpower, Productivity, and Economic Progress," Paper presented at the Conference on Labor Productivity, Cadenabbia, Lake Como, Italy, August 31 to September 8, 1961. Chapter 24, Labor Productivity (New York, McGraw-Hill, 1964). pp. 322-335.

Considers "brainpower"--or high-level manpower--as a strategic determinant of both enterprise efficiency and the overall productivity of an economy.

5.062 Henderson, John P. "Inflation and the Structure of Employment," Southern Economic Journal, April 1962, pp. 340-347.

Hypothesizes that the inflation from 1955-62 resulted largely from interindustry shifts in the pattern of employment. A large percentage of workers shifted into low-productivity service occupations, but wages in these occupations increased more rapidly than productivity.

5.063 Hitch, Thomas K. "Labor Productivity as a Wage Determinant," Economics for the 1960's (Honolulu, First National Bank of Hawaii, 1961). pp. 65-72.

Argues that wage increases should be related to increases in productivity, but that this should not be attempted on the individual firm or industry level. Attempts should be made to equalize the bargaining strength of labor and management, and to insure competition among business firms.

5.064 Holland, David G. "Costs, Productivities, and the Employment of Salaried Staff," Bulletin of the Oxford University Institute of Economics and Statistics, August 1963, pp. 127-164.

Considers the substitution of work in the office for work in the factory. Indirect production cost changes are shown in relation to total cost, and percentage increases in overall labor productivity related to changes in the proportion of salaried staff to total employment are discussed.

5.065 Hultgren, Thor, assisted by Green, Dorothy Dorfman. Changes in Labor Costs During Cycles in Production and Business, Occasional Paper No. 74 (New York, National Bureau of Economic Research, 1960). 85 pp.

The cyclical behavior of labor cost per unit of output is analyzed in the light of productivity changes and their relation to the wage rate and labor cost during the short periods encompassed by business cycles.

5.066 Hultgren, Thor. "Productivity and Unemployment," Challenge, March 1959, pp. 57-61.

Maintains that productivity tends to increase faster during periods of business expansion than it declines during periods of business contraction.

5.067 Johansen, L. "A Method for Separating the Effects of Capital Accumulation and Shifts in Production Functions Upon Growth in Labour Productivity," Economic Journal, December 1961, pp. 775-782.

Presents a theoretical method for examining the relative effects of technical change and capital accumulation upon increases in labor productivity. The method is applied to United Kingdom industries for the change in productivity between 1924 and 1950.

5.068 Kendrick, John W. "Domestic Implications of Postwar Productivity Trends in the United States," American Statistical Association, Proceedings of the Business and Economic Statistics Section, 1958, pp. 258-263.

Describes changes in productivity for the U.S. economy and for selected industry groups since World War II, and discusses the implications of productivity changes.

5.069 Kendrick, John W., and Sato, Ryuzo. "Factor Prices, Productivity, and Economic Growth," The American Economic Review, December 1963, pp. 974-1003.

Estimates an elasticity of substitution less than unity, supporting the view that the conventional Cobb-Douglas function is not an adequate description of the U.S. economy in recent decades. An alternative production function and rates of growth in key U.S. macroeconomic variables are presented.

5.070 Kendrick, John W. Productivity Trends in the United States, National Bureau of Economic Research, General Series No. 71 (Princeton, Princeton University Press, 1961). 630 pp.

Historical measures of output, input, and productivity for the U.S. economy and industry groups, including descriptions of concepts and methods of measurement. Includes a discussion of implications of productivity change for economic growth, prices, incomes, and resource allocation.

5.071 Kendrick, John W. "The Wage-Productivity-Price Issue," California Management Association, Spring 1960, pp. 42-50.

Considers the interrelationships of wages, productivity, and prices. Suggests that productivity is only a very rough guide to permissible wage increases.

