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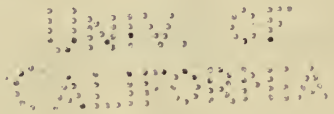
CYCLES OF PROSPERITY AND DEPRESSION IN THE UNITED STATES, GREAT BRITAIN AND GERMANY

A STUDY OF MONTHLY DATA 1902-1908



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CHAPTER I

INTRODUCTION: THE SUBJECT MATTER AND THE METHOD

A. Comparison Between This and Other Studies

Two distinct differences appear between the earlier and the more recent books on prosperity and depression. One is a difference in the subject matter discussed; the other is a difference in method.

The earlier writers in this field centered their entire discussion on crises. They looked upon prosperity as the normal thing in industry. A crisis appeared to be a pathological condition, a temporary affliction. The problem was to diagnose a malady. The study of crises was the pathology of Political Economy. The method applied was almost wholly *a priori* reasoning.

Not until the twentieth century was the subject matter broadened. Quantitative studies in annual production and price movements revealed steady, progressive, wave-like movements beginning with a period of low prices, inactivity in trade and production, and culminating in high prices and great activity in industry and commerce. Attention was no longer directed solely to the monetary stringency of panic conditions, nor to the widespread inability of debtors to meet their obligations, but rather to the continuous cycles of prices, and the steady rhythmic waves of production. Business was no longer looked upon as though it were normally in a static condition of prosperity interrupted intermittently by cataclysmic intervals of panic and crises, but rather as a dynamic, changing thing which must be studied as a process. The method necessarily became statistical and historical.

This book attempts two things, which so far as the writer knows, are relatively new in this field: first, a detailed analysis of monthly data for a single cycle of prosperity and depres-

sion; second, a comparative analysis of monthly data in the three great industrial nations of the world, the United States, Great Britain and Germany.

B. Description of Period 1902-1908

The period selected for this study was chosen because it includes a well defined, world-wide cycle of prosperity and depression. The year 1902 was chosen as the starting point in order to include within the cycle not merely the trough preceding the crisis of 1907, but also the preceding crest. The year 1908 was chosen as the end of the study in order to include the succeeding depression and the beginning of the recuperation which followed. A general description of the period follows.[1]

The year 1902 was in the United States a period of general prosperity. Crops were excellent, the cotton crop being one of the largest on record. On the railroads there was heavy traffic resulting in severe congestion toward the end of the year. The demand for iron and steel products exceeded home production and there were heavy importations from abroad. The coal trade was disturbed by the anthracite coal strike. Stringency in the money market became very severe in September. The Secretary of the Treasury attempted to relieve this by substituting municipal bonds for government bonds as security for government deposits, thus inducing a great increase in the circulation of national bank notes by releasing the government bonds for use as the basis for further note issue. Another severe stringency occurred in December, which was partially relieved by the formation of a fifty million dollar money pool. On the stock market there was a considerable rise during the first half of the year with a subsequent fall during the period of money stringency. Trading in bonds declined materially during the year.

Foreign trade in Great Britain was adversely affected by the drought in India and Australia, the exhaustion of China after the Boxer trouble, and the war in South Africa. A large

[1] Cf. *Financial Review, London Economist,* and *Volkswirtschaftliche Chronik,* 1902-1909.

foreign trade was carried on however with South America and Turkey. The coal trade was stimulated by the coal strikes in the United States and France. The iron and steel industry supplied a strong demand from the United States and Canada, the United States alone importing nearly 680,000 tons of pig iron, rails, blooms, and billets. German competition in iron and steel was very severe, immense quantities being sold in both the United States and Great Britain frequently below cost of production. Depression ruled in ship-building and the textiles. The money market was affected by large shipments of gold to the United States, the Continent and Argentina. Open market rates ruled high. For Great Britain the year was a half-way stage between prosperity and depression.

Germany suffered from depression in 1902. Crops were rather poor, and general business continued at a low ebb as in the preceding year. The stock market tended downward. Reserves were plentiful and money rates were very low throughout the year.

Slight depression ruled on the whole in the United States in 1903. Crops were good but not as large as in 1902. Iron and steel production declined heavily toward the end of the year though the total for the year was good. Unemployment increased somewhat. Stock prices dropped severely, resulting in heavy liquidation and bankruptcies. Interest rates ruled high, loans were extremely hard to float and short time loans were resorted to. Funds borrowed abroad were recalled by Europeans. This forced the banks in turn to recall loans, which in turn compelled the borrower to dispose of his securities. New capital for industrials or railroads could not be secured by the flotation of securities and hence retrenchment was the policy pursued.

Great Britain likewise suffered during 1903. Crops were bad, depression ruled in ship-building and the textiles, exports decreased, unemployment increased, and wages were lowered. The coal trade was fairly steady and was supported toward the close of the year by heavy buying from Russia and Japan. The pig iron trade was helped by a good demand from Ger-

many. On the stock market there was a heavy drop in government, railroad, and industrial securities.

Germany fared better than the other countries in 1903, while she fared worse in 1902. The stock market was rising, there being improvement in almost every kind of security. Production in iron and steel ran high, foreign trade increased, crops were good, and unemployment diminished.

Depression still ruled during the greater part of 1904 in the United States though a revival was apparent toward the end of the year. Railroad earnings and pig iron production ran low during the first few months of the year but soon recovered. The stock market turned upward with a great rise toward the last of the year. New issues were floated easily. Municipalities made large bond offerings which were easily absorbed. Surplus bank reserves ran high and money rates ruled very low.

Great Britain fared much the same as the United States. Production diminished and unemployment increased. Crops were slightly better. The colonies and municipalities had been unable to float bonds and public works were postponed. House building, which had previously gone on at a great rate, broke down. The cotton crop was short and factories ran on short time. The wool trade was poor. Spinners made scarcely any profit. Ship-building yards had little work until toward the close of the year. The iron and steel trade was injured from underselling by the United States due to depression there. Railroad net earnings greatly decreased, dividends were cut down, and the companies found difficulty in borrowing. All past profits had been distributed in dividends, and nothing had been set aside for betterments. Hence retrenchment was necessary. Like the situation in the United States the condition of the stock market improved. Money rates were low. Toward the end of the year improvement occurred in the iron and textile industries.

Germany's somewhat doubtful prosperity of 1903 declined during 1904. The Bourse had a severe panic in the early part of the year due to the outbreak of the Russian-Japanese war. Heavy failures resulted. Coal, iron and steel production de-

clined, while the electrical and textile industries fared better than in 1903. Crops were poor in some lines but good in others.

The year 1905 was a period of tremendous prosperity in all countries. In the United States crops were good, the iron and steel industry was flooded with orders, and the railroads were unable to cope with the volume of traffic offered. Track and equipment were both insufficient. Freight congestion toward the close of the year was very severe. Great speculative activity ruled on the stock exchange. Stocks were generally advanced, a great rise occurring in coal, iron, steel, and copper securities. The money market grew tense particularly toward the close of the year, due to the great activity of trade, big crops, large speculative movements and government operations.

Prosperity returned more slowly in Great Britain. Trade was active in the north, but London suffered because of the shifting of factories from the metropolis to the coal and iron fields of the north. The woolen trade was good, and the cotton trade was exceedingly profitable. Ship-building gained ground with a rush of orders toward the close of the year. The iron and steel trade was good. Municipalities still found some difficulty in floating loans. Money rates were easy.

Germany's condition was quite similar to that of the United States. Railroad earnings increased enormously as did pig iron production. Unemployment was reduced to a minimum. On the Bourse there was great activity and stock prices rose to an unprecedented level. Cash in the banks decreased and money rates advanced. Loans were greatly extended.

The extraordinary prosperity of 1905 continued through 1906 in the United States. Equipment and track shortage continued. James J. Hill stated[2] that between 115,000 and 120,000 miles of additional track were urgently needed. To provide this and necessary equipment he claimed was beyond human ability. "Why", he said, "there is not money enough, nor rails enough in all the world to do this thing." Said Secretary Shaw in December:[2] "We who pray should ask God to save

[2] *Commercial and Financial Chronicle,* January 5, 1907, p. 6.

us from any increased prosperity." Dividends were raised by the Union Pacific, the Southern Pacific, the Atchison, Topeka and Santa Fé, the Baltimore and Ohio, the Pennsylvania, the New York Central, the Lehigh, the Michigan Central, the Lake Shore, and the Norfolk and Western. Dividends were renewed on the United States Steel common. Surplus reserves fell below the legal limit four times during the year. Money rates rose. Government receipts were in excess of disbursements, and the Secretary of the Treasury helped to ease the situation by increasing government deposits and by making treasury advances to banks importing gold. An immense volume of American finance bills were floated in Europe representing borrowing abroad. Loans at home were difficult to place. Syndicates formed in previous years still had unsold bonds. Life insurance companies were compelled to unload some of their securities in order to meet their obligations growing out of the San Francisco earthquake disaster.

Great Britain's exports for 1906 were extraordinary. The greatest expansion occurred in the iron, steel and machine industry. Iron and steel were demanded in large quantities by Germany and the United States. This year marked the highest record ever reached for the importation of iron ore, the production of pig iron, the output from steel works, the exports for manufactured iron and steel, and shipping tonnage launched. The coal trade was also enormous due to the extreme prosperity particularly of the United States and Germany. The textiles were unable to meet the demand. Eighty of the large spinning companies averaged profits of about 18 per cent. Money was dear and scarce due to the strong demand from other countries for London gold. The bank rate was advanced to 6 per cent in October particularly to stop the large demand from New York. Russia, Germany, Egypt, India, Argentina and Brazil were also helping to drain the supply. The security market began to decline.

Germany's prosperity continued. Railroad earnings and pig iron production continued at the high levels reached at the close of the preceding year, and unemployment sought a still lower level. Loans were greatly extended by the Reichsbank.

Reserves declined, and the already high money rates were raised.

The industrial activity of the two preceding years continued in the United States until October, 1907. Pig iron production, railroad gross earnings and imports rose steadily higher. Industries generally flourished. Security values had been shrinking since the close of 1906. Corporations found it impossible to float bonds advantageously, and were compelled to resort to short time notes. The New York Central issued $50,000,000 three-year 5 per cent notes, and the Pennsylvania $60,000,000. Tension continued in the money market, particularly in June owing to large gold exports and treasury withdrawals. Finally came the disclosure of the affairs of the Mercantile National Bank of New York which had loaned heavily on copper securities. A run occurred on banks, first in New York, and later spread to other large cities. Many banks were compelled to close their doors. Cash could be secured only at a premium ranging from 5 per cent at the beginning of the period to 1 per cent toward the close of the year. Clearing-house certificates, and cashiers' checks were used as substitutes. The Treasury poured its resources into the banks, gold was imported in large quantities, and bank note circulation was considerably extended by the issue of Panama Canal bonds. After the panic, time loans were practically unobtainable for the rest of the year, though they were quoted at from 10 to 12 per cent.

In Great Britain, also, trade continued very prosperous for the greater part of the year. Her coal trade was greater than ever. Germany was so exceedingly prosperous that she required for her industries almost as much British coal as did France in spite of her large home supply. South America, Egypt and Europe increased their demand for coal. The iron and steel trade was equally fortunate during the first half of the year. Germany and the United States still continued to buy large quantities of these products, though this demand of course fell off at the close of the year. The copper trade was very good during the first half of the year, owing to the electrification of railroads and the very large expenditures all

over the world for ships and guns. The spinning trade was even more prosperous than the year before, scores of companies paying dividends of 30 to 35 per cent, and many others paying 18 to 20 per cent. A large demand came from the continent, continental spinners being unable to supply the local demand. New mills were being rapidly built. Ship-building suffered a considerable falling off from the preceding year. The stock market was depressed all during the year, with prices falling steadily. Heavy selling occurred in March and again in August. New security issues were not taken by the investing public, very large proportions being left on the hands of the underwriters. The high money rate of the preceding year was lowered to 4 per cent in April, and in August raised again to 4½ per cent. The panic in the United States forced it up to 7 per cent. France, Germany and Japan all helped to supply the London market with gold while London, in turn, was shipping enormous quantities to New York.

Germany's industrial activity continued to increase until October. Railroad gross earnings reached the highest figure in October as did also pig iron production. Unemployment reached its lowest point in September. Tension continued on the money market and rates averaged very high. Stocks declined rapidly during the course of the year.

The year 1908 was a period of deep depression in the United States. Pig iron production was reduced to almost one-half of the production of the preceding year. Imports were reduced by over $300,000,000. Bank reserves rose to a high point and money was obtainable on very easy terms. The security market recovered rapidly during the entire year. Large issues of new securities were placed.

In Great Britain depression, low profits, and unemployment prevailed. The iron and steel trade was greatly depressed. The pig iron market especially felt the lack of any demand from the United States and Germany. Ship-building was almost paralyzed. The weaving branch of the cotton trade was very bad, though spinning was fairly good. The woolen trade suffered severely owing to large accumulation of goods in other countries and particularly in the far east. New issues

of securities were floated on an enormous scale. Still the stock market recovered slowly in spite of the rapidly rising market in the United States. Money was cheap throughout the year. Recovery became faintly evident late in the year.

Germany's history in 1908 is in the main similar to that of the other countries. Her production of pig iron declined though it was reduced by only one-tenth as compared to one-half in the United States. Railroad gross earnings also diminished some, but not severely. Unemployment was very great throughout the year. Wholesale prices dropped steadily until November. A slight revival of industrial activity was noticeable toward the close of the year. The stock market alone showed signs of marked improvement, the trend being upward from March on.

A skeleton summary of conditions is given in Table I.

TABLE I

	United States	Great Britain	Germany
1902	Prosperity	Semi-prosperity	Depression (partial)
1903	Depression (partial)	Depression (partial)	Semi-prosperity
1904	Depression	Depression	Depression
1905	Prosperity	Prosperity	Prosperity
1906	Prosperity	Prosperity	Prosperity
1907	Prosperity	Prosperity	Prosperity
1908	Depression	Depression	Depression

C. Three Types of Fluctuations

Three kinds of fluctuations are involved in financial and industrial statistics, the seasonal, the cyclical and the secular.

The seasonal fluctuations are those which are due to the influence of the seasons, summer and winter, harvest and seed time. The seasons affect very greatly the prosperity of the clothing industry, railroad earnings, the coal trade, bank reserves, unemployment, and so on through the entire realm of business activity, though in some fields the influence of the seasons is less marked than in others. Railroad gross and net earnings, for example, invariably rise to the highest point in

the fall of the year; building invariably reaches the highest point in the spring of the year, and exports are regularly greatest in the fall. The seasonal fluctuations are therefore the short-time fluctuations which come and go with the seasons, and are due to the seasons.

Cyclical fluctuations are those due to the recurring waves of prosperity and depression. They have nothing to do with the seasons. Each cycle, from the crest of one wave to the crest of the next, is spread over a period of years. The cause or causes of these cycles lie obscured in the mazes of modern industry, explanations ranging all the way from meteorological cycles on the one hand to cycles of mob psychology on the other.

Secular fluctuations are mainly those due to the growth factor in progressive societies. Thus while railroad gross earnings for example rise and fall with the seasons, and in larger waves rise and fall with the cycles of prosperity and depression, each succeeding crest in the cycles seeks higher and higher levels because the country is rapidly growing in population, production and wealth. But some secular fluctuations are independent of the growth factor. Thus secular fluctuations in general prices may be due to changes in the issue of currency, increasing or decreasing production of gold. Hence secular fluctuations are the very long-time changes which in progressive countries generally are in the direction of growth.

D. The Elimination of Secular and Seasonal Fluctuations

A study of cycles of prosperity and depression is of course concerned with the cyclical fluctuations alone. We are not interested in the actual fluctuations in which are combined the seasonal, cyclical and secular movements, but only in those phases of the fluctuations which are due to cyclical causes. Hence, in order to study the fluctuations of prosperity and depression in the most advantageous manner it would be highly desirable to eliminate from the actual data the fluctuations which are due to seasonal or secular forces. If annual data

are used, seasonal fluctuations do not appear. Hence only the secular fluctuations need be eliminated. Over a long period of time the secular fluctuations would be very considerable, and it would become highly desirable if not essential to eliminate them in order to concentrate attention on the cyclical changes. If the period considered is of short duration, the growth factor becomes less apparent, and may therefore more safely be disregarded. Especially is this true if the series under consideration have similar secular trends. On the other hand if the secular trends of two series are in opposite directions it may become necessary to eliminate the secular trends. In comparing the Banking Group with the Investment Group, and the Investment Group with the Industrial Group it was found desirable to eliminate the secular trends. Likewise in comparing the American composites with the European composites the trends were eliminated. The secular trends were determined by the method of moments.

The seasonal fluctuations also tend to obscure the cyclical movements. By eliminating the seasonal fluctuations the curves are smoothed out and the cyclical correlation between the series becomes more apparent. When the Pearsonian coefficient is used to establish correlation it is true that the cyclical correlation is vitiated but little by the seasonal fluctuations. Nevertheless some gain results from the elimination of the seasonal fluctuations.

That seasonal fluctuations should be eliminated might be objected to on the ground that even seasonal fluctuations have their influence on cyclical movements. The position taken by the writer is that this is true only of extraordinary fluctuations. Normal seasonal fluctuations could obviously never operate as influences affecting the cyclical movements. Extraordinary seasonal fluctuations would however influence the cyclical movements, but such extraordinary fluctuations over and above the normal are not eliminated by the method used in this study.

