PART II

Staff Reports

1. National Income, Consumption, and Capital Formation

THE MOBILITY OF CAPITAL IN MANUFACTURING INDUSTRIES

The isolation and measurement of the determinants of the allocation of capital among manufacturing industries, and the rate of return on it, are the chief objects of my study. First a basic statistical record of capital and returns was required; this was recently completed for the approximately one hundred "minor" or "three-digit" industries that comprise manufacturing, from 1938 through 1954.

The period was one of immense growth in capital (in which I include all assets except investments in other companies) measured in book values – more than a tripling in sixteen years (Table 1). Measured in stable (1947) dollars the growth was much smaller, but still at an average rate of 3.2 per cent per year. Capital in stable prices decreased substantially after 1943, and not until 1950 was a new peak reached. One reason my figures show a larger and longer decline in investment than other sources (e.g. Wooden and Wasson, *Survey of Current Business,* Dept. of Commerce, November 1956) is that I did not attempt to estimate what portion of accelerated depreciation was excessive in the sense that postwar usefulness of defense facilities was underestimated, whereas the Commerce estimates assume that all accelerated depreciation was excessive in this sense. No one has the information to carry through the more reasonable calculations that would lie between these polar assumptions.

The rate of increase of capital has been highly variable, and that of the individual industries has of course been even more so. Increases of 557.6 per cent and decreases of 99.7 per cent in the capital of an industry were recorded in the munitions sector in single years. Even in peacetime increases or decreases of 10 to 20 per cent were not uncommon. The ranking of industries by rates of increase is also unstable, and the sources of the instability, which unfortunately include deficiencies in the data, are being studied.

TABLE 1

ASSETS IN MANUFACTURING INDUSTRIES, 1938-1954

(dollars in millions)

YEAR[a]	TOTAL ASSETS[b] Percentage Change (book value)	TOTAL ASSETS[b] Amount (book value)	TOTAL ASSETS[b] Amount (1947 prices)	INCREASES IN ASSETS[c] Industries (number)	INCREASES IN ASSETS[c] Amount (book value)	DECREASES IN ASSETS[c] Industries (number)	DECREASES IN ASSETS[c] Amount (book value)
1938		$48,848	$94,189				
1939	4.3%	50,955	96,195	66	$2,897	30	$ 717
1940	8.0	55,048	101,817	83	4,240	13	208
1941	19.7	65,889	113,466	95	10,973	6	57
1942	21.9	80,297	128,549	76	16,164	25	1,806
1943	11.7	89,666	135,282	69	10,852	32	1,447
1944	.9	90,497	132,623	71	3,514	30	2,584
1945	—4.5	86,425	122,714	55	2,091	46	6,272
1946	7.8	93,134	122,186	87	14,671	14	7,899
1947	14.2	106,313	125,911	86	13,787	15	596
1947[d]		106,580	126,548				
1948	8.9	116,106	131,118	84	11,306	22	985
1949	1.7	118,088	132,060	52	3,673	57	1,942
1950	14.4	135,142	142,056	102	17,123	7	205
1951	13.9	153,948	151,878	100	19,075	9	219
1952	5.8	162,853	157,327	75[e]	17,556[e]	34[e]	1,501[e]
1953	4.2	169,695	160,399				
1954	2.0	173,111	161,229	60	7,321	49	4,208

[a] As of December 31, in this table and in Tables 2 and 3. [b] Based upon two-digit industries
[c] Based upon three-digit industries. [d] On 1948 basis. [e] For two-year period, 1951-53.

TABLE 2

RATES OF RETURN IN MANUFACTURING INDUSTRIES, 1938-1954

YEAR	MINOR INDUSTRIES[a] (number)	Average Rate of Return Weighted (book value)	Average Rate of Return Unweighted (book value)	Standard Deviation of Ratio of Return	MAJOR INDUSTRIES[b] (number)	Average Rate of Return (book value)	Average Rate of Return (1947 prices)
1938	96	2.62%	2.70%	3.31	20	2.87%	2.88%
1939	96	6.00	6.31	2.08	20	6.19	6.08
1940	96	7.12	7.07	3.26	20	7.06	7.00
1941	96	8.56	8.49	2.65	21	8.51	8.38
1942	101	7.30	7.49	2.10	21	7.30	6.98
1943	101	7.30	7.46	2.06	21	7.41	6.93
1944	101	6.59	6.86	1.91	21	6.73	6.37
1945	101	5.43	5.88	2.15	21	5.78	5.59
1946	101	8.13	8.90	5.67	21	8.55	8.07
1947	101	10.34	10.03	4.40	21	9.94	9.51
1948	109	10.68	9.14	3.49	23	9.70	9.48
1949	109	8.12	6.59	3.48	23	7.26	7.35
1950	109	10.22	8.99	2.69	23	9.59	9.67
1951	109	7.50	6.27	2.55	23	6.86	7.32
1952	n.a.	6.08	n.a.	n.a.	23	5.77	6.28
1953	109	6.17	5.43	2.30	23	5.71	6.21
1954	109	5.68	4.73	2.83	23	5.73	6.13
Average			7.02			7.12	7.07

n.a. = not available. [a] Based upon three-digit industries. [b] Based upon two-digit industries.

TABLE 3

ANNUAL PERCENTAGE INCREASE OF CAPITAL AND RATES OF RETURN, 1938-1947

(*book value*)

YEAR	TYPE OF INDUSTRY			
	Munitions[a]	*Suppliers of Munitions*[b]	*Other Producer Goods*	*Consumer Goods*
	Percentage Increase in Capital			
1939	35.0	6.8	6.4	2.9
1940	96.3	20.9	7.3	6.1
1941	115.8	34.0	19.6	15.5
1942	355.8	39.2	13.4	7.6
1943	103.7	20.7	3.5	4.5
1944	−14.3	−1.3	−0.6	6.1
1945	−24.9	−12.3	−2.1	3.8
1946	−77.6	7.2	12.1	31.7
1947	−24.6	15.7	22.0	11.9
	Average Rate of Return			
1939	7.01	7.74	6.01	6.17
1940	9.32	10.36	8.03	6.25
1941	8.52	11.12	9.23	7.89
1942	7.39	8.39	7.46	7.08
1943	7.20	8.00	6.98	7.57
1944	6.65	7.16	6.23	6.92
1945	5.11	5.22	5.39	6.16
1946	−2.65	4.90	9.19	10.25
1947	3.51	9.01	11.84	9.97

[a] Ships, aircraft, firearms, ammunition, tanks, sighting and firing equipment, and munitions not elsewhere classified.

[b] Industrial chemicals, blast furnaces, structural steel, miscellaneous iron and steel, basic nonferrous metals, miscellaneous nonferrous metals, communications, engines and turbines, general industrial machinery, and metal working machinery.

The average of industry rates of return (including interest) on all assets, after taxes, was 7.02 per cent over the period (Table 2). Price level changes had much less impact upon the rates of return than upon the quantity of investment. For major industrial groups the rates in current and in 1947 prices differed by only 0.05 per cent on the average, and never by more than 0.51 per cent. The span of industry rates is normally wide, but when an excess profits tax was in force (1940-45; 1950-53), there was a sharp reduction in dispersion. Unlike the rates of increase of capital, the industrial pattern of rates of return is relatively stable from year to year.

The mobilization and demobilization of capital in the munitions industries is a striking episode in the first half of the period we are studying. The rates of increase and then of decrease of the capital stocks in munitions industries were immense (see Table 3) whereas the rates in even the industries supplying the semifabricated components of munitions underwent only moderate fluctuations. The rates of return after taxes, on the other hand, moved together: the average of rates of return in the munitions industries roughly parallel those in other industries up to 1945. There are reasons for qualifying this conclusion: the rates of return in companies converting to munitions are calculated on assets that include assets appropriate only to their peacetime products, and rates calculated on end-of-year assets are biased downward for rapidly growing industries. The impression survives, however, that differential profitability was not the primary device to mobilize the economy.

GEORGE J. STIGLER

CAPITAL FORMATION AND FINANCING IN THE UNITED STATES

Numerous papers (listed in the 1956 Annual Report) and several monographs have grown out of our study of long-term trends and future prospects in capital formation and financing, initiated in 1950 with the aid of a grant from the Life Insurance Association of America. Two monographs were issued in 1957:

Capital in Agriculture: Its Formation and Financing since 1870, by Alvin S. Tostlebe

Financial Intermediaries in the American Economy since 1900, by Raymond W. Goldsmith

One monograph issued in 1956 has gone into its second printing:

Capital Formation in Residential Real Estate: Trends and Prospects, by Leo Grebler, David M. Blank, and Louis Winnick

Another monograph will shortly go to press:

Capital in Transportation, Communications, and Public Utilities: Its Formation and Financing, by Melville J. Ulmer

A manuscript on "Trends in Capital Formation and Financing in Manufactures and Mining," by Daniel Creamer, Sergei Dobrovolsky, and Israel Borenstein has been completed and is being prepared for review by the Directors. Morris Copeland's monograph, "Trends in Government Financing," has been reviewed by the staff and is expected to be revised by mid-year.

The eight substantive chapters of a summary volume I am preparing have been completed and mimeographed. Perhaps the best way to indicate the scope of the volume is to cite the titles of the parts and the chapters:

Part I Introduction

1 Capital Formation, Saving, and Financing — Definitions and Relations

2 The Meaning of Long-Term Trends

Part II Trends in Capital Formation

3 Trends in Total Capital Formation, 1869-1955

4 Trends in the Structure of Capital Formation, 1869-1955

Part III Trends in Financing of Capital Formation

5 Trends in the Share of Internal Funds, 1900-1955

6 Trends in the Structure of External Financing, 1900-1955

Part IV The Long Swings

7 Long Swings in Population Growth, Capital Formation, and National Product

8 Long Swings in Financing Capital Formation

Part V Summary and Interpretation

9 A Summary of Findings

10 The Past as Prologue to the Future

Chapter 9 is now being prepared, and Chapter 10 should be completed in the spring.

A separate, second volume containing the statistical series on the basic national product and capital formation aggregates and their components back to 1869 has been completed.

SIMON KUZNETS

REVIEW OF THE NATIONAL ECONOMIC ACCOUNTS

A committee to review and appraise the national economic accounts was set up in November 1956 by the National Bureau at the request of the Division of Statistical Standards of the Bureau of the Budget. Members of the committee, apart from myself as *Chairman,* were:

V Lewis Bassie, professor of economics, University of Illinois

Gerhard Colm, chief economist, National Planning Association

Richard A. Easterlin, member of the research staff of the National Bureau of Economic Research and associate professor of economics, University of Pennsylvania

Edwin B. George, director of economics, Dun & Bradstreet, Inc.

Joseph A. Pechman, research staff, Committee on Economic Development

Roy L. Reierson, vice president, Bankers' Trust Co.

Richard Ruggles, professor of economics, Yale University

Lazare Teper, director of research, International Ladies' Garment Workers' Union (AFL-CIO)

To ascertain the experience and needs of the main groups of users of national accounting data, meetings were held with representatives of federal agencies, including those primarily producing and those primarily using national accounting data; with university, business, and labor economists specializing in the national accounting field; and with representa-

tives of the American Institute of Accountants. Also two questionnaires were sent to business, labor, and university economists working in the field, and more than seventy replied. A third questionnaire was directed specifically to persons interested in regional aspects of national accounting, and about twenty-five replied.

The committee held twelve meetings, usually lasting two days, to plan its work and to discuss successive drafts of the report. The final draft was adopted unanimously on June 21, 1957, and was transmitted by the Bureau's Director of Research to the Division of Statistical Standards on August 9.

Hearings on the report were held by the Subcommittee on Economic Statistics of the Joint Economic Committee on October 29 and 30 at which the members of the National Accounts Review Committee testified. The hearings, including the full text of the report (pages 109-302), were published by the Joint Economic Committee in December 1957. A reprint of the report is available as General Series 64.

The report contains the following chapters and appendixes:

- I Summary of Findings and Recommendations
- II Organization and Activities of Committee
- III Guiding Considerations
- IV Present Status of National Accounts
- V Objectives of National Economic Accounts and Their Implications for the General Form of the Accounts
- VI Constant-Dollar Estimates
- VII Specific Problems of Main Accounts
- VIII Short-Term Estimates
- IX Problems of Regional Estimates
- X Size Distributions of Income
- XI Statistical Adequacy of National Income and Product Estimates
- XII Flow-of-Funds Statements within the System of National Accounts
- XIII Input-Output Tables
- XIV National Balance Sheet
- XV The Challenge of Electronic Accounting
- A Illustrative Tables for System of National Accounts
- B Illustrative Quarterly Income and Product Tables
- C Replies to Questionnaires
- D A Comparison of National Accounting Structures in Selected Countries
- E The National Income Accounts: Future Directions of Research and Suggestions for Improving the Basic Data, a Statement prepared by George Jaszi
- F Personnel and Appropriations for Work of National Income Division, Office of Business Economics, United States Department of Commerce
- G Preliminary National Balance Sheet, 1955

RAYMOND W. GOLDSMITH

INVESTMENT IN EDUCATION

Begun in October 1957 under a grant from the Carnegie Foundation, the first objective of the study is the measurement of the economic return to public and private funds invested in education. Although of course there are many other kinds of educational returns and costs, I am estimating only the monetary ones.

TABLE 4

AVERAGE WAGE AND SALARY INCOME OF URBAN WHITE MALES, 1939

Age	*College Graduate*	*High-School Graduate*	*Difference*
18	$ 102.68	$ 409.35	$–306.67
20	102.68	674.20	–571.52
23	1,029.10	946.50	+82.60
25	1,661.10	1,243.80	+417.30
35	3,147.00	2,073.40	+1,073.60
54	3,483.00	2,285.60	+1,197.40
64	3,147.00	2,104.80	+1,042.20

Source: Morton Zeman, "Quantitative Analysis of White-Nonwhite Income Differentials in the United States," unpublished dissertation, University of Chicago, 1955, Tables 13 and 16, Chapter IV. Calculated from *16th Census of the U.S.: 1940, Population, Education, Educational Attainment by Economic Characteristics and Marital Status,* Tables 29, 31, 33, and 35.

Table 4 gives some illustrative income data from the 1940 census for male high-school and college graduates, which show clearly that the crude income differentials are not only large but tend to increase with age. The major problem is to adjust the differentials for other

influences so that the role of education itself can be more properly assessed.

TABLE 5

ADJUSTED AVERAGE WAGE AND SALARY INCOMES OF URBAN WHITE MALES, 1939

Age	*College Graduate*	*High-School Graduate*	*Difference*
18	$–275.42[a]	$ 459.70	$–735.12
	–51.06[b]		–408.64
20	–275.77[a]	754.76	–1,030.53
	–51.41[b]		–806.17
23	1,104.65	1,052.53	+52.12
25	1,774.51	1,376.52	+397.99
35	3,268.49	2,230.88	1,037.61
54	3,113.42	2,116.59	+996.83
64	2,221.09	1,538.97	+682.12

[a] Adjusted for social educational costs.
[b] Adjusted for private educational costs.

Table 5 gives preliminary estimates of the incomes of high-school and college graduates in 1939 after their incomes were adjusted for educational costs, abnormal unemployment, expected mortality at different ages, and other factors. Social costs refer to the total educational expenditures by a college on a student in 1940, receipts coming from students, and government and private donations. Private costs refer to the educational expenditures by a student or his family.

The figures can be taken as a first approximation of the incomes that someone receiving a high school or college education in 1939 might expect to receive at different ages. The income differentials are narrowed considerably by the adjustments, especially at the earliest ages – reflecting educational costs, and at the later ages – reflecting the mortality rate.

Even with no adjustment for differences in intelligence, ambition, etc., between college and high school graduates, the data are still useful. For if college graduates as a group are superior to high school graduates in these respects, as is commonly supposed, we can estimate an upper limit to the return from college education, which we can use to compare the return from investment in a college education with that from investment elsewhere. The adjusted data in Table 5 indicate that this upper limit was about 12 per cent per year on income invested by society, and over 14 per cent on that invested by private individuals and their families. Presumably the actual rates of return are less, perhaps substantially less. Yet even these rates are no greater than the before-tax return on capital owned by manufacturing corporations during 1938-47, as that return is measured in George Stigler's study of capital in manufacturing.

It is likely that college graduates, having, as group, relatively high ability and ambition, might receive higher than average incomes even without a college education. An allowance for this factor, therefore, would tend to reduce the rates of return given above. I plan to take account of this bias and to estimate the rates of return for other levels of education and for more recent years.

GARY S. BECKER

THE DISTRIBUTION OF WEALTH ACCORDING TO ESTATE TAX RETURNS, 1953

The study is designed to continue and extend earlier work by Horst Mendershausen and Raymond W. Goldsmith. The year 1953 was selected because more information is available for that year than for any other year about the people for whom federal estate tax returns were filed. Tabulations of the returns were made available to us by the Treasury Department.

By using the estate multiplier method – that is, by applying inverse mortality rates to the estates of each age and sex group of the deceased for whom estate tax returns were filed – one can estimate how many living persons have over $60,000 of "estate tax wealth," the total of such wealth, and its composition by type of property. Moreover, for 1953, one can relate the size and composition of estates to the age and sex of the living "estate-holder" and observe the differences between the states under community-property law and those under common law.

In 1953 about 1.7 million living persons had over $60,000 of estate tax wealth, and held a total of $319.2 billion of gross estate. Both

the number of such wealth holders and the amount of gross estate grew rapidly in the postwar years, the number having risen 117 per cent and the amount having about doubled since 1944.

The average gross estate size was $162,400 for men and $220,500 for women, but there were twice as many men as women. Over half were between forty and sixty years of age, and the size of estates increased with the age of the holder. Most estate tax wealth consisted of intangible property, with corporate stock making up 39 per cent of total estate tax wealth. Real estate was 22 per cent of the total wealth. Larger estates had relatively more corporate stock and less real estate, more state and local government (tax-exempt) bonds and less miscellaneous property (mainly unincorporated business). And in recent years asset price movements have been favorable to the investment patterns of the upper group of wealth holders.

Among the holders, the top 27,000 with over $1 million of gross estate held 23.6 per cent of total gross estate tax wealth. Comparing the estate-tax wealth holders with the entire adult population, we find that the top 1.7 per cent of all persons age twenty years and over (1.7 million) held about 25 per cent of all assets of the household sector as set out in the preliminary national balance sheet for 1952, holding two-thirds of the corporate stock, four-fifths of the state and local bonds, and between 14 and 35 per cent of each other type of property in that sector.

Tentatively, a 10 per cent upward adjustment in the aggregate of gross estate appears called for to compensate for underreporting. The only other important correction is for personal trust funds, which aggregated over $50 billion in 1953. By a conservative estimate about $30 billion of this amount may be attributed to those having gross estates of over $60,000. The conclusions stated above, except those concerning the average size of estate, reflect the correction for underreporting but do not take account of trust funds.

ROBERT J. LAMPMAN

CONSUMERS' BUYING PLANS

Our basic data consist of replies to an annual questionnaire sent to subscribers by the Consumers Union of the United States, a nonprofit organization whose main function is the testing and rating of consumer goods – primarily durables. A preliminary analysis of the returns, more than 100,000 a year in recent years, indicated that the reported buying intentions were closely related to subsequent actual purchases by the United States population as a whole.

When the study was initiated in 1957, one of our first tasks was to integrate the buying intentions data obtained from the 1956 and 1957 questionnaires into the previously available series; the aggregate intentions data now cover the period 1948-57. We made minor revisions in the expected price data and tested the effect of alterations in the weights of products in the sample. The expanded and revised buying intentions series showed that over the period about 90 per cent of the variation in purchases of major durables by the population could be explained by the buying intentions of the Consumers Union (CU) sample (see Table 6). For automobiles and household equipment separately, the relationship between CU buying intentions and population purchases is less close.

Perhaps even more striking is the degree to which the CU data appear to have net forecasting value. Much of the variation in purchases of durables is clearly associated with changes in disposable income. After taking account of the effects of income, I find that the buying intentions of the CU sample explained some 80 per cent of the remaining variations in purchases. Taken together, income and intentions explain about 95 per cent of the total variation in purchases of major consumer durables in the postwar period. Comparable figures for the automobile and household equipment subcategories would be lower, although the results would be similar.

It should be realized that this analysis measures forecasting value only in the "retrospective" sense that is an inherent feature of correlation analysis. That is, the average rela-

TABLE 6

YEAR-TO-YEAR CHANGES IN PLANNED PURCHASES OF MAJOR DURABLE GOODS BY THE CONSUMERS UNION SUBSCRIBER SAMPLE COMPARED WITH SIMILAR CHANGES IN ACTUAL PURCHASES BY THE TOTAL POPULATION, 1948-1957

	PERCENTAGE CHANGE FROM PRECEDING PERIOD[a]					
	Automobiles		*Household Equipment*		*Total Durables*	
APPROXIMATE PERIOD	*Planned*	*Actual*[b]	*Planned*	*Actual*[b]	*Planned*	*Actual*[b]
July 48 - June 49	−2	+20	+13	−7	+6	+4
Nov. 49 - Nov. 50[c]	+20	+42	+55	+22	+40	+30
Oct. 50 - Sept. 51	−3	−3	−12	−4	−9	−4
Aug. 51 - Aug. 52[c]	−39	−14	−27	−10	−32	−11
July 52 - June 53	+28	+20	+7	+6	+14	+13
Oct. 53 - Sept. 54	[d]		[d]		[d]	
Oct. 54 - Sept. 55	+54	+38	+22	+17	+34	+27
Oct. 55 - Sept. 56	+9	−9	−2	+6	+4	−2
Oct. 56 - Sept. 57	+6	+5	−4	+1	0	+3
Coefficient of determination (r^2)	0.57		0.70		0.89	

[a] The planned changes do not cover precisely one twelve-month period to the next, since plans are taken from questionnaires sent out at slightly different times of the year. The actual changes are intended to cover the same period as the planned changes, but the two may differ in coverage by as much as a month and a half or half a quarter.

[b] "Actual" refers to actual purchases by the population, not to purchases by the CU subscriber sample.

[c] Mid-month.

[d] The questionnaire did not ask about spending intentions in this year; respondents were asked "which products would you like CU to rate," rather than "which products do you plan to purchase."

Source: Planned purchase data from Consumers Union surveys: actual purchases are from the *Survey of Current Business*, Dept. of Commerce.

tionship over the 1949-57 period between buying plans and actual purchases is used to correct any systematic bias in the plans. One would feel more confident of making predictions with a relationship of this kind if a larger number of observations were available, and, of course, if they were tested on observations that did not enter into the estimated average relationship. Still, there is reason to suppose that the above results are neither based on factors peculiar to the period nor of purely retrospective value. For example, if anyone had taken the raw intentions series at face value, he could have forecast the 1949-57 level of durable goods purchases with a margin of error of less than 5 per cent in most years.

Analysis of the factors that influence purchases and purchase plans is still in process as I write. For this phase of the project we punched and tabulated 15,000 returns from the 1955 questionnaire, and 20,000 from the one sent out in late 1957. Clearly income expectations, adjusted for the influence of income levels, exert a substantial influence on both purchases and purchase plans. By examining the impact of such factors as age, number of children, etc. we hope to determine whether income expectations continue to show a net effect when these variables are accounted for. I shall also examine other factors, such as budgeting habits, home ownership, and stock of durables.

Preliminary analysis of the questionnaire sent out in September 1957 suggests additional research possibilities. Because the wording of the buying intentions question was changed, we could not compare the level of intentions in late 1957 directly with those of previous

years, although there is some evidence that CU members were in less of a buying mood than they had been a year earlier. However, answers to a question about purchase plans are clearly influenced by the time horizon implied by the question. If one asks about intentions over a relatively short future period – six months – the answers probably indicate what people expect to do unless something unforeseen happens. If the time horizon is lengthened – to twelve months or longer – the answers may really be more an index of general optimism or pessimism than an indication of what people actually expect to do.

More light may soon be thrown on this and related questions, since we are currently making a special interim survey. Some 35,000 CU members had indicated their willingness to answer a questionnaire whose sole purpose is the accumulation of data for research into "broad patterns of consumer income and outgo." Such a survey should obtain extensive data on consumer expectations, plans, debts, assets, and so forth, from a much larger group of people than has ever been reached in the past. The information should be of considerable value, not only in improving forecasting techniques, but also in throwing light on the broader question of how consumer spending decisions are framed and carried out.

F. THOMAS JUSTER

OTHER STUDIES

Four books were published, three of them proceedings of the Conference on Income and Wealth:

Problems of Capital Formation: Concepts, Measurement, and Controlling Factors, Studies in Income and Wealth, Volume Nineteen, presents revised and extended series on capital formation for Canada and the United States. It offers thoroughgoing critiques of the conceptual and statistical basis for further understanding of the capital formation process, including fresh work toward applying "input-output" techniques in that field.

Problems in the International Comparison of Economic Accounts (Volume Twenty) shows how the United Nations system of standard accounts recently proposed can be simplified so as to become more practical for smaller, less developed countries. Proposals are also made for elaborating the system in the direction of input-output, moneyflows, and balance sheet analysis. This conference volume includes papers on the treatment of government activity in such accounts, and the measurement of the comparative purchasing power of national currencies. A world matrix of trade relations is outlined.

Regional Income (Volume Twenty-one) reports a conference that dealt with the quality and uses of income estimates for states, counties, or other local areas. New data on state differences in average income since 1929, in both current and constant dollars, are presented. Several papers deal with conceptual issues common to various branches of regional studies, and several concentrate on problems in measuring county income.

A Theory of the Consumption Function, by Milton Friedman, attempts to explain the relationships between savings, consumption, and income, and presents some striking regularities in consumers' spending and savings behavior, demonstrated by a technique that takes account of their long-run income prospects. The significance of these results for research into consumer behavior and for business cycle policy is explored.

Two other volumes of Studies in Income and Wealth are in press – the first, ready to issue:

A Critique of the United States Income and Product Accounts, Volume Twenty-two.

An Appraisal of the 1950 Census Income Data, Volume Twenty-three.

A conference on income and investment in the nineteenth century in the United States and Canada was held in September (see Part Three). A study of the postwar capital markets and a study of capital financing are reported in Section 4. A study of international capital movements is reported in Section 6.

STATISTICAL INDICATORS

At the request of the Council of Economic Advisers, we have been experimenting with measuring the severity of the current business contraction along lines developed in 1953 and 1954. First, the date of the peak from which the contraction began had to be set. July 1957 was selected, tentatively, as the monthly business cycle peak date, and the third quarter of 1957 as the quarterly peak date. This determination was made in October 1957, when data through September were available for most important economic series.

The selection of a peak date was difficult because a moderate decline in output and employment in manufacturing had been under way since late in 1956, while activity in most other sectors continued to advance. Also, because of the continued rise in prices and wages, physical volume series on output or trade reached peaks earlier than did the corresponding value series. In general, between late 1956 and mid-1957 the physical volume of labor input (manhours) and output of the economy remained nearly constant or at best gently rising, while greater increases occurred in the value of output, trade, and income. Although declines in activity became widespread between August and September and have been extended since, it is difficult to say whether July or August should be considered the zenith. Subsequent revisions of the data may shift the weight of evidence to August, or, less likely, to an earlier month.

Once the peak date was determined, we could construct tables showing the extent of the decline after the peak for many economic series and compare this decline with what occurred during similar intervals of time in previous business contractions. The first comparisons were with the two relatively moderate postwar contractions, 1948-49 and 1953-54, and the two severe prewar contractions that began in 1929 and 1937. More recently, with the aid of a computational program developed for the IBM 704 electronic computer, we extended the comparisons to earlier cycles and made the computations in several variant forms.

Table 7 illustrates the type of comparison

TABLE 7

PERCENTAGE CHANGES IN INDUSTRIAL PRODUCTION AFTER BUSINESS CYCLE PEAKS, 1929-1957

Months after Peak	Percentage Change after Peak of					Rank of Five Contractions, after Peak of				
	Aug. 1929	May 1937	Nov. 1948	July 1953	July 1957	Aug. 1929	May 1937	Nov. 1948	July 1953	July 1957
1	−1.1	−1.0	−1.6	−0.2	0	4	3	5	2	1
2	−2.7	+0.5	−2.6	−2.4	−0.7	5	1	4	3	2
3	−7.7	−1.0	−4.5	−3.2	−2.1	5	1	4	3	2
4	−11.0	−4.1	−6.4	−5.4	−4.1	5	1	4	3	2
5	−11.0	−11.9	−7.4	−7.6	−6.9	4	5	2	3	1
6	−11.0	−19.6	−8.4	−8.3	−8.3	4	5	3	2	1
7	−12.6	−27.3	−8.4	−8.3	−10.3	4	5	2	1	3
8	−12.6	−28.9	−9.3	−9.8	−11.7	4	5	1	2	3
9	−15.9	−30.4	−7.4	−9.8		3	4	1	2	
10	−17.6	−30.4	−6.4	−8.3		3	4	1	2	
11	−20.9	−32.0	−9.3	−9.0		3	4	2	1	
12	−24.2	−33.5	−7.4	−9.8		3	4	1	2	

Source: Federal Reserve Board index of industrial production, adjusted for seasonal variations. The percentage changes are computed from the following three-month averages of the index (1947-49 = 100) centered on the peak months: 1929, 60.7; 1937, 64.7; 1948, 103.7; 1953, 136.3; 1957, 145.0. A rank of 1 is given to the smallest decline (or largest rise) among the five (or four) contractions, a rank of 5 (or 4) to the largest decline, etc.

made for the Federal Reserve index of industrial production. Note that the peak dates used are not those at which the index reached its peak, but rather when business activity at large did so. Usually the peak in the index has not differed by more than a month or two from the business cycle peak. But in the latest instance, the index reached its highest level (146) in December 1956 and February 1957 rather than in July 1957 (in June, July, and August it was 145). The business peak dates are used so that a wide variety of series can be examined on a comparable basis.