5.072 Kerr, Clark. "The Impacts of Unions on the Level of Wages," Chapter 4, Wages, Prices, Profits, and Productivity (New York, Columbia University, The American Assembly, 1959). pp. 91-108.

Reviews wage levels in seven European countries and in the United States and attempts to assess the impact of unions in the attainment of labor's share of cost-price margins or productivity increases.

5.073 Kerr, Clark, Dunlop, John T., Harbison, Frederick H., and Myers, Charles A. "Managers of Enterprises: Their Power, Position, and Policies," Chapter 6, Industrialism and Industrial Man, revised pocket edition (New York, Oxford University Press, 1964). pp. 113-139.

Discusses the historical aspects of management as an economic resource or factor of production, and the increasing role of management and capital investment in the productivity of labor.

5.074 Kerr, Clark. "Productivity and Labor Relations," Labor and Management in Industrial Society (Garden City, N.Y., Doubleday and Company, Inc., 1964). pp. 241-283.

Explains the impact of physical and social environment on the amount of productivity increase and how the resulting benefits are distributed.

5.075 Kerr, Clark. Productivity and Labor Relations (Berkeley, Calif., Institute of Industrial Relations, 1957). 35 pp.

Examines productivity as one of the most complex and important phenomena in any society, particularly in an advanced industrial society characterized by a complex division of work and by a substantial division of individual and group interests.

5.076 Kiernan, Russell Lowell. Analysis of the Impact of Automation Upon Specific Manufacturing Processes (Thesis presented at University of Southern California, 1961). 400 pp. Available as: Microfilm No. 62-1322, listed and reviewed in Dissertation Abstracts, Vol. 22, No. 10, April 1962, p. 3449 (Ann Arbor, Michigan, University Microfilms, Inc.).

Suggests that continued research and development and the application of automated systems in the manufacturing process will result in the achievement of long-run productivity goals during the 1960's.

5.077 Kuh, Edwin. "Profits, Profit Markups, and Productivity: An Examination of Corporate Behavior Since 1947," Study paper No. 15, Joint Committee Print, 86th Congress, 2nd Session, Materials Prepared in Connection with the Study of Employment, Growth, and Price Levels for the Joint Economic Committee, Congress of the United States (Washington, U.S. Government Printing Office, 1960). pp. 61-111.

Studies the behavior of aggregate corporate profits and profit markups from 1947 to 1958 and discusses the causal determinants of productivity, economic growth, and inflation.

5.078 Lancaster, K. "Productivity-Geared Wage Policies," Economica, August 1958, pp. 199-212. Reply with Rejoinder by W. Peters, May 1959, pp. 154-157.

Theoretically examines the consequences of wage policies which are geared to productivity trends. Concludes that matching wage increases to national productivity increases may not be the optimum wage policy.

5.079 Levinson, David. "The Meaning of Productivity in Wage Negotiations: What the Connection is Between Wages and Productivity," Labor Law Journal, January 1959, pp. 45-48.

Explains the relationship between wages and productivity and how each is affected by competition.

5.080 Long, Clarence D. Wages and Earnings in the United States, 1860-1890 (Princeton, Princetion University Press, 1960). 169 pp.

Part of a study by the National Bureau of Economic Research on the history of wage rates and of changes in productivity in the United States over the past century.

5.081 Machlup, Fritz. "Another View of Cost-Push and Demand-Pull Inflation," The Review of Economics and Statistics, May 1960, pp. 125-139.

Examines responsive, defensive, and aggressive cost increases and suggests that the distribution of productivity gains to the worker or owners in the progressing industries would result in technological unemployment, and remedial full employment measures would inflate the price level. Indicates that the ideal way to avoid inflation is through price reductions in industries where productivity has increased.

5.082 Mitchell, James P. "Productivity and the Consumer," Wages, Prices, and Productivity (New York, Columbia University, The American Assembly, 1959). pp. 161-165.

Describes how foreign competition and a consumers' market can be met through greater production and increased productivity.