The method here used is to construct relative or index numbers from the actual data by using a new base for each of the twelve months of the year. The average of the actual figures

for each January in the seven-year period is used as the base for January data, the average of the actual figures for the seven Februarys is used as the base for February data and so on. Thus the average of all the January figures is divided into the figure for each January, and similarly for each of the other months of the year. In this way the normal monthly fluctuations as nearly as they could be judged by a seven-year period are eliminated, but any extraordinary fluctuation in any one month would still remain in so far as it was above normal. The method may be illustrated by giving the computations for a single series, viz., railroad gross earnings. The actual monthly data are given in Table II. The averages given in the right hand column are then used as bases, each base being divided into the actual figures for that month for each of the seven years. Table III gives the result of this computation. By reducing the actual numbers into relative numbers using the twelve averages for each month as bases, the seasonal fluctuations have been eliminated. The numbers for each month were summated to verify the result. Obviously the sum in each case should equal 700.0 but the use of the slide rule as well as the fact that the index numbers are carried out to only one decimal place makes this degree of accuracy impossible.

TABLE II—RAILROAD GROSS EARNINGS—(000 OMITTED)

Month	1902	1903	1904	1905	1906	1907	1908	Average for all Years
January	$34,234	$39,661	$37,997	$40,534	$49,591	$53,594	$46,902	$43,216
February	30,430	35,579	37,749	37,414	46,532	49,609	42,582	39,984
March	34,039	41,138	41,715	45,436	51,141	56,534	48,726	45,532
April	34,915	41,659	40,594	43,785	46,037	56,745	47,036	44,395
May	36,456	41,271	40,671	44,864	49,890	59,188	45,761	45,443
June	35,819	40,713	40,898	45,560	50,079	57,063	46,919	45,293
July	37,848	42,806	39,505	44,773	51,038	58,828	45,907	45,814
August	39,496	44,066	43,544	48,431	54,105	60,892	52,504	49,005
September	40,769	44,862	46,253	50,566	54,136	59,733	55,196	50,216
October	44,216	47,633	47,901	53,228	58,784	63,806	58,065	53,375
November	40,796	43,819	47,052	52,095	55,743	57,384	55,032	50,274
December	40,750	42,182	45,423	50,995	56,029	53,311	53,370	48,865

TABLE III—INDEX NUMBERS FOR RAILROAD GROSS EARNINGS

Month	1902	1903	1904	1905	1906	1907	1908	Base
January	79.3	91.8	87.8	93.8	115.0	124.0	108.5	43,216
February	76.2	87.8	94.5	93.8	116.7	124.2	106.6	39,984
March	74.7	90.3	91.5	99.7	112.1	124.2	107.0	45,532
April	78.7	93.9	91.5	98.6	103.4	127.9	106.0	44,395
May	80.2	90.8	89.4	98.7	109.8	130.1	100.8	45,443
June	78.7	89.7	90.4	100.6	110.6	126.0	103.5	45,293
July	82.3	93.5	86.5	97.9	111.3	128.4	100.2	45,814
August	80.6	90.0	88.9	98.8	110.5	124.2	107.1	49,005
September	81.2	89.3	92.1	100.9	107.9	119.0	110.0	50,216
October	82.9	89.2	89.7	99.7	111.0	119.7	108.6	53,375
November	81.3	87.2	93.6	103.6	110.9	114.0	109.5	50,274
December	83.3	86.2	93.0	104.2	114.7	109.0	109.1	48,865

CHAPTER II

THE ANALYSIS OF MONTHLY DATA FOR THE UNITED STATES

A. Scope of Data

Twenty-three series of monthly data for the United States were selected for study and analysis. They are as follows:[1]

1. Commodity Prices at Wholesale.
2. Prices of Consumers' Goods at Wholesale.
3. Prices of Producers' Goods at Wholesale.
4. Prices of Ten Investment Stocks.[2]
5. Prices of Forty Transportation Common Stocks.
6. Prices of West Shore Railroad Bond.
7. Prices on Ten Leading Railroad Bonds.[3]
8. Shares Traded on the New York Stock Exchange.
9. Liabilities of Business Failures.
10. Building Permits in Twenty Leading Cities.
11. Production of Pig Iron.
12. Railroad Gross Earnings.
13. Railroad Net Earnings.
14. Exports.
15. Imports.
16. Unemployment.
17. Immigration.
18. Total Bank Clearings, the United States.
19. Cash held by New York Clearing-House Banks.
20. Loans of New York Clearing-House Banks.
21. Deposits of New York Clearing-House Banks.
22. Call Loan Rates.
23. Prime Commercial Paper Rates.

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[1] Prices of consumers' and producers' goods were obtained from the *Bulletin* of the U. S. Department of Labor, January-May, 1912, pp. 520-523.
Prices of Forty Transportation Stocks and the West Shore Railroad Bonds were obtained from W. C. Mitchell, *Business Cycles* (Berkeley, 1913) 212-213.. Call loan rates were also obtained from Mitchell, pp. 153-155.
The figures for Unemployment were obtained from Hornell Hart, *Fluctuations in Unemployment in Cities in the U. S., 1902 to 1917,* Helen S. Trounstine Foundation, Cincinnati, Ohio.
All other data were obtained from Babson's *Desk Sheet of Tables.*

[2] The Ten Investment Stocks are Central of New Jersey; Chicago, Milwaukee & St. Paul; Delaware & Hudson; Great Northern & Ore. cert; Illinois Central; Louisville & Nashville; New York Central, N. Y., N. H. & Hartford; Pennsylvania; Pullman.

[3] The Ten Bonds are Atchison, Top. & S. Fe Gen. 4's; Baltimore & Ohio 1st 4's; Central of Georgia Cons. 5's; Central of N. J. Gen. 5's; Chicago & Alton Ref. 3's; Col. & Southern 1st 4's; N. Y. Central Ref. 3½'s; St. Louis & San Fran. Ref. 4's; Southern Ry. Cons. 1st 5's; Wabash 1st 5's.

Here is a heterogeneous group of statistical series all of which are related in a causal way somehow or other to the cycle of prosperity and depression. The problem before us is to ascertain their relation to that cycle and to each other.

The raw figures in the incommensurable terms of tons, dollars, per cents, etc., are not usable. They must be reduced to a common denominator to make them comparable. This may be done by reducing the actual figures to relative figures, or index numbers. The seasonal fluctuations which confuse and obscure the cyclical changes must also be eliminated. Both of these ends were accomplished by reducing the actual data to index numbers by means of the method described in the last chapter.

If these index numbers are plotted it will be seen at once that out of the chaos of incomprehensible raw figures which, disturbed by the seasonal fluctuations, seemed to move in all sorts of directions, an orderly trend of cyclical fluctuations appears. The next problem is to analyze and classify the place of each series in the cycle of prosperity and depression.

All the series rise and fall with equal wave lengths, but they do not rise and fall synchronously. Which rise first, which lag behind and how much? Which series forecast prosperity, which indicate prosperity and which, if any, may be said to be the moving forces of the entire cycle movement?

Here must be applied tests of synchronous correlation, which can only be worked out very roughly by comparing the plotted curves of the index numbers of the different series. In order to determine correlation more definitely, mathematical formulae of correlation become necessary. The Pearsonian coefficient is the method here used to establish correlation, and to determine whether the series are synchronous or whether there is a lag, and if so how much of a lag.

Two points may be noted with regard to the coefficients that appear in the following pages. First, the nearer the coefficient approaches $+1$ or -1 the more perfect is the evidence of direct or inverse correlation. It is of course evident that if a small number of items are used a high coefficient may be purely accidental. The larger the number of items used the smaller

is the probable error. In the present study 84 items are used which makes the probable error for any fair sized coefficient very small. For instance, the coefficient of correlation between call loan rates and cash reserves is —.477, and the probable error is ±.048. This is very nearly the smallest coefficient and the largest probable error in the entire study. In this case the coefficient is nearly ten times as large as the probable error. In short in this study a coefficient of .475 represents good correlation, while .600 or above indicates very high correlation.

In the second place it may be noted that several coefficients are given for each series, indicating the coefficient for varying lags. Examination of the tables will show that the coefficients increase to the point of maximum correlation and then steadily decline. In other words the highest coefficient would indicate the degree of lag if there is any.[3a] Thus if two series fluctuate synchronously the coefficients of correlation would be highest for concurrent correlation, somewhat smaller for a lag of one month, and still smaller for a lag of two months. Thus the coefficients would become steadily larger until the two series were concurrent, and then steadily decrease again. In this study coefficients are scarcely necessary to prove the existence of correlation. They are used largely for the purpose of determining whether or not the series are synchronous, or whether one lags behind the other, and if so how much.

B. The Three Groups

A large number of correlations were worked out between the twenty-three series to test the relative position of each series in the cycle of prosperity and depression. Through this process, from the twenty-three series were finally selected three main groups which may be termed the Investment, Industrial, and Banking Groups. The Investment Group includes series that anticipate general prosperity or depression and are related to the investment market. The Industrial Group includes those series which constitute the very essence and substance of prosperity and depression; it is the touch-

[3a] Cf. W. M. Persons, "Construction of a Business Barometer," *Am. Econ. Rev.*, December, 1916, p. 750.

stone, the barometer of good and bad times. The Banking Group represents the monetary and credit facilities, the tools and instruments of the modern business mechanism.

1. THE INVESTMENT GROUP

The following series were classified in the Investment Group:

1. Prices of ten investment stocks.
2. Prices of forty transportation stocks.
3. Shares traded on the New York Stock Exchange.
4. Total bank clearings.
5. Liabilities of business failures.
6. Building permits.
7. Railroad net earnings.
8. Prices of ten railroad bonds.

The index numbers for the different series in this group are given in Table A in the Appendix to this chapter.

Here are classed two types of series: first, forecasters of prosperity representing the capitalization or valuation of prospective profits; second, forerunners of general prosperity or depression.

In the first mentioned type belong the two series of stocks, the railroad bonds, the volume of shares traded on the stock exchange, and the liabilities of business failures. These series are closely related to the stock market. The stock market is an institution where specialists armed with every available information are engaged in the work of determining the trend of profits in business. The resulting stock market prices are the capitalized value of the anticipated profits. To the superficial observer it appears as though the stock market prices are the result of the arbitrary bidding of wild speculators. But the man on the stock exchange knows that he is dealing with an objective reality which rests on solid facts, and in so far as he misjudges these facts he will most certainly crash up against a stone wall. The stock market is not the arbitrary product of a few hundred individual minds. It rests on the solid basis of earnings, earnings however which are not patent to all, but which lie obscured in the future. It is the speculators' business to forecast what they will be. Selwyn-Brown puts it

well as follows: "The leading investors on the stock exchanges are among the largest bankers, corporation directors and business men in the country. They are in close touch with developments all over the world. Their agents and information bureaus enable them to watch every small change in corporation earnings and expenditures, crop values and prospects, the state of the money market. They are the great discounters of the future. . . ."[4]

To the second type, the forerunners of prosperity and depression, belong bank clearings, building operations, and railroad net earnings. They do not represent the anticipation of prospective profits as do stock prices, but are rather the advance guard of prosperity or depression.

Bank clearings represent on the one hand activity on the stock exchange, and general industrial activity on the other hand. Hence this series falls in point of time between the Investment Group proper and the Industrial Group. Bank clearings therefore anticipate general industrial activity.

Building operations feel the effect of the new turn in affairs sooner than general business. The growing demand which ushers in prosperity first makes itself felt in new construction work. This is the necessary preliminary to a general extension of business and industrial activity. Likewise when demand begins to fall off the building industry is first affected. When bank credit begins to contract and discount rates are high, available capital will be utilized for the operation of businesses already greatly extended. Construction work on a large scale in such periods would be decidedly inopportune.

Railroad net earnings anticipate general prosperity conditions by a few months. Railroad gross earnings on the other hand move synchronously with general prosperity conditions. Net earnings probably tend to anticipate gross earnings in the railroad industry somewhat more than in other industries due to the fact that in this industry, unlike others, the selling prices (rates) are fixed, while costs mount up as in other industries during the period of prosperity. Gross earnings continue to rise so long as the volume of traffic increases, but when costs

[4] Selwyn-Brown, "Economic Crises and Stock Security Values," *Annals of the American Academy of Political and Social Science*, XXXV, 636-645.

begin to mount up net earnings are cut into. In other industries gross earnings are increased not only by the greater volume of business but also by the rise in selling prices. Costs lag behind selling prices at first, but toward the close of the period of prosperity rise more rapidly than selling prices. Thus in all industries net earnings tend to precede gross earnings.

The average prices of ten investment stocks were taken as the best single representative of the Investment Group and it was correlated with each of the other series. Table IV gives the coefficients of correlation between each series and the ten investment stocks. Correlation was tried in each case with the ten investment stocks preceding the other series by one or more months, then making the two series concurrent, and then lagging the ten investment stocks one or more months. This was done in order to determine the point of highest correlation.

It now appears that between the first three series in our group—the average prices of the ten investment stocks, the average prices of the forty transportation stocks and the shares traded, the highest correlation exists when they are perfectly concurrent. The liabilities of business failures precedes one month. Bank clearings and building permits lag three months behind, and railroad net earnings lag six months behind.

Three series then correlate synchronously, while one series precedes the rest by just one month. The fluctuations of four of the series in the general Investment Group are then substantially synchronous. These four series were combined to form a single Investment Composite. The natural method of doing this would be to find the average of the index numbers for each month. But here a difficulty arises. In some series the fluctuations are much larger than in others. If all the relative figures were summated for each month and an average struck, the series having the widest fluctuations would be given greatest weight in the composite series. In order to obviate this difficulty and give each series approximately the same weight in the composite, the fluctuations in the different series were reduced to approximately the same amplitude. This result was accomplished by the following method. The deviation of each item from the average was divided by the standard

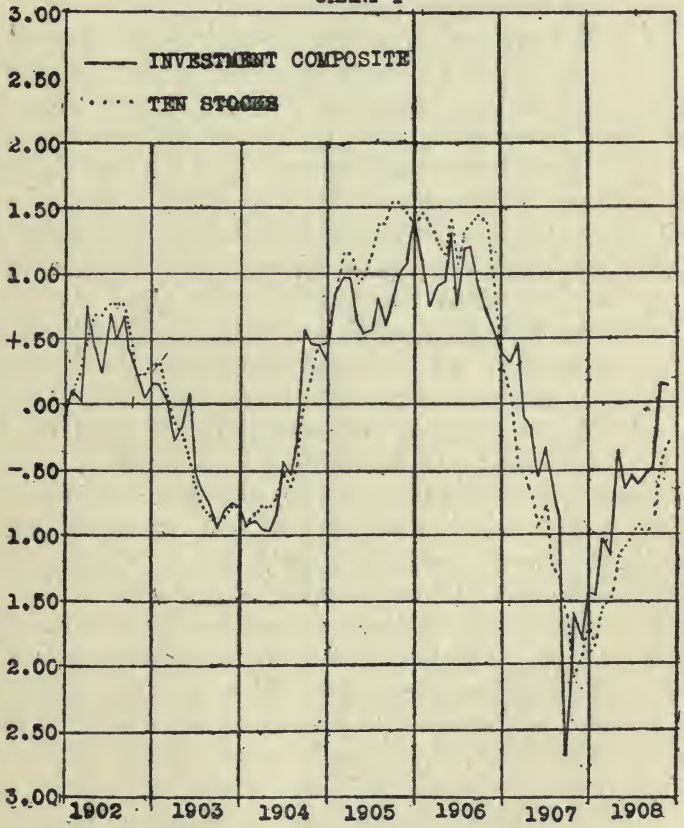
TABLE IV—COEFFICIENTS OF CORRELATION—INVESTMENT GROUP

Series correlated with average prices of Ten Investment Stocks	Each series precedes (—) or lags behind (+) the Ten Investment Stocks by:										
	—3 mo.	—2 mo.	—1 mo.	0 mo.	+1 mo.	+2 mo.	+3 mo.	+4 mo.	+5 mo.	+6 mo.	+7 mo.
Forty Common Stocks			+.875	+.*904*	+.890						
Shares Traded			+.569	+.*580*	+.542						
Liabilities of Business Failures		—.521	—.*542*	—.520	—.499						
Ten Bonds	+.799	+.*808*	+.807	+.792	+.757						
Bank Clearings			+.408	+.513	+.532	+.538	+.*557*	+.554			
Building Permits			+.421	+.437	+.455	+.470	+.*482*	+.478			
Railroad Net Earnings								+.393	+.435	+.*473*	+.470

deviation of that series. Thus the items of each series were reduced to new relatives, the standard deviation being used as the base. The standard deviation was used in preference to the average deviation because it gives greater weight to the extreme deviations, and therefore serves to equalize more perfectly the fluctuations of the different series.

The relatives for the composite thus constructed may be found in Table D, Appendix to Chapter II. In the case of the liabilities of business failures the signs were reversed since

CHART I



this series correlates inversely with the rest in the group. The correlation between the composite and the Ten Stocks is shown graphically in Chart 1.

2. THE INDUSTRIAL GROUP

By preliminary tests of correlation I attempted in the second place to classify those series which seem the best indicators of prosperity and depression. Here we are interested in those series which constitute the essence of industrial activity.

Obviously one such series would be the production of pig iron. In this age of steel no better barometer of prosperity and depression could be found. Pig iron is the basic material of the modern machine age. It is therefore a sensitive indicator of industrial prosperity.