Table 7 makes it clear that changes in the volume of industrial output in the first month or two of a business recession are typically slight. Declines of only 2 or 3 per cent are the rule. Moreover, the relative severity of the decline manifests itself only irregularly during the first six months or so after the contraction begins. From this point on, but not before, the mild recessions of 1948 and 1953 are readily distinguished from the sharp contractions of 1929 and 1937. It is important to realize that in the first few months of what turns out to be a mild recession the decline in output may be as sharp or sharper than in a severe contraction. Furthermore, the ultimate severity of the 1929 contraction in comparison with the 1937 contraction was not evident in terms of the magnitude of the decline in industrial output even after twelve months had elapsed.

Tables similar to Table 7 have been constructed for some seventy important economic series. Chart 1 shows for two groups of series a summary ranking of changes during the first five and the first twelve months of all the business contractions since 1920 except the one immediately after World War II (1945-46). The current contraction is at the left; the others are arrayed from left to right according to their general severity – that is, the contraction beginning in October 1926 was the mildest, that beginning in August 1929 the most severe.

After twelve months, the declines in the six general business indicators array themselves in the appropriate order.[1] After only five months, however, the array is much more ragged. In particular, the severe contraction of 1920-21 began in a mild way.

On the other hand, the rankings of the changes in the eight leading indicators even after five months is in fair accord with the severity of the contractions. At least, the severe contractions of 1920-21, 1937-38, and 1929-33 are sharply distinguished from the rest. The relatively mild character of the 1953-54 contraction was also indicated within the first five months, that is, in terms of the decline that had occurred by December 1953. In these terms the contraction beginning in July 1957 ranks neither as the mildest nor yet as the most severe in our list. Data now available through February and March 1958 confirm this indication.

Further study of these relationships will be required before their stability and significance can be adequately appraised. While our results suggest that a rough ordering of business cycle contractions according to severity can be made within four to six months after they begin, they do not imply that the ultimate depth or duration of recessions can be reliably forecast by these means. Many factors not taken into account have an important bearing on the severity and duration of business contractions. The method appears useful primarily in providing a yardstick against which a current decline in various aspects of economic activity can be compared, and thereby facilitating a more accurate and enlightened appraisal of what has already taken place. A draft of a paper analyzing the results and making the basic data available has been prepared.

To the work described above, Charlotte Boschan, Alexander Pitts, and Sophie Sakowitz contributed significantly. The International Business Machines Corporation contributed machine time for the development and application of a program on the 704 electronic computer.

[1] Of course, most of these contractions did not last much more than a year. The durations (the intervals from peak to trough) are as follows (identified by the date of peak): October 1926, 13 months; July 1953, 13 months; November 1948, 11 months; May 1923, 14 months; January 1920, 18 months; May 1937, 13 months; August 1929, 43 months.

Additional work on indicators included a paper on cyclical aspects of new business incorporations prepared by Victor Zarnowitz, who utilized the long historical records of state charters compiled for the National Bureau by G. Heberton Evans, the current comprehensive series of Dun and Bradstreet, and the Department of Commerce data on new business firms. A comparative analysis of recent figures shows the usefulness, for study of the cyclical

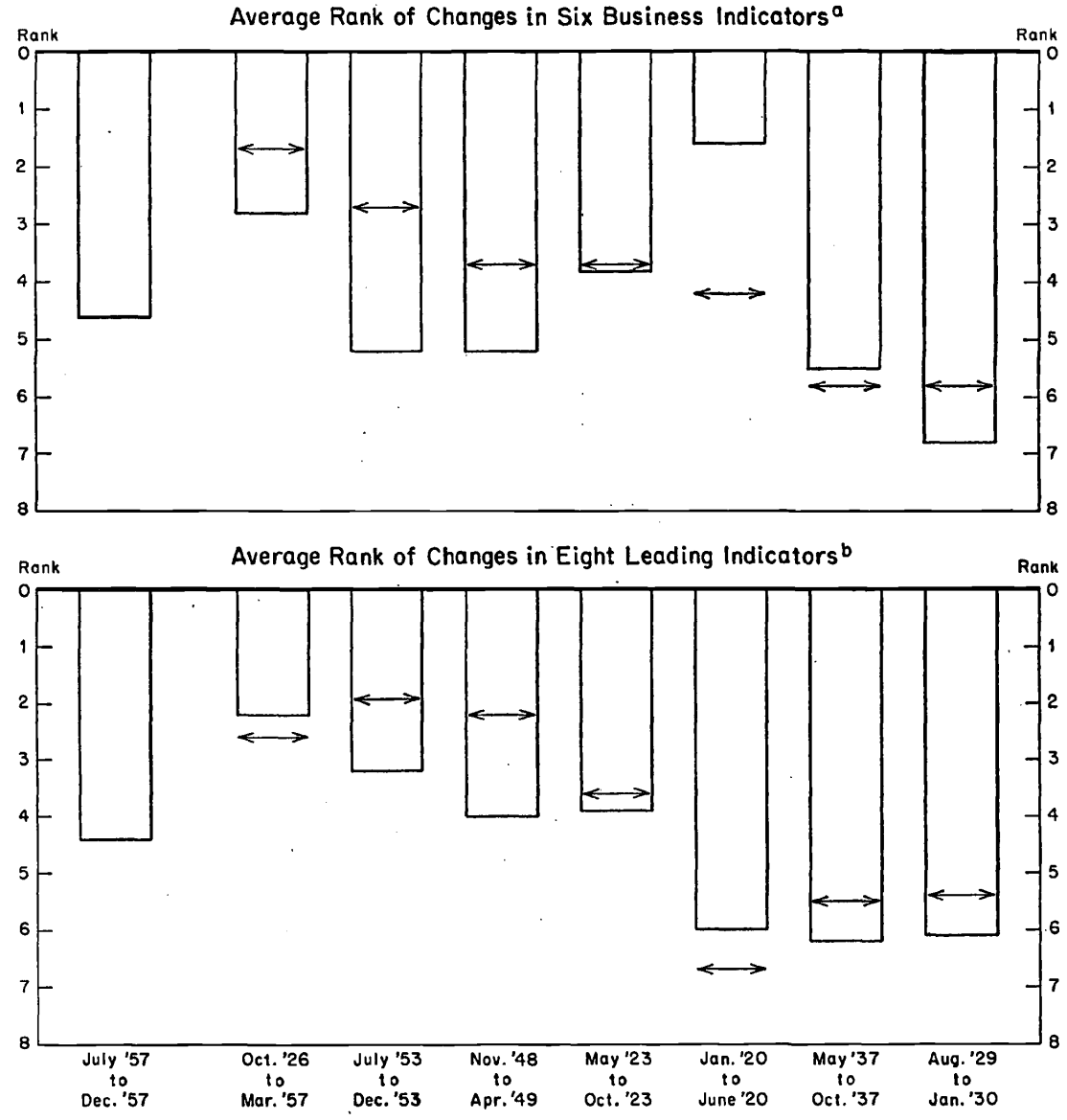
CHART 1

Average Rank of Percentage Changes during the First Five and First Twelve Months of Business Contractions, 1920-1957: Two Groups of Indicators

a Industrial production, freight carloadings, personal income (from 1923 only), bank debits outside New York City, retail sales, and the wholesale price index.

b Average workweek (from 1923 only), new orders for durable goods, residential construction contracts, commercial and industrial construction contracts, new incorporations, liabilities of business failures (inverted), basic commodity prices, industrial stock prices.

Note: Percentage changes in each series during the first five months of the eight contractions are ranked from 1 to 8, the smallest decline (or largest rise) getting a rank of 1, the largest decline a rank of 8. The ranks assigned to a given contraction by each series are then averaged. The lines with arrows indicate average ranks based on changes during the first twelve months of contraction.



behavior of business births and transfers, of some of the classifications developed for these data, as well as the need for more information of this type.

A paper by Zarnowitz and Lionel J. Lerner analyzes cyclical changes in the number and liabilities of business failures, with particular reference to their relation to total profits, profit margins, and diffusion indexes of profits. Among other aspects, they investigated the systematic difference in sensitivity to business conditions of small and large business failures.

In a paper that appeared in the February issue of the *Journal of Political Economy,* I presented a method of adjusting the average cyclical amplitudes of different series to a common level and converting the adjusted series to index numbers so that they can be combined. The method was tested on the eight leading series. One result was that the amplitude adjustment produces a type of smoothing effect, apparently because series with large cyclical amplitudes usually have large irregular movements as well. This result may have useful implications for index number construction.

Drafts of all the essays that we plan to include in a book on business cycle indicators are in hand, but one or two still require some revision.

GEOFFREY H. MOORE

SUBCYCLES

I am writing up the results of my investigation of subcycles as an Occasional Paper. A summary of its contents follows.

Subcycles in Individual Industries

Specific subcycles of output and prices are discussed in leather, cotton textiles, and metals. Subcycles form a continuous series of fluctuations in seasonally corrected time series, averaging about fifteen to eighteen months from trough to trough or peak to peak. Some turns are specific cycle turns, some are those of the additional movements that I identify. For textiles and leather, previous studies permit the character and causes of subcycles to be tentatively outlined. For ferrous and nonferrous metals I can only demonstrate their clear presence in production, shipments, and prices. The amplitude of subcycle phases that counter the cyclical movements – counterphases – is measured and compared with that attributable to the cyclical component of subcyclical fluctuations.

Also I present some general information about the frequency and duration of specific subcycles in many sorts of activities. One finding is that counterphases tend to be short and to concentrate heavily in durations of four to seven months; paraphases are highly variable and largely responsible for the variability in the duration of subcycles around their average term.

Subcycles in the Economy as a Whole

To ascertain whether there is a tendency for specific counterphases to occur at the same time in many industries and aspects of economic life, broadly based time series portraying ten major sectors of national product, four sources of personal and business buying power, and six groups of prices were studied. The figures indicate that interruptions of cyclical phases were sometimes widely spread through the economy. Interruptions of periods of expansion occurred January to May 1925, December 1925 to May 1926, July to November 1933, May to September 1934, December 1938 to May 1939, November 1939 to April 1940, January to July 1947, February 1951 to June 1952. Counter subcycle phases during cyclical contraction occurred October 1923 to February 1924, January to April 1931, and July to October 1932.

Industrial production conforms to all but two counterphases in the sense that the cyclical direction of change ceased or reversed between reference counterphase troughs and peaks (or peaks and troughs). It conformed to all, in the sense that specific subcycles had been marked for periods which overlap the reference counterphase dates. Much the same story applies to the segments, production of durable goods and of nondurable goods other than foods. Analysis of fifty-six to ninety industrial subdivisions of employment suggests that the good conformity of durables is attributable to

finished consumer durables and earlier stages of manufacture of all durables rather than to finished producer capital goods.

Output in the fields of foods, mining, agriculture, and service conforms relatively poorly. Sensitive prices, unlike the prices of finished goods which are typically not responsive, conform in both senses mentioned above to all counterphases with the notable exception of the abortive interruption of the post-1929 depression. The latter movement is absent in sources of business buying power – profits and net new loans or security issues, and these series each miss a few other movements.

Amplitude measures reveal diversity in the response of various sorts of activities to forces that interrupt, relative to forces that intensify, cyclical movements. For example, nondurables (other than foods) have about the same amplitude during counter-cycle movements as do durables, in sharp contrast to the far greater cyclical amplitude of durables. Clearly, the process of investment in fixed capital does not play the central role in minor fluctuation which is typically attributed to it in cyclical fluctuation.

Subcycles before World War I

Making the best of scarce information, I examined a group of thirty-one time series, all conforming well to business cycles and available early in the last quarter of the nineteenth century. They include thirteen series reflecting portions of national product, six financial activities, and twelve prices. These series, various composites intended to reflect total output or economic activity, and the week-to-week reports of the *Financial Chronicle* furnish evidence of subcyclical episodes which may well have been similar to those more clearly visible in the better information of later years. The *Financial Chronicle* usually describes them as periods of exuberance or nervousness in the wholesale and retail buying markets. Other attributes are particular to each occasion.

We selected twelve of these occurrences[2] and computed various measures of conformity for the thirty-one series, and several composite series, to the hypothesized reversal of cyclical trends. Two conclusions emerge: (1) Subcycles did occur in earlier years, since some of these movements are clear and strong and certainly represent pervasive hesitations and reversals in cyclical trends; and (2) pervasiveness of cyclical interruptions is (like pervasiveness of cyclical correspondence) a matter of degree; it shades off until it is doubtful whether on a common sense basis a counter movement worthy of note is taking place.

Subcycles by Chance

If individual industries, prices, and the like undergo minor waves generated within the industry, independently of waves elsewhere, chance alone would cause many industries to experience counter-cycle movements at the same time. What then is the degree of concurrence which could, say, as often as once in a hundred times occur simply by chance, and therefore require no economic explanation?

An experiment, the major outlines of which Millard Hastay designed, was programmed and run on high speed electronic computers by the International Business Machines Corporation. The net result was twenty sets of simulations of our thirty-one time series in which cycles occurred at their actual historical times, but the minor subcycles were located by chance from a frequency distribution which accorded with that found in the thirty-one series as a whole over the seventy-five years studied. For each set of thirty-one series, for each month, the percentage of series in rising specific subcycle phase was computed. This resulted in twenty "diffusion indexes" each applying to one set of thirty-one simulated series. The highest percentage of months in counter-cycle phase for sequences of as long as three, four, five, etc. months was then recorded. Summarized, for all twenty sets, this provided a table, based on chance concurrence of subcycles, against which to measure the degree of concurrence found among the actual thirty-one series during each of the selected counter-phase movements. The shorter the counter-

[2] Tentative dates are given in my "Notes on Subcycles in Theory and Practice," *American Economic Review*, May 1957.

phase, the more likely that as many as half the series could by chance be found in counter cycle subcyclical phase.

All except one of the selected movements fell well below the 1 per cent probability level of occurring by chance. The exception, the three-month interruption of the depression in early 1931, fell at the 2.5 per cent probability level. There are technical reasons why this movement, which on other grounds is certainly not a questionable one, stands up less well to the test. In conclusion, providing my selection of specific movements is not biased with respect to forcing concurrence, and tests indicate that it is not, an economic explanation of concurrence is required for all the episodes selected and doubtless others as well.

Through the simulation experiment we can view the profile of an economy in which what have been called "random fluctuations," in individual time series as distinct from specific cycles, are demonstrably random with respect to when they take place; it certainly is a very different economy from the real one. We see also how the picture is influenced by the frequency distribution of durations of paraphases and counterphases. We see that there are interruption-prone periods having interesting and at the moment somewhat mysterious properties. Especially satisfying is the ability to judge "significance" of fluctuation in particular time series against a criterion which itself has stipulated properties of change; this seems to me a notion of wide applicability.

Causes of Subcycles

I ask first whether in essence counterphases are recurrent or episodic phenomena. The leading candidate as a systematic element is the alternating over and under buying of materials. We see this in the pages of the *Commercial and Financial Chronicle* and later in those of *Business Week*. We see it in the scraps of information readily available on changes in ownership position and unfilled orders. Contrasts of the timing and amplitude of retail sales with those of wholesale sales, and of manufacturers' orders with output (or shipments) speak to the same point. Changes in stock reflect changes in buying most imperfectly and also reflect other things beside changes in buying. Yet inventory investment of department stores conforms to all except the contraction phase of January to May 1925. A diffusion index of manufacturers' finished materials stocks which we constructed also conforms (matched inversely) to all but the 1925 contraction. The better statistics on changes in orders and stocks available for recent years amplify and confirm the story. All these data not only have strong conformity to reference subcycles but are characterized by short fluctuations, among which those associated with business cycles are hard to distinguish from those occurring at the time of counterphases. Thus waves in buying, for which a rationale seems reasonably clear in individual industries, have some tendency to synchronize for many industries. Whence comes the tendency?

This is not a question on which the available time series can throw definitive light. However two possible answers require at least preliminary study through time series – final buying and expectations about change in market conditions. As to the first, there are some indications that the final purchase of most producer durable equipment conforms poorly, and an additional test is in process. On the other hand, consumer buying (total physical volume) probably has movements corresponding to all or nearly all counterphases, though the amount of change associated with most of them is small, sometimes too small, always to show positive reference conformity, in view of less than perfect coincidence with the reference dates. These observations are based on the behavior of the ample post-World War II data and that of income payments and department store sales (total store sales, and sales of each of six departments) 1920-41.

There seems little systematic difference in the presence and timing of counterphases for semidurable and durable consumer goods. The faint movements of retail sales proper are emphasized and conformity improved in the rate of change in sales – a matter of particular relevance to buying waves through its impact on the pattern of retailers' purchasing. The

argument is outlined and tested elsewhere.[3] Analogous tests have been carried out for the interwar period and seem to reinforce the argument.

The role of rates of change is underscored again in the reference conformity of counterphases for eighty-three subgroups of employment in manufacturing. Industries engaged in final manufacture of durable consumer goods and to a lesser extent of durable producer goods, unlike other industries, rank markedly higher when arrayed by conformity of rates of change of employment than of employment proper. I conclude that subcycles are not limited to intermediate buying but also appear in final purchasing and particularly rates of change in purchasing by consumers.

Buying and production at earlier stages magnify the counterphase movements of final demand. But the character of the magnification is not encompassed without taking account of shifts in the short-term timing of buying based on expectations about buying prices and delivery conditions. That this is part of the story appears in the studies of leather and textiles and in virtually every account in trade journals or in any discussion with businessmen. Statistics show the strong involvement in subcycles of sensitive prices and even stock market prices and suggest lines of causal association.

A few aspects of the relation between the processes central to short waves and economic fluctuation as a whole are touched on in the final section of the paper.

RUTH P. MACK

COSTS AND PROFITS

Labor Cost

A manuscript on changes in labor cost during cycles in production and in business was completed and is being circulated to the staff. Among other conclusions, I found that there was a net fall in manhours per unit of product (hereafter called *mh/p*) during most expansions of production and a net rise during most contractions. These conclusions were based on monthly data. For many production cycles, however, we have nothing but annual records, which likewise indicate a decline in most expansions, but also a decline in a majority, although a much smaller one, of contractions.

Can the two findings be reconciled? An examination of the annual data corresponding to our monthly data indicated the same kinds of majorities in them as in annual data generally. Yearly statistics understate the severity of cyclical declines in production and consequently their unfavorable effect on efficiency. They exaggerate the relative influence of improving technology, which tends to reduce *mh/p* at all times. The monthly and their corresponding annual figures provide a kind of Rosetta Stone that can be used to interpret the figures for the many cycles on which we have only annual data. The narrow majority of declines in contraction in those cycles suggests that monthly figures would reveal a majority of rises.

Peaks and troughs in the production of individual industries often differ from peaks and troughs in business at large. In a long business expansion, many industries may have two expansions in production, separated of course by an intervening contraction. When changes in an industry's *mh/p* or *lc/p* (labor cost per unit of product) are measured between business cycle turning points rather than between turning points in the industry's own production, a different picture emerges. Although we are now talking about monthly data, measuring the changes in *mh/p* during business cycles has somewhat the same effect as measuring them from annual data on production cycles. In both cases, the rise and fall in output and the inversely associated changes in *mh/p* are reduced. Indeed, production in some industries is sometimes lower at the end of a business expansion than at its beginning, and higher at the end than at the beginning of a business contraction. In 91 per cent of our production expansions *mh/p* declined, but it

[3] Ruth P. Mack, *Consumption and Business Fluctuations: A Case Study of the Shoe, Leather, Hide Sequence*, Studies in Business Cycles 7, Chapters 8-10, and Ruth P. Mack and Victor Zarnowitz, "Cause and Consequence of Changes in Retailers' Purchasing," *American Economic Review*, March 1958.

declined in only 76 per cent of our observations for individual industries in the several business expansions included in our month-by-month study. In contractions the relative influence of technology is intensified. Although mh/p increased in 73 per cent of our contractions in production, it declined in 67 per cent of our observations for business expansions.

Average hourly earnings increased steadily in the business expansions. Since the latter were longer than the production expansions, the cumulative effect on labor cost was greater. Inversely related to production cycles, lc/p was positively related to business cycles. It rose in 80 per cent of the observations for business expansions, and fell in 57 per cent of those for business contractions. Increases in average hourly earnings during contractions were less rapid than during expansions, and the continued improvement in technology often offset what increase there was and produced a decline in lc/p.

Other Aspects of Costs and Profits

Comparisons of the fluctuations in labor cost with fluctuations in prices received, as indicated (imperfectly) by the most nearly appropriate index of wholesale prices for each industry were begun. It is clear already that the correspondence between costs and prices is closer in some industries than in others. In one, there is a rise or fall in prices received for each rise or fall in cost. In another, prices pursue a steady, or a step-wise rising, course regardless of fluctuations in cost, although not regardless of its trend. For some series, published BLS price indexes have to be combined to obtain an index corresponding to the industry described in the cost study.

I also used price indexes in conjunction with production data to appraise the understatement in some of the FTC-SEC quarterly estimates of manufacturing sales and aggregate costs disclosed by the discrepancy between the old and new estimates for an overlap quarter. I concluded that, after structural as well as seasonal adjustment, the figures can be relied on for two purposes.

For a few industries, they afford quarterly indexes of total cost (including not only production labor but materials and overhead) per unit of product. For more industries the data will help answer such questions as whether the margin of profit begins to be squeezed before sales reach their peak. The FRB quarterly computations for large corporations in six industrial groups can be used for the same purpose; at present the sales and margin data are being seasonally adjusted. There are no comparably comprehensive series before 1947. During the war, profits were, in any case, subject to unusual influences and controls. Before the war, investor services published individual quarterly statements reporting the sales as well as the profits of over two hundred industrial companies. For the fifty largest, we compiled this information back to 1932 whenever possible and plan to go as far back as the reports of each corporation permit. The resulting series will give us further knowledge of the relation between turning points in margins and in sales. The work on margins will be completed during the first half of 1958.

Plans for Publication

Most of the year will be spent preparing the results of the various inquiries for publication. A condensation of the manuscript on labor cost will yield one paper, the work on total cost, prices, sales, cost rates, and margins will yield another. A third paper will deal with the reflection of profits in the stock market. To give readers interested in particular industries the information they might want on labor cost and other aspects of cost and profit, a full-scale monograph will be needed.

THOR HULTGREN

CYCLICAL BEHAVIOR OF MANUFACTURERS' ORDERS

During the past year I completed a revised draft of the study, incorporating suggestions received from the staff. A summary of the principal results follows.

Relations between Orders and Activity in Manufacturing Industries

1. The relative amplitudes of both cyclical

fluctuations and shorter movements are systematically larger for new orders than for the corresponding series on current manufacturing operations. There are apparently two reasons for the difference. First, ordering is not subject to such limitations as are imposed upon output (capacity constraint). Second, manufacturers' efforts to achieve greater stability of production relative to demand are partially successful. (See first part of Table 8.)

2. Some industrial products are made primarily or exclusively against advance orders, others primarily "for the market" and sold from stock. Average ratios of finished inventories to order backlogs indicate that production to order prevails among the producer goods and durables, production to stock among the consumer goods and nondurables. The ratios are typically low for the former and high for the latter categories. (Table 8, second part.)

3. For goods made primarily to order, incoming business tends to lead shipments by substantial intervals. For goods made primarily to stock, the timing of new orders and shipments roughly coincides, with some tendency toward short order leads. (Table 8, third part.)

The leads of new orders relative to output reveal no similar systematic differences. While this finding may partly reflect inadequacies in our sample, it accords with the notion that new orders may guide and thus anticipate production even when they are customarily shipped from stock.

4. Since new orders fluctuate in wider swings than shipments, there is a large measure of agreement in the direction of the major movements in order backlogs and in the industry's current activity. Large backlogs cushion the impact of slumps in buying upon manufacturing activity. Their sustaining influence can even be so strong as to prevent altogether a cyclical decline in output from developing in response to the contraction in new orders, as in 1951-52.

5. When capacity utilization is high or backlog-sales ratios large, lags of delivery relative to new orders are often longer than when utilization is low or the ratios small. Usually the lags are longer at peaks than at troughs, but some exceptions are important. During a boom, advance commitments are accepted even by many companies which at other times do not maintain order backlogs, so that production to order usually gains relative to production for stock. When demand eases off orders can again be filled more promptly. But in advanced stages of a contraction which has lasted long enough to permit manufacturers to reduce their inventories, delivery lags on some items normally shipped from stock may ultimately lengthen too.

Manufacturers' Orders during Business Cycles

1. New orders generally conform closely to business cycles. In about 90 per cent of nearly 450 observations their turning points are related to business cycle turns. At about 85 per cent of the related turns new orders lead. The average of all timing comparisons is about five months. Individual leads vary considerably, but most are long. On the whole, the timing of new orders seems to be nearly as early at troughs as at peaks in business activity. (Table 8, last part.)

2. Together with goods made to order, some staples sold chiefly from stock are among the early leaders. In these industries both buying and activity move far ahead of (at times virtually against) the price, and prices are here positively associated with the business cycle.

New orders of major nondurable goods industries reporting backlogs of unfilled orders turn earlier than business activity at large, but no leading tendency is exhibited by that large part of the nondurables aggregate for which new orders and shipments are equivalent. All available series for the major durable goods industries, on the other hand, have consistent leading records. (Table 8, last line of second part.)

3. The established empirical rule that diffusion indexes lead the corresponding aggregates applies to new orders. Being based on series that have themselves a strong tendency

TABLE 8

SELECTED STATISTICS RELATING TO MANUFACTURERS' NEW ORDERS

	New Orders	*Production and Shipments*
Period[a]	1920-56	1919-56
Number of series	31	30
Average monthly amplitude:[b]		
Seasonally adjusted series	20.5	7.4
Irregular component	18.8	6.4
Cyclical component	4.6	2.6
Ratio of irregular to cyclical amplitudes[b]	3.7	2.7
Average duration of run of seasonally adjusted series, months[b]	1.8	2.1

	Durable-Goods Industries, Total[d]	*Nondurable-Goods Industries, Total*[d]
Period	1939-55	1939-55
Median ratio of finished stocks to unfilled orders, per cent:		
All years covered	11.3	162.1
Expansion and peak years[c]	11.3	162.1
Contraction and trough years[c]	13.0	189.5
Average lead (−) or lag (+) at business cycle turns, months	−5.8	−3.8

	New Orders for Commodities Made Primarily	
	To Order	*To Stock*
Period[e]	1919-55	1913-55
Number of commodities or industries	11	7
Number of shipment turns:		
Covered	128	75
Matched	125	75
Leads of orders at shipments turns:		
Number	109	40
% of turns matched	87	53
Average lead (−) or lag (+), months	−6.3	−1.2

	New Orders	
	Individual Industries or Products	*Major Manufacturing Industries*
Period[e]	1873-1954	1948-54
Number of series	30	15
Number of business cycle turns:		
Covered	420	60
Matched	363	55
Leads of orders at business cycle turns:		
Number	302	51
% of turns matched	83	93
Average lead (−) or lag (+), months	−5.1	−5.9

[a] Identifies the earliest and the latest year covered by any of the series.

[b] The measures are supplied by the Univac time series analysis program developed by Julius Shiskin (cf. *Electronic Computers and Business Indicators,* Occasional Paper 57). The average amplitudes are computed by averaging the monthly percentage changes without regard to sign. The average duration of run is the average number of months of continuous rise or fall in the series.

[c] Identified according to the annual business cycle chronology of the National Bureau.

[d] The figures pertain to the aggregate series covering all durable-goods industries and all nondurable-goods industries that report order backlogs. The average timing for the aggregate orders (sales) of those nondurable-goods industries that do not report order backlogs is 0.

[e] Identifies the years of the earliest and the latest shipment or business cycle turns covered.

to move ahead of the ebb and flow of general business, diffusion indexes of new orders are therefore especially early indicators of cyclical revivals and recessions.

4. Comprehensive series beginning in 1939 show order backlogs turning down long before the peaks in business cycles, but turning up approximately at the time of the troughs. Expansions in backlogs, especially those of durable goods orders, reached unprecedented heights during World War II and in the following prosperity periods. From these top levels, backlogs receded only gradually, which helped to make business expansions longer.

5. Rapid increases in demand for some industrial commodities tend to be accompanied by duplication, and rapid decreases by cancellation, of orders placed with manufacturers. Due to cancellations, cyclical declines are as a rule larger in net than in gross new orders. In many industries, however, the effect of cancellations on the cyclical behavior (in particular, timing) of new orders appears to be small.