5.083 Myers, Charles A. "Management and Enterprise Efficiency (The American Experience)," Chapter 25, Labor Productivity, Paper presented at the Conference on Labor Productivity, Cadenabbia, Lake Como, Italy, August 31 to September 8, 1961 (New York, McGraw-Hill, 1964). pp. 336-349.

Considers alternative management theories and their impact on organizational structure and enterprise efficiency, and suggests some implications for modern industrial society.

5.084 Nelson, Richard R. "Aggregate Production Functions and Medium Range Growth Projections," The American Economic Review, September 1964, pp. 566-606.

Productivity is one of a number of factors used to explore aggregate production functions in order to make medium range growth projections.

5.085 Ockert, Roy A. "Wage Negotiation and Productivity," Proceedings of the Eleventh Annual Union-Management Conference on Some Vital Issues Before the Parties (Notre Dame, Ind., The University of Notre Dame, Department of Economics, 1963). pp. 65-67.

Union members discuss a wage-negotiation that resulted in the adoption of a program in which employees share in the benefits of increased productivity.

5.086 Parker, Sanford, and Charles E. Silberman. "How the U.S. Can Get 50 Percent Richer," Part III of a Series, Fortune, March 1959, pp. 107-111 ff.

Charts and graphs of long and short term productivity trends in the U.S. Concludes that productivity prediction is subject to controversy among economists.

5.087 Peltzman, Sam. "The Relative Importance of Unionization and Productivity in Increasing Wages," Labor Law Journal, August 1961, pp. 716-730.

The effect of union activity in raising wages is compared with other forces which may have caused wage increases.

5.088 Peters, W. "Productivity-Geared Wage Policies: A Comment," Economica, New Series, May 1959, pp. 154-157.

Describes a model of a two-sector economy with cost determined prices and suggests a wage policy appropriate to an economy in which productivity is increasing at different rates in different sectors.

5.089 Ranis, Gustav. "Investment Criteria, Productivity and Economic Development: An Empirical Comment," Quarterly Journal of Economics, May 1962, pp. 298-302. Reply by H. Leibenstein, February 1962, pp. 298-302.

Presents criteria governing the optimum choice of technology, given a stipulated output mix.

5.090 Reder, Melvin W. Labor in a Growing Economy (New York, John Wiley and Son Inc., 1957). 521 pp.

Includes sections on economic progress and worker productivity, unions and collective bargaining, wages, hours and work rules related to productivity, the "war on poverty", and some thoughts on the effect of minimum wages on employment and productivity.

5.091 Reder, Melvin W. "Wage Differentials: Theory and Measurement," Aspects of Labor Economics, National Bureau of Economic Research, Special Conference Series Report Number 14 (Princeton, Princeton University Press, 1962). pp. 257-317.

Part of a study on wage differentials, reporting short-run and long-run behavior patterns of average hourly earnings and the effects of productivity, unions, and skills on relative changes in hourly earnings.

5.092 Rees, Albert, assisted by Jacobs, Donald P. Real Wages in Manufacturing, 1890-1914 (Princeton, Princeton University Press, 1961). 163 pp.

Reviews trends in wages and productivity and suggests the reasons for the stationary real wages in the U.S. from 1890-1914.

5.093 Reynolds, Lloyd G. "Productivity, Real Wages, and Labor's Share of National Income," Chapter 17, Labor Economics and Labor Relations, Fourth Edition (Englewood Cliffs, New Jersey, Prentice-Hall, Inc., 1964). pp. 438-461.

Explains concepts and measurement of productivity, productivity increase, real wage increase, and the distribution of national output.

5.094 Roberts, Richard S., Jr. Economic Development, Human Skills, and Technical Assistance (Geneva, Universite de Geneve, Institution Universitaire de Hautes Etudes Internationals, 1962). 157 pp. (Thesis No. 136 for Doctor of Political Science from the University of Geneva).

A study of ILO technical assistance in the field of productivity and management development.