But most writers on crises and prosperity cycles have selected by general accord commodity prices at wholesale as a universal and dependable indicator or barometer of industrial conditions. Because of the somewhat greater uniformity of the fluctuations of commodity prices I have selected it as the standard series of this group.

Of the remaining series under examination it was found that railroad gross earnings, imports, exports, unemployment and immigration belong to this general group. Railroad gross earnings would be expected to be a fairly good indicator of industrial conditions. The volume of transportation naturally varies with the volume of production, and with relatively fixed rates the gross earnings of railroads may be expected to vary with the volume of transportation.

Imports and exports increase with increased prosperity because the volume of production is greater both at home and abroad. The increase in production results in a greater volume of exchanges between countries.

Unemployment and immigration are closely bound up with industrial activity and belong to this general group. With a slowing down of the industrial machine, workers are thrown out of a job, and prospective immigrants are warned to stay at home.

To the Industrial Group therefore belong the following:

1. Commodity prices at wholesale.
2. Production of pig iron.
3. Railroad gross earnings.
4. Imports.
5. Immigration.
6. Unemployment.
7. Exports.

The Index numbers for these series are given in Table B.

Each of these series was correlated with wholesale prices which was taken as the standard representative of the group. The coefficients of correlation are given in Table V.

From this table it appears that gross earnings and immigration fluctuate concurrently with wholesale prices, while production of pig iron and imports precede wholesale prices one month. The exports series lags four months behind wholesale prices. Unemployment precedes prices three months. Railroad net earnings has been included in the table. It will be noticed that it precedes prices four months.

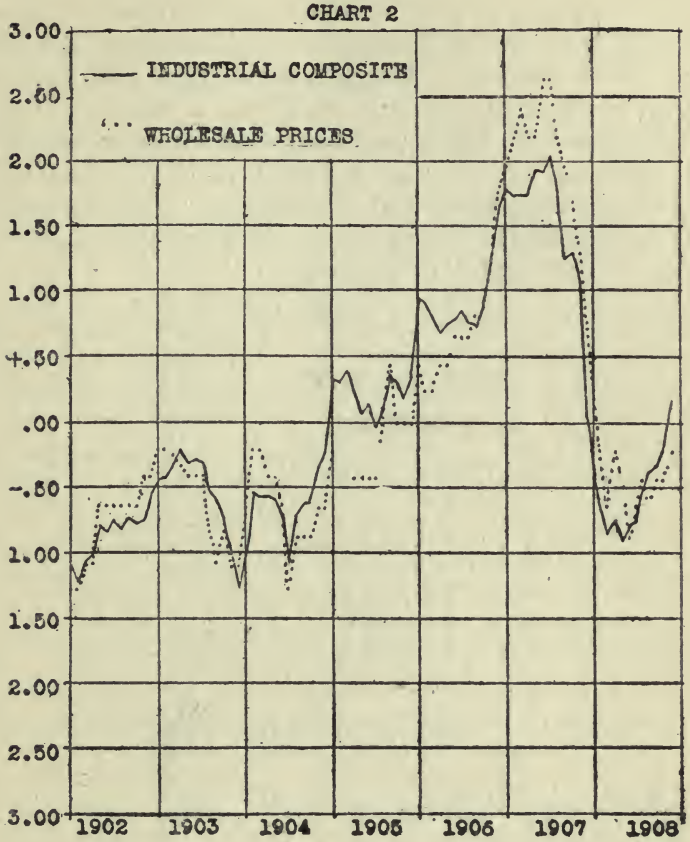
Unemployment, as was noted above, does not seem to correlate synchronously with wholesale prices. This seems somewhat puzzling as one would expect unemployment to be a very clear barometer of prosperity and depression, being in fact the very reverse of industrial activity. This may possibly be explained in part at least by the fact that the building series precedes the industrial group by several months. The slackening of building operations would affect unemployment. The same is doubtless also true of other industries in the class of pure producers' goods.

The five series which are substantially concurrent, viz., wholesale prices, production of pig iron, railroad gross earnings, imports and immigration, were then combined to form the Industrial Composite. The method used was the same as the one described above. New relatives were constructed with the standard deviation being used as the base. The results are given in Table D. The composite and wholesale prices are shown graphically in Chart 2.

TABLE V—COEFFICIENTS OF CORRELATION—INDUSTRIAL GROUP

Series correlated with Wholesale Prices	Each series precedes (—) or lags behind (+) wholesale prices by:										
	—5 mo.	—4 mo.	—3 mo.	—2 mo.	—1 mo.	0 mo.	+1 mo.	+2 mo.	+3 mo.	+4 mo.	+5 mo.
Production of Pig Iron				+.785	+.*797*	+.780	+.725				
Imports				+.885	+.*905*	+.891	+.843				
Railroad Gross Earnings					+.837	+.*857*	+.854				
Immigration					+.688	+.*696*	+.663				
Exports						+.725	+.734	+.741	+.744	+.*758*	+.740
Unemployment		—.707	—.*719*	—.705	—.673	—.626	—.563				
Railroad Net Earnings	+.744	+.*756*	+.745								

CHART 2



3. THE BANKING GROUP

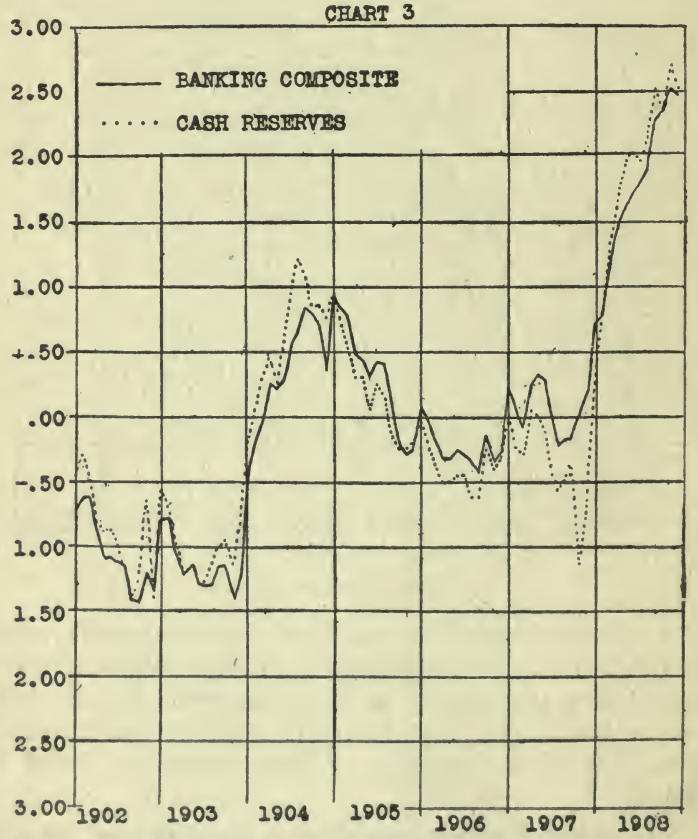
The third grouping derived from the twenty-three series through tests of correlation was the Banking Group. To this group belong the reserves of the banks, bank deposits, bank loans and discounts, call loan rates and commercial paper rates. The index numbers for these series are found in Table C.

For our period direct correlation is found to exist between the first three series named. When bank reserves are large it is found that bank loans and deposit liabilities are increased. With diminished reserves it is found that loans are contracted

and with that goes a diminution of bank deposits. The remaining two series in the group correlate in inverse ratio with the rest of the group. Money rates are high when bank reserves are depleted, and low when there is a plethora of funds.

Bank reserves, deposits and loans drop during the period of prosperity and find their lowest level at the crisis period, while they rise during the period of depression. Money rates on the other hand rise during the period of prosperity and fall after the crisis and during depression.

CHART 3



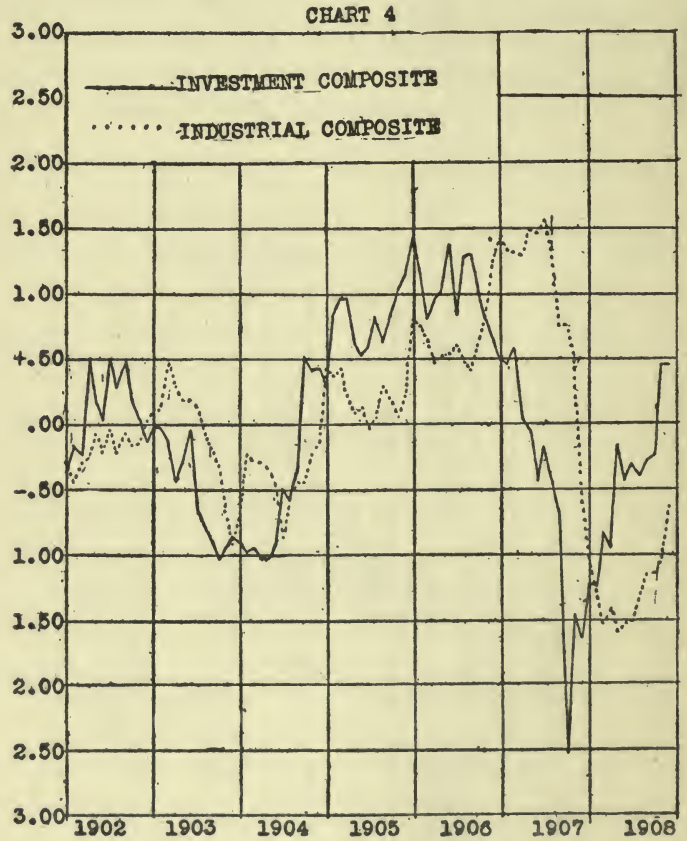
Reserves were selected as the best single representative of the group. Coefficients of correlation were worked out between it and the other series testing various lags as before. The results are given in Table VI.

TABLE VI—COEFFICIENTS OF CORRELATION—BANKING GROUP

Series Correlated with Cash Reserves	Each series precedes (—) or lags behind(+) cash reserves by:					
	—1 mo.	0 mo.	+1 mo.	+2 mo.	+3 mo.	+4 mo.
Loans	+.838	+.*889*	+.801			
Deposits	+.917	+.*956*	+.950			
Call Loan Rates	—.459	.*477*	—.434			
Commercial Paper Rates	—.537	—.631	—.646	—.679	—.*686*	—.646

From this table it is clear that reserves, deposits, loans, and call loan rates have synchronous cyclical fluctuations. The commercial paper rates series lags three months behind.

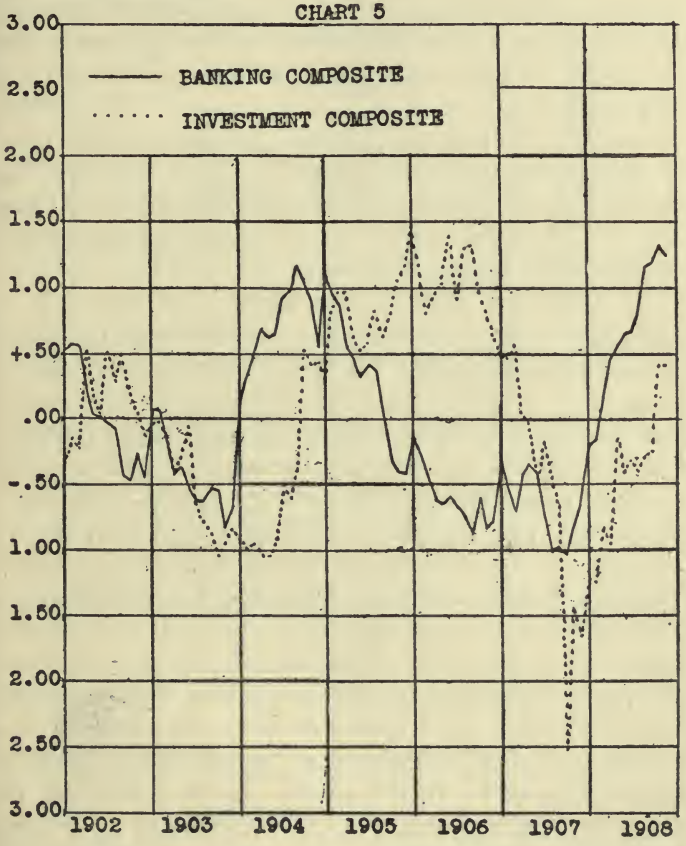
A Banking Composite was next constructed. For this composite I selected the three closely related series—cash reserves,



loans and deposits. Call loan rates correlate synchronously but inversely with the banking series named above, and might well have been included in the composite. However I concluded to present separately the movement of money rates as it actually occurs without inverting the series. Hence the composite includes only the series that correlate directly with cash reserves.

The Banking Composite was constructed by the method already described. The relatives for the composite are given in Table D. Chart 3 shows the fluctuations of the composite and the cash reserves.

CHART 5



C. The Relation Between the Groups

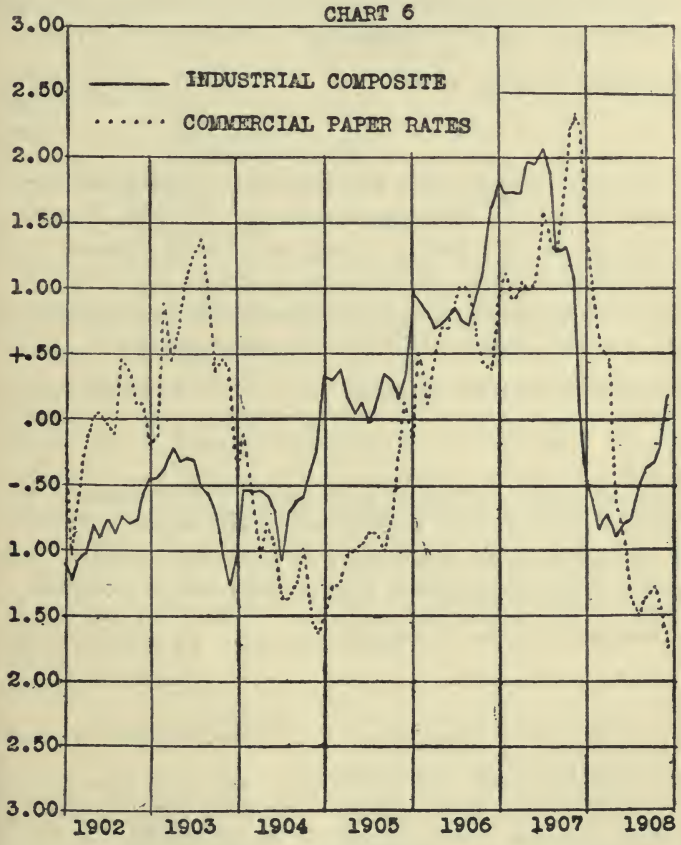
The question now arises: What is the chronological relation of the three series—the Investment Group, the Industrial Group and the Banking Group—to one another? It is not the purpose at this point in the discussion to enter into the theory of their causal relations to each other. That will be treated fully in Chapter IV. The purpose here is merely to ascertain their position chronologically.

Charts 4 and 5 show the relation between the industrial, investment and banking composites. In these charts the secular trends have been eliminated by the method of moments. The relatives appear in Table K, Appendix to Chapter III. The Industrial Composite lags behind the Investment Composite by several months. It will be noticed that the lag is very much more marked at the crest of the wave than it is at the trough of the wave.

The relation between the Banking Composite and the Investment Composite appears in Chart 5. The Investment Composite lags considerably behind the Banking Composite. Again it will be noticed that the lag is much more pronounced at the crest than at the trough of the wave.

Chart 6 has been added in order to show the relation of discount rates to the business cycle. In this case the secular trends are not eliminated. It will be remembered that call loan rates correlate synchronously but inversely with cash reserves, loans and deposits. Commercial paper rates also correlate inversely, but lag three months behind. Discount rates, if inverted would therefore move in the same direction as reserves, loans and deposits. In Chart 6, however, the real movement of commercial paper rates is plotted along with the industrial composite. It will be seen that the money rates lag somewhat behind. From this it is obvious that reserves, loans and deposits would also correlate with the industrial composite with only a slight lag. In this case, however, the correlation would be inverse. As a matter of fact all the banking series have commonly been thought of as lagging slightly behind the business barometer. In the opinion of the writer this relegates them altogether too much to the position of mere lagging reflexes of business conditions. For reasons that will be set forth fully in Chapter IV the writer believes that the causal relation works on the whole the other way. If it is thought that reserves, loans and deposits rise as a result of depression and fall as a result of prosperity, then naturally the fluctuations of these series will be thought of as lagging behind, and therefore moving inversely with the other series in the business cycle. If on the other hand the movements of reserves,

loans and deposits are thought to be causal factors resulting in similar movements in stock and commodity prices, production and profits, then the fluctuations of these series will naturally be thought of as moving in the same direction but preceding the other series in the business cycle. Chart 5 suggests the latter view. Following out this line of reasoning it is clear



that discount rates fluctuating in response to the movements of reserves, loans and deposits, constitute a causal factor affecting business conditions. But if one has his eye on the lag which appears in Chart 6, one is apt to conclude that discount rates are merely a result of business conditions. In interpreting Chart 6 it is therefore necessary to be on one's guard.

When discount rates for example begin to drop, one should consider it not so much a belated index of depression as a harbinger of better things to come. The writer does not deny, however, that the causal relation works both ways.