6. The cyclical movements in the volume of new orders and in the monthly change of wholesale prices show a high degree of parallelism. Close interrelation of buying and price change is also demonstrated by comparisons involving first differences in unfilled orders and diffusion indexes of wholesale prices.

VICTOR ZARNOWITZ

THE TIMING OF CYCLICAL CHANGES IN THE AVERAGE WORKWEEK

A preliminary manuscript on the subject was completed. I am now revising the draft in the light of critical comments and suggestions by staff members. In the course of this revision I shall seek deeper understanding of the reasons for the observed timing behavior of weekly hours of work. Below is a brief account of the main statistical findings:

All Manufacturing

For manufacturing as a whole, months before business activity reverses its direction businessmen collectively begin to change the average length of the workweek. These changes appear in more and more series, finally causing cyclical turn in the aggregate series. As a consequence, turns in the average workweek usually precede business cycle turns by about four months. Leads tend to be somewhat longer at peaks than at troughs. The lead of average weekly hours can be found in statistics for skilled and unskilled workers, for men and women. It is also reflected in regional data, and very generally among different industries. Before average hours for all manufacturing attains its peak, the percentage of industries with increasing hours reaches its zenith. This is reflected in the behavior of diffusion indexes of hours, which show leads at business cycle turns two or three times as long as those of the average workweek itself.

Managerial action affecting labor input is not restricted to average weekly hours. Although cyclical turns in the number employed occur close to reversals in general business activity, accessions and layoffs — i.e. those elements of employment fluctuations over which management exercises discretion — turn considerably in advance of business cycle peak and trough dates. Voluntary quitting of jobs by workers tends to lead at peaks but to lag at troughs; quit rates are highest as labor markets tighten. Net accession rates, reflecting labor turnover as a whole, show a consistent lead at all turning points, on the average exceeding the lead of weekly hours but not that of the corresponding diffusion index of hours. In evaluating this timing behavior one must realize that labor turnover rates, being based on month-to-month changes, are more akin to diffusion indexes than to measures of absolute levels.

Management might be expected to reduce overtime hours early, particularly at peaks, to avoid premium rates. Overtime hours tend indeed to lead reference cycle turns at peaks, and not at troughs. But the lead at peaks is only about the same as that of average hours. Short-time is inversely related to business cycles.

Businessmen do not wait to adjust hours until changes in demand are indicated by turns

in sales. Nor do they necessarily receive their clues from new orders, since the latter do not systematically precede hours changes. The average lead of new orders is, in fact, of roughly the same length as that of hours.

Manufacturing Industry Detail

Analysis of industrial detail within the manufacturing group produces additional observations. The tendency of hours to precede business cycle turns thoroughly pervades the experience in all twenty-one manufacturing industries. Also the longer lead at peaks than at troughs can be observed in the industry detail. The differential lead is sharply reduced if hours turns are measured against employment turns. This is partly due to atypical behavior of employment during the expansion following World War II.

Nonmanufacturing Industries

Changes of labor input in nonmanufacturing industries are not as closely related to general business activity as those in manufacturing. Average hours in nonmanufacturing industries frequently show no cyclical fluctuations or fluctuate in largely independent rhythm. Hence peaks and troughs of hours in nonmanufacturing industries can be related to business cycle turns in only two-thirds of the theoretical opportunities, compared with 96 per cent in manufacturing. Cyclical turns of hours in nonmanufacturing industries lead business cycle turns by two months, on the average, compared with four months in manufacturing. However, measured against employment, the average timing of hours shows little difference between the two industry sectors. Hence, if differences in economic activity among various industries are considered, the timing of hours shows a fair degree of consistency throughout the industrial structure.

GERHARD BRY

MONEY SUPPLY

A draft of much of the monograph by Anna Schwartz and myself on the stock of money is being read by a staff committee. The major additions this year were a more extensive statistical analysis and interpretation of the behavior of the velocity of circulation and of real cash balances and a long chapter on "The Money Stock in its Historical Setting: from Resumption to World War I." The one remaining job of importance, now in preparation, is a companion historical chapter covering the period since World War I.

Income Velocity of Circulation of Money

Real cash balances have risen secularly more rapidly than real income so that the income velocity of circulation of money (the ratio of a measure of national income to the stock of money) has declined secularly. Roughly, a 1 per cent increase in real per capita income has been associated with a nearly 2 per cent increase in real cash balances demanded per capita and hence a nearly 1 per cent decline in income velocity.

Real income conforms positively to business cycles, that is, rises during expansion and falls during contraction. The secular results seem to imply that real cash balances would also conform positively and with a larger amplitude than real income, and that hence income velocity would conform inversely, falling during expansion and rising during contraction. In fact, while the real stock of money conforms positively, it has an exceedingly small cyclical amplitude, much smaller than the amplitude of income, so that velocity also conforms positively. The positive pattern of velocity is highly regular and is roughly synchronous, showing a significant lead or lag at neither reference peaks nor reference troughs.

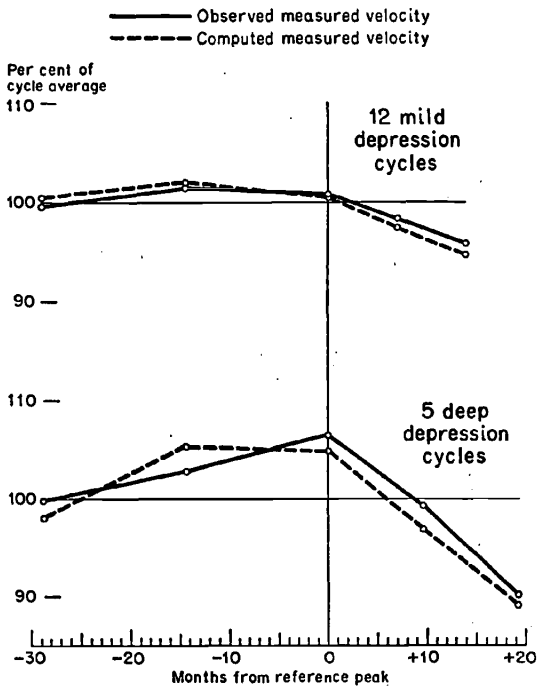
The apparent contradiction between the secular and the cyclical results can be resolved by distinguishing between income as measured and a longer-term concept of income – expected or "permanent" income – and between the price level as measured and a longer-term expected or "permanent" price level. Suppose the demand for real cash balances is related to real permanent income and the relation is that suggested by the secular results. Then real cash balances – calculated in terms of the permanent price level, not the measured

price level – would be expected to conform positively with an amplitude nearly twice that of permanent income, not measured income. Presumably permanent prices and permanent income have smaller cyclical amplitudes than their measured counterparts. Use of permanent prices to deflate nominal cash balances will therefore yield a real balance series with a larger cyclical amplitude than that in measured real balances; and this amplitude may in turn be larger than that of permanent real income – as required by the secular results – and smaller than that of measured real income – as required by the positive conformity of measured velocity.

Chart 2 shows how well this interpretation explains the observed cyclical pattern of measured velocity, both qualitatively and quantitatively. For mild depression and deep depression cycles separately, the figure shows the average reference patterns of (1) observed measured velocity – the ratio of measured income to the nominal stock of money; and (2) an estimate of measured velocity constructed year by year from measured money income and an estimate of cash balances derived from the demand equation described below. The agreement is remarkably close. Since both observed and computed cash balances have small amplitudes, the results may seem to reflect mainly the larger amplitude of measured income, common to both patterns, rather than the accuracy of our estimates of cash balances. The similarity between the cyclical patterns of observed and computed cash balances (not shown here) is, however, marked, which is significant because the estimates are based on data that are completely independent of the cyclical behavior of observed cash balances.

CHART 2

Observed and Computed Measured Velocity, Average Reference-Cycle Patterns, Mild and Deep Depression Cycles, 1878-1954



Source: Observed measured velocity is net national product in current prices (preliminary estimates by Simon Kuznets, prepared for use in the study of long-term trends in capital formation and financing in the United States, variant III), divided by our estimates of money stock centered to June 30.

Computed measured velocity is net national product in current prices as above divided by an estimate of nominal cash balances computed as described in the text.

The cycle relatives plotted were derived as in Arthur F. Burns and Wesley C. Mitchell, *Measuring Business Cycles*, Studies in Business Cycles 2, pp. 197-202.

Deep depression cycles are 1891-94, 1904-08, 1919-21, 1927-32 and 1932-38. All others are mild depression cycles except for war cycles 1914-19 and 1938-46.

To obtain the estimate of cash balances, estimates of permanent income and permanent prices were first constructed for each year by forming, in each case, a weighted average of a series of corresponding measured magnitudes, the numerical weights being those derived in estimating an aggregate consumption function.[4] The estimates of permanent income and permanent prices were averaged over reference cycles to give reference cycle bases. A demand curve relating real per capita cash balances to real per capita income was then computed from the reference cycle bases for the corresponding magnitudes. This secular demand function was used to estimate year by year the nominal amount of cash balances demanded from the annual estimates of permanent income and permanent prices. The ratio of measured income to the resulting estimated nominal cash balances gave the estimates of computed measured velocity whose average reference pattern is given in the chart. It may be noted that the agreement is excellent not only on the average but also cycle by cycle.

[4] Milton Friedman, *A Theory of the Consumption Function*, General Series 63, p. 147.

The results give strong support for the view that the greater part of the cyclical movement in velocity reflects a movement along a stable demand curve for money, and that the apparent discrepancy between the secular and cyclical results is to be explained largely by a divergence between measures of income and of prices constructed by statisticians for short periods and the longer-term magnitudes to which holders of money adjust their cash balances.

Supply of Money

Phillip Cagan has continued his study of factors determining the supply of money and has written a first draft of the part dealing primarily with the factors accounting for the long-run changes in the money supply.

During the past year he completed a study of the long-run movements in the currency ratio – the fraction of the total money supply held by the public in the form of currency rather than deposits. Two variables appear to account for most of the ratio's long-run movements. The expected net rate of return on deposits accounts for most of the movements since the 1920's; the rise in real income per capita, for most of the long-run decline in the ratio from 1875 to World War I.

Perhaps the most intriguing result is Cagan's explanation of the large increases in the ratio during World Wars I and II. After examining a considerable number of explanations that have been suggested, he concludes that the most important was probably the higher tax rates on income. These increased the incentive to use currency, since transactions in currency are more difficult to trace than transactions involving checks on banks and hence offer greater opportunity of concealing income from the tax authorities. A manuscript presenting these results has been accepted for publication in the *Journal of Political Economy* later this year and will be issued as an Occasional Paper.

Cagan recently turned to an analysis of the determinants of the cyclical movements in the money supply. Anna Schwartz and I found that specific cycles in the rate of change of the money supply correspond regularly to reference cycles and show long leads at both peaks and troughs. Cagan is trying to see what role is played in producing this behavior by each of three sets of factors that account for changes in the money supply: (1) high-powered money, (2) the reserve ratio of the banking system, and (3) the currency-deposit ratio. His tentative findings to date throw some doubt on a statement made in the last Annual Report on this question. We there stated that the currency ratio "has generally played a secondary role in cyclical variations" of the money stock. It now seems that the cyclical behavior of the currency ratio may be a highly uniform and quantitatively important contributor to the cyclical behavior of the rate of change of the money supply.

Extension of Money Stock Series

Our money stock series begins, it will be recalled, in 1875. James Kindahl, a member of the Workshop in Money and Banking that I direct at the University of Chicago, has just completed estimates of deposits and vault cash in nonnational commercial banks for the period 1867-75, based on tax records accumulated in connection with a tax on bank deposits. The set of records as a whole is far too voluminous to be used in full and no usable summaries of them exist – this is why David Fand did not go back before 1875 in constructing his estimates of nonnational bank deposits and vault cash. Thanks to their recent transfer to the National Archives, Kindahl was able to have physical access to them. He has sampled them, and his estimates are based on an ingenious combination of the results from the sample and other available data. We shall use his estimates to push our own series back to 1867 and publish the full series, though it may not be worth redoing all of the analysis to include this additional segment.

MILTON FRIEDMAN

ANALYSIS OF BUSINESSMEN'S EXPECTATIONS

My current work on business expectations was outlined in the last Annual Report, and I ex-

pect to complete the manuscript this spring. One chapter, "The Formation of Businessmen's Expectations about Operating Variables," was presented at the conference on the quality and economic significance of anticipations data, held by the Universities–National Bureau Committee at Princeton in November. The paper, in abbreviated form, will be included in the proceedings of that conference.

MILLARD HASTAY

POSTWAR CYCLES IN MANUFACTURERS' INVENTORIES

My investigation has been carried out within the general framework of hypotheses and methods used by Moses Abramovitz in his *Inventories and Business Cycles, with Special Reference to Manufacturers' Inventories,* Studies in Business Cycles 4. The principal data analyzed are the monthly inventory and sales series of the Office of Business Economics, and individual commodity stocks and shipments series. Deflators have been constructed for all the total stock and stage of fabrication series, 1947-55. The major sections of the draft under preparation follow.

The General Pattern of Inventory Behavior during the Interwar and Postwar Periods

Comparison of changes in gross national product with changes in nonfarm inventory investment and in manufacturing investment for all cycles since 1919 reveals that changes in inventory investment typically played a more important role in recessions than in expansions, and, second, that changes in manufacturers' inventory investment contributed substantially to the total movement in nonfarm inventory investment.

Although the various phases before and after the war cannot be ranked with complete assurance according to the relative importance of manufacturers' inventory fluctuations because of the coarseness of annual data, manufacturers' inventory movements since the war apparently played at least a role equivalent to that of the prewar period, even though stocks have been smaller relative to the volume of sales.

The Behavior of Total Inventories and Inventory Investment

Analysis of the deflated OBE total stocks data deals with two major questions: (1) What is the characteristic timing of movements in stocks and inventory investment? (2) What are the essential differences between the behavior of durable and nondurable manufacturers' stocks?

From 1947 to 1955 turns in total manufacturers' stocks lagged reference turns from two to seven months in contrast to Abramovitz' estimate of a lag of six to nine months before the war. The timing of total inventory investment turns varied from roughly coincident timing to reference leads as long as six months, compared to an estimated coincident timing prewar. However, the prewar estimates were based on year-end data, and hence are necessarily less precise than the postwar ones.

Durables inventories were found to be cyclically more sensitive than nondurables inventories. The individual durables industry series conformed better to business cycle movements and moved with greater amplitude. Moreover, these series moved together more closely than the nondurables.

The Behavior of Manufacturers' Inventories by Stage of Fabrication

Turns in purchased-materials stocks typically occurred earlier than corresponding turns in finished-goods stocks, tending to lead or turn coincidentally with specific cycle output turns at peaks and to lag at troughs. The finished-goods series displayed inverted tendencies, lagging all output turns but turning upward well before output peaks and downward well before output troughs. The goods-in-process series displayed irregular timing but, in general, conformed well to output movements.

In analyzing finished goods behavior, I could examine stocks and sales data for twenty-five nonfarm commodities as well as the OBE finished stock series. When diffusion indexes of the total inventory investment of the com-

modity series were constructed, their behavior was found to be almost the same as that noted in the OBE total finished inventory investment series. Since the commodity series represented principally staple, made-to-stock items, one can conclude that total manufacturers' finished-goods investment was dominated by the movements of that category of finished goods classified by Abramovitz as staple, made to stock, and that the behavior of other categories was of negligible importance.

In the purchased materials analysis, a strong tendency for quarterly investment (rate of change in stocks) in purchased materials to move in a manner remarkably similar to that of the volume of new orders appeared. This was true for both durable and nondurable manufactures. If the tendency can be established for a longer period, it may have important implications for cycle forecasting.

An Appraisal of the Theory of Inventory Behavior in the Light of Empirical Findings

In this section I shall re-examine the work of Abramovitz, Metzler, Nurkse, and others.

The Use of Inventory Statistics: a Critique of Existing Methods

Here the use of total inventory statistics and stock-sales ratios in analysis will be criticized and compared with the use of stage-of-fabrication series.

T. M. STANBACK, JR.

THE APPLICATION OF ELECTRONIC COMPUTERS TO THE ANALYSIS OF ECONOMIC STATISTICS

A major factor impeding analysis of current economic conditions at all levels of interest, from the individual firm to the entire national economy, has been the cost of calculations required to organize, summarize, and relate large masses of data. Electronic computers opened up the possibility that such calculations could be made quickly and cheaply, and that consequently new measures of economic events and new approaches to economic analysis could be developed.

The objective of our study is to investigate ways in which high speed computers can be used to improve our understanding of current business trends by: (1) faster application and fuller use of the most reliable statistical techniques employed by economists, (2) the development of new and improved measures for current economic series, (3) more powerful analyses of historical business fluctuations, and (4) more efficient and more flexible organization of basic records.

The project has been financed in part by a grant from the National Science Foundation, and substantial grants of machine and programming time have been made by the International Business Machines Corporation and the Sperry Rand Corporation. The Bureau of the Census has made its electronic equipment available on a contract basis. The project has profited from the suggestions and comments of an advisory committee of distinguished economists and statisticians under the chairmanship of W. Allen Wallis, Dean of the School of Business of The University of Chicago.

Seasonal Adjustments

An important problem that has long plagued statisticians has been how to make seasonal adjustments of the many monthly series compiled by governmental and private agencies for current economic analysis. As a result of the electronic computer program for seasonal adjustments developed at the Bureau of the Census and extended and thoroughly tested at the National Bureau last year, the problem has been solved, for all practical purposes.

Many important national economic series are now available in seasonally adjusted form, the seasonal adjustments are of high quality, and they are up to date. More than 4,000 series were adjusted by the Univac program at the request of many government agencies and research organizations. The Department of Trade and Commerce of the Canadian government also made extensive use of the program.

A few experimental analyses of the economic records of individual business concerns were made at commercial computer centers,

with promising results. As the use of the technique spreads, the businessmen's use of their own records and related data to estimate seasonal and nonseasonal changes should improve, and consequently also their ability to reach appropriate decisions on the basis of such data. This may have particular value for smaller business concerns which do not have the staff or the technical knowledge necessary to apply complex statistical methods.

Measuring Short-Term Changes

New measures of economic fluctuations were developed that are helpful in understanding the significance of current changes, including measures of the average month-to-month changes in cyclical, irregular, and seasonal components of economic time series, and the average number of months required for the cyclical factor to dominate the irregular in each series.

These measures show that in many national economic series the average month-to-month change in the seasonal factor is greatest, that of the irregular factor next, and that of the cyclical factor the smallest. The number of months required for cyclical dominance is helpful in interpreting the significance of month-to-month changes and provides an automatic guide to the computer for calculating a more significant economic series, for cyclical analysis, than the original observations or the seasonally adjusted series. We now also know that series with large cyclical amplitudes generally also have large seasonal swings and large irregular movements. Series that usually lead at business cycle turning points typically have large irregular fluctuations, and series that lag usually have small fluctuations.

Measuring Secular Trends and Cyclical Patterns

A technique for measuring long-run trends and cyclical patterns is being programmed for the IBM 704. The technique is described in Arthur F. Burns' and Wesley C. Mitchell's *Measuring Business Cycles,* and has for many years formed the basis for the National Bureau's Studies in Business Cycles. For any monthly, quarterly, or annual series, such as steel production, the wholesale price index, or unemployment, the technique produces a set of measures of secular trend, cyclical timing, amplitude, duration, pattern, and cyclical conformity. Since the cycle chronology used is supplied as "input" separately from the data, any chronology whatever can be applied to a given series, whether it is based on that series own "specific cycles," or on business cycles, or on movements in some other related series.

The electronic computer program is at first being designed to reproduce precisely the technique of analysis as it was developed, tested, and applied by Burns and Mitchell. The availability of this program will facilitate current studies of business cycles and of economic growth and the measures will be fully comparable with those already computed by hand calculator methods for several hundreds of series. While the basic method is being programmed, various refinements, elaborations, and extensions will be explored and tested. Possibilities suggested by Burns and Mitchell, which they might have pursued had resources been available, will be followed up, together with other suggestions for adding to the value of the results.

The first part of the program to be completed is trend measurement technique, and it has been applied by Richard Easterlin to the measurement of trends in income and population by state, annually, 1927-55 (see his report in Section 2). Another part of the program also completed provides measures of percentage changes from peaks or troughs to successive months following these dates, so that comparisons of changes over comparable intervals of cyclical expansions or contractions can be made. Some of the preliminary results of this program, which is being applied to the current business contraction, are described in the report above on statistical indicators.

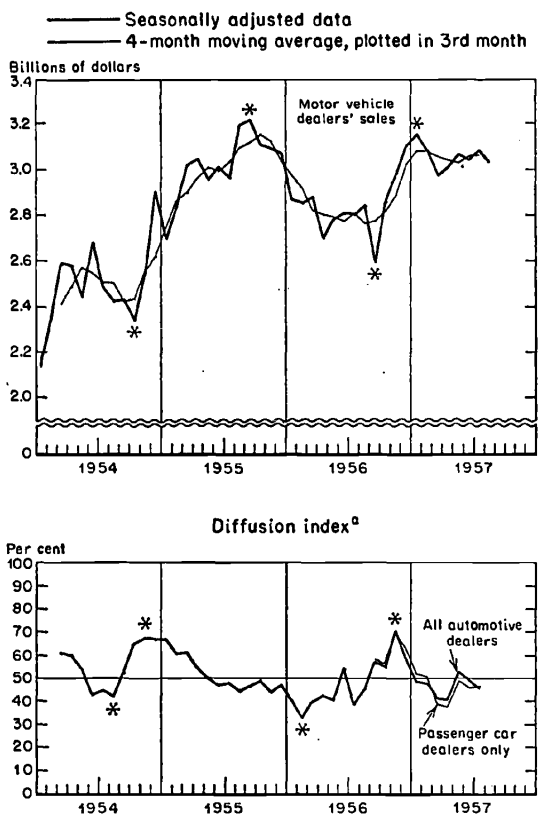
Dispersion Program

A tool for analyzing short-term economic movements, which we refer to as the dispersion program, was programmed for the Univac and applied to a level of business activity (the sales

of individual firms in an industry) that could not previously be studied currently and on a wide scale because of the prohibitive costs. From this program a diffusion index has been constructed for automobile dealers' sales (Chart 3). It suggests that the proportion of dealers experiencing rising sales begins to diminish some months before total automobile sales reach cyclical peaks, in a manner similar to that shown by diffusion indexes for other groups of series. This property indicates the possible value of similar measures for each process (e.g. orders, sales, inventories) of any industry. The dispersion program also provides measures of the magnitude as well as the direction of change in the component series of a group.

CHART 3

Total Automobile Dealers' Sales and Its Diffusion Index, 1954-1957



Asterisk = cyclical peak or trough.

[a] Percentage of dealers showing a rise in seasonally adjusted sales over four-month span, plotted in the third month. Last entry, plotted in July 1957, covers the interval May to September 1957. All points and lines through February 1957 were plotted mechanically from punched cards on a Dataplotter (Electronic Associates, Inc.).

Source of original data: Bureau of the Census.

A technique for comparing the scope and intensity of a current business revival or recession with similar business fluctuations in the past was prepared as a special application of the dispersion program. This variant computes measures of dispersion, diffusion, average rate of change, etc. for successively longer intervals after business cycle peaks (or troughs) for many economic series for different business cycles. These measures for periods one, two, three, etc. months following the peak in July 1957, together with similar measures for corresponding periods following the business cycle peaks in 1929, 1937, 1948, and 1953, have recently been computed at the Bureau of the Census for the Council of Economic Advisers. They provide an up-to-date and comprehensive reading on the breadth and severity of the decline in business activity that began in mid-1957.

Other Programs

An experiment designed by Ruth P. Mack and Millard Hastay to simulate short cycles in economic time series, for the purpose of determining whether such movements could be attributed to chance or are of a systematic nature, was completed. Mrs. Mack's report, above, on subcycles describes the results.

A large-scale application of regression procedures in analyzing the Dun & Bradstreet reports on businessmen's expectations for sales, inventories, prices, and profits was conducted by Millard Hastay. This is contributing information on the interaction between expectations or plans of small and medium-sized business firms and actual developments.

Some preliminary planning and experimental work on a directory-library of economic time series has been started. At present the materials consist of decks of punched cards, and computer print-outs for many economic series. It will gradually be expanded as more economic time series are processed by electronic computer programs. This directory-library will contribute a great deal of flexibility to our use of economic time series and analyses

of them, and measures of seasonal and cyclical behavior can be kept up to date much more readily than heretofore.

Reports

"Electronic Computers and Business Indicators," by Julius Shiskin, published in the October 1957 issue of the *Journal of Business* and reprinted as Occasional Paper 57, describes the purposes of the Univac time series program, all the derivative series and measurements it yields, and shows how it can be used to analyze business conditions at both the national and company levels. Appendixes list all the steps in the program and provide current data in various forms for eighteen monthly economic indicators.

"Seasonal Adjustments by Electronic Computer Methods," by Julius Shiskin and Harry Eisenpress, published in the December 1957 issue of the *Journal of the American Statistical Association* and reprinted as Technical Paper 12, describes the seasonal adjustment program in full detail and analyzes the results of the tests to which it has been subjected.

"Seasonal Adjustments of Economic Indicators – A Progress Report," by Julius Shiskin, was presented at the September meetings of the American Statistical Association and will be published in the proceedings of the Business and Economic Statistics Section of the ASA for 1957. The paper shows the relative magnitude of the month-to-month movements of the cyclical, seasonal, and irregular components of a group of 150 representative economic series. It also describes tests of the method of time series decomposition and of seasonally adjusting current data.

"Measuring the Scope and Intensity of Business Fluctuations," by Julius Shiskin and Geoffrey H. Moore, shows how the dispersion program works when applied to the monthly sales of about 285 individual automobile dealers, 1954-57, and to other groups of series (e.g. the industrial production indexes for 26 major industry groups, hours worked in manufacturing industries for 21 major industry groups, etc.), 1947-57.

"Electronic Computers in Economic Time-Series Analysis," by Julius Shiskin and Geoffrey H. Moore, was given at a meeting of the Econometric Society in Philadelphia, December 30, 1957. It summarizes and illustrates the results of the several parts of the electronic computer project carried out last year.

Plans have been made to carry forward and complete the work described above and extend it to new areas during the next two years provided adequate financial and other resources can be obtained.

GEOFFREY H. MOORE
JULIUS SHISKIN

OTHER STUDIES

The following new publications deal partly with business cycles:

The Measurement and Behavior of Unemployment, Special Conference Series 8, offers new evidence on long-term and short-term movements in unemployment for the United States, and for seven Western European nations plus Canada and Australia. Other sections of the volume deal critically with present techniques for estimating unemployment and for analyzing its behavior and causes.

Consumer Instalment Credit: Conference on Regulation augments and analyzes the available evidence as to changes in consumer instalment debt and the ways in which they affect and are affected by other processes of the economy. Questions of the feasibility and desirability of controlling cyclical fluctuations in such credit are examined.

A Theory of the Consumption Function, by Milton Friedman; *Federal Lending and Loan Insurance,* by R. J. Saulnier, Harold G. Halcrow, and Neil H. Jacoby; and *Corporate Bonds: Quality and Investment Performance* (Occasional Paper 59), by W. Braddock Hickman, and his full report, *Corporate Bond Quality and Investor Experience,* are described elsewhere in this report.

Clarence D. Long's *The Labor Force under Changing Income and Employment* and Oskar Morgenstern's *International Financial Trans-*

actions and Business Cycles are in presswork.

"Wages in Germany, 1871-1945," by Gerhard Bry, is being revised toward publication, and "Merger Movements in American Industry, 1895-1955," by Ralph L. Nelson, is being prepared for press. A conference proceedings volume on the "Quality and Economic Significance of Anticipations Data" is being edited. "Cyclical Behavior of Federal Receipts and Expenditures, 1879-1954," by John M. Firestone, will shortly be ready to submit to the Directors. A manuscript by George Borts on "Regional Business Cycles in the United States, 1914-53" is being reviewed by the staff.

Studies of changes in the quality of credit in booms and depressions and of risks and returns in small business financing during a business cycle expansion are reported in Section 4. A study of government credit policies for housing and economic stability is reported in Section 5, and a study of cycles in foreign trade in Section 6.

3. *Economic Growth*

LONG SWINGS IN UNITED STATES ECONOMIC GROWTH

The long swings in the secular rate of growth of economic activity – fluctuations some fifteen to twenty years long – remain a challenging problem for description and analysis. The swings were first noticed by Kuznets in the rate of growth of the production and prices of many commodities.[1] Burns showed that the commodity swings tended to occur together to form swings in the rate of growth of total output.[2] He also offered evidence that there were concomitant swings in other aspects of economic life. More recently Kuznets showed that the same swings appear in the gross national product of this and other countries and in the United States immigration and labor force.[3]

The salient characteristics of these long surges and relapses in the pace of economic development are, however, far from fully described. We cannot yet say whether they reflect some stable structure of economic relations which tends to generate recurrent periods of acceleration and retardation in growth or whether they are largely accidental. And even if the origin of the swings is largely accidental, they may yet display important uniform characteristics. These, however, have still to be fully and accurately established.