5.095 Rosen, Robert W. "Problems of Applying Productivity Guidelines," Personnel, November-December 1964, pp. 22-26.

Considers the productivity guidelines and the technical problems involved in their application to wage determination.

5.096 Ruttenberg, Harold J. "The Impact of Increased Productivity on the Face of Society," Solving Problems of Productivity in a Free Society (Madison, Wisc., The University of Wisconsin, School of Commerce, Center for Productivity Motivation, June 1962). pp. 41-52.

Stresses the importance of increasing productivity to help alleviate world proverty, and the need to use "humanation" in the distribution of the fruits of increased productivity.

5.097 Saco, Alfredo. "Farm Productivity and Income as Related to Economic Growth," Problems of Development Series of Lectures on Economic Growth, University of Madrid, January-February 1961, OEEC Publication No. 13.511 (Paris, Organization for Economic Cooperation and Development, 1961). pp. 55-69.

Maintains that it is necessary to create local sources of capital in order to increase agricultural productivity and to liberate manpower from farms for new industrial centers in underdeveloped countries.

5.098 Sangha, Kehar Singh. Productivity and Economic Growth (New York, Asia Publishing House, 1964). 121 pp.

Analyzes the meaning of productivity and its relation to employment, wages, and inflation. Discusses the role of productivity in economic growth, with special reference to underdeveloped areas.

5.099 Schultze, Charles L. Prices, Costs and Output for the Post War Decade: 1947-1957 (New York, Committee for Economic Development, 1960). 82 pp.

An empirical investigation into the structure of prices, costs, and output in the major industries of the nation during the postwar period.

5.100 Segal, Martin. "The Relation between Union Wage Impact and the Market Structure," The Quarterly Journal of Economics, February 1964, pp. 96-114.

Theoretical comparisons of the degreee of union influence on wages in competitive and noncompetitive market situations. Discusses situations in which wage increases equal to productivity increases are not possible.

5.101 "Sharing the Benefits of Productivity," International Labour Review, July 1960, pp. 1-25.

Deals with increased productivity gains and the problem of their equitable distribution among the economic agents involved.

5.102 Shultz, George, and Siegel, Abraham, and ten other members of an independent study group. "Collective Bargaining, Inflation, and the Effective Use of Manpower," The Public Interest in National Labor Policy, December 1961 (New York, Committee for Economic Development, 1961). pp. 111-129.

Discusses the relationship of prices, inflation, and wage increases to increases in productivity on a national level.

5.103 Simon, Herbert A. "Decision Making as an Economic Resource," Chapter 3, New Horizons of Economic Progress (Detroit, Wayne State University Press, 1964). pp. 71-95.

Distinguishes between physical capital and human capital, with emphasis on the latter as a major source of increasing productivity in an industrialized country.

5.104 Slichter, Sumner H. "Labor Costs and Prices," Wages, Prices, Profits, and Productivity (New York, Columbia University, The American Assembly, 1959). pp. 167-180.

Examines labor costs and prices in relation to deflation, inflation, increasing demand, and changes in the real product per man-hour in private industry.

5.105 Sutermeister, R. A. An Inquiry into Labor Rates and Labor Productivity, Washington State Compared with Other Regions, Occasional Paper No. 7 (Seattle, University of Washington, College of Business Administration, Bureau of Business Research, August 1959). 58 pp.

Compares labor productivity and wage rates of plants in Washington State with plants of the same firm in other regions of the United States.

5.106 Taggart, Joseph H., and Clark, Clifford D. Wage Theory, Wage Rates, and Productivity (New York, New York University, Graduate School of Business Administration, 1959). 23 pp.

Attempts to determine long-run and short-run effects of tying-in wage increases with various productivity indexes.

5.107 Thulin, W. Bernard. "Productivity Guidelines Won't Work," Harvard Business Review, November-December 1962, pp. 70-78.