The exact lag of the various series shown in these charts can be established more definitely by means of the Pearsonian coefficient. The coefficients of correlation between the Banking Composite and the Investment Composite are as follows:

Banking Composite	precedes	.....	11	months,	+.581
"	"	.....	12	"	+.593
"	"	.....	13	"	+.561

It therefore appears that the Investment Composite lags 12 months behind the Banking Composite. It must be remembered however that the lag is very much more marked at the crest of the wave than it is at the trough of the wave.

The coefficients of correlation between the Investment Composite and the Industrial Composite are as follows:

Investment Composite	precedes	.....	7	months,	+.756
"	"	.....	8	"	+.770
"	"	.....	9	"	+.735

The Industrial Composite then lags 8 months behind. Here again the lag is greater at the crest of the wave.

The coefficients of correlation between the Industrial Composite and the Commercial Paper Rates are as follows:

Industrial Composite	precedes	.....	4	months,	+.681
"	"	.....	5	"	+.688
"	"	.....	6	"	+.676

The Commercial Paper Rates series therefore lags 5 months behind the Industrial Composite.

To summarize the foregoing, it appears that the Banking Group moves first chronologically; lagging behind it is the Investment Group; and lagging behind the Investment Group in turn is the Industrial Group. Of the twenty-three series examined the following belong in each group. The different series for each group are substantially synchronous.

I. Banking Group.
   1. Reserves in New York clearing house banks.
   2. Deposits in New York clearing house banks.
   3. Loans in New York clearing house banks.
   4. Call loan rates.

II. Investment Group.
   1. Prices of ten investment stocks.
   2. Prices of forty common transportation stocks.
   3. Shares traded on the New York Stock Exchange.
   4. Liabilities of business failures.

III. Industrial Group.
   1. Wholesale prices.
   2. Production of pig iron.
   3. Railroad gross earnings.
   4. Imports.
   5. Immigration.

To the Banking Group belongs also commercial paper rates but it was omitted from the above classification since it lags 3 months behind the rest.

To the Investment Group belong in a general way ten bonds, building permits, bank clearings and railroad net earnings. But they were omitted above because the ten bonds precede 2 months, bank clearings and building permits lag behind 3 months, while railroad net earnings lag 6 months behind.

To the Industrial Group belong in a general way unemployment and exports. They were excluded from the composite because unemployment seems to precede the group by 3 months, while exports lag 4 months behind.

D. Comparison With Other Groupings

The results of this study differ in certain particulars from the groupings used by the Brookmire and Babson services, and from the grouping made by Professor W. M. Persons in his study of annual data.[5] This may best be shown by outlining the groupings of each of the two services, and of Professor Persons. Their groupings are as follows:

[5] W. M. Persons, "Construction of a Business Barometer," *American Economic Review*, VI, 739-769.

1. BROOKMIRE'S GROUPINGS

I. Banking Group.
   1. Reserves.
   2. Deposits.
   3. Percentage of loans to deposits.
   4. Percentage of reserves to loans.
   5. Rate of commercial paper.

II. Investment Group.
   1. Thirty-two leading stocks.

III. Business Group.
   1. Bank clearings.
   2. Railroad earnings.
   3. Pig iron production.
   4. Pig iron prices.
   5. Commodity prices.
   6. Imports.
   7. Building.
   8. Immigration.

The writer would offer no objection to the first two groupings, but the results of the investigations given in this chapter would indicate that bank clearings and building should not be included in the business group.

2. BABSON'S GROUPINGS

I. Monetary Group.
   1. Domestic money rates.
   2. Foreign money rates.
   3. Foreign trade.
   4. Commodity prices.

II. Investment Group.
   1. Leading crops.
   2. Railroad earnings.
   3. Stock prices.
   4. Political factors.

III. Mercantile Group.
   1. Immigration.
   2. New building.
   3. Commercial failures.
   4. Bank clearings.

The present study indicates that these groupings are badly mixed up. Foreign trade and commodity prices belong more properly with immigration. The present study would also indicate that commercial failures is entirely in the wrong place when grouped with immigration. Bank clearings and business failures may more properly be placed with the Investment Group.

3. PERSONS' GROUPINGS

I. Forecaster.
   1. Shares traded.
   2. Prices of stock.
   3. Bank clearings.
   4. New railroad mileage.
   5. Percentage of business failures.

II. Barometer.
   1. Gross receipts of railroads.
   2. Net earnings of railroads.
   3. Coal produced.
   4. Exports.
   5. Imports.
   6. Production of pig iron.
   7. Price of pig iron.
   8. Immigration.
   9. Relative wholesale prices.

III. Classed as Synchronous with Barometer.
   1. Ratio of loans to resources.
   2. Ratio of cash to deposits.
   3. Surplus Reserves of New York Associated Banks.

The study of monthly data shows that exports lag 5 months behind imports; that railroad net earnings precede railroad gross earnings and the rest of the industrial group by 4 months. As has already been pointed out the group classed as synchronous with the barometer by Professor Persons, the writer believes might more properly be classed as a separate group.[5a]

[5a] Unfortunately, this was written before Professor Persons' able studies of monthly data were published in the *Review of Economic Statistics*. He there does classify a separate banking group, but the position he gives it in the business cycle differs from mine.

APPENDIX TO CHAPTER II

TABLE A—INDEX NUMBERS OF THE SERIES IN THE AMERICAN INVESTMENT GROUP

		10 Investment Stocks	40 Common Stocks	10 Leading Bonds	Shares Traded	Total Bank Clearings	Liabilities of Business Failures[6]	Building Permits	R. R. Net Earnings
	January	99.7	100.7	104.7	73.2	86.9	102.3	69.8	97.0
	February	100.8	105.0	105.2	88.6	85.7	97.4	105.8	97.0
	March	103.2	107.9	105.9	61.9	80.4	76.9	75.2	83.5
	April	105.8	112.8	106.1	141.2	99.5	76.1	67.4	86.1
	May	108.5	114.7	106.0	84.1	95.4	88.0	77.1	82.5
1902	June	108.6	117.3	106.0	68.1	82.4	115.9	81.5	81.4
	July	110.2	117.7	106.2	114.5	95.5	75.7	86.2	87.7
	August	110.2	120.8	106.0	78.5	88.5	82.8	68.6	81.6
	September	109.9	120.0	105.8	120.0	99.0	113.3	67.2	86.2
	October	106.9	115.8	104.7	86.1	93.3	93.7	65.6	98.0
	November	102.8	109.7	104.9	85.3	88.1	79.9	64.1	85.4
	December	102.5	103.5	103.3	75.1	81.7	87.0	71.3	84.6
	January	103.6	109.0	102.5	79.2	90.5	92.8	73.6	83.8
	February	104.0	110.2	101.7	74.5	86.8	94.1	79.6	93.9
	March	101.3	105.5	101.0	78.1	86.7	99.1	102.1	95.5
	April	98.2	99.9	100.3	65.4	87.2	122.1	75.7	105.6
	May	97.5	98.3	101.0	77.5	83.6	119.0	80.1	98.1
1903	June	95.2	89.7	100.1	133.9	94.6	95.0	65.8	87.6
	July	92.1	83.9	98.6	104.3	91.2	183.1	70.5	95.7
	August	90.5	77.8	98.2	78.8	78.4	111.7	71.8	90.1
	September	89.0	75.4	98.4	61.8	74.8	81.7	55.4	91.4
	October	88.0	74.5	99.2	67.9	75.4	158.8	69.0	91.7
	November	89.1	74.8	100.0	53.9	71.3	86.9	64.3	89.1
	December	90.4	78.3	99.6	72.7	76.9	138.4	69.8	86.1

	January	90.5	79.8	98.9	60.7	77.1	132.0	73.8	76.7
	February	88.5	77.3	98.3	60.0	79.2	136.3	54.9	94.7
	March	89.1	77.4	98.5	59.2	76.1	130.7	77.4	87.5
	April	90.5	78.2	99.4	43.7	75.7	135.9	42.6	90.2
	May	90.2	76.4	99.7	32.9	75.5	94.9	77.8	88.1
1904	June	91.2	77.7	100.3	43.2	81.0	96.6	85.0	92.7
	July	92.8	80.8	101.3	87.3	81.4	96.3	84.4	85.7
	August	92.0	84.7	101.8	68.5	79.4	107.7	87.0	92.3
	September	94.2	89.2	102.5	107.3	86.4	145.1	104.3	102.8
	October	100.0	97.2	103.2	171.2	94.7	90.9	87.7	93.8
	November	103.3	102.1	103.2	159.0	109.2	153.7	99.7	98.4
	December	106.3	100.8	103.8	134.3	106.1	98.3	99.6	90.0
	January	106.3	102.6	103.1	102.7	96.6	74.4	102.9	84.6
	February	110.7	109.3	103.8	152.2	109.2	84.3	120.0	77.5
	March	115.1	114.6	104.1	150.9	117.0	94.4	128.5	102.4
	April	115.2	111.1	104.3	155.9	116.0	83.3	115.0	96.6
	May	111.5	106.4	103.9	127.4	110.7	86.1	107.8	97.2
1905	June	113.1	107.8	104.4	109.2	108.8	100.1	122.7	97.0
	July	114.5	110.8	104.3	92.9	102.0	67.3	114.9	90.5
	August	117.9	113.8	104.5	111.0	107.9	63.1	135.2	99.1
	September	117.8	113.8	104.6	91.6	106.1	90.8	135.5	108.2
	October	120.4	116.8	104.6	93.0	103.8	58.3	106.4	102.9
	November	120.2	116.4	104.3	133.7	114.6	83.0	123.1	109.6
	December	118.5	116.4	103.5	150.5	119.6	78.9	112.4	114.6
	January	118.4	121.1	102.2	190.2	133.2	98.6	152.4	125.8
	February	118.7	120.0	102.1	145.2	127.9	87.6	131.2	130.7
1906	March	117.5	119.7	101.9	100.7	117.8	98.8	121.8	118.1
	April	116.3	118.3	101.4	129.5	117.3	82.6	143.8	100.3
	May	115.4	117.4	100.8	149.4	121.5	111.6	124.8	107.6

TABLE A—Continued

		10 Investment Stocks	40 Common Stocks	10 Leading Bonds	Shares Traded	Total Bank Clearings	Liabilities of Business Failures[6]	Building Permits	R. R. Net Earnings
	June	118.2	120.1	101.2	176.9	123.0	92.6	120.1	112.1
	July	113.6	115.1	100.7	114.5	109.2	77.1	123.5	112.6
	August	117.1	121.0	100.4	174.5	130.1	133.8	133.9	134.3
1906	September	118.2	122.3	100.1	148.9	122.0	68.7	129.8	110.9
	October	119.3	122.7	101.0	115.1	119.6	98.3	129.7	110.8
	November	118.2	120.4	101.3	96.6	119.1	96.3	128.8	113.4
	December	111.0	118.0	100.0	97.7	118.1	97.1	131.0	119.7
	January	103.8	111.3	98.5	112.3	122.8	109.8	156.9	125.0
	February	101.1	107.4	98.2	112.2	121.2	87.8	137.9	116.3
	March	93.8	98.7	98.6	166.9	132.7	91.7	125.9	116.0
	April	93.4	98.4	97.0	102.4	115.1	108.4	156.9	123.9
	May	91.0	95.3	94.9	98.5	113.9	99.2	148.7	127.0
1907	June	87.9	95.0	94.9	84.7	111.9	194.8	122.7	126.7
	July	89.8	97.9	95.1	89.8	116.1	143.7	114.5	114.1
	August	83.7	87.6	93.9	85.4	114.3	126.1	108.5	103.8
	September	83.3	86.6	92.5	70.0	103.0	171.2	99.5	94.7
	October	78.6	76.7	90.0	91.3	113.4	863.9	107.2	99.1
	November	72.6	70.8	87.3	48.1	84.4	235.5	75.0	94.8
	December	75.2	73.0	89.7	60.4	78.0	377.4	83.9	89.7

	January	77.6	75.7	89.6	82.5	92.7	328.8	70.3	107.1
	February	76.2	70.5	90.6	67.2	89.9	236.2	69.9	89.3
	March	79.6	76.9	90.0	82.6	88.7	192.3	68.9	97.1
	April	81.0	82.1	91.6	62.0	89.0	220.5	98.4	97.4
	May	85.1	91.6	93.5	130.2	99.7	196.0	83.4	99.5
1908	June	85.8	92.5	93.3	83.9	98.7	183.8	102.6	102.7
	July	86.7	93.7	93.6	97.0	104.0	199.8	105.9	114.0
	August	88.3	94.1	95.1	103.4	101.5	253.3	94.8	98.8
	September	87.5	93.4	96.4	100.6	108.5	199.5	108.1	105.8
	October	87.6	97.0	97.4	75.1	99.8	143.9	134.2	103.4
	November	94.5	105.9	99.0	124.0	113.2	124.5	145.0	109.0
	December	96.0	110.1	100.1	109.8	119.1	125.6	131.9	115.8
	January	171.2	230.64	102.7	20,235,000	12,259,000	13,999,000	22,700,000	12,626,000
	February	169.3	226.21	102.9	14,660,000	9,753,000	11,592,000	24,000,000	10,789,000
	March	166.8	221.29	102.7	19,321,000	11,034,000	10,547,000	40,500,000	14,206,000
	April	167.0	220.64	102.5	18,797,000	10,987,000	9,669,000	42,800,000	13,410,000
	May	165.4	216.71	102.2	16,090,000	10,901,000	10,339,000	42,400,000	14,136,000
Base	June	164.4	215.71	102.4	11,503,000	9,966,000	8,775,000	45,200,000	14,817,000
	July	166.5	219.71	101.9	14,286,000	10,646,000	9,139,000	39,800,000	15,524,000
	August	169.3	224.79	101.8	18,230,000	10,107,000	9,740,000	35,600,000	17,740,000
	September	170.6	227.86	101.8	17,481,000	10,255,000	8,850,000	33,700,000	17,925,000
	October	168.6	223.92	101.5	19,000,000	12,169,000	11,581,000	35,200,000	19,821,000
	November	167.6	224.71	100.9	20,100,000	11,465,000	10,677,000	30,700,000	17,610,000
	December	168.0	228.96	101.8	20,951,000	12,080,000	13,710,000	25,800,000	16,092,000

[6] In the case of Liabilities of Business Failures a five-year average was used for the base instead of a seven-year average. The five-year average was preferred because extreme fluctuations in the panic year upset the normal seasonal fluctuations. In computing the Pearsonian coefficient the deviations were of course taken from the actual average for the entire seven-year period.

TABLE B—INDEX NUMBERS OF THE SERIES IN THE AMERICAN INDUSTRIAL GROUP

		Commodity Prices	Production of Pig Iron	Imports	R. R. Gross Earnings	Unemployment in U. S.	Immigration	Exports
1902	January	93.7	91.5	83.6	79.3	131.7	59.5	82.5
	February	93.9	84.0	73.0	76.2	135.0	75.1	77.2
	March	94.7	84.1	82.1	74.7	129.3	79.7	79.1
	April	95.5	84.5	79.7	78.7	127.6	85.0	85.7
	May	97.0	87.7	82.3	80.2	134.4	88.6	89.0
	June	97.5	87.9	80.9	78.7	130.0	79.1	80.4
	July	97.2	91.0	87.9	82.3	124.0	77.1	86.6
	August	97.3	90.4	82.8	80.6	131.0	72.3	87.3
	September	97.5	85.7	92.6	81.2	127.2	78.2	92.8
	October	97.4	84.5	87.3	82.9	103.3	79.5	87.0
	November	98.1	88.5	86.6	81.3	100.7	76.5	75.5
	December	98.3	93.0	93.4	83.3	98.1	84.6	82.6
1903	January	98.7	94.4	89.9	91.8	94.1	81.4	85.7
	February	98.7	93.1	88.3	87.8	98.3	96.7	95.5
	March	99.2	92.5	93.8	90.3	89.2	94.4	98.0
	April	99.5	93.5	92.0	93.9	75.6	112.2	86.1
	May	97.8	97.5	86.0	90.8	83.5	113.8	95.6
	June	97.7	101.8	90.7	89.7	89.8	103.4	85.7
	July	97.8	95.3	91.3	93.5	93.1	102.1	89.6
	August	95.7	94.8	86.1	90.0	95.7	102.0	82.2
	September	95.5	92.0	86.3	89.3	95.5	105.2	84.6
	October	96.3	79.6	81.8	89.2	91.8	102.1	96.7
	November	95.4	62.7	78.1	87.2	75.5	94.4	96.6
	December	94.6	52.8	77.0	86.2	66.9	74.6	97.5

	January	97.5	59.1	87.2	87.8	109.1	73.3	90.8
	February	98.8	80.6	95.2	94.5	81.8	69.4	90.3
	March	98.6	84.1	89.1	91.5	102.5	80.6	89.0
	April	97.6	90.4	87.7	91.5	104.0	81.2	86.1
	May	97.6	87.3	87.8	89.4	106.6	84.0	78.2
1904	June	96.6	78.6	89.8	90.4	107.6	79.0	84.0
	July	94.5	68.2	79.0	86.5	133.0	87.7	83.1
	August	95.9	70.4	92.0	88.9	136.0	94.9	84.8
	September	95.9	80.1	88.7	92.1	111.3	97.7	102.8
	October	96.5	80.9	92.6	89.7	109.0	94.2	98.0
	November	97.2	89.6	96.5	93.6	116.0	98.5	95.3
	December	97.2	100.9	95.6	93.0	120.3	105.3	81.0
	January	98.8	114.3	103.8	93.8	101.5	144.5	79.0
	February	98.7	106.8	110.2	93.8	114.6	137.1	81.3
	March	98.7	112.5	107.7	99.7	111.5	131.8	101.5
	April	98.0	115.8	99.9	98.6	94.5	121.9	100.8
	May	98.0	111.6	100.8	98.7	97.4	105.5	107.6
1905	June	98.1	109.1	100.1	100.6	107.6	117.6	109.2
	July	98.3	107.4	94.0	97.9	93.1	115.5	105.1
	August	100.2	111.2	100.6	98.8	90.7	100.7	108.1
	September	101.8	112.3	107.7	100.9	84.9	106.0	104.0
	October	100.2	114.6	107.3	99.7	68.8	108.5	93.1
	November	99.6	121.5	99.6	103.6	65.5	85.1	102.6
	December	100.3	127.8	100.0	104.2	66.9	102.8	111.4