Long Swings before the Civil War

Almost all the evidence assembled in the past about long swings refers to the period since 1870. Isard's work on the "transport-building" cycle suggested that such swings were a characteristic of the pre-Civil War economy in the United States, but he could offer little evidence, and some of it was unsatisfactory.[4] Establishing the existence of long swings before the Civil War would help to show how long they have existed and would give us more cases from which to draw evidence.

We have assembled some twenty-three time series covering all or a considerable part of the period between 1810 and 1865. They include both physical and financial processes, investment, international and domestic trade, money supply, prices, and immigration – all the important time series I could find and many more than have been assembled before for this purpose. From the series we computed the average standings of the annual data for periods bounded by the troughs of successive business cycles and then by the peaks of successive business cycles, producing a series of averages for overlapping business cycle periods. Next we computed annual rates of change in the same way. The results were arranged chrono-

[1] Simon Kuznets, *Secular Trends in Production and Prices*, 1930.

[2] Arthur F. Burns, *Production Trends in the United States since 1870*, General Series 23, Chap. V.

[3] Simon Kuznets, "Quantitative Aspects of the Economic Growth of Nations," *Economic Development and Cultural Change*, Sec. IX; and Simon Kuznets and Ernest Rubin, *Immigration and the Foreign Born*, Occasional Paper 46.

[4] Walter Isard, "A Neglected Cycle: The Transport-Building Cycle," *Review of Economics and Statistics*, November 1942.

logically to produce a series of rates of growth between averages for successive overlapping business cycle periods.

Although few, the series offer persuasive support for the view that the period before the Civil War was marked by long swings similar to those observed since 1870. All display clear and sizable long swings in their rates of growth. They tend to move together, and their turning points cluster in relatively narrow time bands. As might be expected, in many series long swings are less prominent or nonexistent in the level of the activity, as contrasted with its rate of growth. This is consonant with post-Civil War experience, and so is the fact that long swings in the level of activity do appear prominently in series representing building, construction of transport facilities, and other types of activity involving long-term decisions. Again the turning points are generally well defined and cluster in neighboring years. The turning points of the collection of series suggest the following rough chronology of long swings in the rate of growth of the economy at large:

Peak	1814-15
Trough	1819
Peak	1833-34
Trough	1839
Peak	1846-50
Trough	1858

As in long swings after 1870, the fluctuations lasted about fifteen to twenty years.

Long Swings in Economic Activity and in Long-Term Investment

Construction affords the best-known example of the long waves that characterize the process of long-term investment. But the tendency seems to apply to all activities in which people commit themselves for long periods of time — to the foundation of new businesses, the settlement of land, the movement of people from one country to another, and the exploitation of new technology. This holds true both before and after the Civil War.

Among the various activities involving long-term commitments, the long swings in residential construction have been most thoroughly studied and are presumably best understood. Burns attributed them principally to the sluggish response of such construction to changes in demand, the result of a compound of three general conditions.[5] One is that construction must depend on the long-term outlook for profits rather than on a short-term outlook. Another is the long production period required by the planning and production processes and organization of the industry. And the third is that an oversupply of buildings tends to persist because buildings are so durable. These characteristics imply a slow response in the supply of structures to changes in demand which, if demand rises, encourages the creation of an oversupply and so sets the stage for a downturn in building which is, in turn, protracted because supply adjusts slowly to demand and because the long-term outlook changes only slowly.

Since the other processes characterized by long swings in the level of activity — as well as in its rate of growth — also involve long-term commitments, some challenging questions are posed. One is to discover to what extent our explanations of residential construction cycles can be generalized to embrace all activities involving long-term commitments. Another is to discover how the various activities are bound together with each other and with other aspects of economic activity.

If, for the moment, we accept the existence of generally concurrent long waves in the level of construction, immigration, land settlement, transportation development, and, possibly, of the explicit introduction of new technology as evidenced by patent grants, there are solid reasons for believing that these waves should be reflected in fluctuations in the rate of growth of output at large. For the activities are all either measures of the growth of resources and productivity or are intimately connected with such growth. Thus current construction, even of average quality, directly increases the capacity to produce. The same is true of immigration, whose fluctuations have in the past

[5] Arthur F. Burns, "Long Cycles in Residential Construction," *Economic Essays in Honor of Wesley C. Mitchell*, 1935.

controlled the fluctuations in the rate of growth of the labor supply. And the same is true of land settlement.

At the same time, these activities are also closely related to the growth of productivity. New structures will embody the newest technology, not the average embodied in existing ones. Additions to our transportation facilities are the basis for a more efficient organization of our resources. And so is urbanization and, latterly, the suburbanization of population and industry reflected in waves of residential and nonresidential building.

We might, therefore, expect to see waves in building, transport construction, immigration, land sales, and so on, accompanied or followed by waves in the rate of growth of output. Moreover, the demand for building is partly derived from the rate of growth of output. If the rate of growth of output fluctuates, one element in the demand for new structures should rise and fall and so reinforce the swings in construction initially postulated.

These plausible expectations, however, are not fully consistent with the broad surface of experience. Peaks and troughs of the long waves in the level of construction lag years behind the corresponding turning points in the rate of growth of output. The relation implied in the speculative argument just advanced, if it corresponds to reality at all, must be mediated through a more complicated process.

Long Swings and Severe Business Depressions

The resolution of the difficulty may well lie in the connection between long swings and business cycles. Burns found that each retardation in the secular rate of growth since 1870 was marked by a business depression of unusual severity.[6] The same was true of the pre-Civil War swings. The retardation starting in the late 1840's culminated in the severe depression of 1857-58. The retardation beginning in 1833-34 was marked by the panic of 1837, the generally depressed condition of business lasting until 1843. The retardation which began about 1815 was accompanied, according to Thorp, by a depression in 1816 which passed, with scant recovery, into the severe depression of 1819-20.[7] Once again, in spite of differences inevitably present because of the changes in the importance of agriculture and other aspects of the structure of industry and trade, the long swings in the two periods apparently belong to the same family.

The connection between severe depressions and long swings in the rate of growth of output suggests that the swings consist of alternations between periods of relatively severe and long business cycle depressions and of relatively mild and short ones. Also the influence of the long swings in long-term investment may be twofold. They act to increase *capacity* to produce more rapidly at some times than at others, but fluctuations in investment are also likely to influence the severity and duration of business cycles and so the intensity with which capacity is used. Since the actual rate of growth of output is a matter not only of the volume and productivity of resources but also of the intensity of use, our expectations about the relation between the observed rate of growth of output and the long swings in the level of long-term investment must be reconsidered.

The Relation between Construction Cycles and Business Cycles

Let us postulate the existence of business cycles averaging forty months which, in the absence of building cycles, would be utterly uniform apart from random disturbances, and of construction cycles of fifteen to twenty years, which, in the absence of business cycles and random disturbances, would sweep smoothly from trough to peak and back. In an economy such as ours, how would these two varieties of fluctuations tend to interact and to modify each other's appearance?

In the first place, construction activity will tend to be drawn into the shorter rhythm of business cycles, because cost of construction, the cost and availability of finance, and short-term expectations will rise and fall together with the state of business. Some building projects justified by their long-term promise will

[6] Burns, *Production Trends in the United States since 1870.*

[7] Willard L. Thorp, *Business Annals,* General Series 8.

be postponed when costs and interest rates become high and the short-term outlook deteriorates. And building will turn up again when costs and interest rates become favorable and when the short-term outlook for profits improves. But as I noted above, the fluctuations of building during business cycles are greatly tempered by the influences which tend to make building move in a longer swing. The upshot is that the long swing in building comes to consist of alternating sets of specific cycles, a set consisting of relatively vigorous and protracted specific cycle expansions and mild and short contractions which constitutes the rising phase of the long swing, followed by a set with opposite specific cycle characteristics which constitutes its declining phase.

These expectations are consistent with the empirical evidence presented by Burns and Mitchell.[8] However, business cycles are not, in fact, uniform, and they do not act on building activity only in the ways already described. A long depression, be it the result of possible systematic causes or of some accidental conjuncture, presumably alters long-term expectations and reduces population growth, especially when immigration is a factor. Internal migration also declines because employment opportunities are poor. All three lines of influence might be expected to prolong and deepen the accompanying contraction of building. Finally, not all business cycle expansions are favorable to building activity. War expansions put a great strain upon the economy and cause private building to decline either by government regulation or because costs of construction are exceedingly high or finance difficult and costly to obtain.

On the other side, there is the impact of the long swings in building on the character of business cycles. This impact needs to be considered from a number of sides.

1. First, what is the relation between the *level* of building activity at various stages of the building cycle and the character of business cycles? The stage of the building cycle may be considered to determine the level about which specific cycles in construction will fluctuate during the course of any given business cycle. The higher the level, the greater should be the chance that total investment will offset saving at full employment levels – that "prosperity" will be attained and, at least for a time, maintained; the lower the level, the greater the chance that income will fall to very low levels before saving ceases to outrun investment – that the economy will experience "depression."

To test these expectations, I used Thorp's descriptions of business conditions. Excluding the Civil War and World War I periods, of the ninety-six years between 1830 and 1932 Thorp characterized twenty-two as years of prosperity in the United States, sixteen as years of depression. If we classify these years according as they fall in periods when the Riggleman index of building contracts is above or below its trend value,[9] we obtain the following table:

Building Index	*Years of:*	
	Prosperity	*Depression*
Above normal	15	2
Below normal	7	14

Since the building index lies above or below its trend value according to the stage of the long building cycle, not according to the stage of specific cycles in building, the results are consistent with the notion that there is a long swing in the character of business cycles associated with long cycles in building.

2. Consider next the relation between the rising and declining phases of long building cycles and the duration of business cycle expansions and contractions. In construction, specific cycle expansions tend to be relatively vigorous and long and specific cycle contractions relatively mild and short during the rising phase of long building cycles. During the declining phase the reverse is true.

Other things being equal, we should expect the pattern to affect the length of business cycle expansions and contractions, partly through the direct effects of construction activity on the demand for goods and the flow of income,

[8] Arthur F. Burns and Wesley C. Mitchell, *Measuring Business Cycles*, Studies in Business Cycles 2.

[9] John R. Riggleman, "Variations in Building Activity in United States Cities," doctoral dissertation, The Johns Hopkins University, 1934, unpublished.

partly indirectly. The relatively vigorous specific cycle expansion of construction during the rising phase of the building cycle will tend to prevent businessmen during business cycle expansions from increasing the volume of stocks they hold, and this will tend to make expansions of inventory investment longer and perhaps more vigorous. The mild contractions of building during the rising phase will act to make inventory liquidation easier and more prompt and thus shorten and cushion business cycle contractions. Opposite effects on the cyclical patterns of inventory investment may be expected during the declining phase of building cycles.

Two tests of these expectations, insofar as they concern business cycle durations, are now available. First, from the National Bureau reference cycle chronology, we can identify business cycle phases of more than average length and classify them according as they fall in the up or down phase of long building cycles. We did so for the years 1836-1954, excluding business cycle phases falling during the Civil War and the two World Wars.[10]

Phase of Long Building Cycle	*Long Business Cycle Phases Occurring during the Building Cycle:* *Expansions*	*Contractions*
Rising	10	2
Falling	2	6

Next, one can compare the average length of business cycle expansions during long upswings of building with that during long downswings, and do the same for contractions, and for the average ratio of business expansions to full cycles. Burns and Mitchell present such an analysis for 1875 to 1932.[11] Their results do not support the expectation that expansions are relatively long and contractions relatively short during the upswings of long building cycles and that the reverse is true during downswings; the business cycle phases differed little in length with the long building phases, and variance ratios did not approach significant levels. But if one (a) eliminates the Civil War and World War I cycles, (b) eliminates the doubtful contraction, 1865-67 and treats April 1865–June 1869 as an unbroken expansion, and (c) extends the period covered back to 1834 (when the Riggleman building index begins) and forward to the present, the differences in average phase durations are large, the variance ratios are high, and one of the three is significant at the 5 per cent level.

[10] The building cycle chronology was based on Riggleman's index from 1836 to 1932, thereafter on the estimate of gross expenditures on residential real estate in Leo Grebler, David M. Blank, and Louis Winnick, *Capital Formation in Residential Real Estate: Trends and Prospects,* Studies in Capital Formation 1.

[11] *Op. cit.*

Phase of Long Cycle in Building	*Average Duration of Business:* *Expansion* (*months*)	*Contraction*	*Average Ratio of Duration of Business Expansion to Full Cycles*
Burns and Mitchell:			
Upswing	26	21	0.54
Downswing	24	22	0.56
Difference	+2	−1	−0.02
Alternative calculation:			
Upswing	30.33	16.67	0.62
Downswing	19.50	25.54	0.47
Difference	+10.83	−8.87	+0.15

	Ratio of Variance between Groups to Variance within Groups: *Expansion*	*Contraction*	*Ratio of Expansions to Full Cycles*
Burns and Mitchell	0.31	0.02	0.04
Alternative calculation	4.64	2.81	3.77
Value exceeded no more than 1 in 20 by chance	4.26	4.28	4.41

Each change on which the alternative calculation is based adds measurably to the difference in the results. Each seems justifiable. War cycles should be eliminated because our normal expectation is that wars produce a prolonged business expansion accompanied by a marked decline, not by a rise, in residential construction. 1865-67 is a doubtful business contraction.[12] The period covered should be lengthened, partly to enlarge the range of experience, and partly because the long building cycles between the Civil War and World War I were notably milder than those that came before 1860 and after 1918.

3. Two other aspects of the theoretical relation between long swings in building and the character of business cycles deserve attention. First, the deep business depressions associated with the downswings of the building cycle are themselves conducive to vigorous business expansions. Burns and Mitchell found that the first cyclical expansions in output after severe depressions were of exceptionally large amplitude. Moore found a more general correlation between the amplitude of expansion and the depth of the preceding contraction.[13] A likely explanation is that, when an expansion starts from a state of relatively deep depression, it can go far before being checked by capacity limitations. The latter reduce the rate of growth directly and tend to produce contraction via the acceleration principle, especially in its application to inventory investment, and also through the increases in costs which the approach to full utilization of resources engenders.

If this line of speculation is valid, expansions of relatively large amplitude and duration should occur not only at the upturn of the long building cycle, but also before it, provided building is itself no longer declining rapidly. An illustration may be the vigorous and long business expansion of 1896-99. According to Riggleman's index, the upturn of the building cycle did not occur before 1900, but his and other building indexes suggest that this was a flat-bottomed trough and that building did not fall markedly below its 1896 levels. These considerations help to provide a systematic explanation for one otherwise exceptional occurrence and, as we shall see below, they re-enter at a later stage of the argument.

Still another complication has to do with the rate of growth of building as distinct from its direction of movement. Reasoning along the lines made familiar by Harrod and Domar suggests that stability of the trend of investment is not a sufficient condition to maintain a steady level of resource utilization.[14] Income and expenditure must grow sufficiently rapidly to absorb the increments to capacity, which in turn implies an equally rapid growth of investment. Rapid growth of investment will tend to make increasing demand exceed increasing capacity, so that the expansion of capacity acts as the real upper limit to output growth. But very low rates of growth of investment will tend to cause demand to increase too slowly to absorb increments to capacity, which in turn slows investment growth.

As an example, the Riggleman index of building does not reach its long cycle peak before 1909, and other indexes of building indicate a long cycle peak still later, perhaps in 1912 or 1913. But all agree that the long cycle peak of building was flat-topped and that the secular rate of growth of building had fallen to low levels by 1907. If the argument above has merit, it helps us connect the deep depression of 1907-08 and the chronically high levels of unemployment and relatively low rate of output growth of 1907-15 with the state of the building cycle.[15]

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[12] *Ibid.*, p. 111, n. 67.

[13] See his introduction to *Personal Income during Business Cycles*, by Daniel Creamer, Studies in Business Cycles 6, pp. xxvi-xxviii.

[14] R. F. Harrod, *Toward a Dynamic Economics*, 1954, Lecture III, and Evsey Domar, "Expansion and Employment," *American Economic Review*, March 1947.

[15] Lebergott's new estimates of unemployment are interesting in this connection. The average rate of unemployment among nonfarm workers from 1900 to 1907 was 4.9 per cent; from 1908 to 1915, 10.1 per cent. In only three out of eight years from 1908 to 1915 was the unemployment rate lower than it was in the year of greatest unemployment from 1900 to 1907. (Stanley Lebergott, "Annual Estimates of Unemployment in the United States, 1900-1954," *The Measurement and Behavior of Unemployment*, Special Conference 8.)

Future Work on the Relation between Building and Business Cycles

The positive results so far provide no more than a preliminary test of the association between long building cycles and business cycles. We are collecting and assessing more comprehensive data than are afforded by the Riggleman index, and experimenting with an index of total construction (including residential and nonresidential building and railroad construction) from 1870 to 1918 to supplement and check the Kuznets estimates for the period before the official figures beginning in 1915 are available. Our new index has been calculated in variant forms from combinations of Long's indexes, the newer work on residential construction by Grebler, Blank, and Winnick, and estimates of railroad construction based both on Poor's mileage data and Ulmer's expenditure estimates.[16]

It is possible, however, to indicate some of the results as they now appear. First, I think the ensemble of series goes some way to dispel the doubts raised by Colean and Newcomb that total construction did not exhibit long declining phases between 1880 and the late 1920's.[17] The estimates of total construction, both those by Kuznets and those of my own devising, show decided declines in the 1890's and after 1913.

Secondly, the newer estimates of total construction have somewhat different characteristics from those of the Riggleman index, and ones somewhat more favorable to the thesis outlined in the preceding section. Mine suggest a marked decline from 1881 or 1882 to 1885 – chiefly the result of a decline in railroad construction – which matches the protracted and serious business cycle contraction of those years. Both my indexes and Kuznets' figures suggest that the peak of the long swing in construction occurred in 1892 rather than 1890, thus bringing the marked expansion of May 1891 to January 1893 within the bounds of a construction upswing rather than within that of a downswing. Similarly they suggest that the construction trough occurred earlier than 1900, perhaps as early as 1896 or 1897, thus bringing the relatively long and very vigorous expansion of 1896-99 within the bounds of a building upswing. Further, the currently available official indexes indicate that total construction did not reach its peak until 1927, instead of 1925 as Riggleman's index would have it. Finally, the newer indexes, as already indicated, support a shift in the peak date from 1909, as suggested by Riggleman, to 1912 or 1913, but agree with Riggleman that the building crest took the form of a plateau stretching from about 1906 to 1913.

Long Swings in the Rates of Growth of Construction and Total Output

We have noted that the relation between long swings in the rate of growth of construction and those in total output did not correspond with expectations derived from a model which assumed full employment. But the association suggested between long swings in construction and the character of business cycles helps to rationalize the observed behavior of long swings in rates of growth.

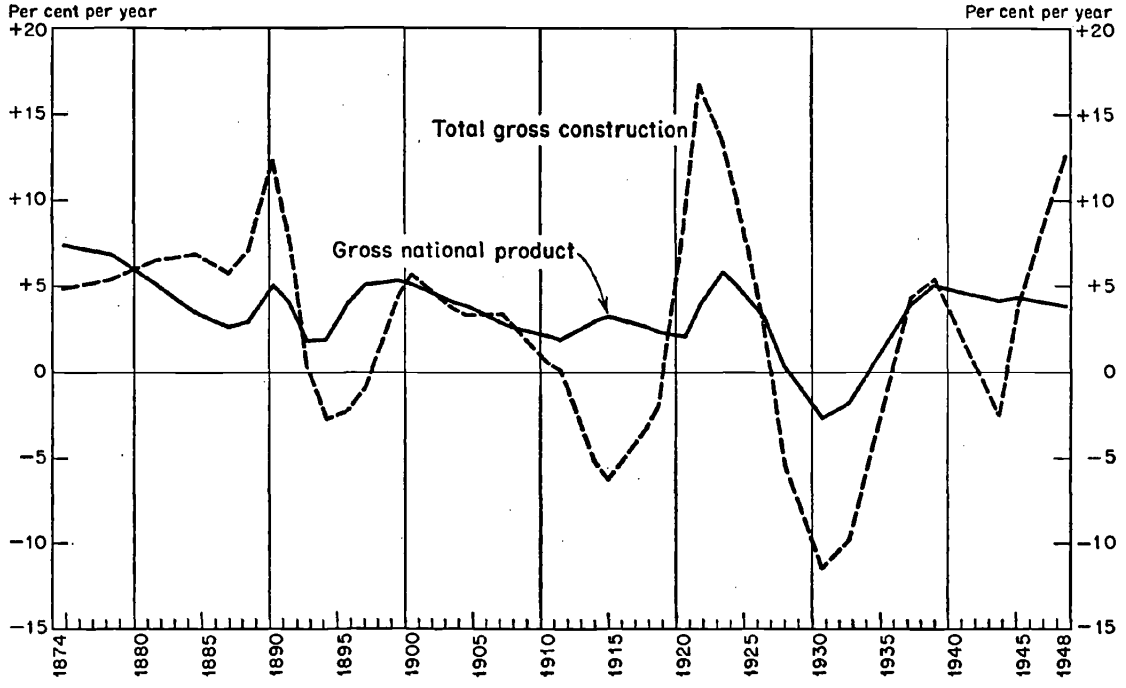
Before World War I, the secular rate of growth of construction tended to lag that of total output at turns, but from World War I until just after World War II the two rates turned together or construction led (see Chart 4). The "normal" pattern is that which obtained before World War I as the previous discussion has indicated. Consider, first, the course of events beginning with the serious depression which is the characteristic terminal event of the long swing. The occurrence of this depression involves a rapid decline both of output and construction. The trough in the rate of growth of total output is reached when the pressure to liquidate inventories, which is associated with the early stages of serious depression, is relieved. Before this period, the economy has been under pressure both from the side of inventory investment and from that of durables and structures. Thereafter, output

[16] Clarence D. Long, *Building Cycles and the Theory of Investment*, 1940, and Melville J. Ulmer, *Capital in Transportation, Communications, and Public Utilities: Its Formation and Financing*, Studies in Capital Formation and Financing 4.

[17] Miles L. Colean and Robinson Newcomb, *Stabilizing Construction*, 1952.

CHART 4

Rates of Yearly Change between Reference Cycle Bases, Gross National Product and Total Gross Construction, in 1929 Prices, 1869-1954



Source: Simon Kuznets, "Supplement to Summary Volume of Capital Formation and Financing," mimeographed, Tables T-2, T-5, and T-9.

may continue to decline, but at a slower pace. The trough in the rate of growth of construction is likely to be reached at a somewhat later point for a number of reasons. The durability of structures makes it difficult to eliminate a surplus as quickly as a surplus of inventories may be liquidated. And the conditions associated with a deep depression for a time act cumulatively to reduce the incentive to build. There is a decline in immigration, in internal migration, and, probably, in family formation. Financial difficulties are widespread. There is a loss of confidence in the long-term demand as well as in the short.

Once the rate of decline of construction has become sufficiently small, the standard business cycle processes, centering in inventory investment, in the financial markets, and in costs of materials and labor, can produce a revival of total output. It is likely to be a disappointing revival, however, failing to reach high employment levels and relapsing into serious depression, unless construction itself begins to rise vigorously. If construction does rise markedly, the rate of growth of output, favored by the existence of much excess capacity and an easy labor market, will be especially high. This is the rebound of output from deep depression. It produces the peak rate of growth of output during the long swing, a rate which necessarily falls, as the economy approaches its capacity, to a pace limited by the growth of resources and the rate of technical improvement.

The rebound of construction, meanwhile, is likely to be stretched over a longer period. There are technical obstacles, interposed by the organization of the construction industry and by the long planning and production period, to a very rapid revival of construction. And there are forces connected with the general revival from deep depression and the elimination of serious unemployment which, for a time, add force to the construction boom. Confidence in the long future is gradually restored. Immigration, internal migration, and

family formation are encouraged by more favorable conditions in the labor market. The demand for additional capital is enhanced by high rates of utilization of existing capacity. The peak rate of growth of construction and, *a fortiori,* the peak level of construction, are reached later in the long swing than the peak rate of growth of output.

The decline in the rate of growth of construction, when it comes, as it must sometime come, does not necessarily produce a deep depression. So long as construction continues to grow fast enough so that total investment can offset growing volume of saving and so that expenditures can absorb our growing capacity, total output, though interrupted by mild recessions, can follow a rising secular trend whose slope corresponds to the growth of capital, of labor force, and of technique. But when the retardation of construction growth becomes sufficiently pronounced, still more when the long swing in the volume of construction turns down, a serious and long depression becomes likely. Its arrival brings the secular rate of growth of total output to its low point in the long swing.

This sketch of a "theory" of long swings is manifestly inadequate. It takes for granted the existence of long swings in the volume of construction. The various processes – in population, labor force, finance, international trade and capital movement, prices, costs, and consumption – by which the interaction of long-term investment with the economy at large might produce a long swing in construction must be accounted for explicitly. The hypothesis of long swings in construction, however, has a fair empirical basis and, at least so far as residential construction goes, it has received a considerable theoretical development at the hands of Burns and others. Making use of it, it appears that we can go some distance to explain the changing character of business cycles. And by treating the observed long swings in the rate of growth of output as a fluctuation in the severity of business cycles associated with construction cycles, we can rationalize the relation between construction and the secular rate of growth of output. For if we proceed on the basis of a model which neglects business cycles and unemployment, we should expect fluctuations in the secular rate of growth of output to accompany or even to lag behind fluctuations in the volume of construction and immigration and in the rate of growth of the labor force. But proceeding along the lines of the foregoing sketch, we can readily understand why fluctuations in the secular rate of growth of output should *precede* fluctuations in long-term investment and growth of labor force. The undeniable effects of labor force growth and movement and of long-term investment in enlarging our stock of resources and in raising its productivity are submerged by the waves of output growth associated with changes in the rate of utilization of capacity.

The rate of growth of construction has not regularly lagged behind that of output since World War I. This departure from "normality" is attributable chiefly to the effects of war. The acceleration of output growth during World War I was accompanied by a sharp decline of private construction, but also by a great increase in government construction. To satisfy a large backlog of unfilled demand, with the end of the war in 1918, both residential and private nonresidential building rose rapidly, but the collapse of government building prevented total construction from rising. The decline in total construction, which had been proceeding slowly since before the war, did not end until 1920. Even in 1921 total construction was low compared with prewar levels. This then was one factor, though only one, making for the serious depression of 1920-21 which brought with it a trough in the secular rate of growth of total output. The troughs in construction and in the rate of growth of total output, therefore, occurred together; the trough in the rate of growth of construction occurred before that in the rate of growth of output.

Because private construction, once more the dominant factor, had been booming since 1918, total construction reached its peak rate of growth perhaps as early as 1922; and the peak rate of growth of total output, rebounding from the depression of 1920-21, also oc-

curred in 1922. Though the rate of growth of construction fell, it remained high until the mid-twenties, and total construction did not begin to fall before 1927, and then only slowly. This behavior, of course, was an important factor contributing to the generally high level of prosperity during the twenties.

I can think of no special explanation for the roughly synchronous troughs in the rates of growth of output and construction in 1930-31, but, thereafter, the relation of the two series is consistent with what we should expect in view of the disturbances caused by the second World War. The rebound from the Great Depression brought a peak in the rate of growth of total output in the late thirties, which has proceeded at slower pace since then. The rate of growth of construction again turned with output; indeed, the volume of construction declined from 1942 to 1945. This early downturn, however, was a clear result of the impact of war. By 1939, when the rate of growth of construction had reached its pre-World War II peak, the volume of total construction stood at only its 1922 level. Residential construction was only some 15 per cent greater than in 1916; it was less than half as large as in the mid-twenties. Private nonresidential building stood lower than in 1915 and only one-third as high as in the late twenties. It seems plausible, therefore, that in the absence of war, construction would have continued to rise rapidly for some years in an effort to make good the gap in building activity associated with the Great Depression.

Held to low levels during the war, building leaped to great activity beginning in 1946. This initial bound almost doubled the volume of building which, thereafter, increased at a slower but still impressive pace until 1955. The annual percentage increases were only twice lower than 4.5 per cent in constant prices. Six of the nine inter-annual rises were between 7 and 20 per cent per annum. Again, the high level and impressive rate of growth of building must have contributed in a significant way to the steady advance (though at a slowing pace) of total production.

MOSES ABRAMOVITZ

LONG SWINGS IN CANADIAN ECONOMIC GROWTH

The plan of this study of the secular growth of the Canadian economy falls into three parts: (1) analysis of population changes; (2) analysis of major economic changes; (3) the interrelations among the changes in the economic and population variables.

Since Canada is a region or a complex of regions within a larger international economy, a concept of region is essential in organizing the data. Two characteristics reflected in the records of growth of the Canadian population and labor force provide a basis for a logical and manageable concept of region. The first is the differentials in rates of growth of population among different provinces, cities, census divisions, and so on, which can serve to distinguish areas by rates of growth in considerable detail. The second characteristic, established in the studies of Simon Kuznets, is the tendency of changes in the flows that constitute additions to and drafts upon the population of a given area to exhibit long swings, which are reflected in similar long swings in the changes in population increments of the area. The chronology of the long swings in population growth can be used to establish terminal dates within which to analyze the changing regional patterns of growth.