Suggests that even though economists have proposed a plausible standard for noninflationary national economic growth, the practicalities of business and investment decision-making indicate that productivity guidelines won't work.

5.108 Turner, H. A. "Wages, Productivity, and the Level of Employment: More on the Wage Drift," The Manchester School of Economics and Social Studies, January 1960, pp. 89-123.

Attempts to explain wage drift, or the difference between agreed-to wage rates and actual increases in earnings, by comparing it with wage structure, hours of employment, effects of relative bargaining strength, productivity growth, and pieceworkers' productivity gains.

5.109 Turner, J. Howell. "Wages and Productivity: So-called Productivity Formula as an Alternative to Barganing on Annual Wage Increases," Personnel, May/June 1959, pp. 8-14.

Argues against the use of productivity-wage formulas as an alternative to bargaining for annual wage increases.

5.110 U.S. Congress, Joint Economic Committee. Productivity, Prices, and Income, Materials prepared for the Congressional Joint Economic Committee by the Committee Staff (Washington, U.S. Government Printing Office, 1957). 281 pp.

Studies the entire economy, the manufacturing sector, and two industrial areas with regard to productivity, prices, incomes, and measures of cost-price.

5.111 U.S. Department of Labor, Bureau of Labor Statistics. Productivity, Changing Technology, and Employment, A reprint from the Manpower Report of the President (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1964). 21 pp.

Examines the major technological trends in the U.S. economy and evaluates the potential impact of technological change on employment and manpower.

5.112 Wallis, W. Allen. "Inflation, Economic Growth and Collective Bargaining," Labor Law Journal, July 1960, pp. 653-661.

Reviews postwar cyclical price movements, the effect of increased productivity in retarding costs in mechanical and chemical industries, and the question of tying wages to productivity increases.

5.113 Wernette, John Philip. "The Inflation Problem," Chapter 11, Government and Business (New York, The Macmillan Company, 1964). pp. 196-209.

Discusses price changes as measured by the consumer price index and the attempt of the U.S. Government to deal with inflation by allowing only productivity benchmark wage increases. Special reference is made to the Kennedy-U.S. Steel negotiation in the spring of 1962.

5.114 Wernick, Murray. "The Mystery of Wage Costs," Fortune, June 1958, pp. 202-204.

Deals with the rate of increase in employee productivity in manufacturing industries and its relationship to unit labor costs.

5.115 Wilkes, John, Editor. Productivity and Progress (Sydney, Australia, Australian Institute of Political Science, 1957). pp. 35-69.

Papers and discussion on productivity, including "The Social and Economic Background" by K. E. Walker, "Productivity and Labour Relations" by Clark Kerr, and "British Trade Unions and Productivity" by C. J. Geddes. Other papers deal exclusively with labor relations and productivity in Australia.

5.116 Wilson, G. W. "Relationship Between Output and Employment," The Review of Economics and Statistics, February 1960, pp. 37-43.

A study of the relationship between employment and the amount and availability of labor required in different time spans.

5.117 Wilson, Thomas A., and Eckstein, Otto. "Short-Run Productivity Behavior in U.S. Manufacturing," The Review of Economics and Statistics, February 1964, pp. 41-54.

An econometric study examining the hypothesis that marginal requirements of production workers and overtime hours increase at high levels of capacity utilization.

5.118 Wirtz, W. Willard. "Freer Trade and Fuller Employment," Labor and the Public Interest (New York, Harper and Row, 1964). pp. 167-173.

Stresses the importance of productivity in relation to international trade.

5.119 Wood, Rawson L. "Employer-Employee Cooperation for Increased Productivity," Solving Problems of Productivity in a Free Society (Madison, Wisc., The University of Wisconsin, School of Commerce, Center for Productivity Motivation, June 1962). pp. 53-58.

Discusses a company's experience with profit sharing as an incentive to increased productivity and a reward for cooperative effort.

5.120 Young, F. J., and Cameron, James. "Productivity and Wages," Department of Industrial Relations (Kingston, Ontario, Queens University, 1958). 33 pp.