TABLE B—Continued

		Commodity Prices	Production of Pig Iron	Imports	R. R. Gross Earnings	Unemployment in U. S.	Immigration	Exports
	January	101.7	132.8	112.3	115.0	71.6	131.1	109.1
	February	100.6	127.3	111.4	116.7	73.7	140.2	107.8
	March	100.5	126.1	110.8	112.1	53.5	137.0	107.9
	April	101.5	120.4	112.8	103.4	52.0	133.7	113.1
	May	102.0	119.1	114.1	109.8	51.0	124.9	113.5
1906	June	103.2	120.2	111.3	110.6	58.3	125.5	112.7
	July	102.8	124.0	113.9	111.3	62.1	128.0	108.9
	August	103.0	116.1	110.9	110.5	50.3	129.5	119.2
	September	103.9	116.7	108.2	107.9	53.0	128.1	106.0
	October	104.2	122.6	118.0	111.0	57.4	125.0	113.0
	November	106.1	132.2	121.2	110.9	50.3	131.2	111.0
	December	107.5	139.7	133.0	114.7	44.6	143.6	106.3
	January	108.9	141.4	133.5	124.0	37.7	139.8	121.0
	February	109.8	136.8	131.5	124.2	41.0	134.0	121.2
	March	111.3	129.3	129.9	124.2	44.6	143.2	119.9
	April	109.9	128.3	136.1	127.9	47.3	129.1	123.5
	May	109.9	130.1	137.6	130.1	46.3	153.0	117.1
1907	June	111.5	135.9	124.5	126.0	44.9	162.0	124.1
	July	112.3	139.0	138.3	128.4	44.3	147.2	125.3
	August	110.3	135.4	132.0	124.2	50.3	156.8	117.0
	September	108.5	129.2	112.3	119.0	53.0	132.5	103.5
	October	107.9	130.3	111.8	119.7	97.5	139.5	108.7
	November	106.0	110.3	112.5	114.0	131.0	162.9	121.1
	December	102.9	77.2	91.3	109.0	160.5	111.9	115.5

	January	101.2	67.1	89.7	108.5	154.2	70.0	131.9
	February	99.2	71.9	90.6	106.6	155.5	47.7	127.4
	March	97.5	71.4	86.9	107.0	169.5	33.4	105.0
	April	98.8	66.7	91.8	106.0	198.5	36.7	104.5
	May	97.9	66.3	91.5	100.8	180.8	30.1	98.9
1908	June	95.8	66.4	101.9	103.5	161.4	33.4	104.1
	July	97.1	75.1	96.0	100.2	150.6	41.8	100.6
	August	98.0	81.9	96.1	107.1	146.0	44.0	101.5
	September	97.3	84.0	103.8	110.0	175.0	51.4	106.6
	October	97.7	87.5	101.9	108.6	172.1	51.2	103.6
	November	97.9	95.3	105.4	109.5	161.1	51.3	97.2
	December	99.1	108.7	110.6	109.1	142.5	77.3	105.2
	January	8.187	1,560,000	94,771,000	43,216,000	2,657,000	38,944	156,404,000
	February	8.182	1,496,000	93,582,000	39,984,000	2,443,000	48,959	131,553,000
	March	8.198	1,720,000	102,580,000	45,532,000	2,243,000	97,167	134,928,000
	April	8.165	1,721,000	95,207,000	44,395,000	2,114,000	112,456	127,520,000
	May	8.131	1,758,000	91,916,000	45,443,000	2,157,000	120,798	114,979,000
Base	June	8.063	1,644,000	90,302,000	45,293,000	2,229,000	95,540	110,998,000
	July	8.054	1,622,000	90,099,000	45,814,000	2,257,000	65,892	102,457,000
	August	8.096	1,659,000	95,318,000	49,005,000	1,986,000	63,037	108,832,000
	September	8.127	1,689,000	94,725,000	50,216,000	1,886,000	74,363	130,713,000
	October	8.207	1,791,000	100,235,000	53,375,000	1,743,000	79,956	165,887,000
	November	8.241	1,656,000	98,637,000	50,274,000	1,986,000	72,127	166,034,000
	December	8.279	1,601,000	101,192,000	48,865,000	2,243,000	59,500	179,165,000

TABLE C—INDEX NUMBERS OF SERIES IN THE AMERICAN BANKING GROUP

		Cash held by N. Y. Banks	Deposits of N. Y. Banks	Loans of N. Y. Banks	Call Loan Rates (7)	Commercial Paper Rates
	Jan.....	93.2	92.9	86.9	108.1	97.1
	Feb.....	95.4	94.5	88.3	100.9	83.5
	March..	92.8	94.6	89.4	101.0	89.9
	April...	87.0	90.5	86.7	143.4	97.2
	May....	85.6	88.0	83.9	175.0	100.3
1902	June....	86.1	87.7	84.3	121.3	100.8
	July....	84.6	86.7	85.5	149.7	98.9
	Aug.....	82.1	87.4	85.6	168.8	98.0
	Sept....	78.1	82.6	83.3	437.5	106.6
	Oct.....	79.8	81.6	81.9	228.6	105.6
	Nov....	89.6	83.3	81.8	113.9	102.3
	Dec.....	78.3	84.2	84.1	132.2	102.1
	Jan.....	91.3	89.2	88.6	136.2	97.1
	Feb.....	88.9	89.7	90.4	122.1	98.3
	March..	84.0	87.2	89.2	154.0	113.5
	April...	80.7	83.9	87.1	117.8	106.9
	May....	81.6	84.8	87.8	76.7	110.9
1903	June....	80.4	82.9	86.4	130.8	116.7
	July....	79.8	82.1	85.7	106.3	119.8
	Aug.....	82.5	82.0	85.0	90.6	122.4
	Sept....	83.8	83.7	86.1	94.0	115.5
	Oct.....	85.3	83.4	85.6	80.5	105.6
	Nov....	81.8	80.5	83.3	121.0	106.7
	Dec.....	86.7	82.1	84.5	106.9	106.4
	Jan.....	96.4	94.2	94.4	55.5	92.5
	Feb.....	100.3	96.6	95.8	76.7	98.3
	March..	105.2	99.4	97.0	44.9	92.1
	April...	107.5	104.0	100.3	38.8	82.6
	May....	103.7	103.5	101.1	48.8	87.1
1904	June....	109.1	103.6	99.7	48.3	84.8
	July....	114.6	107.6	102.1	43.8	78.1
	Aug.....	118.6	108.4	101.9	40.2	78.3
	Sept....	117.5	111.9	105.8	62.0	80.0
	Oct.....	112.8	112.4	107.3	60.8	83.6
	Nov....	112.7	110.2	104.9	65.3	74.6
	Dec.....	112.4	107.1	97.3	60.8	74.4
	Jan.....	114.8	113.7	108.8	53.3	76.3
	Feb.....	110.7	112.5	108.9	92.9	78.6
	March..	109.1	112.4	109.2	82.1	80.4
	April...	105.1	107.9	106.0	91.3	82.6
	May....	104.7	107.0	105.3	76.1	84.4
1905	June....	101.3	104.9	104.5	106.8	84.8
	July....	104.2	107.1	105.1	98.4	85.9
	Aug.....	101.7	106.7	106.3	91.5	85.7
	Sept....	97.7	101.9	102.7	144.2	84.4
	Oct.....	95.6	97.0	97.8	159.1	88.0
	Nov....	96.5	96.2	96.7	179.6	96.1
	Dec.....	97.2	95.6	96.6	320.8	102.1

TABLE C—Continued

		Cash held by N. Y. Banks	Deposits of N. Y. Banks	Loans of N. Y. Banks	Call Loan Rates [7]	Commercial Paper Rates
	Jan.....	98.8	100.7	102.0	202.5	97.1
	Feb.....	96.1	99.2	101.5	196.5	108.1
	March..	94.3	96.6	99.7	125.3	101.7
	April...	91.7	94.7	98.8	267.1	106.9
	May....	92.2	95.1	98.9	130.5	110.9
1906	June....	93.4	97.0	100.5	138.9	111.3
	July....	92.6	95.1	98.6	126.2	114.5
	Aug.....	90.4	95.4	99.6	98.2	117.5
	Sept....	89.9	94.1	98.0	380.0	115.5
	Oct.....	95.7	97.6	100.3	158.2	110.0
	Nov....	94.5	94.5	97.8	175.0	106.7
	Dec.....	95.4	94.7	99.1	272.2	106.4
	Jan.....	100.0	102.3	106.3	145.7	115.5
	Feb.....	96.4	99.9	105.1	186.0	118.0
	March..	94.6	97.1	102.9	163.9	113.5
	April...	101.3	102.4	106.3	66.0	116.7
	May....	100.2	103.0	107.5	72.4	116.1
1907	June....	98.2	103.0	108.0	133.8	116.7
	July....	93.3	98.6	104.6	197.3	125.0
	Aug.....	90.8	95.9	102.2	136.6	122.4
	Sept....	93.1	96.4	102.1	162.0	120.0
	Oct.....	92.9	96.1	102.0	628.5	127.7
	Nov....	82.0	101.5	110.9	286.0	136.6
	Dec.....	89.9	102.8	111.9	284.0	136.2
	Jan.....	105.5	107.2	112.8	112.5	124.8
	Feb.....	113.1	107.8	109.9	76.7	115.5
	March..	120.0	112.7	112.7	47.5	108.8
	April...	126.6	116.7	114.6	48.3	106.9
	May....	131.4	118.6	114.7	52.2	89.7
1908	June....	132.0	120.8	116.4	65.0	84.8
	July....	130.5	122.1	118.2	52.0	78.1
	Aug.....	134.0	124.0	119.2	47.3	75.7
	Sept....	140.0	129.4	122.5	54.7	77.7
	Oct.....	137.6	131.7	125.0	43.2	79.2
	Nov....	143.0	133.0	124.8	27.5	76.9
	Dec.....	140.1	133.4	126.2	56.3	72.3
		(000)	(000,000)	(000,000)		
	Jan.....	268,200,	1,001,	999,	4.23	5.41
	Feb.....	281,900,	1,062,	1,040,	2.36	5.08
	March..	274,400,	1,046,	1,032,	3.90	5.28
	April...	281,700,	1,057,	1,037,	3.56	5.14
	May....	287,700,	1,078,	1,050,	3.18	4.73
Base	June....	289,800,	1,079,	1,052,	2.34	4.71
	July....	296,300,	1,094,	1,063,	2.35	4.80
	Aug.....	302,900,	1,113,	1,076,	2.24	5.10
	Sept....	289,800,	1,089,	1,072,	2.47	5.62
	Oct.....	281,400,	1,070,	1,063,	3.34	5.67
	Nov....	267,300,	1,059,	1,068,	4.28	5.85
	Dec.....	257,300,	1,035,	1,045,	5.14	5.87

[7] In the case of Call Loan Rates a three-year average was used for the base in computing the index numbers. The results of course have practically no significance so far as the elimination of seasonal fluctuations is concerned. The deviations from the actual average for the seven year period were used in computing the correlation coefficient.

TABLE D—RELATIVES OF SERIES APPEARING IN CHARTS 1, 2, 3 AND 6

	Ten stocks	Investment Composite	Wholesale Prices	Industrial Composite	Com. Paper Rate	Cash Reserves	Banking Composite
1902							
January	.00	— .10	—1.30	—1.10	— .19	— .44	— .72
February	+ .08	+ .10	—1.30	—1.24	—1.06	— .31	— .62
March	+ .23	+ .02	—1.09	—1.07	— .63	— .44	— .61
April	+ .46	+ .75	—1.09	—1.01	— .19	— .82	— .94
May	+ .69	+ .40	— .65	— .82	.00	— .88	—1.09
June	+ .69	+ .24	— .65	— .91	+ .06	— .88	—1.09
July	+ .77	+ .72	— .65	— .76	— .06	— .94	—1.11
August	+ .77	+ .49	— .65	— .88	— .12	—1.13	—1.14
September	+ .77	+ .69	— .65	— .75	+ .44	—1.38	—1.42
October	+ .54	+ .38	— .65	— .81	+ .38	—1.26	—1.44
November	+ .23	+ .23	— .43	— .78	+ .12	— .63	—1.20
December	+ .23	+ .05	— .43	— .57	+ .12	—1.38	—1.36
1903							
January	+ .31	+ .16	— .22	— .46	— .19	— .57	— .81
February	+ .31	+ .15	— .22	— .45	— .12	— .69	— .79
March	+ .08	+ .04	— .22	— .37	+ .88	—1.01	—1.01
April	— .15	— .27	— .22	— .22	+ .44	—1.20	—1.21
May	— .23	— .15	— .43	— .33	+ .69	—1.13	—1.13
June	— .38	+ .09	— .43	— .31	+1.06	—1.26	—1.29
July	— .62	— .51	— .43	— .33	+1.25	—1.26	—1.32
August	— .77	— .64	— .87	— .53	+1.37	—1.13	—1.30
September	— .85	— .75	—1.09	— .60	+1.00	—1.01	—1.18
October	— .92	— .94	— .87	— .73	+ .38	— .94	—1.18
November	— .85	— .82	—1.09	—1.05	+ .44	—1.13	—1.42
December	— .77	— .75	—1.09	—1.28	+ .38	— .82	—1.23
1904							
January	— .77	— .79	— .65	—1.00	— .44	— .25	— .42
February	— .92	— .89	— .22	— .55	— .12	.00	— .20
March	— .85	— .87	— .22	— .57	— .50	+ .31	— .01
April	— .77	— .95	— .43	— .57	—1.06	+ .44	+ .25
May	— .77	— .96	— .43	— .61	— .81	+ .25	+ .22
June	— .69	— .83	— .65	— .72	— .94	+ .57	+ .29
July	— .54	— .43	—1.30	—1.09	—1.37	+ .94	+ .58
August	— .62	— .55	— .87	— .73	—1.37	+1.20	+ .67
September	— .46	— .27	— .87	— .62	—1.25	+1.13	+ .87
October	.00	+ .57	— .87	— .61	—1.00	+ .82	+ .80
November	+ .23	+ .45	— .65	— .37	—1.56	+ .82	+ .69
December	+ .46	+ .46	— .65	— .24	—1.62	+ .75	+ .35
1905							
January	+ .46	+ .33	— .22	+ .32	—1.50	+ .94	+ .95
February	+ .85	+ .85	— .22	+ .29	—1.31	+ .69	+ .84
March	+1.15	+ .98	— .22	+ .37	—1.25	+ .57	+ .78
April	+1.15	+ .98	— .43	+ .18	—1.06	+ .31	+ .49
May	+ .92	+ .63	— .43	+ .06	—1.00	+ .31	+ .44
June	+1.00	+ .52	— .43	+ .12	— .94	+ .06	+ .30

TABLE D—Continued

	Ten stocks	Investment Composite	Wholesale Prices	Industrial Composite	Com. Paper Rate	Cash Reserves	Banking Composite
1905							
July	+1.15	+ .57	— .43	— .03	— .88	+ .25	+ .42
August	+1.38	+ .82	.00	+ .10	— .88	+ .13	+ .41
September	+1.38	+ .61	+ .43	+ .35	—1.00	— .13	+ .10
October	+1.54	+ .79	.00	+ .28	— .75	— .25	— .22
November	+1.54	+1.00	.00	+ .16	— .25	— .25	— .28
December	+1.46	+1.11	.00	+ .33	+ .12	— .18	— .26
1906							
January	+1.38	+1.40	+ .43	+ .94	— .19	— .06	+ .07
February	+1.46	+1.11	+ .22	+ .91	+ .50	— .25	— .05
March	+1.38	+ .75	+ .22	+ .81	+ .12	— .38	— .21
April	+1.23	+ .92	+ .43	+ .68	+ .44	— .50	— .33
May	+1.15	+ .95	+ .43	+ .73	+ .69	— .50	— .33
June	+1.38	+1.31	+ .65	+ .77	+ .69	— .44	— .26
July	+1.08	+ .75	+ .65	+ .85	+ .88	— .44	— .31
August	+1.31	+1.19	+ .65	+ .75	+1.06	— .63	— .34
September	+1.39	+1.20	+ .87	+ .72	+ .94	— .63	— .43
October	+1.46	+ .92	+ .87	+ .92	+ .63	— .25	— .14
November	+1.38	+ .72	+1.30	+1.16	+ .44	— .38	— .35
December	+ .85	+ .56	+1.74	+1.61	+ .38	— .31	— .27
1907							
January	+ .31	+ .39	+1.96	+1.78	+1.00	.00	+ .23
February	+ .08	+ .33	+2.17	+1.73	+1.12	— .25	+ .07
March	— .46	+ .45	+2.39	+1.73	+ .88	— .31	— .09
April	— .54	— .09	+2.17	+1.72	+1.06	+ .06	+ .25
May	— .69	— .17	+2.17	+1.94	+1.00	.00	+ .32
June	— .92	— .58	+2.61	+1.92	+1.06	— .13	+ .28
July	— .77	— .33	+2.61	+2.04	+1.56	— .44	— .02
August	—1.23	— .59	+2.17	+1.85	+1.37	— .57	— .24
September	—1.31	— .85	+1.96	+1.28	+1.25	— .44	— .19
October	—1.62	—2.70	+1.74	+1.30	+1.75	— .44	— .19
November	—2.08	—1.61	+1.30	+1.10	+2.31	—1.13	+ .01
December	—1.92	—1.82	+ .65	+ .01	+2.25	— .63	+ .23
1908							
January	—1.69	—1.42	+ .22	— .43	+1.56	+ .38	+ .70
February	—1.85	—1.44	— .22	— .63	+1.00	+ .82	+ .78
March	—1.54	—1.02	— .65	— .86	+ .56	+1.26	+1.15
April	—1.46	—1.15	— .22	— .74	+ .44	+1.70	+1.47
May	—1.15	— .36	— .43	— .91	— .63	+1.95	+1.60
June	—1.08	— .64	— .87	— .80	— .94	+2.01	+1.71
July	—1.00	— .54	— .65	— .76	—1.37	+1.95	+1.77
August	—. 92	— .61	— .43	— .54	—1.50	+2.14	+1.92
September	—1.00	— .52	— .65	— .38	—1.37	+2.52	+2.30
October	— .92	— .49	— .43	— .35	—1.31	+2.33	+2.37
November	— .46	+ .17	— .43	— .22	—1.44	+2.71	+2.53
December	— .31	+ .16	— .22	+ .17	—1.75	+2.52	+2.49

CHAPTER III

COMPARISON OF MONTHLY DATA FOR GREAT BRITAIN, GERMANY, AND THE UNITED STATES

In this chapter an analysis will be made of various statistical series for Great Britain and Germany, and a comparison will be made between American, British, and German data. This chapter has two purposes in mind: first, to ascertain the chronological relation of the various economic series of Great Britain and Germany as was done for the United States; and second, to determine the chronological relation of the different groups in the three countries. We shall therefore first attempt to classify the groupings within the foreign countries, and then determine the relation of the group of one country to similar groups in the other two countries.