This method of breaking down time into manageable units is a logical one whether or not the Kuznets swings are a distinct species of cycle. If they are products of random rather than systematic forces, they have nevertheless clearly marked the secular pattern of growth; and if growth in particular regions has occurred in surges or bursts, it can well be studied on that basis. At the same time, whatever data are developed using this approach will be in a form useful for investigating the source and nature of the long swings.

The analysis of the components of population changes in Canada from 1850 to 1950 and in the Catholic population of Quebec from 1820 to 1950 is nearly complete, and I am writing the findings. Meanwhile, I have begun an analysis of the regional redistribution of

population within Canada in the period 1850 to 1950, and between Canada and the United States from 1870 to 1950.

With respect to the analysis of economic changes I have assembled and plotted many of the existing economic series. In addition, sources of data were canvassed and preliminary estimates developed of annual investment in steam railways, 1848 to 1900, and in canals, 1820 to 1850. The railway series was linked with that from my *Capital Formation in Canada, 1896-1930* and the official estimates which begin with 1926, to obtain a continuous series from 1848 to 1950. The quality of the estimates is good from 1867. The earlier railway figures, and those for canals, are not reliable as annual series; but through fuller exploitation of the basic sources, they can be greatly improved in the planned revision.

Seven and a half long cycles stand out very clearly in these measures of transportation investment from 1824 to 1950. The average length of the cycles is 17 years. And, apart from the behavior of births and natural increase in the eighties and nineties, there is a clear one-to-one relationship between the transport cycles, building cycles, and the long swings in components of population change since 1870. When comparison is made between investment in transportation and annual changes in the flow of Roman Catholic births in Quebec, the one-to-one relationship is found to persist over the whole period since 1820 with the same and single exception centered on the eighties.

KENNETH A. H. BUCKLEY

INTERSTATE DIFFERENCES IN ECONOMIC GROWTH

To secure a fuller picture of the long-term movement of income in the various states and regions of the United States, our previous income series,[18] which were limited to the dates 1880, 1900, 1919-21, and 1949-51, were extended in two ways. First, estimates were prepared for 1840 of income originating (and also of the labor force) in agriculture and in nonagricultural commodity production and distribution in each state and region, and the earlier estimates for 1880 and 1900 were adjusted to approximately comparable scope. Second, the new Department of Commerce series for state personal income for 1927 through 1955 were incorporated in the analysis. To obtain better measures of the secular tendencies, we converted the latter data to cycle averages, using a program prepared for the IBM 704 electronic computer.

Table 9, which is based on the revised and extended series, throws additional light on the changes that have occurred in the magnitude of interstate differences in per capita income. The following are among the more important new findings it suggests:

1. In 1840 interstate differences in per capita income were considerably less than they were in 1880. The underlying figures indicate that much of this reflects the inclusion in the 1880 average of values for the Mountain and Pacific states. But even if the 1880 calculation is limited to the twenty-nine states of 1840, the average level of interstate income differences in 1840 is still found to be less than it was in 1880, primarily as the result of the much poorer relative position of the Southern states at the latter date. Indeed, the basic dollar figures suggest that in 1880 the absolute amount of per capita income in the Southern states may have differed little from that of four decades earlier.

2. While the primary trend since 1880 has been toward a reduction of interstate differences in per capita income, there was a noticeable reversal during the twenties and early thirties.

3. If one treats the series in Panel A as con-

[18] These series and estimates of state migration, labor force, and manufacturing activity for selected dates from 1870 to the present, prepared by the staff of the University of Pennsylvania Study of Population Redistribution and Economic Growth, were published during the year in Everett S. Lee, Ann Ratner Miller, Carol P. Brainerd, and Richard A. Easterlin, *Population Redistribution and Economic Growth, United States, 1870-1950,* Volume I, *Methodological Considerations and Reference Tables,* prepared under the direction of Simon Kuznets and Dorothy S. Thomas, 1957. A second volume, containing analyses of these data, is scheduled for publication in 1958.

tinuous with that in Panel B – a procedure which seems reasonable judging from the closeness of the overlap values for 1880 and 1900 – it appears that in the most recent decade interstate differences in per capita income were less than for any date on record.

4. In recent years the average level of per capita income differences has changed very little. The tendency, if any, has been towards a slight increase.

These and other findings, together with the basic estimates and a description of their derivation, were presented in a paper entitled "Interregional Differences in Per Capita Income, Population, and Total Income, United States, 1840-1950," at the meeting of the Conference on Research in Income and Wealth at Williamstown, Massachusetts in September. A second paper, "Long Term Regional Income Changes: Some Suggested Factors," drawing on the results of this and earlier studies, was presented at the meeting of the Regional Science Association at Philadelphia in December.

Since an important element in the interpretation of the trend in interregional differences in per capita income is the redistribution of various types of industry, we have been organizing state data for about seventy individual manufacturing industries, for which comparable though fairly broad industrial classifications covering the period have been developed. To date, employment data for 1879 and 1947 have been transcribed, and we are proceeding with similar work from the censuses of 1899 and 1919.

RICHARD A. EASTERLIN

TABLE 9

AVERAGE (DISREGARDING SIGN) OF STATE PERCENTAGE DEVIATIONS FROM NATIONAL AVERAGE FOR SPECIFIED SERIES, 1840-1955

A. Income Originating in Commodity Production and Distribution per Capita[a]	
1840A	25.1%
1840B	23.3
1880	45.1
1900	35.9
B. Personal Income per Capita	
1880	46.9%
1900	34.0
1919-21	24.4
1927-32	29.2
1929-37	29.5
1932-38	28.6
1937-44	24.7
1938-46	22.5
1944-48	17.7
1946-49	17.1
1948-53	18.1
1949-54	18.5
1953-55[b]	18.7

[a] For 1880 and 1900 commodity production and distribution covers agriculture, mining, construction, manufacturing, and transportation and other public utilities. The scope of the 1840A entry is somewhat broader, including also, wholesale and retail trade; that of the 1840B entry, somewhat narrower, excluding transportation and other public utilities.

[b] Incomplete cycle.

ECONOMIC GROWTH IN THE UNITED STATES BEFORE 1860

During the past year, I completed a study of the balance of payments of the United States from 1790 to 1860 and presented a paper on it at the Conference on Research in Income and Wealth in September. The study included annual estimates (five-year moving averages before 1820) of the separate components of the United States balance of payments with the residual considered as a measure of capital movements. Estimates of capital indebtedness were also constructed. The two most striking findings were (1) that the trade and payments balance tended to deteriorate during expansions and improve during contractions of the domestic economy, and (2) that from the end of the Napoleonic wars onward, the capital movements exhibit long cycles with peaks and troughs which roughly coincide with those in other series currently being investigated by Abramovitz.

Export and import price indexes were also completed for the period 1815-60. The most significant conclusions the indexes suggest are (1) that import prices tended to fall more rapidly than export prices during this period (and as a result the net barter terms of trade improved), and (2) that the terms of trade moved heavily in favor of the United States

when there was capital inflow and deteriorated relatively when there was little capital importation or there was an outflow of capital (in the 1840's).

I have also been studying ocean freight rates, 1753-1913. All the data are gathered on microfilm, and some have been processed. We now have freight rates on many commodity routes from the late eighteenth century onward. A freight rate index of American exports and imports was calculated from 1815 to 1910 and freight factors were computed for a wide variety of United Kingdom imports from 1753 to 1913. The task during the next six months is (1) to process the microfilm data, (2) to compute freight factors upon each major commodity route, and (3) to develop freight rate indexes for each major ocean trade route.

DOUGLASS NORTH

TRENDS IN WAGES AND PRODUCTIVITY IN THE UNITED STATES

Three of the reports being prepared in this study, undertaken with the assistance of a grant from the Alfred P. Sloan Foundation, are nearing completion. Clarence D. Long's manuscript on wages and earnings in the United States, 1860-1890, will soon be submitted to the Directors. Albert Rees's study of real wages, 1890-1914, and John W. Kendrick's monograph on productivity trends are reported on below.

Real Wages, 1890-1914

The basic research for the study of real wages in manufacturing, 1890-1914, has been completed, and the principal findings, subject to possible minor revision in the course of preparing the manuscript, are shown in Table 10.

TABLE 10

MONEY AND REAL EARNINGS IN ALL MANUFACTURING, 1890-1914

Year	*Average Annual Earnings*	*Days Worked per Year*	*Average Daily Earnings*	*Average Full-time Hours per Day*	*Average Hourly Earnings (cents)*	*Cost of Living Index (1914 = 100)*	*Index of Real Hourly Earnings (1914 = 100)*
1890	$433	296	$1.46	9.98	14.7	91	74
1891	438	299	1.47	9.97	14.7	92	73
1892	440	298	1.48	10.00	14.8	91	73
1893	417	273	1.53	9.95	15.4	90	78
1894	382	274	1.40	9.88	14.1	86	74
1895	398	287	1.39	9.93	14.0	84	75
1896	392	272	1.44	9.92	14.5	84	79
1897	393	282	1.39	9.90	14.1	83	77
1898	394	286	1.38	9.93	13.8	83	76
1899	420	290	1.45	9.90	14.6	83	79
1900	431	289	1.49	9.85	15.2	84	82
1901	446	287	1.56	9.80	15.9	85	84
1902	474	294	1.61	9.75	16.5	86	87
1903	481	291	1.65	9.67	17.1	88	88
1904	471	288	1.63	9.65	16.9	89	87
1905	487	292	1.67	9.67	17.2	89	88
1906	526	297	1.77	9.60	18.5	90	93
1907	539	294	1.83	9.56	19.2	94	93
1908	482	274	1.76	9.51	18.4	92	92
1909	512	289	1.77	9.52	18.6	91	92
1910	536	286	1.88	9.45	19.8	95	95
1911	542	284	1.91	9.43	20.2	95	96
1912	561	290	1.94	9.34	20.7	97	97
1913	582	285	2.04	9.31	21.9	99	100
1914	574	282	2.04	9.23	22.1	100	100

The movement of hourly money earnings is similar to that shown by Paul H. Douglas in *Real Wages in the United States, 1890-1926* (1930), although the sources were different. Douglas used Bureau of Labor Statistics data on hourly earnings, and we worked from annual earnings data given in the Census of Manufactures and reports of state labor bureaus. However, our level of hourly money earnings is almost a fourth lower than Douglas's level, which is based on union rates as a measure of earnings in some industries.

For the cost-of-living index we used Douglas's estimates for food, liquor, and tobacco, to which were added new components for fuel, rent, clothing, and home furnishings. The fuel index includes illuminating gas prices collected from utility companies and retail kerosene prices from the New Jersey state cost-of-living index. The rents were taken from newspaper advertisements in six cities. The clothing and furniture prices are from mail order catalogs.

The rise in the cost-of-living index shown in the table is much less than the rise in Douglas's index over the full period, resulting in a greater rise in the real wage index – 35 per cent – compared with his 8 per cent rise. Our estimate of the rise in real wage is of the same general order of magnitude as the rise during the latter part of this period in output per unit of all inputs as estimated by John Kendrick. Thus our estimates do not imply a redistribution of income adverse to labor.

ALBERT REES

Productivity Trends

The first eight chapters of the monograph on productivity trends in America have been submitted for staff review. Chapter 9, reviewing recent productivity changes and evaluating the outlook, is being written. The manuscript consists of the following chapters:

Part I. Introduction

1. The Importance of Productivity Advance: Introduction to Study and Summary of Findings
2. The Concept and Measurement of Productivity

Part II. Productivity in the Total Economy

3. National Productivity Trends
4. Productivity and Economic Growth
5. National Productivity, Factor Returns, and Prices

Part III. Productivity Change by Industry

6. Patterns of Productivity Change by Industry Groupings
7. Factors Underlying Industry Patterns of Productivity Change
8. Relative Changes in Productivity, Prices, and Resource Allocation

Part IV. Concluding Observations

9. Productivity Trends in Perspective: Conclusions and Outlook

A brief summary follows of some of the major findings with respect to national productivity movements:

1. Over the sixty-four years between 1889 and 1953, total factor productivity – i.e. output per unit of labor and capital combined – increased at an average annual rate of 1.7 per cent in the private domestic economy. Since real private domestic product grew at an average annual rate of 3.5 per cent over the same period, clearly productivity advance and increases in real inputs contributed in like proportions to its growth.

2. Output per unit of labor input (manhours weighted by industry average hourly earnings) increased at an average annual rate of 1.9 per cent a year while output per unit of capital input rose at an annual rate of 1 per cent. The difference is associated with the fact that real capital stock per unit of labor input grew at an average rate of almost 1 per cent a year.

3. Output per manhour in the private domestic economy (unweighted) increased on the average at the rate of 2.3 per cent a year. This rate is greater than the 1.9 per cent increase of output per unit of labor input, because here the upward effect of interindustry manhour shifts is transferred from the labor input measures to the partial productivity ratio itself.

4. The estimated rate of productivity advance in the private domestic economy (1.7 per cent) is somewhat greater than the 1.6 per

cent a year average rate in the national economy as a whole. The first measure is preferable since it excludes government inputs and outputs, measurement of which encounters serious conceptual and statistical problems.

5. Several methods of measuring trends all show a distinctly higher rate of growth in productivity of the private domestic economy after World War I than in earlier decades. Total factor productivity has grown at an average annual rate of 2.1 per cent since 1919 compared with a 1.3 per cent average rate per year between 1889 and 1919. The fact of acceleration is confirmed by use of a weighted average of available industry productivity measures.

6. Acceleration is also apparent in both the partial productivity ratios. It is more marked in the output-capital ratio, which rose from an average rate of increase of 0.5 per cent a year between 1889 and 1919 to 1.5 per cent a year between 1919 and 1953, while the rate of advance in the output-labor ratio rose from 1.6 per cent to 2.3 per cent at average annual rates.

7. Annual variations in "labor productivity" are great, and their major cause is business cycles. In forty-four years of cyclical expansion the average increase in labor productivity was 2.4 per cent; in twenty years of contraction, productivity rose on the average by only 1.2 per cent per annum.

JOHN W. KENDRICK

DIVERSIFICATION AND INTEGRATION IN AMERICAN INDUSTRY

This study seeks to answer the following questions:

How diversified is the output of companies in various sectors of the American economy?

What have been the trends in diversification and integration and the directions in which companies have diversified?

Is there a relationship between the extent of diversification and integration and a company's size, its rate of growth, and the industry group to which it belongs?

What characterizes industries in which a significant proportion of the industry's output arises from companies whose primary productive activities are in other industries?

Three bodies of data are being used. First, I developed a record of changes in the product structure of 111 large companies between 1929, 1939, and 1954, drawing on various public sources of information. Second, for the same companies the Bureau of the Census prepared a special tabulation showing the scope of the 111 companies' operations within manufacturing industries in 1947. Third, material developed in the enterprise-establishment statistics program for the 1954 censuses is available (subject, of course, to the nondisclosure rules with respect to individual companies). It gives information on the scope of operations in both manufacturing and other sectors of the economy for the 111 companies in 1954, similar information for an additional group of several hundred companies, and finally certain classes of summary data for all multi-unit enterprises.

A manuscript of five chapters is largely completed:

1. Concepts and Methods. Definitions of "diversification" and "integration" are offered. Alternative measures of diversification are discussed, and their results compared.

2. The Directions of Diversification. This chapter describes the industries which the 111 companies entered in various intervals of time from 1929 to 1954, and examines relationships between the frequency with which an industry is entered and such characteristics as its rate of growth, productivity change, and concentration ratio.

3. The Heterogeneity of Output. Measures of diversification developed in Chapter 1 are applied for the 111 companies in 1954. Relationships are sought between degree of diversification and the rate of growth of the company, its size, its profitability, and the characteristics of the industry to which it primarily belongs.

4. Trends in Diversification. Variations in the intensity of the movement to diversify over

the period 1929-1954 are considered, once again for the 111 companies. In contrast with Chapter 2, attention is on the relation between product changes and the characteristics of companies undergoing these changes, such as their rate of growth, size, and industry affiliation.

5. Integration and Nonmanufacturing Operations. This deals with both the pattern as of 1954 and trends through the period 1929-54 in the extent of the 111 companies' integration and nonmanufacturing operations. As in Chapters 3 and 4, an attempt is made to relate observed patterns to various company characteristics.

I hope to extend the analysis in four ways: First, through census summary tables, to examine the characteristics of industries in relation to the proportion of the output of each industry that arises from companies whose primary productive functions fall in other industries. This will complement Chapter 2 of the current manuscript. Second, in exploring the relation between size of company and the extent of diversification and integration, to examine the 1954 record for companies falling roughly into ranks 100 to 600 when classified on the basis of size according to employment. Third, by means of the 1954 data for several hundred large companies, to compare the degree of diversification and integration in large manufacturing enterprises with those falling into certain wholesale, retail, and service industries. Finally, again using census summary tables, to show the relative importance of multi-industry and single-industry enterprises in various sectors of the American economy. A manuscript revised along those lines would, I expect, be completed during the latter part of 1958.

MICHAEL GORT

ECONOMIC GROWTH OF THE SOVIET UNION

The object of the study, begun in 1954 under a grant from the Rockefeller Foundation, is to set forth and analyze the evidence bearing on the question: How rapidly has the Soviet economy been growing? The study was undertaken in full recognition of the inherent difficulty of arriving at an answer and of the special difficulties in securing reliable information.

Studies of the industrial, transportation, and agricultural sectors of the Soviet economy are reported below. Research on a number of other sectors, including housing construction, labor force and population, and the standard of living, has been completed.

Industrial Production

We spent the year revising output series, and constructing production indexes for Russian industry. I also drafted a monograph which will be ready for review in the near future. Occasional Paper 55, *Some Observations on Soviet Industrial Growth,* was published.

The revision of output series was made necessary when in July the Soviet Union released a much more detailed statistical abstract for industry than the one published in 1956, itself the first such abstract to appear in almost twenty years. The extensive revision of time series required with the appearance of each new source book indicates the difficulties faced in research on the Soviet economy, although this time the new data did not lead to any substantial changes in the general conclusions already drawn about Soviet industrial growth.

A summary of some preliminary production indexes is presented in Table 11, in the thought that the differences traceable to weighting systems and product coverage may be of interest even in the absence of a full discussion of pertinent details. To shed more light on these matters, we are also constructing indexes using weight factors drawn from United States data. We will be comparing our indexes with ones calculated by other Western scholars.

Three broad types of indexes were constructed to measure the production of (1) industrial materials, (2) finished industrial products, and (3) all kinds of industrial products. Production in each year was measured for the Soviet territory of that year – in the case of 1913, for the interwar territory. The effects of territorial expansion are, therefore, reflected in the indexes. To make the best use of Soviet

data, we followed the Soviet definition of industry, which includes mining, manufacturing, electric power, timber cutting, and fishing. Official Soviet output data were used, except for adjustments to include small-scale production.

Industrial Materials Index. The first index represents an effort to measure production at an intermediate stage of fabrication, in the manner employed by Geoffrey Moore in his study of American output, *Production of Industrial Materials in World Wars I and II* (Occasional Paper 18). The primary advantage of such an index is that it circumvents the enormous measurement problem created when an economy radically alters its mix of finished products, as the Soviet economy did during the 1930's. The name "industrial materials" somewhat oversimplifies the nature of the index, since it covers 37 intermediate industrial products (metals, fuels, construction materials, and so on) and 17 "basic" nondurable consumer goods (flour, butter, fabrics, and so on) – 54 products in all. We constructed the index on the basis of 1913, 1928, and 1955 prices, adjusting the prices wherever necessary to exclude the cost of nonindustrial materials used in production. All forms of the index were calculated with full product coverage for benchmark years (those in Table 11), dictated essentially by the practices of Soviet statistics. Annual interpolations were made with less complete coverage, but always as large as available data permit.

Finished Industrial Products Index. The second index tries to measure output of the "final" products of industry. It covers transportation equipment and agricultural machinery, construction materials, and consumer goods of all types – 67 products in the index weighted with 1928 prices, 79 in the one weighted with 1955 prices. The categories do not, of course, exhaust all final industrial products. In particular, a substantial fraction of fuel is consumed outside the industrial sector, just as a substantial fraction of construction materials is consumed within it. There is, however, no feasible way to separate these dual uses of products. Similarly, military end items are not covered because of lack of data. Some

TABLE 11

INDEXES OF INDUSTRIAL PRODUCTION FOR THE SOVIET UNION, BENCHMARK YEARS, 1913-1955

	INDUSTRIAL MATERIALS			FINISHED INDUSTRIAL PRODUCTS		ALL INDUSTRIAL PRODUCTS	
	1913 weights	*1928 weights*	*1955 weights*	*1928 weights*	*1955 weights*	*1928 weights*	*1955 weights*
			(*index, 1913 = 100*)				
1913	100	100	100	100	100	100	100
1928	103	100	99	97	92	102	107
1932	141	131	130	125	117	142	145
1937	249	229	211	234	182	258	238
1940	276	254	232	220	173	281	231
1945	161	148	142	89	77	163	104
1950	364	338	300	329	226	410	335
1955	588	550	463	507	353	676	488
			(*percentage change*)				
1913-28	+3	0	−1	−3	−8	+2	+7
1928-32	+36	+31	+31	+30	+27	+40	+36
1932-37	+77	+75	+62	+86	+56	+81	+64
1937-40	+11	+11	+10	−6	−5	+9	−3
1940-45	−42	−42	−39	−60	−56	−42	−55
1945-50	+126	+129	+110	+270	+195	+151	+223
1950-55	+62	+63	+54	+54	+56	+65	+45
1928-55	+469	+448	+368	+424	+282	+564	+357

of the covered products (machinery and consumer durables) involve advanced stages of fabrication; others (consumer nondurables and construction materials) do not. The index should, therefore, represent growth trends at most relevant stages of fabrication. Both 1928 and 1955 weights were used, although only benchmark years are covered.

All Industrial Products. The third index is "comprehensive," covering industrial products of all kinds (except extremely heterogeneous categories of machinery) for which reasonably continuous output data are available. In all, over 100 products are included – 102 in the index weighted with 1928 prices and 119 in the one weighted with 1955 prices. Two weighting systems were used: value added per unit for 1928 and employment per unit for 1955. A rather detailed industrial breakdown of value added was constructed for 1928. Where value added covered a group of products, their outputs were weighted with prices, net of cost of nonindustrial materials. The products in the index account for about 70 per cent of total value added by industry in 1928. The index was constructed with direct weights; that is, the weights assignable to missing products were not imputed elsewhere. Since the employment data for 1955 are available for only broad industrial categories, one cannot estimate the fraction of industrial employment accounted for by the covered products in that year, or the extent to which weights have been necessarily imputed in constructing the index. Here, again, weighting within industrial categories was done by prices, in this case for 1955. For both sets of weights, the index was constructed for benchmark years, with annual interpolations for the period 1928-55.

Seven basic production indexes result from the calculations, as shown in the table. The indexes all differ, and some of the divergences among them are substantial. For example, industrial production is shown as multiplying from 3.8 to 6.6 times between 1913 and 1955. The wide divergence of behavior, when coupled with knowledge of the concrete shortcomings of each index, makes it reasonably clear that there is no single best way to construct a Soviet index. And since none of the indexes is based on anything approaching the amount of verifiable data encompassed in standard indexes of industrial production used in most Western countries, none can be considered an accurate measure, by Western standards, of what it purports to measure.

Each index based on 1928 weights shows a more rapid rise over the whole period than does its counterpart based on 1955 weights. Similarly, the index with 1913 weights shows a more rapid rise than does its counterpart with 1928 weights. The slowest-rising index based on 1928 weights (industrial materials) rises more rapidly than the fastest-rising index based on 1955 weights (all industrial products). This general relation between "early-year" and "late-year" weighted production indexes conforms with what has been observed for other countries.

Among those participating in work on the industrial sector last year were Israel Borenstein, Adam Kaufman, and Marie-Christine Culbert. Gregory Grossman has also been revising a paper on the Soviet statistical system, which we hope to submit soon for review.

G. WARREN NUTTER

Transportation

A draft of a monograph on transportation in the Soviet Union has been circulated in the form of a working memorandum among experts for their critical comments. The basic statistics are being checked, and revisions will be made in the text in the light of suggestions and comments. An outline of the proposed monograph follows:

1. The Composition of Soviet Transportation
   - A Railroad Economy
   - Water Transport
   - Truck Transport
   - Petroleum Pipelines
   - Aggregate Intercity Transportation
   - Transportation in the United States
   - Comparisons of Soviet and United States Traffic

2. Soviet Railroad Traffic
   - Statistical Measures
   - The Growth of Soviet Rail Freight Traffic
   - Freight Traffic Performance in War
   - Railroad Passenger Traffic
3. Factors Affecting Soviet Railroad Traffic
   - Control of Freight Traffic
   - The Use of Rates in the Control of Traffic Zoning
   - Control of Traffic Variation through Storage at Origin
   - The Planning of Traffic Movement
   - Comparison of Soviet and U.S. Average Hauls
   - Composition of Freight Traffic
4. An Analysis of Soviet Railway Operation
   - The Nature of Soviet Railway Operations
   - Soviet Use of Plant and Equipment
   - Measures of Efficiency
5. Conclusions

Appendixes

A summary paper, "Freight Transportation in the Soviet Union," was presented at the December meeting of the American Economic Association. An abstract will appear in the *Proceedings* of the Association, and a revised version will shortly be submitted to the Directors as an Occasional Paper.

ERNEST W. WILLIAMS, JR.

AGRICULTURAL PRODUCTION

Agricultural output data are still a scarce item in the veritable deluge of statistical compilations released in the Soviet Union largely during the last year (10 national compilations, 17 handbooks for individual republics, and some 41 regional and city handbooks). Output data for grains and some major industrial crops on a barn yield basis were published as relatives of 1950 from 1950 on. Absolute magnitudes of output for a few livestock items (meat, milk, eggs, and wool) were released for several postwar years. In the wake of the announced decision by the Central Statistical Administration to release unpublished data to scholars, one is beginning to find hitherto unavailable data in less formal sources. A case in point is the recent unusually candid study of the textile industry by L. M. Korneev (*The Textile Industry of the USSR and Ways of Its Development,* Moscow, 1957) which contains output data on a "factual yield" basis for flax fiber and hemp fiber for several recent years with the Central Statistical Administration cited explicitly as the source.

The table on the next page, the most recent, but rather abbreviated version of a number of such tables, illustrates concretely both the persisting scarcity of output detail and coverage and the rough adjustments required in basic items. It gives various indexes of Soviet agricultural output (1928=100), for selected years, 1927-57.

1. The key adjustment in the grains component is the setting of the level of total grain output in 1955 at 100 million metric tons on the basis of indirect but compelling considerations. This implies a discount of some 50 per cent of the official "biological yield" output figure for 1952. Only wheat is broken out of the aggregate, although it is possible to do so also for corn as was done in other variants of the table.

2. The technical crop component includes newly published data on flax fiber output, which for the 1950's are only 36 per cent of the mildly discounted official data previously used. Flax seed and hemp seed output had to be estimated indirectly. The sunflower seed series carries an arbitrary downward adjustment beginning with 1940.

3. In the livestock component, milk, eggs, and wool are represented from 1940 on by recently released official Soviet figures without adjustment. The meat series for the same period consists of our own estimates which are some 25 per cent below the new official figures.

I have little doubt that in a span of a few months substantial changes will have to be made in tables such as this. The obsolescence rate of estimates of Soviet agricultural output by Western students has become uncomfortably high.

GEORGE M. KUZNETS

	1927-1929	1930-1932	1933-1935	1936-1938	1940	1950	1951	1952	1953	1954	1955	1956	1957
Grain crops:													
Total	97	95	98	110	135	106	102	128	113	117	145	187	148
Per capita	97	91	93	101	106	87	83	102	88	90	110	140	109
Technical crops:													
Five crops[a]													
Total	95	128	141	203	184	235	242	251	258	265	312	347	
Per capita	95	123	133	185	144	193	196	199	202	204	237	260	
Seven crops[b]													
Total	95	111			143	178					240		
Per capita	95	107			112	146					182		
Potatoes:													
Total		96	125	110		158			159			220	196
Per capita		92	118	101		130			125			165	144
Livestock products:[c]													
Total	100	69	52	81	93	106	107	112	120	128	137	148	
Per capita	100	66	49	74	73	87	86	89	94	99	104	111	

Outputs within each group weighted by 1926/27 (Soviet) farm prices. Crop data adjusted for seed use.

[a] Sugar beets, cotton, flax fiber, flax seed, and sunflower seed.

[b] Hemp fiber and hemp seed included.

[c] Meat (all varieties, including poultry) and animal fat, milk for all uses, eggs, and wool.