Attempts to clarify issues involved in the discussion of productivity particularly in relation to wages.

5.121 Zager, R. "Management and Productivity of Labor," Advanced Management, June 1961, pp. 4-9.

Discusses the interdependence of the efforts of workers and management to increase productivity.

VI - Bibliographies

This section includes bibliographies which pertain to productivity and technological change.

6.001 Jehring, J. J., and Helburn, I. B. A Comprehensive Bibliography on Total Group Productivity Motivation in Business (Madison, Wisc., The University of Wisconsin, Center for Productivity Motivation, September 1961). 75 pp.

Includes reference material on profit-sharing, employee stock ownership and employer-employee cooperation. A selection of non-American literature is also presented.

6.002 Trager, R. N. "A Selected and Annotated Bibliography on Economic Development, 1953-1957," Economic Development and Cultural Change, July 1958, pp. 257-329.

An annotated bibliography of 409 references pertaining to economic development. Section VII includes 26 entries on productivity, technology, and resource allocation.

6.003 *U. S. Department of Labor, Bureau of Labor Statistics. Implications of Automation and Other Technological Developments, A Selected Annotated Bibliography, Bulletin 1319 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1962). 136 pp.

An annotated bibliography of published material concerning the benefits and problems of automation and technological change.

6.004 *U.S. Department of Labor, Bureau of Labor Statistics. Implications of Automation and Other Technological Developments, A Selected Annotated Bibliography, Bulletin 1319-1 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1963). 90 pp.

An annotated bibliography of published material pertaining to automation and its social and economic effects. Covers publications issued from 1956-1961. (Supplements Bulletin 1319. See reference code number 6.003.)

See footnote at the end of the following page.

6.005 *U.S. Department of Labor, Bureau of Labor Statistics. Productivity: A Bibliography, Bulletin 1226 (Washington, U.S. Department of Labor, Bureau of Labor Statistics, 1958). 182 pp.

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* Out of print but available at many university, college, or public libraries that are depositories for government publications.

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Advanced Management
Society for Advancement of Management, Inc.
74 Fifth Avenue
New York, New York 10011

Allen, George, and Unwin, Ltd.
40 Museum Street
London, England

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American Economic Association
Northwestern University
629 Noyes Street
Evanston, Illinois 60201

American Iron and Steel Institute
150 East 42nd Street
New York, New York 10017

American Management Association
135 West 50th Street
New York, New York 10020

American Statistical Association
810 18th Street, NW.
Washington, D.C. 20006

Architectural Forum
Lawrence W. Mester, Publisher
111 West 57th Street
New York, New York 10019

Asia Publishing House
Calicut Street
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Also available from:
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New York, New York 10019

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Sydney, N. S. W., Australia

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Cleveland, Ohio 44113

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68-74 Carter Lane
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Brookings Institution
1775 Massachusetts Avenue, NW.
Washington, D.C. 20036

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The Ohio State University
230 West 17th Avenue
Columbus, Ohio 43210

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1231 24th Street, NW.
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London, England

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McGraw-Hill Publishing Company, Inc.
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New York, New York 10036

Columbia University
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New York, New York 10027

Columbia University Press
2960 Broadway
New York, New York 10027

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Research and Policy Committee
711 Fifth Avenue
New York, New York 10022

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1925 K Street, NW.
Washington, D.C. 20006

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460 Park Avenue
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2, rue Andre Pascal
Paris 16e, France

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330 West 42nd Street
New York, New York 10036

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Post Office Box 3200
Honolulu, Hawaii 96801

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Stanford University
Palo Alto, California 94305

Fortune
Time, Inc.
540 North Michigan Avenue
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The Penton Publishing Company
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917 15th Street, NW.
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1606 New Hampshire Avenue, NW.
Washington, D.C. 20009

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Department of Economics
Notre Dame, Indiana 46556

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