A. British and German Data

The following monthly data for Great Britain were examined:[1]

1. Thirteen Railroad Preferred Stocks—British.
2. Eight Corporation Stocks—U. K.
3. Fourteen Railroad Debentures—British.
4. Nineteen Ordinary Railroad Stocks—British.

[1] The data for the five stock and bond price series were obtained from the *Banker's Magazine*, London. In a few cases interpolation had to be resorted to. In every case the data for 1907 and 1908 had to be adjusted to the preceding years because of changes that were made at the close of 1906 in the number of stocks or bonds quoted in each series. Both the old and the new figures were given for December of 1906. The proportion existing between the old and the new figures in that month was used as the medium through which the data for the succeeding two years were adjusted. For example, the old figure for December, 1906, for one of the series was 247.2 while the new figure for the same month was 303.7. The data for 1907 and 1908 were then adjusted to the preceding data by multiplying the figure for each month of these two years by 2472/3037, or .814.

The data for the 2¾ per cent consol were obtained from *Volkswirtschaftliche Chronik*, 1910, p. 362.

The quotations for the reserve of note and coin, bullion, public deposits, other deposits—all for the Bank of England—are for the first week of each month as given by the *Financial Review*.

The quotations for the open market rate are for the first week of the month as given by the *Financial Review*.

The quotations for the Bank of England bank rate are from the *Statistical Abstract for the U. K.*, 1897-1911. They are the average minimum rates of discount charged by the Bank of England in each month.

Exports and imports of merchandise and traffic receipts were taken from the *Labour Gazette*, 1902-1909.

5. Total Values of Stocks and Bonds.
6. Consol—2¾ per cent.
7. Reserve of Note and Coin—Bank of England.
8. Bullion—Bank of England.
9. Bank Rate—Bank of England.
10. Open Market Rate.
11. Public Deposits—Bank of England.
12. Other Deposits—Bank of England.
13. Exports—U. K.
14. Imports—U. K.
15. Traffic Receipts—(20 principal railroads of U. K.)

For Germany the following data were analyzed:[2]

1. Transactions on the Bourse.
2. Twelve Stocks.
3. Bank Clearings.
4. Note Circulation, Reichsbank.
5. Coin and Bullion—Reichsbank.
6. Discounts and Advances, Reichsbank.
7. Deposits, Reichsbank.
8. Bank Rate, Reichsbank.
9. Open Market Rate.
10. Prussian Konsol 3½ per cent.
11. Production of Pig Iron.
12. Railroad Gross Earnings.
13. Wholesale Prices.
14. Prices of Producers' Goods.
15. Prices of Consumers' Goods.

[2] For Germany "Umsatzsteuer" indicating the volume of transactions on the Bourse, bank clearings, the 3½ per cent Prussian Konsol, production of pig iron and railroad gross earnings, were obtained from *Volkswirtschaftliche Chronik, passim,* 1902-1909.

The quotations for the Berlin bank and open market rates are for the first day of the month as given by the *Financial Review.*

The coin and bullion, discounts and advances, deposits, and notes of the Reichsbank are taken from the *London Economist.*

The average relative prices of 12 stocks were computed by the writer from data obtained from the *Volkswirtschaftliche Chronik,* Table 6, 1902-1909. The 12 stocks used are as follows: Gelsenkirchen Bergw. Akt.; Harpener Bergb. Akt.; Bochumer Gussstahl Akt.; Dortmunder-Union Vorz. Akt.; Konigs. u. Laurahütte, Akt.; Stettiner Vulkan B. Akt.; Berl. Machinenbau; Allgem. Elektr. Ges. Akt.; Siemens & Halske, Akt.; Hamb. Amer. Packetfahrt, Akt.; Nordd. Lloyd, Akt.; Deutsch Bank Akt. An average was computed from the average monthly prices of each of the 12 stocks. These figures were reduced to the average monthly bases used in this study.

The relative prices of producers' goods were computed by the writer from data obtained from the *Vierteljahrsheften,* 1902-1909. Sixteen commodities are included in the series. See notation (15) at the close of Chapter IV for a full description of the commodities and the method of computation.

The prices of consumers' goods were also obtained from the *Vierteljahrsheften.* Fourteen commodities are included. See notation (15) at the close of Chapter IV for description and explanation of method.

The index numbers of wholesale prices were computed by summating the price summations of the consumers' and producers' goods. Index numbers were then constructed from these summations by using the monthly averages as bases.

The actual data in each case were reduced to relative numbers by the method already described. Groupings were selected by the same tests of correlation applied in the last chapter.

B. The British and German Investment Groups

Of the five series of British stock prices listed above, two were selected, the average prices of nineteen ordinary railroad stocks, and the total values of stocks and bonds. The relative numbers for these two series are given in Table E, Appendix to Chapter III.

The nineteen ordinary railroad stock series was correlated with the stocks and bonds series. The results are given below:

Railroad stock series precedes	1	month	+.897
" "	0	"	+.943
" lags behind	1	"	+.865

As would be expected very high concurrent correlation obtains between the two series. The two series were combined to form a British Investment Composite by the method described in the last chapter.

Of the German series the two that belong to the Investment Group are the average prices of 12 stocks, and transactions on the Bourse. The other series which naturally would belong to this group is bank clearings, but a chart of the index numbers does not reveal any cyclical fluctuations at all, but only a rather steady secular growth. This series, because of the relatively small use of checks or similar credit instruments in Germany, is at all events of comparatively little significance. The index numbers for the 12 stocks and transactions on the Bourse are given in Table F.

The coefficients of correlation between the average prices of the twelve stocks and transactions on the Bourse are given below:

Transactions on Bourse precedes	2	months	+.643
" " "	1	month	+.659
" " "	0	"	+.651
" " lags behind	1	"	+.610

It appears that the stock series lags one month behind the transactions on the Bourse. The two series being substantially concurrent were then averaged together by the method previously described to form the German Investment Group.

C. Comparison of the Three Investment Groups

The next task is to ascertain the chronological relation of the investment composites of the three countries. The relatives for the three groups are given in Table K. The two European composites were plotted with the American composite. The curves appear in Chart 7. From this chart it is evident that there is very close correlation between the American and British composites. For the two years 1902 and 1903 there appears to be little or no similarity between the German composite and the other two curves. For the rest of the period the correspondence is quite close. The secular trends of the three curves have been eliminated by the method of moments.

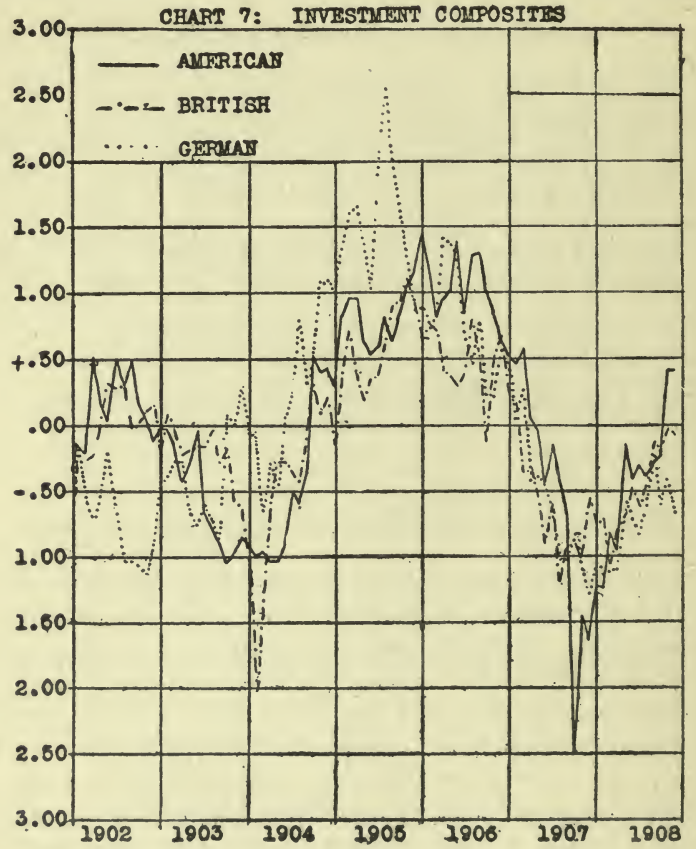
D. Comparison of Bonds of the Three Countries

At this point it may be of interest to add a comparison of British and German consols and some American security of equal grade. Mitchell[3] shows clearly that we have no government security which can be fairly compared with European government securities, and he used in place of United States securities a railroad bond which meets the requirements fairly well, viz., the bonds of the West Shore Railroad. Chart 8 shows the comparison of the relative prices of the English 2¾ per cent consol, the Prussian 3½ per cent consol and the bonds of the West Shore Railroad. It will be noticed that the correspondence is closest between the British and American bonds.

A difference may here be noted between the long run trend of bonds as compared to the long run trend of stocks and commodity prices. The short-time, cyclical fluctuations of bonds

[3] Mitchell, *Business Cycles*, p. 164.

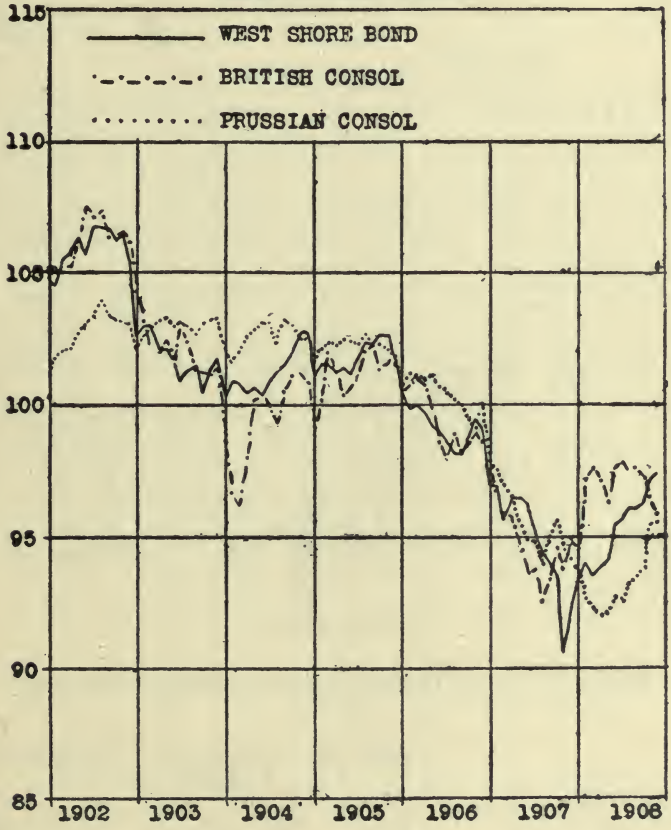
correspond with the fluctuations of stocks and commodity prices, but the long-run trend is in the opposite direction. Both the principal and the interest of bonds are fixed, and are constantly depreciating in value because of diminishing purchas-



ing power due to a depreciating money standard. On the other hand stocks participate in the larger earnings and increased value of business assets which normally result from rising prices. Again the current rate of interest on long-time investments tends to rise with rising prices, and therefore the fixed interest rate of bonds is capitalized at higher and higher rates, and bond values are correspondingly reduced. Hence, while

the short-time fluctuations of bonds correspond with the movements of the business cycle, the long-run tendency is the opposite of the movement of stocks and commodity prices.

CHART 8: BOND PRICES



E. The British and German Barometers

Exports, imports, and traffic receipts are the British series which fall in the industrial group. Traffic receipts however fail to register any cyclical fluctuations. The receipts follow a level course until the close of 1905 when a sudden drop occurs after which the receipts continue relatively constant again.

Only two series, therefore, remain for the industrial group, imports and exports. The relative numbers are given in Table G. The coefficients of correlation between the two series are as follows:

Imports	precedes	1 month	+.816
"	"	0 "	+.882
"	lags behind	1 "	+.759

High concurrent correlation is evident. In the case of the United States, exports were found to lag considerably behind the rest of the industrial group. In Great Britain, because of the extraordinary importance of her foreign trade, exports as well as imports constitute a sensitive indicator of prosperity and depression.

Of the monthly data available for Germany the analysis of groupings in the United States would indicate that production of pig iron, railroad gross earnings and wholesale prices should be classed together in the industrial group. The prices of consumers' goods and producers' goods might also be classed here, but as both are represented in wholesale prices the analysis of these two groups, as in the case of the United States, may be deferred until the following chapter where the theory of prosperity cycles will be discussed. The relative

TABLE VII

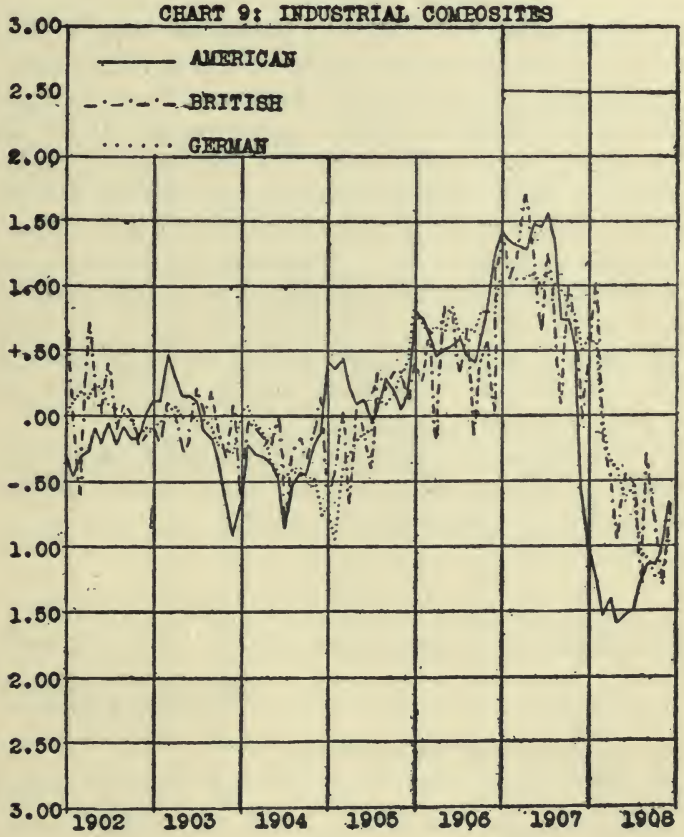
COEFFICIENTS OF CORRELATION—GERMAN INDUSTRIAL GROUP

	Each series precedes (—) or lags behind (+) wholesale prices by:				
Series correlated with Wholesale Prices:	—1 mo.	0 mo.	+1 mo.	+2 mo.	+3 mo.
Pig Iron Production:	+.917	+.922	+.926	+.920	
Railroad Receipts:	+.784	+.805	+.837	+.844	+.845

numbers for the remaining series are given in Table H. In Table VII are given the coefficients of correlation between Wholesale Prices and the other series in the group.[4] Pig iron

[4] A slight error is involved in the coefficients given in Table VII owing to the fact that the deviations from the average of a seven-year cycle are correlated with deviations from the averages of six and five-year cycles.

production is substantially synchronous with prices, lagging as it does only one month behind. Railroad receipts lags somewhat more behind. Hence wholesale prices and pig iron production were the only series included in the German industrial composite. These two series were combined by the usual method.