OTHER STUDIES

Several new publications deal with economic growth and the factors affecting it:

The Growth of Public Employment in Great Britain, by Moses Abramovitz and Vera F. Eliasberg, is part of a larger investigation of the growth of governments and the functions they have assumed in modern life. Through trends in the number of persons directly employed by government agencies, British experience over a sixty-year period is analyzed, and is compared with experience here by drawing on the predecessor volume, *The Trend of Government Activity in the United States since 1900.*

Concentration in Canadian Manufacturing Industries, by Gideon Rosenbluth, deals with concentration by number of firms as well as by number of plants in an attempt to account for industry differences in degree of concentration in a large sample of Canadian firms. It includes comparisons between Canada and the United States, and traces the major trends in plant concentration for Canada since 1890.

The Demand and Supply of Scientific Personnel, by David M. Blank and George J. Stigler, examines methods of explaining or predicting the supply and demand for technological professional workers, particularly engineers and chemists, who together form at least nine-tenths of the persons with advanced knowledge of natural science and its applications.

For other new publications see Section 1. "Merger Movements in American Industry, 1895-1955," by Ralph L. Nelson, is being prepared for press.

Investigations dealing with various aspects of economic growth are reported in Section 1. A study of the growth of British government expenditures, 1890-1954, is described in Section 5, and work on indexes of American foreign trade, 1879-1923, in Section 6.

4. *Banking and Finance*

POSTWAR CAPITAL MARKETS

Work began in 1955 under a grant from the Life Insurance Association of America and the first results are in print. The project consists of three studies dealing with certain major sectors of the capital market – government securities, corporate securities and loans, and nonfarm mortgages; a fourth on quarterly flows of funds through the capital markets; and development of basic statistics of saving, national wealth, and national and sectoral balance sheets for the postwar decade, generally continuing and extending the comparable estimates in *A Study of Saving in the United States*. Reports on the first four inquiries are given below by the staff members responsible for them.

The estimates of national wealth for the years 1945 through 1955 were slightly revised and extended through 1956. Separate estimates have been constructed for the three main sectors of nonfarm businesses: manufacturing and mining; transport and public utilities; and others. Some experiments were also made with capital coefficients. I hope to prepare a paper on these matters in the near future. Some progress was also made in continuing the estimates of saving through 1956. These, together with national balance sheets for at least 1945, 1949, 1952, and 1956 should be completed during the spring.

Recent studies have made it evident that for economic analysis the nation-wide capital coefficients (capital-output ratios) usually encountered in the literature are of very limited value. What is needed are coefficients for sectors and smaller subdivisions. Some have been developed in the project on capital formation and financing, but they usually do not extend beyond 1950. Our new estimates furnish numerators of capital-output ratios for a half dozen major sectors of the economy for the postwar decade. Combined with estimates of net national product in current or constant prices, or with sector indexes of the volume of output, they permit the calculation of annual sectoral average and marginal capital coefficients.

TABLE 12

SECTORAL CAPITAL-OUTPUT RATIOS

Preliminary estimates. Reproducible tangible wealth divided by gross national product for the sector, both in 1947-49 prices.

	Manufacturing and Mining (1)	*Public Utilities* (2)	*Other Private* (3)	*Real Estate (Commercial Structures)* (4)	*Agriculture* (5)	*Total Domestic Private* (6)	*Government* (7)	*Total* (8)
				I. Average Ratios				
1946	0.93	2.62	0.68	13.70	2.45	2.14	3.36	2.26
1947	1.05	2.55	0.73	13.68	2.57	2.13	4.14	2.29
1948	1.06	2.67	0.74	13.68	2.36	2.10	4.11	2.25
1949	1.17	2.89	0.75	13.74	2.51	2.21	4.07	2.35
1950	1.05	2.63	0.76	13.38	2.47	2.08	4.13	2.23
1951	1.06	2.51	0.79	13.17	2.71	2.08	3.37	2.19
1952	1.10	2.56	0.79	13.45	2.62	2.08	3.22	2.18
1953	1.05	2.50	0.79	13.75	2.56	2.04	3.41	2.16
1954	1.14	2.60	0.80	13.72	2.50	2.12	3.72	2.25
1955	1.05	2.41	0.76	13.87	2.44	2.01	4.01	2.16
				II. Marginal Ratios				
1946-55	1.00	2.06	0.94	14.58	2.40	1.72	12.05	1.92
1948-53	0.99	1.99	1.03	14.32	5.60	1.78	1.83	1.78
1948-55	1.01	1.85	0.82	14.82	2.97	1.73	3.75	1.90

As an example of the experimental work done in this field Table 12 shows the ratios of reproducible tangible wealth to gross national product (both in 1947-49 prices) for six main sectors of the economy for every year of the postwar decade. The figures are conceptually not yet quite in the form we want them – for instance, the divisor should be net rather than gross national product – and both numerator and denominator are subject to considerable error. What is more important for adequate analysis, we need similar figures for narrower and more homogeneous sectors, particularly for "other private," which is now a shelter for such diverse sectors as trade, services, construction, and finance. The required detailed breakdown of reproducible tangible wealth by industry is not yet available. Separate ratios for the main components of reproducible tangible wealth – structures, equipment, and inventories – have been calculated, but would require too much space to be presented here.

The figures, nevertheless, suffice to illustrate three facts of considerable importance for any study of capital-output ratios:

The first, and an obvious one, is the erratic nature of capital-output ratios using annual data. This is evident even from some of the marginal ratios for five- to nine-year spans shown in the lower part of the table. Our present data and methods are of little use when short-term marginal capital output ratios are theoretically required.

Second, while the average national capital-output ratio has shown only a very slight downward trend over the decade, there are considerable movements in the ratio for some sectors, including movements in the opposite direction.

Third, the seemingly erratic movements that occur occasionally in even the total average capital-output ratio – such as the one-year rises of 1949 and 1954 – and several of the shorter movements in sectoral ratios, particularly in manufacturing and public utilities, clearly reflect changes in the rate of capacity utilization, and hence are irrelevant for most analytical purposes to which capital-output ratios are usually put. The lesson is that all annual ratios should in principle be adjusted for changes in capital utilization. Unfortunately, data for such adjustments are lacking for the most part, except in manufacturing and public utilities.

The general impression that emerges from the table is the absence of any clear trend in the capital-output ratios. This finding differs from some of the discussions of the subject which have inferred a rising capital-output ratio during the postwar period, particularly in manufacturing. It is not possible here to go into the reasons for discrepancies in the various estimates, all of which are admittedly rough. Nor is it claimed that the new set of estimates is necessarily superior to others. The discrepancies are so plain, however, as to suggest great caution in drawing conclusions from the available data, and to emphasize the need for much more intensive work in this field than has hitherto been devoted to it – the present study included – before we can have reasonable confidence in the figures or in their interpretation.

RAYMOND W. GOLDSMITH

Government Securities Markets

The manuscript on "The Postwar Market for State and Local Government Securities," described in last year's annual report, was circulated for comment, and responses have been received from more than a dozen readers. A revised manuscript will be ready shortly for submission to the Directors.

Time, and the circumstances of my employment, have made it necessary to reduce greatly the scope of the companion study of the market for U. S. government securities. During the summer I investigated the informal "underwriting" of new Treasury cash offerings, and of refundings. The underwriting of both kinds of financing was measured by the changes in ownership during the first two months following allotment or exchange. In addition, the study of refundings was supplemented by comparison of the ownership of maturing securities just prior to exchange with ownership of

the new securities at the time of the exchange. I plan to prepare a paper setting forth the results, together with related work completed earlier.

ROLAND I. ROBINSON

The Market for Corporate Securities and Loans

The basic data for my monograph on the market for corporate securities and loans are nearly complete. Further exploration of the secondary markets for corporate securities, refinement of data on new-issue yields, and cyclical measurements for security issues remain. Meanwhile I have begun analyzing the data and writing up the findings, and hope to submit a manuscript along the lines suggested in an earlier report by the summer of 1958.

Under the direction of David Meiselman, the arduous task of deriving sources-and-uses-of-funds statements for six broad subsectors of the corporate universe (manufacturing, mining, communications, railroad, gas and electric utilities, and other) for the years 1950 to 1955 has been completed. By splicing these series to the data prepared independently by John Dawson of Grinnell College, we can examine sources and uses of funds on an annual basis from 1938 through 1955. In addition we have prepared quarterly series for the same subsectors for 1953-55 – on a gross basis, with a great deal of detail shown. These will be of interest to students concerned with capital formation, business financing, and the capital markets. We hope to make them available in mimeographed form soon.

As an adjunct to analysis of the demand for funds in the capital market as well as the response of suppliers of funds, we have developed a set of balance sheets for the six subsectors of the corporate universe for which fund flows were derived, annually from 1945 through 1955. We have also completed annual data on the volume of corporate securities outstanding since 1945, and on changes in holdings. This material together with an analysis of portfolio policy of the suppliers of funds should tie in with our data on security issues and enable us to report the behavior of fund suppliers in the capital market in the period under review.

Material on two aspects of the new-issues market – direct placements, and changes in the investment banking machinery – is being drafted.

In connection with our earlier work on the personal trust industry, Raymond Goldsmith and I have prepared a short account of changes in the absolute amounts and the portfolio composition of personal trust funds, which extends his discussion of personal trust fund assets in *Financial Intermediaries in the American Economy since 1900*. These figures may serve to fill a statistical gap for one of the large financial institutions about which very little is currently known.

ELI SHAPIRO

Postwar Mortgage Market

The paper on *The Postwar Rise of Mortgage Companies* is in press, and that on *The Volume of Mortgage Debt in the Postwar Decade* is just coming out. The former, described in last year's Annual Report, is based largely on new financial data developed especially for this study. The latter is believed to provide the most complete and consistent set of statistics now available on mortgages outstanding by type of property and type of holder, and on net mortgage flows; it includes a detailed description of sources and methods of estimation, and an appraisal of mortgage debt statistics generally.

A revised draft of the monograph on mortgage markets should shortly be ready for staff review. As it now stands, it attempts to combine a statistical analysis of the net flow of mortgage funds from major lenders to major sectors of the market (including underlying causes of change) with a description and appraisal of mortgage lending policies of major suppliers of funds and the changing institutional framework of the market. The chapters are:

1. Introduction and Summary of Findings
2. An Overview of Mortgage Market Changes in the Post-World War II Decade

3. Elements in the Changing Postwar Mortgage Market
4. The Postwar Pattern of Mortgage Interest Rates
5. The Flow of Funds into Mortgage Markets
6. Mortgage Lending Policies of Financial Institutions
7. Characteristics and Techniques of Mortgage Market Operations
8. The Postwar Rise of Mortgage Companies

SAUL B. KLAMAN

Quarterly Flow of Funds through the Capital Markets

Work on methods, and collection of data for 1953-55 measuring the quarterly flow of funds through the capital markets within a social accounting framework, have been completed, and a manuscript presenting the accounts is nearly ready to be circulated for criticism. It contains balance sheets and sources and uses of funds statements for the various sectors and subsectors; a detailed description of the derivation of the data; a general discussion of the sectoring and the classification of assets, liabilities, and transactions; and an appraisal of the accounts and the data.

One of the prime objectives of the work was to determine the feasibility of constructing quarterly accounts. We have little doubt on the basis of our experience that reasonably good estimates of the financial levels and flows are within reach. A number of improvements are desirable, and some appear possible: for example, considerably better quarterly accounts of fire and casualty companies in the near future, and, at long last, regular – if only annual – figures for personal trust funds.

Most financial flows are measured as balance sheet changes. Unless adjustments are made for amortization and capital gains or losses in the case of securities, for loss reserves in the case of book credit, etc., there will be some error, which occasionally can be substantial. In general the adjustment can be made on an annual basis for the total financial flow of any group of institutions by means of the income account. The real difficulties arise in allocating the adjustments over the quarters. Allocation to the individual types of financial instruments is most serious in connection with stock, and particularly common stock with its more rapid turnover and greater volatility of prices. There, in addition to the realized gains, one also has to contend with unrealized gains reflected in the balance sheet. It was fortunate that the period covered by the staff report to the U. S. Senate Committee on Banking and Currency, *Institutional Investors and the Stock Market, 1953-55,* is approximately the same as that of this study. Purchases and sales of common stock for samples of the major institutional investor groups were given in the Senate report. From them we derived universe estimates of net flows.

Estimates of consumer holdings of financial assets are residuals. The error involved in them depends upon the degree of conceptual similarity between the measure of the obligor liability for the financial instrument in question and the records of institutional holders. Besides float and valuation problems, there is the question whether the obligor and holder classifications of financial instruments are the same. For example, a good measure of obligor liability corresponding to the holder classification "nongovernment bonds and notes" is lacking. The measure used in our study is believed an improvement over earlier ones, but identifiable errors remain.

No discussion of social accounts is complete without a plea for better data on unincorporated enterprises. Data on nonprofit organizations and personal trust funds especially need improvement. In general, in so far as the data used in this study improve upon earlier series, one can conclude that most estimates of consumer holdings of the various types of financial assets tended to be overestimates.

Surprisingly enough, first and third quarter data on commercial banks also leave much to be desired. Most such data are not for the last day of the quarter but for dates that differ from the last day by as much as three weeks. Because of extreme volatility in some of the balance sheet items for banks, simple interpolation is not a satisfactory solution.

This brief discussion does not completely catalogue the difficulties which continuation of quarterly data would involve, and is intended only as a sample of problems that bear further investigation.

Meanwhile, analytical uses of the quarterly accounts are being explored, and I expect to have a manuscript ready for circulation by the summer.

MORRIS MENDELSON

CAPITAL FINANCING: SOURCES OF FUNDS

Work has been resumed after a year's interruption for other research. The study aims to describe and explain variations in capital financing patterns. Thus far it has dealt with major categories of sources and uses of funds for two relatively homogeneous groups of companies from 1921 through 1953, and for a larger, more heterogeneous sample for 1946-55. The former consists of seventeen steel companies and twenty-four petroleum companies, the data having been developed partly by myself and partly in earlier National Bureau studies. The latter consists of an additional 168 large manufacturing companies, for which the Board of Governors, Federal Reserve System provided data. I have studied the variations between companies and over time in the relative importance of various sources of long-term capital funds, and the relationship of such differences to capital expenditure rates and to several other factors.

Among the findings are: (1) The relative importance of debt capital as a source of long-term funds is larger during peak years in capital expenditures and smaller in low years. (2) The relative importance of "external" funds is positively correlated with capital expenditure rates both over time for individual companies and as between different companies in identical periods. (3) Companies with more volatile earnings in the petroleum and steel industries appear to have relied somewhat more on debt as a source of funds than those with more stable earnings, even after allowance is made for the effect of larger fixed charges on the stability of earnings. (4) While size of company appears to be related to certain aspects of financing patterns for large manufacturing corporations, there is little evidence of relationship between financing patterns and the industry group within manufacturing in which the companies can be classified. Hence, knowledge of the industry to which a company primarily belongs tells little about the way in which it will finance its capital requirements.

I plan to extend the data for steel and petroleum companies through 1957, and, for the Federal Reserve data, to examine in greater detail the relationship between financing patterns in long-term capital and the magnitude of short-term debt and of liquid asset holdings. A manuscript should be available by fall of 1958.

MICHAEL GORT

THE QUALITY OF CREDIT IN BOOMS AND DEPRESSIONS

Changes in lending policies and in the quality of credit have been and continue to be a matter of great consequence to the financial community, to supervisory authorities and other public officials concerned with monetary policy, and to the public at large. Too frequently, information on the nature and significance of these changes has become available only long after the event and long after it could be most effectively utilized. Our studies represent an effort to reduce this lag by developing new sources of current data and evaluating their usefulness in the light of past experience.

Work began in July 1956 under a grant from the Merrill Foundation for the Advancement of Financial Knowledge, following exploratory studies supported by the Association of Reserve City Bankers. Progress on the several sectors of the study is reported below by the members of the staff principally concerned.

Bank Examination Studies

Our purpose is to determine whether data generated as a by-product of bank examinations can be used to construct useful aggregate measures of the current condition of bank loan portfolios. In addition some empirical materials will be developed bearing on the rela-

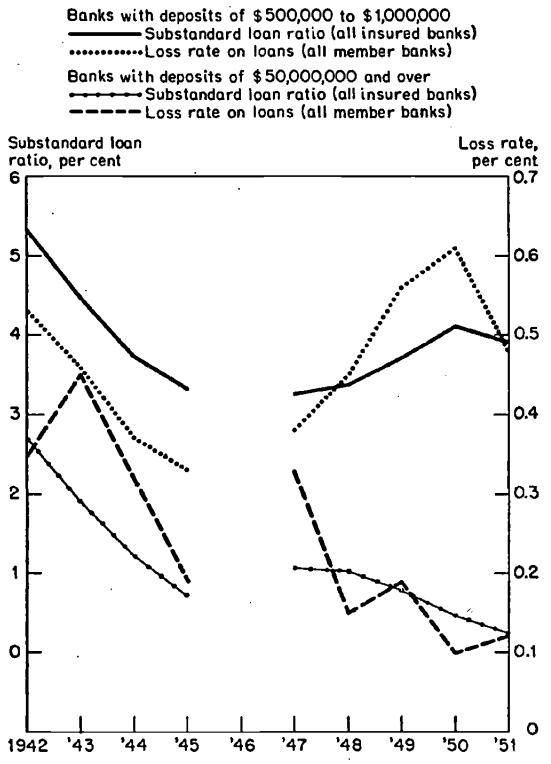
tionship between bank examiners' evaluations and subsequent collection experience, taking into account changes in business conditions and other factors. At the same time, information on the quality of and experience with loans to small business concerns will be provided. The results along all these lines, we hope, will prove useful not only to bank supervisory authorities in framing their policies, but also to other governmental agencies, bank loan officers, and others concerned with monetary and credit policy.

In the bank examination process numerous data pertaining to loan and investment portfolios are collected for use in analyzing the condition of individual banks. There is reason to believe that these same data can be utilized to construct current measures of the changing quality of bank loan and investment portfolios in the aggregate. For example, from 1934 through 1951 the Federal Deposit Insurance Corporation published an aggregate series of examiner evaluations for deposit size groups of banks. Various difficulties – some of which can be rectified by further work – impede comparing the evaluations with actual loss experience by the banks. Nevertheless, a crude comparison of the criticized loan ratios with actual loss rates indicates an impressive degree of similarity (Chart 5). Not only do the criticized loan ratios correspond well with the differences in the level of loss rates for small and large banks, they also correspond with general trends in loss rates since the early 1940's and with the widening spread between the experience of small and large banks in recent years.

Plans have been formulated for coordinated study of data from several different sources (including the 1955 and 1957 Federal Reserve loan surveys, member bank condition reports, examination reports, and examiners' loan card files). If they can be carried out, with the cooperation of the bank supervisory authorities and without jeopardizing the confidentiality of the records, the information provided will make a considerable contribution both towards the general objectives of the credit quality study and towards the study of risks in small business financing (see below).

CHART 5

Substandard Loan Ratios and Actual Loss Rates, Two Size Groups of Banks, 1942-1951



The plans result from a joint effort by Donald P. Jacobs, Edward J. Kilberg, Thomas R. Atkinson, and myself.

GEOFFREY H. MOORE

Loss and Earnings Experience of Commercial Banks

The major purpose of this investigation is to ascertain whether observable changes in the relative importance of types of loans and borrowers to which banks lend can be useful as a measure of changes in prospective credit quality (i.e. of expected loss and recovery rates, taking into account economic conditions and other relevant factors). To develop such a measure and explore its validity it is necessary to investigate the extent to which changes or differences in types of loans and borrowers to which banks lend have been related to differences in loss or recovery experience during prosperous as well as less prosperous periods.

In addition, the extent to which differences in loss rates are reflected in or compensated by differences in interest rates is of course pertinent.

Our basic unit of measure is the individual bank, rather than the individual loan. So far, we have had to utilize groups of banks, consisting mainly of various aggregates published by the supervisory agencies. For these units loss and recovery data, and interest earnings are available only on all loans, and not with regard to any type of loan, class of borrower, etc. It is therefore necessary to relate differences among banks in (1) the composition of their loan portfolios according to class of borrowers or type of loan to (2) differences among the same banks in loss and earnings experience. From these relationships loss experience associated with different classes of borrowers or types of loans may be inferred.

The amounts of loans outstanding for broad classes of borrowers or types of loan are available from condition reports for some of the same groups of banks for which earnings and dividends statements appear. While the breakdown from condition reports is crude for our purposes, it does permit a glimpse of the potentialities that exist in relating borrower and loan characteristics of bank portfolios to their loss and earnings experience.

Condition report data can be grouped into six major categories:

1. Commercial and industrial loans.
2. Farm loans ("other loans to farmers" and real estate loans secured by farm land).
3. Loans to consumers.
4. Noninsured real estate loans on residential properties and "secured by other properties" (the latter includes business loans secured by mortgages).
5. Insured and guaranteed loans (real estate loans insured or guaranteed by FHA and VA and loans to farmers guaranteed by the Commodity Credit Corporation).
6. All other categories of loans (loans to brokers and others for carrying or purchasing securities, loans to banks, etc.).

For three categories (consumer loans, farm loans, and nonfarm loans secured by mortgages) a preliminary analysis has been made of ninety-two groups of banks in 1953, consisting of all insured banks in six states, and all insured member and nonmember banks separately in forty-two states and the District of Columbia.[1] Groups of banks were subdivided according to whether their percentages of consumer, farm, and nonfarm real estate loans fell into the upper, middle, or lowest third of separate arrays of these loan percentages.

The results by these broad categories of loan portfolio are shown in Table 13. It is apparent that loss rates (column 4) are consistently higher for groups of banks which lend more to farmers. Also, for banks which make more consumer loans (holding farm and real estate classes fixed) loss rates tend to be higher, though not altogether consistently. The relationship between lending on nonfarm real estate and loss rates, however, is not much better than might have occurred from a random ordering of the numbers. This may result from the fact that in the initial analysis we combined insured and guaranteed mortgages with noninsured mortgages on residential and other properties.

Loss rates also increase with decreasing size of bank (column 3). This is consistent with evidence for the period 1939-56 that loan loss rates of smaller banks are, on the average, greater than those of larger banks. Yet such differences in bank loss experience appear to be more a function of loan composition of different size banks than, say, something inherently different in their management or selection of credit risks. Some evidence for this view shows up in Table 13. Loss rates increase with

[1] The analysis was made possible by data on earnings and dividends generously supplied by the Federal Deposit Insurance Corporation for groups of nonmember banks (two banks or more) in forty-two states and the District of Columbia. This together with published data supplied the ninety-two observations.

increasing lending to farmers more consistently than they do with decreasing size of bank.

However, in order to separate effectively the influence of type of borrower (or type of loan) on loss experience from the influence of size of bank, it is important to obtain a sufficient number of observations for small and large banks of similar as well as different loan portfolio characteristics – observations for groups of banks of various sizes within each state, or, preferably, for sufficient numbers of individual banks countrywide, within several deposit size categories. If such data can be released, with due safeguards for confidential information, not only can the effect of loan portfolio characteristics be better revealed, but

TABLE 13

AVERAGE LOSS RATES AND INTEREST EARNINGS RATES FOR 92 GROUPS OF BANKS CLASSIFIED BY RELATIVE IMPORTANCE OF FARM, CONSUMER, AND REAL ESTATE LOANS, 1953

Loan Portfolio Composition (% of total loans outstanding)		*Bank Groups (number)*	*Banks (number)*	*Av. Asset Size of Bank ($000,000)*	*Av. Loss Rate (per $100 of loans outstanding)*	*Av. Int. Earnings Rate (per $100 of loans outstanding)*	*Adjusted Int. Rate (5) – (4) (per $100 of loans outstanding)*
		(1)	(2)	(3)	(4)	(5)	(6)
Consumer Loans Low (9-22%)							
R.E. low	Farm low (0- 8%)	2	558	55.2	0.117	4.034	3.917
(7-18%)	Farm med. (8-24%)	2	736	18.2	0.210	4.553	4.343
	Farm high (24-77%)	9	1,451	3.8	0.382	4.947	4.565
R.E. med.	Farm low (0- 8%)	1	72	19.8	0.081	4.223	4.142
(18-31%)	Farm med. (8-24%)	1	178	23.6	0.139	4.371	4.232
	Farm high (24-77%)	5	1,174	5.5	0.283	5.170	4.887
R.E. high	Farm low (0- 8%)	4	372	62.9	0.134	4.639	4.505
(31-73%)	Farm med. (8-24%)	4	444	6.3	0.213	5.063	4.850
	Farm high (24-77%)	2	33	13.5	0.424	5.665	5.241
Consumer Loans Medium (22-28%)							
R.E. low	Farm low (0- 8%)	1	139	33.3	0.107	4.300	4.223
(7-18%)	Farm med. (8-24%)	3	722	13.1	0.323	4.662	4.339
	Farm high (24-77%)	2	128	12.8	0.648	5.188	4.540
R.E. med.	Farm low (0- 8%)	4	1,143	32.6	0.137	4.596	4.459
(18-31%)	Farm med. (8-24%)	6	708	24.7	0.206	5.445	5.239
	Farm high (24-77%)	4	637	4.3	0.338	5.775	5.437
R.E. high	Farm low (0- 8%)	5	614	12.0	0.174	4.999	4.825
(31-73%)	Farm med. (8-24%)	6	1,142	5.5	0.160	5.372	5.212
	Farm high (24-77%)	1	61	2.7	0.199	5.562	5.363
Consumer Loans High (28-60%)							
R.E. low	Farm low (0- 8%)	4	262	22.5	0.197	4.908	4.711
(7-18%)	Farm med. (8-24%)	3	213	18.8	0.205	5.152	4.947
	Farm high (24-77%)	4	582	4.6	0.628	6.085	5.457
R.E. med.	Farm low (0- 8%)	3	77	30.6	0.173	4.909	4.736
(18-31%)	Farm med. (8-24%)	5	540	19.4	0.452	6.001	5.549
	Farm high (24-77%)	3	560	2.8	0.311	5.887	5.576
R.E. high	Farm low (0- 8%)	6	632	10.4	0.155	5.439	5.284
(31-73%)	Farm med. (8-24%)	2	234	18.9	0.108	5.120	5.012
	Farm high (24-77%)	—	—	—	—	—	—

Source: Federal Deposit Insurance Corporation.

Farm loans include real estate loans on farm land, loans directly guaranteed by the Commodity Credit Corporation, and other loans to farmers. Real estate loans include those on residential and other properties, and exclude such loans on farm land. Consumer loans consist of the total of instalment and personal loans to individuals.

adjustment made, too, for the effects of variations in regional economic conditions on loss experience.

It may also be possible to infer changes in expected loss experience from differences in interest charges on loans. But the difficulties are formidable. Interest charges presumably reflect, in addition to charges to cover risk and perhaps a premium for risk-bearing, the basic risk-free cost of money, operating expenses incurred in extending and servicing loans, and perhaps other factors. It is only if the factors not connected with risk can be isolated that inferences about expected loss experience may be derived from interest earnings data. In the present cross-section comparison the riskless cost of money is doubtless quite similar for all groups of banks. However, we have not been able as yet to make any adjustments for differences in expenses incurred in making loans of different kind and amount. In particular, interest charges of smaller banks very likely reflect higher costs per dollar of loan from making smaller loans.

The two influences – risk and cost differences – presumably are reflected in the interest earnings rates shown in column 5 of Table 13. This is supported by tests which show for the entire 26 entries in Table 13 a coefficient of rank correlation between interest earnings rates and loss rates of +0.67, and between interest earnings rates and size of bank of −0.68. Furthermore, as expected, the relationship between loss rates and size of bank is somewhat weaker, −0.59. When the interest earnings rates are adjusted for loss experience (column 6), their correlation with size of bank turns out to be −0.61, a relation that presumably reflects the smaller loans and higher expenses per dollar of loan of small banks.

The general tendencies shown in Table 13 are summarized in Table 14 for farm and consumer loans. (Real estate loans are not summarized since their relationship with loss rates were not significant.) Average changes in loss experience (and interest earnings) due to farm loans or to consumer loans are suggested by comparing the changes in the loan ratios by which banks are classified (farm loans in the first three rows and consumer loans in the next three) with those of loss rates and interest earnings in the center columns. The table should not be read too literally, since other loan ratios do not remain completely constant and portfolio categories other than farm, consumer, and real estate loans have not been included in the analysis.

In order to extend and refine the work shown here, it is planned to reclassify the real estate category and to include in the analysis

TABLE 14

SUMMARY OF RELATIONSHIPS OF FARM AND CONSUMER LOANS WITH INTEREST EARNINGS AND LOSS RATES FOR GROUPS OF MEMBER AND NONMEMBER INSURED BANKS, 1953

	Farm Loans	*Consumer Loans*	*Real Estate Loans*	*Av. Loss[a] Rate*	*Av. Int. Earnings[a] Rate*	*Bank Groups*	*Banks*	*Av. Asset Size of Bank*
	(av. % of total loans outstanding)			*(per $100 of loans outstanding)*		*(number)*		*($000,000)*
Farm loans low	3.36	25.02	26.49	0.140	4.576	24	3,237	33.6
Farm loans medium	11.97	24.50	24.84	0.238	5.077	30	4,683	16.2
Farm loans high	33.48	23.04	23.32	0.402	5.535	30	4,624	6.3
Cons. loans low	18.56	17.78	24.80	0.195	4.632	28	4,985	24.4
Cons. loans medium	14.28	24.91	26.66	0.262	5.046	31	5,233	17.3
Cons. loans high	13.50	34.09	24.09	0.279	5.438	30	3,100	16.0

Source: Table 13 and Federal Deposit Insurance Corporation.