F. Comparison of the Three Barometers

We turn now to the chronological relation between the industrial barometers of the three countries under consideration. The relatives for the American, British and German Industrial composites appear in Table K. The three composites

are plotted together in Chart 9. The secular trends have been eliminated by the method of moments. From this chart it is evident that the cyclical movements are quite closely concurrent.

G. The British and German Banking Groups

In the Banking Group we find among the available British data the following: reserve of note and coin of the Bank of England, bank rate of the Bank of England, open market rate, bullion in the Bank of England, public deposits of the Bank of England, and "other deposits" of the Bank of England. Of these it was found best to make use of only the first three named. Bullion in the Bank of England was found to be almost exactly identical in its changes to the reserve of note and coin. Hence only one was used, and the reserve of note and coin was selected. "Other deposits" showed no cyclical movements, and public deposits proved to be very irregular. Both were ruled out. The index numbers for the other series are given in Table I, Appendix.

The coefficients of correlation between the bank rate, open market rate, and the reserve of note and coin were computed. The coefficients are given in Table VIII.

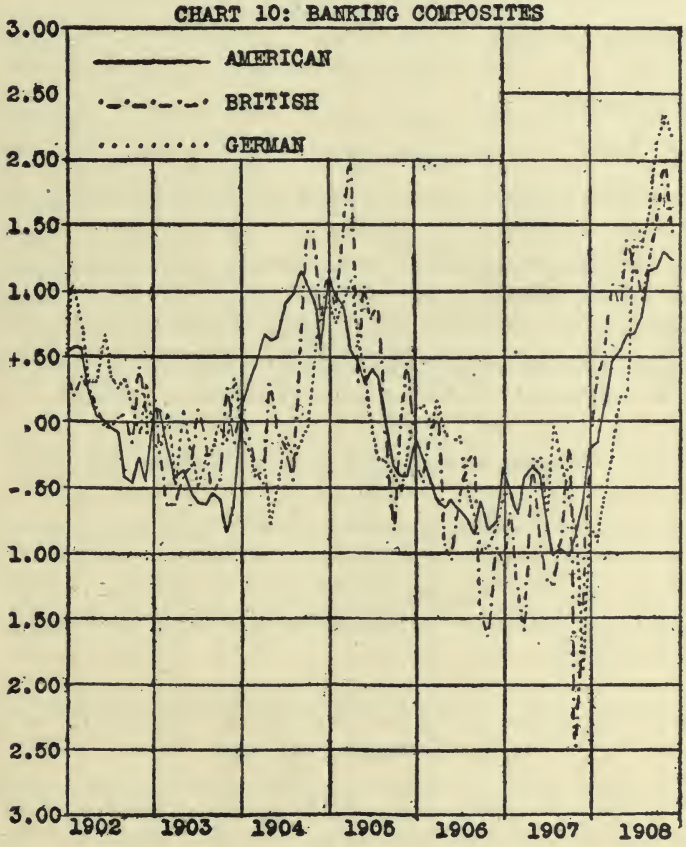
TABLE VIII

COEFFICIENTS OF CORRELATION—BRITISH BANKING GROUP

	Each series precedes (—) or lags behind (+) Reserves by:		
Series correlated with Reserve of Note and Coin	—1 mo.	0 mo.	+1 mo.
Bank Rate	—.254	—.538	—.519
Open Market Rate	—.236	—.501	—.474

Concurrent inverse correlation obtains in each case. These three series were averaged together to form the British Banking composite by the method used above. The relatives thus derived appear in Table K. In constructing this composite the bank and open market rates were inverted.

Of the available German data the following fall in the Banking Group: note circulation, coin and bullion in the Reichsbank, discounts and advances of the Reichsbank, deposits of the Reichsbank, bank rate, open market rate. Note circulation shows a steady secular growth, but no cyclical movements of



any note. It was therefore omitted. The index numbers for the remaining five series are given in Table J.

Coin and bullion in the Reichsbank was correlated with the other series in the group. The coefficients of correlation appear in Table IX.

TABLE IX

COEFFICIENTS OF CORRELATION—GERMAN BANKING GROUP

Series correlated with Coin and Bullion in Reichsbank:	Each series precedes (—) or lags behind (+) coin and bullion by:						
	—1 mo.	0 mo.	+1 mo.	+2 mo.	+3 mo.	+4 mo.	+5 mo.
Deposits:	+.426	+.502	+.389				
Loans:		—.523	—.588	—.584			
Open Market Rates:		—.603	—.671	—.711	—.732	—.676	
Bank Rate:		—.504	—.636	—.699	—.756	—.769	—.739

From this it appears that deposits and loans are substantially synchronous with coin and bullion. In the case of deposits the correlation is perfectly synchronous, while in the case of loans there is a lag of one month. The open market rate and bank rate lag three and four months behind, respectively.

Coin and bullion, deposits and loans (inverted) were therefore combined to form the German banking composite.

H. Comparison of the Three Banking Groups

The three banking composites are compared in Chart 10. The relatives are given in Table K. It appears that the three groups are fairly concurrent, though not entirely so. On the whole the American series seems to precede the European series slightly.

I. Comparison of the Amplitudes of Fluctuation of Different Series

It will be of interest to compare the three countries as to the amplitude of the fluctuations of the different series. Table X is therefore appended showing the standard deviations of the different series. It is of course clear that the larger the standard deviation the greater is the fluctuation of the series.

TABLE X

STANDARD DEVIATIONS OF SERIES IN UNITED STATES, GERMANY, AND GREAT BRITAIN

Series	United States	Great Britain	Germany
Stock Prices	13.0 (Ten stocks)	3.8 (Stocks & Bonds)	10.0
	16.0 (Forty common)	6.2 (Nineteen Ord.)	
Shares Traded	34.7		29.6
Liabilities of Business Failures	98.0		
Wholesale Prices	4.6		8.5
Production of Pig Iron	22.4		10.8
R. R. Gross Earnings	13.9		
Immigration	32.7		
Imports	15.7	7.8	
Exports		15.4	
Cash Reserves	9.3	7.2	9.3
Deposits	12.6		9.7
Loans	11.1		13.4
Money Rates	16.0 (Com. Paper)	22.6 (Bank)	23.5 (Bank Rate)
	94.3 (Call Loan)	27.5 (Open Market)	25.3 (Open Market)

APPENDIX TO CHAPTER III

TABLE E—INDEX NUMBERS OF THE SERIES IN THE BRITISH INVESTMENT GROUP

		Prices of Stocks and Bonds	Prices of 19 R. R. Ord. Stocks			Prices of Stocks and Bonds	Prices of 19 R. R. Ord. Stocks
	January...	102.3	106.4		January...	102.5	102.3
	February..	103.0	108.3		February..	102.9	103.4
	March....	103.3	108.2		March....	103.0	101.7
	April.....	103.3	107.9		April.....	102.2	100.2
	May.....	103.8	109.2		May.....	101.8	99.5
1902	June.....	105.0	111.0	1906	June.....	101.3	99.2
	July.....	104.7	110.0		July.....	100.7	100.1
	August....	104.7	109.6		August....	102.4	103.0
	September	104.1	106.8		September	101.2	100.7
	October...	104.1	106.9		October...	100.3	94.0
	November.	103.8	107.7		November.	101.4	99.8
	December.	103.6	107.7		December.	101.5	99.6
	January...	102.7	105.0		January...	100.1	97.1
	February..	103.0	107.5		February..	99.6	96.4
	March....	102.9	106.4		March....	96.8	93.6
	April.....	102.3	105.3		April.....	96.6	94.0
	May.....	102.4	104.6		May.....	95.6	92.7
1903	June.....	102.3	104.7	1907	June.....	94.1	91.1
	July.....	101.9	105.0		July.....	95.4	93.2
	August....	101.8	105.7		August....	92.2	90.3
	September	101.1	103.7		September	93.0	91.2
	October...	100.9	104.7		October...	92.9	91.1
	November.	100.7	100.2		November.	91.4	92.5
	December.	100.6	99.0		December.	92.5	94.7
	January...	98.8	97.1		January...	92.8	92.3
	February..	96.2	89.0		February..	92.9	92.0
	March....	97.3	95.3		March....	93.1	89.7
	April.....	98.9	100.0		April.....	92.9	90.1
	May.....	99.9	102.8		May.....	94.1	89.6
1904	June.....	100.5	101.4	1908	June.....	94.3	91.5
	July.....	100.1	100.5		July.....	94.4	89.8
	August....	99.8	100.0		August....	95.0	89.6
	September	100.6	101.7		September	95.6	91.5
	October...	102.0	105.4		October...	95.3	92.3
	November.	102.1	101.8		November.	96.5	90.8
	December.	102.2	103.3		December.	96.7	90.3
						(000)	(000)
	January...	100.9	99.9		January...	3,019,	258,900,
	February..	102.1	103.8		February..	3,010,	252,000,
	March....	103.6	105.2		March....	2,997,	251,900,
	April.....	103.1	102.2		April.....	3,004,	253,800,
	May.....	102.2	101.4		May.....	3,007,	253,300,
1905	June.....	102.5	100.8	Base	June.....	3,000,	253,100,
	July.....	102.6	101.2		July.....	2,994,	250,500,
	August....	103.6	101.8		August....	2,981,	246,600,
	September	104.2	104.5		September	2,982,	245,800,
	October...	104.2	105.4		October...	2,971,	243,700,
	November.	104.0	106.7		November.	2,973,	248,800,
	December.	103.3	105.6		December.	2,975,	248,100,

TABLE F—INDEX NUMBERS OF SERIES IN THE GERMAN INVESTMENT GROUP

		Trade on Bourse	Prices of 12 Stocks			Trade on Bourse	Prices of 12 Stocks
	January...	104.1	85.4		January...	114.7	113.0
	February..	112.0	88.3		February..	105.9	112.8
	March....	91.3	88.1		March....	114.8	112.2
	April.....	86.3	85.7		April.....	147.8	113.2
	May.....	99.9	86.0		May.....	146.3	113.3
1902	June.....	112.1	87.8	1906	June.....	133.8	112.5
	July.....	91.9	85.8		July.....	107.8	110.5
	August....	76.3	84.4		August....	98.3	110.6
	September	79.2	83.2		September	122.4	109.1
	October...	78.7	81.9		October...	93.4	108.2
	November.	76.0	82.3		November.	92.6	108.0
	December.	84.0	83.8		December.	110.6	109.0
	January...	102.1	87.0		January...	97.5	109.9
	February..	100.0	88.9		February..	83.5	108.1
	March....	102.0	91.4		March....	107.6	103.8
	April.....	100.3	91.5		April.....	74.2	101.6
	May.....	81.3	90.0		May.....	78.4	100.9
1903	June.....	80.7	89.2	1907	June.....	78.9	99.8
	July.....	87.0	90.1		July.....	69.9	99.0
	August....	74.7	90.7		August....	59.8	95.0
	September	69.4	90.3		September	58.7	96.8
	October...	118.0	93.2		October...	61.7	97.6
	November.	105.7	96.1		November.	57.5	94.6
	December.	119.2	97.4		December.	49.5	93.9
	January...	94.1	97.6		January...	57.2	96.8
	February..	108.1	94.1		February..	49.7	96.1
	March....	77.9	95.2		March....	54.3	95.8
	April.....	84.9	97.0		April.....	51.8	97.2
	May.....	74.9	98.2		May.....	80.9	97.9
1904	June.....	102.0	99.5	1908	June.....	78.4	96.3
	July.....	108.3	100.8		July.....	70.4	97.2
	August....	131.4	104.2		August....	76.8	98.5
	September	103.4	104.3		September	96.4	99.9
	October...	115.9	104.8		October...	80.8	97.7
	November.	140.9	107.3		November.	93.5	97.8
	December.	137.9	108.2		December.	78.7	97.5
						(000)	(000)
	January...	130.2	109.8		January...	1,569	2,227
	February..	140.5	112.2		February..	1,361	2,239
	March....	151.7	113.8		March....	1,297	2,219
	April.....	154.2	114.0		April.....	1,411	2,242
	May.....	138.5	113.5		May.....	1,197	2,238
1905	June.....	114.9	115.1	Base	June.....	954	2,220
	July.....	164.8	116.9		July.....	1,035	2,197
	August....	182.8	117.6		August....	1,094	2,223
	September	170.5	116.1		September	1,329	2,255
	October...	151.3	115.9		October...	1,361	2,254
	November.	133.9	114.2		November.	1,218	2,246
	December.	120.0	110.5		December.	1,072	2,252

TABLE G—INDEX NUMBERS OF SERIES IN THE BRITISH INDUSTRIAL SERIES

		Imports	Exports			Imports	Exports
	January...	97.3	85.7		January...	103.8	108.5
	February..	90.6	79.0		February..	103.3	106.5
	March....	82.1	78.2		March....	106.9	111.7
	April.....	98.2	88.3		April.....	100.0	101.6
	May.....	93.3	80.6		May.....	110.6	111.9
1902	June.....	91.5	79.9	1906	June.....	108.0	115.2
	July.....	95.6	85.9		July.....	105.2	110.3
	August....	90.1	82.2		August....	109.0	113.3
	September	93.0	83.5		September	100.2	107.0
	October...	92.2	83.7		October...	107.3	110.5
	November.	87.6	85.9		November.	108.2	114.6
	December.	90.2	85.2		December.	102.3	110.5
	January...	89.9	87.8		January...	117.5	123.8
	February..	88.2	84.4		February..	115.1	118.9
	March....	94.2	88.5		March....	115.9	122.2
	April.....	93.1	86.9		April.....	120.9	129.3
	May.....	90.2	85.8		May.....	113.2	130.2
1903	June.....	93.1	83.7	1907	June.....	107.9	124.2
	July.....	98.8	85.4		July.....	113.1	133.4
	August....	95.4	86.8		August....	110.0	126.3
	September	101.1	81.7		September	100.9	123.2
	October...	94.9	86.1		October...	113.3	127.5
	November.	94.6	80.1		November.	111.0	124.6
	December.	97.9	86.6		December.	104.8	115.1
	January...	89.3	85.0		January...	109.3	121.4
	February..	95.9	88.6		February..	114.0	129.5
	March....	97.7	85.4		March....	104.5	115.9
	April.....	96.1	88.3		April.....	100.1	115.2
	May.....	96.4	85.8		May.....	95.3	109.7
1904	June.....	97.5	90.5	1908	June.....	104.0	108.8
	July.....	88.8	81.7		July.....	101.5	111.2
	August....	94.6	89.1		August....	95.4	102.5
	September	95.9	90.9		September	106.8	111.0
	October...	97.3	84.8		October...	99.7	109.9
	November.	98.4	90.8		November.	96.9	101.3
	December.	98.9	98.8		December.	106.4	103.4
	January...	92.8	88.1			(000)	(000)
	February..	93.1	93.6		January...	51,500,	28,360,
	March....	98.2	98.9		February..	46,010,	27,000,
	April.....	92.1	90.7		March....	49,800,	28,410,
	May.....	100.9	96.2		April.....	47,060,	26,630,
1905	June.....	98.2	97.7		May.....	46,450,	28,350,
	July.....	97.1	91.9	Base	June.....	44,360,	26,610,
	August....	104.7	99.8		July.....	46,150,	30,300,
	September	101.8	103.0		August....	44,790,	29,570,
	October...	95.6	97.7		September	49,920,	28,530,
	November.	103.2	102.9		October...	50,830,	30,050,
	December.	99.4	101.0		November.	51,490,	28,770,
					December.	53,420.	28,440,

TABLE H—INDEX NUMBERS OF SERIES IN THE GERMAN INDUSTRIAL GROUP

		Pig Iron Production	R. R. Receipts per Kilometer	Wholesale Prices			Pig Iron Production	R. R. Receipts per Kilometer	Wholesale Prices
	January			88.4		January	90.1	88.0	96.0
	February			89.1		February	91.7	91.9	96.3
	March			89.9		March	88.0	92.9	96.6
	April			90.5		April	88.8	89.9	95.6
	May	Data	Data	91.0		May	89.1	87.4	93.5
1902	June	begin	begin	91.0	1904	June	88.5	92.4	92.5
	July	with	with	90.2		July	87.0	90.5	93.5
	August	1903	1904	90.3		August	87.9	91.3	93.7
	September			90.4		September	87.8	93.1	94.4
	October			89.9		October	88.4	91.4	94.2
	November			89.4		November	86.7	91.3	94.6
	December			89.6		December	88.0	94.3	89.6
	January	85.9		91.3		January	83.0	89.0	95.2
	February	87.5		92.1		February	79.0	88.1	95.2
	March	88.4		93.1		March	92.6	92.1	94.0
	April	87.8		93.6		April	95.3	91.9	95.3
	May	88.2		93.0		May	97.7	97.0	95.1
1903	June	88.9		93.3	1905	June	97.2	92.6	96.8
	July	88.8		92.9		July	96.8	92.7	98.5
	August	90.3		93.3		August	100.0	95.8	100.0
	September	89.5		92.6		September	100.5	98.5	99.5
	October	88.5		92.2		October	102.4	93.8	100.4
	November	87.6		92.4		November	102.8	95.8	102.2
	December	85.7		94.2		December	104.0	99.8	104.3