[a] Simple averages of the eight corresponding entries in Table 13. Thus the first three rows above are based on simple averages from the appropriate rows of Table 13 for the eight full cells, and show the effect on gross interest earnings and losses of differences in the proportion of farm loans in the portfolio when the proportions of consumer and real estate loans (but not other loans or size of bank) remain substantially constant.

all six of the condition report items listed above. Several additional postwar years will also be included. As was mentioned earlier, the condition report items consist of broad categories of borrowers and leave a number of borrower or loan characteristics undefined within each group. For example, within "commercial and industrial" loans we are also interested in such factors as type of industry, and size and age of business. Since data on borrower and loan characteristics of business and farm borrowers are provided by the Federal Reserve Board's recent surveys of business and farm loans, it would be desirable to tie these in with the condition and earnings report material. Interesting results have been obtained in doing just this from data of the 1955 business loan survey for banks lending in varying degree to small business. These are indicated below in the section on risk and returns in small business financing.

EDWARD J. KILBERG

Agricultural Credit

In studying credit quality in agriculture I have been greatly assisted by the Farm Credit Administration in Washington and by their district office in Springfield, Massachusetts, which serves New England, New Jersey, and New York. Attention is directed toward (1) data on the origin and disposition of Production Credit Association loans by grade of loan, (2) federal land bank and Land Bank Commissioner real estate mortgage delinquency rates, and (3) loan experience data with reference to quality-of-farm classifications of the federal land banks. The past year's work focused mainly on an analysis of the quality of PCA loans in the Springfield district.

Close relationships among PCA loss rates, PCA loan grades, and cash receipts from farming are evident for 1937-56. Aggregative data for the district show a positive correlation between loss rates and the proportion of loans graded by FCA examiners in the lowest category (D); and the correlation between cash receipts from farming and both loss rates and D loans is negative (Chart 6). The relationships of losses to income and to D loans for individual states within the district are shown in Table 15.

GEORGE BRINEGAR

TABLE 15

AVERAGE NET LOSS RATES ON PRODUCTION CREDIT LOANS, IN RELATION TO THE PERCENTAGE OF LOANS CLASSIFIED AS D LOANS AND TO CASH RECEIPTS FROM FARMING, FOR EIGHT NORTHEASTERN STATES, 1937-1956

CASH RECEIPTS FROM FARMING[a]	AMOUNT OF D LOANS AS PERCENTAGE OF ALL OUTSTANDING LOANS											
	0-0.49	*0.50-0.99*	*1.0-1.99*	*2.0-2.99*	*3.0-3.99*	*4.0-4.99*	*5.0-5.99*	*6.0-7.99*	*8.0-9.99*	*10.0-11.99*	*12.0-17.49*	*Total and Average*
	Number of Years by State (upper figure), and Average Net Loss Rate (lower figure)[b]											
Highest quartile	13 0.023	18 0.106	6 0.166	1 0	— —	2 0.183	— —	— —	— —	— —	— —	40 0.093
2nd quartile	13 0.005	16 0.103	8 0.444	2 0.290	1 0.101	— —	— —	— —	— —	— —	— —	40 0.118
3rd quartile	12 0.006	11 −0.003	12 0.103	2 −0.107	1 0.660	— —	1 0.148	— —	1 0.839	— —	— —	40 0.063
Lowest quartile	— 0	2 0.017	3 0.006	4 0.148	6 0.099	9 0.294	3 0.942	5 3.230	2 0.384	3 1.401	3 1.225	40 0.788
Total & average	38 0.011	47 0.076	29 0.212	9 0.118	8 0.108	11 0.274	4 0.744	5 3.230	3 0.535	3 1.401	3 1.225	160 0.273

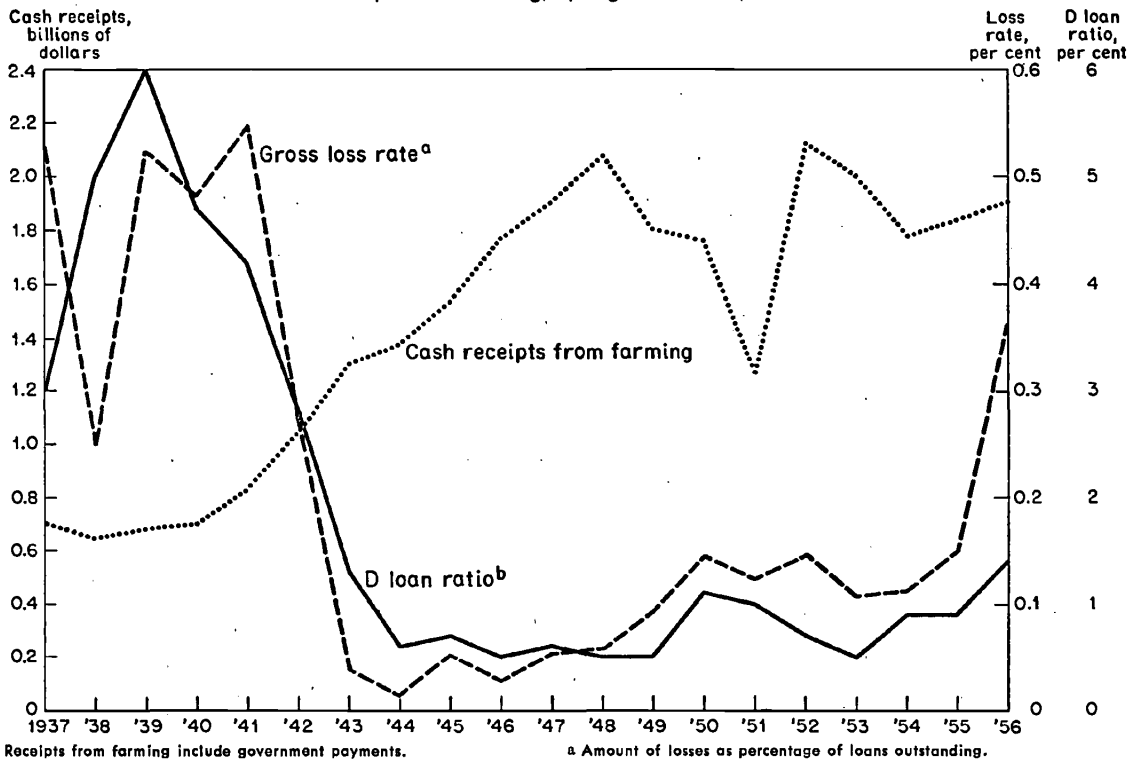
The states included are: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, and New Jersey.

a Including government payments. Annual receipts in each state for the twenty years covered were arrayed and divided into quartiles, each with 40 observations (five annual observations from each of the eight states).

b Amount of losses net of recoveries as percentage of loans outstanding. A negative figure means that recoveries exceeded losses.

CHART 6

D Loan Ratios and Loss Rates of Production Credit Associations, and Cash Receipts from Farming, Springfield District, 1937-1956



Receipts from farming include government payments.

a Amount of losses as percentage of loans outstanding.

b Amount of D loans as percentage of loans outstanding.

Consumer Credit

This study is an outgrowth of the report, "Changes in the Quality of Consumer Credit," by Geoffrey H. Moore, Thomas R. Atkinson, and myself, prepared for the Federal Reserve Board's study of *Consumer Instalment Credit* published in March 1957. We showed the possibility of predicting changes in loan collection experience from changes in the distribution of long-maturity and low-downpayment loans; demonstrated the importance of certain borrower characteristics in determining prospective loan quality; and considered the degree to which collection experience was affected by employment and income fluctuations.

A cross-sectional analysis designed to test and extend the results of the previous aggregative study supports, for the most part, the earlier conclusions.

Two of the largest sales finance companies were the chief source of data – on total dollar volume and number of new and used auto loan accounts purchased, on loan terms, and on collection experience (delinquency, repossession, and loss rates, and frequency of extensions). On a quarterly basis, 1953-56, for twelve metropolitan areas, I examined simultaneously changes in loan maturities, downpayment requirements, and employment in the following quarter to see whether a systematic pattern in collection experience would emerge. Such simultaneous analysis had not previously been possible. Among the findings are:

1. Much of the variation in collection experience can be explained by current or recent changes in employment.

2. When the percentage of loans with low downpayment requirements and long maturities increases, subsequent collection experience worsens. In the years studied, the poorest collection experience was usually found in areas where terms had been eased most.

3. In general, for any given degree of term-easing, the repossession rate is higher if employment declines after loan purchase than if it rises.

4. Downpayment percentage seems to be a somewhat better indicator of subsequent collection difficulty than is loan maturity.

5. The conclusions as to downpayments hold for both new and used autos. In the case of used-car loans, however, collection experience is somewhat better for the longer maturities. This has been found in other studies, too, and is apparently explained by the tendency for long maturities to be offered largely on higher-priced used cars and to better credit risks.

Another focus of the study is the relationship between loan terms, borrower characteristics, and collection experience. Regional data on loan terms and on borrower's age, sex, marital status, monthly income, ratio of monthly payment to monthly income, and occupation have been acquired for half a dozen ten-day sample periods between 1953 and the present, and are being examined by chi-square analysis.

PHILIP A. KLEIN

RISKS AND RETURNS IN SMALL BUSINESS FINANCING

There are some grounds for belief that in periods when business activity is increasing and monetary policy is becoming more restrictive, small business firms are faced with greater restrictions on their use of credit than large business firms. Yet when lenders are questioned about their policies, they frequently contend that their institutions are meeting the needs of all *creditworthy* borrowers. This project is an attempt to determine whether deteriorating creditworthiness of small firms relative to large firms is a significant factor in more restricted use of credit by small firms in such periods.

The work was undertaken in September 1957 at the request of the Board of Governors of the Federal Reserve System, as one part of their broad investigation of small business financing. It complements in many ways the study of the quality of credit in booms and depressions, reported above. A preliminary report on credit risks in the small business area has been submitted to the Federal Reserve, and by them to the several Congressional committees concerned with the subject (see *Financing Small Business,* Report to the Committees on Banking and Currency and the Select Committees on Small Business, U. S. Congress, by the Federal Reserve System, April 11, 1958, Part 1, Vol. I, pp. 40-106, 1958). We intend to prepare a more comprehensive report by the end of the year. Among those who assisted with the first report are Victor Zarnowitz and Elizabeth Simpson, of the National Bureau, and Donald P. Jacobs of Northwestern University.

We find, tentatively, that small business firms typically experience a greater incidence of financial difficulty than do large firms. One interesting indication of this is in rates of business firm discontinuances as developed from Department of Commerce estimates for 1949 and 1950:

Size of Firm	*Discontinuance Rate*[a]
0-3 employees	8.6%
4-7	5.1
8-19	4.1
20 or more	0.3
All size classes	7.5%

[a] Annually; i.e., one-half of the number of firms discontinuing operations in 1949-1950, as a percentage of the number in operation on January 1, 1949.

Further evidence is found in data on loan experience.

Composite credit appraisals by credit rating agencies, and measures of credit standing such as financial ratios, both reflect the somewhat larger hazards involved in lending to small than to large business. Moreover, what evidence we have found indicates that both types of information are of considerable usefulness as indicators of prospective credit quality. To mention but one example: Among RFC direct business loans outstanding on December 31, 1951, only one-half of one per cent by dollar amount of the loans to borrowers who were in

the highest rating grade at time of borrowing went into default, compared to 20.46 per cent of the loans in the lowest grade. At the same time, there was no marked tendency *within* any given agency rating grade for small concerns to have higher default rates than large concerns. Together with other evidence, this suggests that methods of determining creditworthiness commonly used by lenders have a considerable basis in experience. Moreover, since loss experience on the whole has been worse with loans to small concerns, it appears that lenders deliberately adopt somewhat lower credit standards in lending to small firms than to large ones.

In the recent expansion in business activity, financial ratios measuring liquidity and debt positions deteriorated relatively more for small firms. Since these ratios were found to be of some value in portending financial difficulty it appears, on the basis of preliminary evidence, that small firms suffered some loss in creditworthiness relative to large firms, as measured by objective standards. This tentative conclusion is supplemented by our tabulations of bank statement studies by the Robert Morris Associates. They indicate that in industries in which small firms obtained less bank credit while large firms obtained more credit from 1955 to 1956, the financial ratios of the small firms were not only generally less satisfactory than those of the large firms but also were poorer than those of the small firms in other industries. They also indicate that small firms obtained increases in bank credit as frequently as large firms only when they had high financial ratios.

Commercial banks lending extensively to small business firms in 1955, on the average, had somewhat higher loan loss rates than did other banks, according to an analysis of a sample of 138 member banks believed to be representative of all except the extremely large banks. This was true even after allowance was made for bank size and loan portfolio composition, as the accompanying table shows.

Not only the bank loan data cited above but also evidence from the corporate bond field suggests that higher loss rates on obligations of small business firms do not entirely account for the higher rates of interest earned on credit extended to small versus large firms. Higher expenses of loan origination and servicing per dollar of loan on smaller loans undoubtedly account for a sizable proportion of the discrepancy in the bank lending area, but positive findings on this point await the results of work in progress.

GEOFFREY H. MOORE
THOMAS R. ATKINSON
EDWARD J. KILBERG

OTHER STUDIES

The following reports were published:

Federal Lending and Loan Insurance, by R. J. Saulnier, Harold G. Halcrow, and Neil H. Jacoby, is directed to one aspect of the rising tide of governmental activities – the extension of credit by the federal government or by organizations it sponsors, and government insurance or guarantee of loans made by private financial agencies. The report shows how the various credit programs developed over the past thirty-five years and where they stand today. The services offered and the experience

LOANS TO SMALL BUSINESS AS PERCENTAGE OF TOTAL LOANS	BANKS CLASSIFIED TO ALLOW FOR DIFFERENCES IN: SIZE OF BANK		LOAN PORTFOLIO COMPOSITION	
	No. of banks	*Average loss rate*[a]	*No. of banks*	*Average loss rate*[a]
0-12.49%	22	9.4	31	8.1
12.50-24.99%	60	12.6	56	12.7
25.00% and over	38	22.5	27	22.6
All classified banks	120	15.5	114	15.3
All banks	138	14.6	138	14.6

[a] Cents per $100 of loans outstanding.

of the federal government as a lender are described, and the impact of government credit activities on private finance and on the economy generally is analyzed. A summary of the book, entitled *Federal Lending: Its Growth and Impact* was published as Occasional Paper 58.

Corporate Bond Quality and Investor Experience, by W. Braddock Hickman, drawing upon a virtually complete census of domestic corporate bond issues since 1900, examines prospective measures of bond quality against actual investment performance. It traces movements in the volume of high-grade and low-grade securities as selected by investment agencies, by the securities market, and by state authorities that rule on eligibility for savings bank investment; also, of bonds classified by earnings ratios, lien position, and size of issue and of obligor. For the various groups of bonds, the author analyzes default rates, rates of capital gain or loss, and rates of realized return over the life spans of the issues from offering to extinguishment and during shorter assumed periods of investment, so that the effects of cyclical and long-run changes in economic conditions are revealed. A summary of the main findings was issued as Occasional Paper 59, *Corporate Bonds: Quality and Investment Performance.* A supplementary volume, "Statistical Measures of Corporate Bond Characteristics and Experience," is being prepared.

Suggestions for Research in the Economics of Pensions summarizes what is known of the economic structure of public and private pension programs, points out the important economic problems raised by their rapid and continuing growth, and suggests how economists can develop the knowledge needed to cope with such problems.

Patterns of Farm Financial Structure: A Cross-Section View of Economic and Physical Determinants, by Donald C. Horton, analyzes the roles of landlord, other creditor, and equity funds in financing agricultural production, and reveals how they are related to particular combinations of physical and economic factors in different kinds of farming.

Bank Stock Prices and the Bank Capital Problem, Occasional Paper 54, by David Durand, analyzes bank stock prices and the cost of bank equity capital and examines systematically the ratio of price to book value during 1946-53. Estimates of the rates of earnings and dividends required in each year to support bank stocks at book value are developed for banks in New York City, large banks outside New York, and other groups of banks.

Consumer Instalment Credit: Conference on Regulation was published by the Board of Governors of the Federal Reserve System as part of its broad study of regulation in this field.

International Financial Transactions and Business Cycles, by Oskar Morgenstern, is in press.

Other new publications and reports on studies in progress that deal with banking, investment and finance are to be found in Section 1. A study of the money supply is reported in Section 2, a study of governmental credit policies for housing is reported in Section 5, and a study of international capital movements is reported in Section 6.

Two new studies of the public and private pension systems and their bearing on investment, savings, and the distribution of income are described briefly in Part One, Section 3.

5. *Governmental Activity and Finances*

GOVERNMENT CREDIT POLICIES FOR HOUSING AND ECONOMIC STABILITY

In the few months since I joined the staff I have begun research into several aspects of national housing policies which, during 1953-57, became acute problems in the conduct of economic stabilization policies. While they concern housing credit, the issues involved are at the same time of more general significance, for they illuminate some of the difficulties that can result from the federal government's dual commitment to help maintain economic stability and to advance social programs exemplified by housing. Among the issues are:

1. The relationship between sector stability and aggregate economic stability, and the criteria on which policy decisions affecting the composition of total output may be based.

2. The rationale for and effectiveness of the selective controls on housing credit invoked in 1955, which operated mainly through an increase in minimum downpayments and a reduction in maximum maturities of government-underwritten loans and through restraints on borrowings from the Home Loan Banks. This series of measures represented the first peacetime application of nation-wide controls of this type, apart from margin requirements for the purchase of securities and the brief episode of consumer credit regulation in 1948-49.

3. The shift in 1956 and 1957 from selective controls to policies for cushioning the impact of tight financial markets on home building and home purchase – mainly through massive purchases of mortgage loans by the Federal National Mortgage Association – and the relation of these policies to the Federal Reserve program of general restraint.

4. The role of rigid maximum interest rates on government-underwritten mortgage loans and of similar legislative restrictions in accentuating the decline in residential building from 1955 to 1957, and, more generally, in adding to instability in the housing sector both during expansions and contractions.

These and related policy issues will be analyzed against the background of the marked fluctuations in residential building and mortgage lending during 1953-57, which can probably be portrayed as a short cycle, and in light of legislative changes as well as economic forces affecting the fluctuations. An attempt will be made to extract from the data better insight into significant time lags in the complex process of financing and building residences, to sort out the factors associated with the expansion of homebuilding during 1954 and the contraction thereafter, and to examine the bearing of postwar institutional developments (such as the growing practice of forward commitments by mortgage lenders and their use of commercial bank credit) on both the fluctuations in residential construction and the governmental efforts to moderate them.

LEO GREBLER

THE INDIVIDUAL INCOME TAX

The federal individual income tax is by far the biggest single source of tax revenue in the United States. In 1956 it raised $32 billion, or about 47 per cent of the net budget receipts of the federal government. All other tax sources of federal, state, and local governments ranked well behind: the federal corporation income tax yielded $21 billion, and the aggregate of all state and local government taxes, $26 billion.

In our study of the revenue structure of the income tax, we examine how fluctuations in individual incomes as conceived for tax purposes are related to changes in total personal income; the central importance of the level of the personal exemptions and the allowable personal expense deductions in determining the coverage and yield of the tax; the changing composition of income for tax purposes, with special attention to several of the principal components; the rate structure, and the changing distribution of income taxes among the different income groups.

With minor exceptions, the basic statistical materials have been assembled for all parts of the study. One segment, that on interest in-

come, has been published (*Interest as a Source of Personal Income and Tax Revenue,* Occasional Paper 53.) The manuscript of another segment, that on the personal expense deductions (by C. Harry Kahn) has been approved by the Directors for publication. Two others, those on the personal exemptions and on dividend income, are nearly ready. We hope to fill out most of the remaining ones during the year.

There are substantial differences between personal income as conceived and measured by the Department of Commerce for the purpose of the national income accounts, and the tax law's measure of individual incomes. The latter is what the law now calls adjusted gross income. With the exception of certain exclusions, it is essentially the net money income of individuals before their personal exemptions and allowable personal expense deductions. It includes a number of items that are *not* included in personal income as measured by the Department of Commerce. The most important are gains and losses from the sale of property, and employee contributions for social security. On the other hand, it *excludes* a much larger aggregate amount of income components that are included in the Commerce measure of personal income. The largest are transfer payments, such as social security benefits; income in kind, such as the imputed rental value of owner-occupied homes; "imputed" interest, which is property income retained by life insurance companies and mutual financial intermediaries for the account of persons, plus the value of financial services received by persons without explicit payment; "other labor income," such as employer contributions to private pension and welfare funds, and nontaxable military pay and allowances.

Building upon prior work by Selma Goldsmith[1] and Joseph Pechman,[2] we constructed annual estimates of the total adjusted gross income of all individuals, taxable and nontaxable, for the years beginning with 1918 (Table 16, column 1) and compared them with Simon Kuznets' estimates of individuals' income receipts in 1918-29,[3] and the Commerce estimates of personal income for the years 1929-52[4] (column 2). As a statutory entity, adjusted gross income dates only from 1944, but comparable figures for the earlier years were estimated on the basis of the statutory provisions then in effect.

Despite substantial fluctuations in some of the components not common to the two series, the movements of personal income and adjusted gross income have been roughly proportional, if allowance is made for changes in law. This is hardly surprising, for the two measures have a predominantly common content, and their varying exclusions of income components have been partly offsetting.

Some differences apparent in columns 1 and 2 are traceable to factors no longer operative. The sharp rise in the ratio of adjusted gross income to personal income after 1938 resulted from the repeal of tax exemption for wages and salaries paid by state and local governments. The noticeable fall in the war years resulted from the expansion of nontaxable military pay. The narrower spread between the two series in 1918-29 than in the years immediately following reflects the use of a more restricted measure of personal income for the earlier years.

If rough adjustments are made accordingly, the relationship between personal and adjusted gross income becomes remarkably stable throughout, except in years when capital gains and losses bulked large (column 6).

Adjusted gross income, as corrected, ranged between 87.7 and 90 per cent of personal income in most years. The proportion rose above 90 per cent in the years of exceptionally large capital gains, 1924-29 (and in 1943 and 1944, when our correction for the abnormal amount of nontaxable military pay was doubtless imprecise). It fell below 87.7 per cent

[1] "Appraisal of Basic Data Available for Constructing Income Size Distributions," in *Volume Thirteen,* Studies in Income and Wealth.

[2] "Yield of the Individual Income Tax during a Recession," in *Policies to Combat Depression,* Special Conference Series 7, pp. 123-145, and unpublished estimates and work-sheets.

[3] *Shares of Upper Income Groups in Income and Savings,* General Series 55, pp. 570-571, 576-577.

[4] *Survey of Current Business,* Dept. of Commerce, July 1955, national income issue.

TABLE 16

RELATION BETWEEN PERSONAL AND ADJUSTED GROSS INCOME

(billions of dollars, and percentage ratios)

Year	Personal Income[a]	Adjusted Gross Income[b]	Ratio of Col. 2 to Col. 1	Reconstructed Personal Income[c]	Reconstructed Adjusted Gross Income[d]	Ratio of Col. 5 or 2 to Col. 4 or 1
	(1)	(2)	(3)	(4)	(5)	(6)
1918	55.2	50.3	91.1	59.0	51.7	87.7
1919	63.1	57.5	91.1	67.5	59.2	87.7
1919	63.7	58.5	91.8	68.1	60.1	88.2
1920	66.9	60.9	91.0	71.5	62.7	87.7
1921	53.3	47.0	82.2	56.9	49.1	86.3
1922	57.3	51.8	90.4	61.3	54.1	88.3
1923	66.5	60.9	91.6	71.0	63.3	89.1
1924	66.9	62.0	92.7	71.6	64.6	90.3
1925	70.8	67.1	94.8	75.7	69.8	92.3
1926	73.7	69.4	94.2	78.8	72.3	91.8
1927	74.1	70.1	94.6	79.2	73.3	92.5
1928	75.9	73.5	96.8	81.2	76.8	94.6
1929	80.2	76.0	94.8	85.8	79.4	92.6
1929	85.8	75.6	88.1		79.2	92.3
1930	76.9	62.2	80.9		66.0	85.9
1931	65.7	49.0	74.6		52.9	80.5
1932	50.1	37.0	73.9		40.7	81.7
1933	47.2	36.4	77.1		40.1	84.9
1934	53.6	44.1	82.3		48.1	89.8
1935	60.2	48.4	80.4		52.8	87.6
1936	68.5	57.7	84.2		61.5	89.8
1937	73.9	61.6	83.4		65.6	88.8
1938	68.6	55.6	81.0		59.9	87.3
1939	72.9	64.7	88.8			88.7
1940	78.7	70.2	89.2			89.2
1941	96.3	85.1	88.4			88.4
1942	123.5	107.2	86.8		109.0	88.3
1943	151.4	129.0	85.2		137.3	90.7
1944	165.7	137.5	83.0		150.4	90.8
1945	171.2	140.2	81.9		153.5	89.6
1946	178.0	156.1	87.7		158.8	89.2
1947	190.5	171.6	90.1			90.0
1948	208.7	184.8	88.5			88.5
1949	206.8	184.3	89.1			89.1
1950	227.1	201.4	88.7			88.7
1951	255.3	226.6	88.8			88.7
1952	271.1	240.6	88.7			88.8

[a] For 1918-29, Simon Kuznets, *Shares of Upper Income Groups in Income and Savings,* General Series 55, pp. 570-571. For 1929-52, *Survey of Current Business,* Dept. of Commerce, July 1955, national income issue.

[b] Estimated.

[c] Column 1 figures for 1918-29 raised by 6.894 per cent, the fraction by which the Commerce Department's personal income estimate for 1929 exceeds Kuznets' estimate of income receipts for that year.

[d] Column 2 figures increased by the amounts of tax-exempt interest on state and local government obligations in 1918-38, and of estimated abnormal nontaxable military pay in 1942-46 (abnormal in comparison to the 1947-48 average).

only in the depression of the thirties, when capital losses were heavy. The remarkably narrow range of the proportion since 1948 is due in good measure to the absence of great fluctuations in the annual amounts of capital gains and losses: the net gains rose in each year between 1947 and 1952, but the amounts were relatively much smaller, in relation to personal and adjusted gross income, than in the late twenties. Indeed, the absolute amount of gains from sales of property in the peak year between 1947 and 1952 was substantially less than in 1928.

A severe depression, which now would presumably involve substantial increases in social security payments and reduced employee contributions, as well as reduced capital gains and increased capital losses, would probably interrupt the recent stable relationship. Adjusted gross income would tend to decline more sharply than personal gross income. A greater relative reduction in income tax liability than in personal income would probably result, producing a counter-cyclical influence.

LAWRENCE H. SELTZER

Entrepreneurial Income

During the past year I completed revisions of the monograph on "Personal Deductions in the Individual Income Tax," and the Directors approved it for publication. Now I have resumed work on another phase of the personal income tax study, that deals with the taxation of entrepreneurial income (farm operators, self-employed professional persons, and unincorporated business) under the income tax. I am concentrating on:

1. A quantitative historical account of the importance of entrepreneurial income as a component of personal income and taxable income.

2. Changes since 1939 in the coverage of entrepreneurial income on tax returns by farm and nonfarm components and with reference to changes in tax rates.

3. The share of tax liability borne by entrepreneurial income.

Table 17 presents some preliminary figures on the coverage of entrepreneurial income on tax returns. In recent years the relative coverage appears to have been over twice as great for nonfarm as for farm entrepreneurial income. It cannot be concluded from these figures, however, that farm income is reported less accurately than nonfarm enterprise income. At least two additional steps are necessary before any judgment can be made on this point. First, the relative importance of exemptions and deductions for both groups should be taken into account. Probably a larger proportion of farm than of nonfarm income goes unreported because of the size of exemptions and deductions, since the farm income distribution is pitched at a lower level than the nonfarm. A second factor – more difficult to evaluate – is the possible bias introduced by the different sources for the estimates of *total* farm and of nonfarm entrepreneurial net money income. The former is based on Department of Agriculture figures, which are independent of the tax return data. Total nonfarm income is based on Commerce Department estimates, which are not entirely independent of tax return data.

While these two as yet unevaluated factors may explain some of the differences in the level of coverage, they are less likely to help explain the difference in trend. Coverage for the nonfarm sector has been rising continuously from 1939 to 1953. That for the farm component remained almost constant from 1941 to 1947 (after a spectacular rise from 1939 to 1941) even while net money income from farming was rising from $4.6 billion to a peak of $14.2 billion and although exemptions were lowered.

C. HARRY KAHN

Dividends

As presently planned, the report on dividends under the income tax is to be a fairly brief document that will cover the following topics:

1. The tax rates to which dividends and their pre–corporate-tax counterpart have been subject.

2. The importance of dividends as a component of taxable income and source of tax revenue.

3. The degree to which dividend receipts show up on tax returns.

4. Consideration of the size distribution of dividends, the number of dividend recipients, and the relief provisions of the Internal Revenue Code of 1954.

Most of the necessary data have been assembled, and a draft of the report is well along. Much of what I intend to say under (3) above appeared in a paper delivered at the annual meeting of the American Finance Association.

DANIEL M. HOLLAND

STATE AND LOCAL GOVERNMENT EXPENDITURES

The Census Bureau in 1955 made available, through extensive reclassification and recasting of previously collected data, the statistical basis[5] for a study of major trends and patterns in state and local expenditures since 1902. Comparable data are now at hand for the years 1902, 1913, 1922, 1927; biennially from 1932 through 1952; and annually from 1953 through 1956. Total expenditures are reported separately for state and for local governments, and for both levels direct expenditures are broken down by function and by object. In addition, state payments to local units are reported for each year, both in total and classified by major purpose.

Except during the depression of the 1930's and World War II, direct general expenditures of state and local government have increased steadily since 1902. From a level of just over

[5] *Historical Statistics on State and Local Government Finances, 1902-1953*, Bureau of the Census, 1955. Data for the years 1954, 1955, and 1956 are presented in *Summary of Governmental Finances in 1956*, Bureau of the Census, 1957.

TABLE 17

FARM AND NONFARM ENTREPRENEURIAL INCOME REPORTED ON TAX RETURNS, AND TOTAL ENTREPRENEURIAL INCOME: SELECTED YEARS, 1939-1953

(*dollar figures in billions*)

	1939	*1941*	*1943*	*1945*	*1947*	*1949*	*1953*
			Income Reported on Individual Tax Returns				
1. Farm net income	0.2	1.9	3.9	3.8	5.9	4.8	3.8
Sole proprietors	0.1	1.6	3.5	3.3	5.2	4.3	3.4
Partnerships	0.1	0.2[a]	0.4[a]	0.4	0.7	0.6[a]	0.4
2. Nonfarm net income	3.9	6.6	11.8	15.1	16.9	17.1	21.6
Sole proprietors	2.4	4.6	7.2	8.7	9.9	10.2	13.6
Partnerships	1.5	2.0[a]	4.6[a]	6.3	7.0	6.9[a]	8.0
3. Total	4.0	8.5	15.7	18.8	22.8	21.9	25.4
			Total Net Money Income of Unincorporated Businesses				
4. Farm	3.1	4.6	9.5	10.3	14.2	11.1	11.4
5. Nonfarm	6.8	10.6	15.8	17.8	19.8	19.5	24.5
6. Total	9.9	15.3	25.3	28.2	34.1	30.6	36.0
			Tax Return Coverage (percentage ratio of income reported on tax returns to net money income)				
7. Farm	5.2	40.1	41.3	36.6	41.1	43.3	33.3
8. Nonfarm	56.8	72.0	74.7	84.4	85.4	87.9	88.0
9. Total	40.7	55.3	62.2	66.9	66.9	71.7	70.6

[a] Estimated.

Detail may not add to totals because of rounding. Lines 1-3 are from *Statistics of Income*. Line 4, from *The Farm Income Situation*, Agricultural Research Service, July 1957. Figures are farm cash receipts minus production expenses, but including taxes, interest, and depreciation on farm dwellings. Line 5, from *National Income Supplement, 1954, Survey of Current Business*, Department of Commerce. Figures are for income of unincorporated enterprises before inventory valuation adjustment, minus estimated amounts of income in kind and patronage refunds and stock dividends paid by farmers' cooperatives.

one billion dollars in the latter year, they expanded eightfold by 1932. They changed comparatively little from then through World War II. But by 1956 their level was some five times as high as it had been in 1932.

Dramatic as this expansion may seem, it is far less startling when viewed against the background of growth in the economy, as measured by gross national product. State-local expenditures represented about 5 per cent of GNP during the first decade of the century, compared with 8.4 per cent for the five-year period 1952-56, and 9.1 per cent in 1956. Deflating for the rise in both population and prices, we find that the increase in expenditures, from $7.8 billion in 1932 to $36.7 billion in 1956, becomes an increase of much smaller proportions ($109 to $152) when measured in terms of per capita 1947 dollars.[6]

Expenditures for education have absorbed the largest share of total state-local expenditures throughout the period. They rose from a level of $255 million in 1902 to $13.2 billion in 1956, or from 25 to 36 per cent of the total. Streets and highways, the second most important functional category, expanded at about the same rate as total expenditures, over the half century. Public welfare and health and hospitals have increased substantially in relative importance while all other major functional categories except "natural resources" declined, including the traditionally leading functions of local governments – police and fire protection and sanitation.

In examining state-local expenditures classified "by character and object," we find that capital outlays tended to absorb about 25 to 30 per cent of total expenditures except during years of severe depression and during World War II. "Assistance and subsidies," essentially transfer payments, are some five times larger as a proportion of total expenditures than they were in 1902, but have been declining steadily in relative terms since 1948. Finally, interest on debt is less than half as large a proportion of total expenditures as in 1902, and has dropped from more than 10 per cent of the total in 1932 to 3 per cent in 1956.

Further research will involve analyses of the trends indicated above, of the changing roles of state and local governments with respect to major functions, and of the nature and importance of intergovernmental transfers. I hope to obtain insights that will be useful, also, in planning a study of factors associated with differences among the states in levels of expenditure – looking toward the data to be provided by the 1957 Census of Governments.

HARVEY E. BRAZER

BRITISH GOVERNMENT EXPENDITURE, 1890-1954

I have prepared a manuscript in collaboration with Jack Wiseman, and will shortly submit it for staff review.

The book has three aims. First, to fill a gap in the available information about the British economy; the statistics of British government expenditure for the period since 1890 have not previously been made available in a single convenient source and in a form suitable for interpretation by economists. Second, to relate our statistics in a general way to the economic history of the period; we hope to have made a modest contribution to the understanding of the economic development of Britain during the first half of the century. Third, by relating the time-pattern of government expenditure statistics and the facts of British history, to develop hypotheses that may be generally useful in the explanation of the evolution of government expenditure in other countries and at other times. We do not profess to have discovered "laws" of government expenditure, and are not particularly impressed with the ones that have been formulated by other writers. But we do believe that there is an approach to the study of government income and expenditure more rewarding than those at present suggested by a study of economic analysis or of public finance. We also present, in a final chapter, some speculations about the trends of British government expenditure in

[6] State-local expenditures are deflated by application of the Department of Commerce "Implicit Price Deflators for Gross National Product by Major Segments, 1929-56," *Survey of Current Business*, July 1957, p. 25.

the near future – to be taken rather as a *jeu d'esprit* than as the end-result of an impeccable analysis. We do not pretend that we can forecast wars or earthquakes, and surely he who would forecast government expenditure would have to face such tasks.

No one of these aims can be satisfactorily pursued without some discussion of techniques and background. That is the work of Chapter I (on statistical techniques and methods) and Chapter II (on some theories of government expenditure growth, including the hypotheses that we test in subsequent chapters).

Our basic series are offered in Chapter III. They compare the growth in government expenditure and in government resource-use, etc., with the growth in national product, and help to elucidate the nature of the time-pattern of expenditure growth as well as its absolute size. Chapter IV gives a different breakdown of the global statistics. Governments render many different types of service, ranging from the provision of defense and law and order to the subsidizing of agriculture or the provision of free false teeth for foreign citizens. This chapter considers the changes that have occurred in the volume and time-pattern of British government expenditure on particular functions of government.

We advance reasons in Chapter II for expecting certain changes over time in the areas of responsibility of central and local authorities for public expenditures. Chapter V, from the relevant statistics, elaborates and tests that hypothesis (the "scale effect"), as well as others discussed in earlier chapters. To follow this up by examining the "industrial" activities of the British government (i.e. what are now called the nationalized industries) apart from its other functions was not possible over the whole period. But a work of this character would be incomplete without some examination of these increasingly important enterprises, and we have attempted to evaluate the impact of nationalization on the economy statistically in Chapter VI, for the small part of the period that could be examined. Finally, Chapter VII discusses the problems of forecasting the future of government expenditure and presents our own suggestions for Britain.

ALAN T. PEACOCK

OTHER STUDIES

The following reports dealing with governmental activities, described elsewhere in this report, were published:

The Growth of Public Employment in Great Britain, by Moses Abramovitz and Vera F. Eliasberg.

Federal Lending and Loan Insurance, by R. J. Saulnier, Harold G. Halcrow, and Neil H. Jacoby.

Consumer Instalment Credit: Conference on Regulation.

Suggestions for Research in the Economics of Pensions, which deals with both public and private pension programs.

The following manuscripts are in preparation:

"Trends in Government Financing," by Morris Copeland (see Section 1).

"Cyclical Behavior of Federal Receipts and Expenditures, 1879-1954," by John M. Firestone (see Section 2).

"The Postwar Market for State and Local Government Securities," by Roland I. Robinson (see Section 4).

6. *International Economic Relations*

STRUCTURE OF WORLD TRADE AND PAYMENTS

A list of preliminary reports of the study, which is being undertaken with the assistance of a grant from The Ford Foundation, was given in the 37th Annual Report. Robert M. Lichtenberg's Occasional Paper, *The Role of Middleman Transactions in World Trade,* is in press. Abstracts of Herman F. Karreman's paper, "World Transportation Account, 1950-1953," and of mine, "Transactions between World Areas in 1951," and comments on them, which were contributed to the Universities–National Bureau Committee Conference in April 1956, were published in the proceedings of the Conference issued as a supplement to the February 1958 issue of the *Review of Economics and Statistics* entitled *Problems in*

TABLE 18

COMBINED TOTALS OF TRANSACTIONS, WORLD TRADE AND PAYMENTS ACCOUNTS OF ALL COUNTRIES, 1950-1954

(debits, credits, and net balance in millions of U.S. dollar equivalents and net balance as a per cent of gross transactions)

			SERVICES			
	Goods and Services	*Merchandise (f.o.b.)*	*Total*	*Transportation*	*Travel*	*Investment Income*
1950						
Gross credits	72,980	57,364	15,616	5,195	1,938	4,464
Gross debits	72,775	56,142	16,633	5,766	1,991	4,553
Net balance	205	1,222	—1,017	—571	—53	—89
% net to gross[a]	0.28	2.15	—6.31	—10.42	—2.70	—1.97
1951						
Gross credits	97,001	76,808	20,193	7,428	2,188	5,304
Gross debits	98,210	75,774	22,436	8,556	2,383	5,490
Net balance	—1,209	1,034	—2,243	—1,128	—195	—186
% net to gross[a]	—1.24	1.36	—10.52	—14.11	—8.53	—3.45
1952						
Gross credits	95,083	73,411	21,672	7,915	2,328	5,262
Gross debits	96,727	73,239	23,488	8,846	2,489	5,353
Net balance	—1,644	172	—1,816	—931	—161	—91
% net to gross[a]	—1.71	0.23	—8.04	11.11	—6.68	—1.71
1953						
Gross credits	94,706	72,521	22,185	7,155	2,635	5,473
Gross debits	95,518	71,309	24,209	7,695	2,784	5,772
Net balance	—812	1,212	—2,024	—540	—149	—299
% net to gross[a]	—0.85	1.68	—8.72	—7.27	—5.50	—5.32
1954						
Gross credits	100,902	76,994	23,908	7,492	2,970	5,944
Gross debits	100,810	75,051	25,759	8,070	3,068	6,079
Net balance	92	1,943	—1,851	—578	—98	—135
% net to gross[a]	0.0091	2.56	—7.45	—7.43	—3.25	—2.25
Total, 1950-54						
Gross credits	460,672	357,098	103,574	35,185	12,059	26,447
Gross debits	464,040	351,515	112,525	38,933	12,715	27,247
Net balance	—3,368	5,583	—8,951	—3,748	—656	—800
% net to gross[a]	—0.73	1.58	—8.28	—11.36	—5.30	—2.98

[a] Ratio of net to mean of gross credits and debits.

International Economics. I served as editor of the supplement. In the middle of the year, Walther Michael began a study of capital movements between world areas on which he reports below.

We have now combined our eighty or so country accounts by area and have a set of 150 two-valued matrixes showing transactions of different types between world areas for each of the five years 1950-54 and the five years as a whole. This body of statistics provides the basis for an analysis of the structure of world trade and payments on which I have been working most of the year and expect to continue to work on through much of 1958.

For the five years as a whole we added gross goods and services credits (exports), and find they agree closely with total debits (imports) – within a fraction of 1 per cent. The record is subject to systematic errors resulting from misclassification of transactions and shows a marked tendency for exchange to disappear

TABLE 18

COMBINED TOTALS OF TRANSACTIONS, WORLD TRADE AND PAYMENTS ACCOUNTS OF ALL COUNTRIES, 1950-1954

(debits, credits, and net balance in millions of U.S. dollar equivalents and net balance as a per cent of gross transactions)

	SERVICES					
	Government Transactions	*Miscellaneous Services*	*Transfers (net)*	*Capital (net)*	*Gold (net)*	*Uncompensated Error (net)*
1950						
Gross credits	1,278	2,741				
Gross debits	1,814	2,509				
Net balance	—536	232	—261	306	132	—382
% net to gross[a]	—34.68	8.84				
1951						
Gross credits	2,028	3,245				
Gross debits	2,691	3,316				
Net balance	—663	—71	—218	1,067	489	—129
% net to gross[a]	—28.10	—2.16				
1952						
Gross credits	2,818	3,349				
Gross debits	3,577	3,223				
Net balance	—759	126	—299	779	396	768
% net to gross[a]	—23.74	3.83				
1953						
Gross credits	3,292	3,630				
Gross debits	4,306	3,652				
Net balance	—1,014	—22	—373	869	397	—81
% net to gross[a]	—26.69	—0.60				
1954						
Gross credits	3,193	4,309				
Gross debits	4,374	4,168				
Net balance	—1,181	141	—450	270	293	—205
% net to gross[a]	—31.21	3.33				
Total, 1950-54						
Gross credits	12,609	17,274				
Gross debits	16,762	16,868				
Net balance	—4,153	406	—1,601	3,291	1,707	—29
% net to gross[a]	—28.28	2.38				

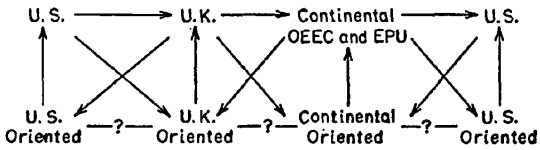
[a] Ratio of net to mean of gross credits and debits.

into hidden reserves at times of economic crisis. Table 18 shows credits and debits for the different types of transactions emerging from our set of accounts, and Chart 7 shows the marked cyclical behavior of divergences in the goods and services, transfer, capital, gold, and error accounts over the period. The five years were characterized by the outbreak of "little" war in Korea, the threat of "big" war when the Chinese came in, and the subsequent subsidence of the war scare. A truce was arranged late in the period. The emergence and resolution of crisis in world confidence is reflected in the Belgian free market price of gold sovereigns, also plotted on the chart.

By joining the results of an analysis of countries trading principally with the United States to the similar results for countries oriented to the sterling area, we could see for the first time that the multilateral trading relationships between main market centers and associated countries trading principally with them were remarkably symmetrical.

Each associated area ran a deficit with its principal market center, including "deficits" incurred through purchasing assets, and covered the deficits through earnings from the other two principal market centers. The United Kingdom drew settlements from the United States in financing its circular flow while the Continent (including the European Payments Union) drew from the United Kingdom and paid out to the United States.

The circular flow of final settlements in the five years, after allowance for current transactions offset by unilateral transfers, capital movements, and gold sales, appears to have followed the pattern shown in the accompanying figure. (The arrow shows the direction of net payments.) While some elements of the pattern characterize balances between the six groups of countries, for net merchandise, net goods and services, and net goods, services, and transfers, account must be taken of capital movements, aid flows, and gold sales before the final pattern emerges.



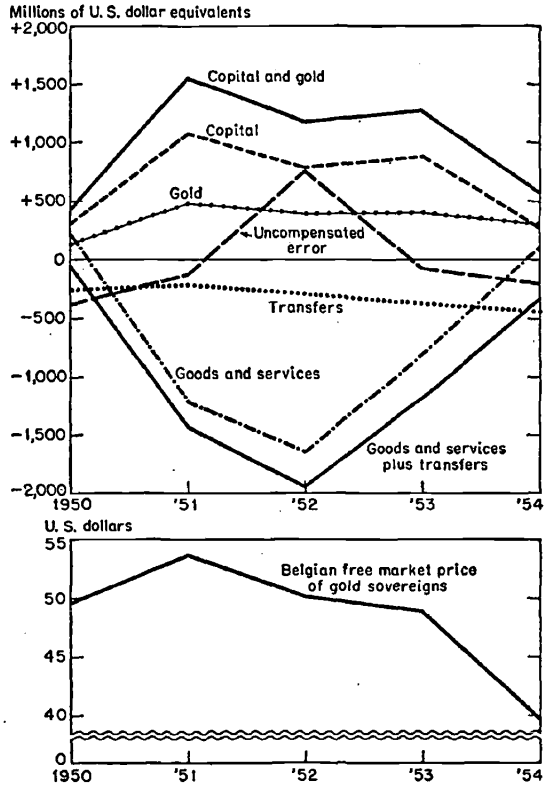
The broad pattern appears to persist with little change from year to year although one important shift occurred between the Continent and the U. S.: in the first half of the period the Continent drew settlements from the U. S.; in the second half and for the period as a whole it made settlement payments to the U. S., including payments made to cover a build-up of assets in the U. S. and gold purchases here.

The pattern might be altered, and certainly the magnitude of inter-area flows would be substantially reduced, if account could be taken of the true purchase-sales pattern of transactions. One of Lichtenberg's findings in his study of merchanting was that many trans-

CHART 7

Divergence in World Trade and Payments Accounts of All Countries

(+ = excess of credit; — = excess of debit)



actions of European overseas territories were conducted through enterprises of the associated metropole, and one suspects from fragmentary evidence that a good deal of the exports of other Western Hemisphere countries are made by enterprises resident in the U. S. The net flows between associated areas and main centers of secondary interest probably are overstated by the use of trade figures on an origin-destination or consignment-consignment basis.

We shall be able to recast the accounts to channel petroleum transactions through the U. S. and U. K., using Cornelius Dwyer's estimates, and observe the extent of the shift in pattern resulting from considering these transactions as channeled through the countries of management. Beyond that it will only be possible to speculate on the extent and character of adjustments required to place the accounts on a pure purchase-sales basis.

HERBERT B. WOOLLEY

International Capital Movements, 1950-1954

The study of international capital movements between world areas was started in May 1957. First I constructed two-valued matrixes from the data on recorded capital movements taken from the files of the International Monetary Fund by pairing changes in assets with those in liabilities for the four types of capital movements, conventionally divided into long-term and short-term movements for both private and official capital, for the five years 1950-54. A matrix for total capital movements was also constructed.

Considering first the aggregate of recorded transactions, I found a total net increase of assets (outflow debited) of $24,115 million, which compares with a total net increase of liabilities (inflow credited) of $24,431 million for the five years as a whole. Capital movements identified as transactions with nonreporting partners were added on the partner's side. The apparent close agreement emerges even though I included on the credit side only the known net private capital inflow of the Central African Federation, and did not include estimates of the inflow for the British colonies and the fleets of Panamanian, Honduran, and Liberian registry.

The totals conceal offsetting discrepancies between components – the outflow of long-term capital, private and official, exceeds the corresponding inflow by approximately $2 billion, while the outflow of official short-term capital falls short of the reported inflow by a similar amount. This offsetting could be the result of classification of the same transactions under different categories by the two partners, or of discrepancies and omissions in reporting by the two sides, which accidentally offset each other. The evidence pointed to the latter reason as the quantitatively more important, and the subsequent reconciliation bore this out.

To pinpoint both of these sources of discrepancies and to arrive at more reliable estimates of capital flows, as well as to analyze the movements themselves, I attempted to identify the character of the reported transactions, which was possible for the transactions of most of the net capital importing countries, frequently by partner country rather than area. For the net capital exporters identification was also generally possible with the exception of private capital movements of the United Kingdom and Belgium. For the United States a complete breakdown by kind of transaction and country for virtually all movements was made from published sources and supplementary data obtained from the Department of Commerce.

The detailed comparison of the identified transactions revealed the discrepancies (and omissions) in reporting as random rather than consistent in pattern. Frequently there are time lags between the reports of lender and borrower on short-term movements, where they might be expected, as well as in specifically defined long-term transactions. But again they are not a consistent phenomenon. A year-by-year reconciliation of the data is impracticable because of the time lags. The five-year totals usually show closer agreement.

About 60 per cent of the net increase in assets for the period consisted of long-term

movements, and three-fourths of these were of private capital. The picture that emerges indicates that the period was in some respects one of transition, marked by large repayments of official capital and repatriation of private capital – both resulting from the war and post-war conditions – while the increase in short-term assets reflects largely the recovery of reserves.

Having reconciled the data – as far as feasible and necessary for our purpose – I plan to turn now to the analysis of the forms of capital transactions between areas that differ in degree of economic development.

WALTHER P. MICHAEL

CYCLES IN FOREIGN TRADE

Trade Balances

An Occasional Paper, "Trade Balances during Business Cycles: The American and British Experience, 1879-1955," has been approved by the Directors. Following Dr. Jacob Viner's suggestion, I added a section on balances of international service transactions which should help in interpreting the findings on trade balances despite unavoidable shortcomings of the statistics on services.

The main finding on service balances is that their fluctuations hardly ever offset changes in the trade balances in either the United States or Great Britain. Consequently the balance on current account, the sum of trade and service balances, as a rule moved in the same direction as the trade balance (Table 19).

This observation is based on official series for service transactions available annually for both countries since the 1920's and quarterly for the United States, semiannually for Great Britain, since World War II. The parallel movement of trade and current account balances is also found before 1913, although the data for changes in service balances in this period can only be regarded as guided guesses. A. H. Imlah says about the British series for the early years, which he constructed: "the most that can be hoped for is that quinquennial or decennial averages are fair approxi-

TABLE 19

CHANGES IN TRADE, SERVICE, AND CURRENT ACCOUNT BALANCES, UNITED STATES AND GREAT BRITAIN, 1879-1956

COUNTRY AND PERIOD	TIME UNIT	AVERAGE BALANCE		AVERAGE CHANGE IN BALANCE		CHANGES IN TRADE BALANCE IN OPPOSITE DIRECTION TO CHANGES IN	
		Trade	*Services*	*Trade*	*Services*	*Service Balance*	*Current Account Balance*
		(*millions of $ or £*)				(*as % of total changes*)	
United States:							
1880-1900	year	+167	−213	114	16	45	5
1922-1938	year	+574	+214	301	76	62	0
1948-1955	quarter	+768	+425	488	93	18	0
Great Britain:							
1882-1913	year	−135	+224	13	9	48	13
1922-1938	year	−342	+366	52	39	62	6
1949-1956	half-year	−343	+228	163	69	36	14

Note: Changes in balances are differences between consecutive annual balances or between balances for same quarters or halves of consecutive years. Signs were disregarded in averaging changes.

United States, Service Balance, 1880-1900 – Matthew Simon, "Statistical Estimates of the Balance of International Payments and the International Capital Movements of the United States, 1861-1900," paper presented at the Conference on Research in Income and Wealth, September 4-5, 1957; *Remaining Data* – U.S. Dept. of Commerce.

Great Britain, 1882-1913 – A. H. Imlah, "British Balance of Payments and Export of Capital, 1816-1913," *Economic History Review*, Second Series, Vol. V, No. 2 (1952), pp. 237-239; *1922-1956* – official data.

mations."[1] The same might be said about the American series for years before 1900, which we owe to Matthew Simon (see notes to Table 19). For 1900 to 1913 an annual series for the American service balance does not, to our knowledge, exist.

What our figures, such as they are, indicate is that the balance on current account moved with the trade balance in both countries and all periods covered, and that this was not because of any parallelism of the service and the trade balances. The trade balance improved when the service balance sank or vice versa in about half of all observed instances. (That these unlike movements are less frequent recently may reflect a real change or merely the improvement of the data.) But the comparative smallness of service balance changes prevented them from offsetting the large trade balance fluctuations. Service balances were, on the average, larger than trade balances in the earlier years and smaller in the later ones. But whatever their level they always fluctuated less than the corresponding trade balances. Probably the shortcomings of the data exaggerate the stability of the service balances, particularly in the earlier years. However, the stability is partly real and plausibly so, given the heterogenous components of these balances, whose divergent movements can be expected partly to offset one another.

United States Exports

I have written three chapters of the study on the cyclical behavior of U. S. exports. The first and second analyze fluctuations in the value, quantity, and price of total exports, 1879 to 1938. The third deals with values, quantities, and prices of exports by the three commodity classes (foods, raw materials, and finished manufactures) 1879 to 1913. A fourth chapter, which will deal with exports by commodity classes in the interwar period, is in preparation.

To note a few findings on the period before World War I, American business cycles had little relation to the cycles in world trade, and since American exports moved with world trade, they did not conform in any simple fashion to domestic business cycles. Nevertheless, there is some regularity in the behavior of exports during business cycles. They rise regularly and considerably in the first half of either an expansion or contraction and decline or rise only slightly in the second halves of both phases. This peculiar pattern can be traced in part to similar movements of world trade, but it also reflects the impact of the domestic business cycle on exports. Both relations are brought out when we compare the patterns of world imports and of U. S. exports in U. S. business cycles (see the tabulation).

AVERAGE QUARTERLY PERCENTAGE CHANGE, 1879-1913

	World Imports	*U.S. Exports*
U.S. expansion:		
First half	+0.74	+2.18
Second half	+1.24	−0.08
U.S. contraction:		
First half	+1.18	+3.28
Second half	−1.13	−1.75

In three of the four segments exports move like world imports though their amplitudes are larger. That exports failed to rise, however, in the second half of expansions, when the increase in world imports was largest, must be attributed to domestic influences. The analysis of our new series for commodity classes reveals that the quantity of raw material exports fell in the second half of eight out of ten expansions, mainly due to cotton exports. Food exports also show an average fall in the same segments and manufactured exports show retardation in seven of the ten expansions. The behavior of prices, which on the average rise in this part – and, except for foods, only in this part – of the cycle, shows that this unfavorable development of exports was due to the domestic expansions.

World Cycle Chronology

The world cycle chronology has been checked and revised on the basis of new seasonal adjustments of world imports provided by the Univac seasonal adjustment program. Cycli-

[1] "British Balance of Payments and Export of Capital, 1816-1913," *Economic History Review*, 1952, p. 222.

cal turns in the newly adjusted series were found to be in general the same as they were when the adjustment was made by constant seasonals. Only in a few marginal cases have the new seasonals led to shifts of turns. In addition they have led to the extension of the chronology backward from 1883 to 1881, years previously omitted because of the difficulty of seasonal adjustment. Trade balance statistics have been and export statistics will be adjusted for the revisions.

ILSE MINTZ

INDEXES OF UNITED STATES FOREIGN TRADE SINCE 1879

I am preparing a manuscript that will set forth our indexes of United States export and import prices, quantities, and values, 1879-1923, and describe the nature and sources of the data used. It will include a brief analysis of trends in American trade from 1879 to the present, examined in the light of our new information for exports and imports as a whole and for the five major economic classes of commodities distinguished by the Department of Commerce. Other chapters will deal with the methods of construction of our indexes and with the nature of the basic data used, including discussion of the interpretation of unit values as prices, the use of price data to supplement customs data, and a comparison of customs with price data. Further chapters will cover the accuracy of the indexes in terms of coverage ratios, measurements of standard error, and sampling problems, and also will compare our results with those of other investigators.

Several appendixes will present the indexes themselves, giving a complete list of the components of each group and the coverage ratios and sources of all information not derived from customs statistics. One will deal with measures of the accuracy of the indexes and another with adjustments for changes in the U. S. customs area.

The collection of quarterly quantity data for imports is now complete except for chemicals, and indexes are being computed for the eighty-four import and sixty-four export commodity groups. The index computations are complete for about half the groups on each side of the trade account.

ROBERT E. LIPSEY

OTHER STUDIES

Two reports were published:

Problems in the International Comparison of Economic Accounts, Studies in Income and Wealth, Volume Twenty.

Problems in International Economics, Special Conference Series 9.

One report is in press:

International Financial Transactions and Business Cycles, by Oskar Morgenstern.

A conference proceedings volume being prepared for publication on United States and Canadian income and investment in the nineteenth century contains a number of papers on the balance of payments and capital movements. Several reports that deal with foreign economies were published or are in preparation, including:

Concentration in Canadian Manufacturing Industries, by Gideon Rosenbluth.

The Growth of Public Employment in Great Britain, by Moses Abramovitz and Vera F. Eliasberg.

Some Observations on Soviet Industrial Growth, Occasional Paper 55, by G. Warren Nutter.

"Wages in Germany, 1871-1945," by Gerhard Bry.