TABLE H—Continued

		Pig Iron Production	R. R. Receipts per Kilometer	Wholesale Prices			Pig Iron Production	R. R. Receipts per Kilometer	Wholesale Prices
	January	110.3	104.3	105.6		January	115.0	109.2	110.9
	February	110.2	103.8	104.9		February	116.8	111.7	108.7
	March	109.4	103.9	104.7		March	108.2	104.2	107.4
	April	108.6	99.8	106.0		April	104.2	107.1	104.5
	May	108.9	103.9	106.3		May	103.7	104.8	104.0
1906	June	113.4	101.3	106.7	1908	June	101.3	103.6	103.1
	July	108.3	101.0	106.8		July	103.7	106.1	102.7
	August	109.9	102.7	106.6		August	96.6	101.2	101.0
	September	109.2	101.2	107.9		September	97.8	103.1	100.4
	October	109.3	104.1	110.7		October	95.9	103.2	99.5
	November	110.4	104.7	110.7		November	96.8	100.0	99.1
	December	108.0	102.6	112.4		December	102.7	98.6	99.4
	January	115.1	109.0	113.0		January	923,000	2,285	3,873
	February	114.9	104.7	113.4		February	851,000	2,269	3,875
	March	113.7	107.0	114.1		March	967,000	2,536	3,865
	April	114.8	111.3	114.2		April	938,000	2,342	3,862
	May	112.4	107.1	116.8		May	973,000	2,439	3,887
1907	June	110.6	110.2	116.8	Base	June	944,000	2,310	3,876
	July	115.3	109.2	115.6		July	973,000	2,464	3,909
	August	115.3	108.8	115.0		August	968,000	2,588	3,928
	September	115.0	104.2	114.9		September	948,000	2,637	3,936
	October	115.8	107.5	113.4		October	982,000	2,870	3,955
	November	115.7	108.3	111.6		November	961,000	2,680	3,963
	December	111.8	104.6	110.7		December	990,000	2,413	3,926

TABLE I—INDEX NUMBERS OF SERIES IN THE BRITISH BANKING GROUP

		Reserves, Bank of England	Bank Rate	Open Market Rate			Reserves, Bank of England	Bank Rate	Open Market Rate
	January	101.8	91.0	90.9		January	98.8	94.6	90.9
	February	99.5	98.0	81.1		February	94.4	100.3	86.7
	March	96.1	80.9	80.1		March	93.2	107.8	95.4
	April	93.0	87.0	70.2		April	89.5	102.9	93.5
	May	98.2	86.7	95.9		May	97.0	86.7	80.6
1902	June	100.0	95.2	105.9	1904	June	91.1	95.2	79.3
	July	99.6	97.7	105.9		July	93.2	97.7	92.8
	August	99.0	96.5	96.9		August	96.9	96.5	113.6
	September	98.1	88.5	99.3		September	104.6	88.5	92.6
	October	99.2	102.5	103.9		October	116.4	77.5	68.0
	November	102.3	92.6	79.8		November	113.8	69.4	72.3
	December	95.3	91.7	99.0		December	100.3	68.8	73.5
	January	99.8	94.6	90.9		January	105.9	70.9	65.0
	February	95.9	100.3	99.5		February	104.2	75.2	73.8
	March	92.1	107.8	110.7		March	113.0	70.9	67.0
	April	97.3	116.0	119.1		April	110.5	72.5	68.1
	May	100.1	109.9	122.0		May	101.9	101.1	80.6
1903	June	97.6	103.1	115.4	1905	June	110.1	79.4	77.0
	July	100.8	97.7	97.9		July	104.4	81.5	74.2
	August	96.1	96.5	96.9		August	105.2	80.4	68.6
	September	92.8	115.1	101.4		September	93.9	88.5	97.2
	October	93.7	103.3	109.4		October	88.2	103.3	116.9
	November	102.3	92.6	94.9		November	95.9	92.6	96.4
	December	94.0	91.7	99.0		December	103.3	91.7	83.1

TABLE I—Continued

		Reserves, Bank of England	Bank Rate	Open Market Rate			Reserves, Bank of England	Bank Rate	Open Market Rate
	January	90.2	94.6	96.6		January	108.9	123.6	131.4
	February	93.9	100.3	114.1		February	109.7	100.3	106.8
	March	101.6	107.8	105.1		March	107.9	90.6	95.4
	April	102.7	103.2	102.1		April	113.6	87.0	80.6
	May	89.6	114.8	122.0		May	111.2	85.0	87.2
1906	June	92.7	121.5	132.4	1908	June	110.9	79.4	52.8
	July	99.6	114.0	132.2		July	108.0	81.5	55.1
	August	102.3	112.5	118.2		August	102.3	80.4	54.5
	September	104.2	112.1	119.1		September	103.8	73.7	48.4
	October	85.7	131.6	128.4		October	108.8	64.6	52.9
	November	88.0	139.0	141.4		November	116.6	57.9	49.6
	December	102.1	137.5	140.9		December	107.4	57.4	57.6
							(000)		
	January	94.7	130.0	135.0		January	19,700,	4.23	3.85
	February	102.6	125.3	138.5		February	25,300,	3.99	3.39
	March	96.5	134.8	147.0		March	27,400,	3.71	3.27
	April	93.0	132.1	165.9		April	25,700,	3.45	2.94
	May	102.2	115.7	111.2		May	24,500,	3.46	2.87
1907	June	97.6	127.0	137.0	Base	June	24,800,	3.15	2.60
	July	94.4	130.3	142.8		July	25,100,	3.07	2.36
	August	98.6	137.9	151.5		August	24,000,	3.11	2.64
	September	103.4	132.9	141.3		September	26,300,	3.39	2.83
	October	107.6	117.1	120.9		October	23,800,	3.87	3.31
	November	81.6	156.3	165.5		November	21,700,	4.32	4.15
	December	97.5	160.6	147.2		December	15,700,	4.36	3.91

TABLE J—INDEX NUMBERS OF SERIES IN THE GERMAN BANKING GROUP

		Reserves	Deposits	Loans	Open Market Rate	Bank Rate
	Jan.....	107.8	102.4	85.5	89.2	57.6
	Feb.....	107.5	123.2	92.5	106.7	65.7
	March..	108.7	110.3	90.3	92.8	67.7
	April...	108.0	97.8	88.5	83.3	70.0
	May....	108.4	93.5	83.7	97.1	72.5
1902	June....	107.9	103.9	82.7	93.5	73.7
	July....	107.0	95.5	84.3	93.5	75.0
	Aug.....	105.4	96.3	84.6	99.3	75.0
	Sept....	102.8	98.4	81.8	91.5	75.0
	Oct.....	103.1	95.4	86.7	83.3	71.2
	Nov....	100.7	88.2	82.5	95.0	62.6
	Dec.....	100.0	102.4	85.6	91.7	60.0
	Jan.....	98.2	98.3	95.1	78.0	76.7
	Feb.....	96.2	91.8	88.3	76.2	87.6
	March..	95.1	99.6	85.3	61.9	79.0
	April...	91.0	90.3	87.8	72.8	81.6
	May....	92.2	111.2	94.5	92.9	84.5
1903	June....	92.8	103.6	99.7	97.2	86.1
	July....	95.7	90.2	95.6	93.5	100.0
	Aug.....	96.3	94.1	93.8	103.3	100.0
	Sept....	99.0	89.6	90.2	106.7	100.0
	Oct.....	104.9	89.7	92.1	100.6	95.0
	Nov....	102.1	90.5	92.8	83.1	83.5
	Dec.....	101.8	95.1	94.1	80.4	80.0
	Jan.....	99.6	97.4	97.6	69.7	76.7
	Feb.....	96.7	94.5	95.0	72.3	87.6
	March..	96.5	90.4	95.5	92.8	90.3
	April...	95.0	97.0	101.3	90.3	93.3
	May....	95.9	80.1	95.2	92.9	96.6
1904	June....	95.7	85.1	89.4	93.5	98.3
	July....	94.5	94.7	89.0	97.2	100.0
	Aug.....	95.7	89.3	88.6	82.8	100.0
	Sept....	97.0	90.0	86.0	79.8	100.0
	Oct.....	97.4	93.3	87.1	86.7	95.0
	Nov....	107.0	93.1	82.3	97.8	104.3
	Dec.....	115.2	94.4	81.5	83.1	100.0
	Jan.....	115.5	97.4	82.1	83.6	96.0
	Feb.....	113.2	98.7	87.1	72.3	87.6
	March..	112.0	106.6	88.8	54.2	79.0
	April...	113.1	109.5	88.8	69.4	70.0
	May....	108.6	107.6	98.9	64.8	72.5
1905	June....	107.6	102.1	99.0	70.1	73.7
	July....	102.2	97.7	103.3	62.3	75.0
	Aug.....	98.7	92.9	101.2	66.2	75.0
	Sept....	97.1	98.1	106.1	76.2	75.0
	Oct.....	93.1	98.5	105.8	93.6	95.0
	Nov....	93.3	95.2	105.4	106.9	104.3
	Dec.....	95.5	94.5	99.1	105.9	110.0

TABLE J—Continued

		Reserves	Deposits	Loans	Open Market Rate	Bank Rate
	Jan.....	101.9	99.9	99.8	94.7	115.2
	Feb.....	101.2	100.5	100.1	99.1	109.4
	March..	100.0	100.5	104.5	112.0	112.8
	April...	102.0	99.4	98.4	114.4	116.5
	May....	101.8	92.0	97.2	105.1	120.9
1906	June....	99.7	91.1	95.9	105.0	110.7
	July....	94.9	104.2	106.4	120.5	112.5
	Aug.....	93.7	94.9	107.9	111.6	112.5
	Sept....	91.2	87.6	103.4	106.7	112.5
	Oct.....	83.4	97.5	115.6	121.4	118.8
	Nov....	86.8	97.4	118.6	124.7	125.2
	Dec.....	86.1	101.8	117.6	114.7	120.0
	Jan.....	86.3	104.2	111.8	128.2	134.4
	Feb.....	89.9	100.1	111.9	133.2	131.3
	March..	91.6	95.9	116.2	150.8	135.4
	April...	91.3	108.1	120.3	156.1	139.9
	May....	93.5	106.6	118.6	129.4	132.9
1907	June....	95.0	110.0	123.1	143.9	135.2
	July....	90.8	98.5	119.4	148.0	137.5
	Aug.....	96.0	112.6	119.7	144.7	137.5
	Sept....	93.7	113.2	129.0	141.0	137.5
	Oct.....	90.1	101.6	118.1	145.8	130.7
	Nov....	85.2	108.1	130.9	130.6	135.8
	Dec.....	78.6	85.7	132.5	160.6	150.0
	Jan.....	90.6	100.5	128.2	156.1	144.1
	Feb.....	94.8	91.1	124.3	140.9	131.3
	March..	95.6	96.8	119.9	135.2	135.4
	April...	100.0	97.8	114.8	114.4	128.2
	May....	99.8	108.8	112.0	117.1	120.9
1908	June....	101.6	104.5	109.8	97.2	122.9
	July....	114.3	119.5	102.0	85.7	100.0
	Aug.....	114.5	120.1	104.4	91.1	100.0
	Sept....	118.7	122.9	102.9	99.0	100.0
	Oct.....	128.1	124.4	94.7	69.4	95.0
	Nov....	125.1	127.4	88.0	62.2	83.5
	Dec.....	122.7	126.2	89.1	62.8	80.0
		(000)	(000)	(000)		
	Jan.....	41,890,	26,240,	57,520,	4.48	5.21
	Feb.....	47,330,	24,720,	42,270,	3.28	4.57
	March..	48,330,	28,630,	42,470,	3.23	4.43
	April...	44,930,	27,380,	53,230,	3.60	4.29
	May....	47,930,	28,230,	47,150,	3.09	4.14
Base	June....	50,100,	29,760.	46,330,	3.21	4.07
	July....	46,280,	26,950,	53,850,	3.21	4.00
	Aug.....	48,120,	26,040,	45,500,	3.02	4.00
	Sept....	46,790,	28,870,	47,280,	3.28	4.00
	Oct.....	40,560,	26,610,	61,120,	3.60	4.21
	Nov....	42,850,	24,920,	52,990,	4.21	4.79
	Dec.....	43,350,	27,770,	49,800.	4.36	5.00

TABLE K—RELATIVES OF AMERICAN, BRITISH AND GERMAN COMPOSITES

(Secular Trends Eliminated)

	American Investm't Comp.	American Indus. Comp.	American Banking Comp.	British Investm't Comp.	British Indus. Comp.	British Banking Comp.	German Investm't Comp.	German Industrial Comp.	German Banking Comp.
1902									
January	— .35	— .28	+ .52	— .61	+ .68	+ .33	— .46	+ .02	+ .50
February	— .14	— .44	+ .59	— .29	+ .03	+ .20	— .18	+ .11	+1.06
March	— .22	— .29	+ .57	— .26	— .61	+ .33	— .54	+ .19	+ .73
April	+ .52	— .25	+ .22	— .23	+ .72	+ .24	— .73	+ .16	+ .31
May	+ .17	— .08	+ .03	+ .01	+ .14	+ .14	— .50	+ .25	+ .30
June	+ .02	— .19	.00	+ .33	+ .01	— .01	— .20	+ .22	+ .68
July	+ .51	— .06	— .05	+ .28	+ .43	— .05	— .65	+ .07	+ .34
August	+ .28	— .20	— .11	+ .31	— .11	+ .02	—1.01	+ .04	+ .26
September	+ .49	— .09	— .42	— .03	+ .08	+ .07	—1.02	+ .01	+ .32
October	+ .18	— .17	— .47	.00	+ .01	— .15	—1.08	— .02	+ .11
November	+ .04	— .16	— .26	+ .11	— .20	+ .43	—1.13	— .16	— .10
December	— .13	+ .03	— .45	+ .14	— .13	— .11	— .90	— .08	+ .28
1903									
January	— .02	+ .12	+ .07	— .20	— .07	+ .17	— .46	— .11	— .16
February	— .02	+ .11	+ .06	+ .07	— .22	— .18	— .39	— .03	— .25
March	— .13	+ .47	— .19	— .06	+ .12	— .63	— .27	+ .05	+ .06
April	— .43	+ .30	— .42	— .24	.00	— .62	— .30	+ .07	— .49
May	— .30	+ .17	— .37	— .21	— .26	— .42	— .68	— .01	+ .09
June	— .06	+ .17	— .56	— .18	— .16	— .33	— .75	.00	— .22
July	— .65	+ .13	— .62	— .15	+ .23	+ .09	— .59	— .03	— .50
August	— .78	— .09	— .63	— .04	+ .01	— .12	— .74	— .02	— .30
September	— .88	— .18	— .54	— .30	+ .20	— .55	— .90	— .09	— .23
October	—1.06	— .33	— .57	— .19	— .09	— .44	+ .08	— .22	— .05
November	— .94	— .67	— .84	— .57	— .31	+ .25	+ .01	— .25	— .15
December	— .86	— .92	— .68	— .62	+ .08	— .16	+ .28	— .26	+ .32

TABLE K—Continued

	American Investm't Comp.	American Indus. Comp.	American Banking Comp.	British Investm't Comp.	British Indus. Comp.	British Banking Comp.	German Investm't Comp	German Industrial Comp.	German Banking Comp.
1904									
January	— .90	— .66	+ .10	—1.01	— .59	+ .13	— .10	+ .01	— .13
February	— .99	— .23	+ .29	—2.02	— .04	— .13	— .06	+ .08	— .23
March	— .96	— .27	+ .45	—1.38	— .08	— .37	— .63	— .08	— .42
April	—1.04	— .29	+ .68	— .68	— .13	— .48	— .31	— .12	— .37
May	—1.04	— .35	+ .62	— .28	— .23	+ .27	— .44	— .33	— .77
June	— .91	— .48	+ .66	— .28	— .01	— .10	+ .06	— .46	— .44
July	— .50	— .87	+ .92	— .38	— .87	— .20	+ .25	— .48	— .13
August	— .61	— .53	+ .98	— .43	— .29	— .44	+ .79	— .41	— .29
September	— .33	— .44	+1.15	— .11	— .18	+ .47	+ .31	— .44	— .14
October	+ .52	— .45	+1.05	+ .30	— .35	+1.44	+ .58	— .47	— .05
November	+ .40	— .23	+ .91	+ .08	— .12	+1.44	+1.09	— .49	+ .43
December	+ .42	— .12	+ .54	+ .19	+ .17	+ .78	+1.09	— .76	+ .76
1905									
January	+ .30	+ .42	+1.11	— .15	— .60	+1.12	+1.04	— .73	+ .90
February	+ .82	+ .37	+ .97	+ .34	— .43	+ .86	+1.33	— .94	+ .75
March	+ .96	+ .43	+ .88	+ .71	+ .02	+1.42	+1.61	— .39	+ .93
April	+ .96	+ .22	+ .56	+ .37	— .65	+2.04	+1.64	— .26	+1.08
May	+ .62	+ .08	+ .48	+ .18	+ .06	+ .30	+1.38	— .16	+ .62
June	+ .52	+ .12	+ .31	+ .35	— .11	+1.04	+1.02	— .12	+ .39
July	+ .57	— .05	+ .40	+ .38	— .39	+ .77	+1.96	— .09	— .06
August	+ .83	+ .06	+ .36	+ .61	+ .35	+ .89	+2.31	+ .14	— .28
September	+ .62	+ .29	+ .02	+ .89	+ .22	— .07	+2.00	+ .09	— .31
October	+ .81	+ .20	— .33	+ .92	— .35	— .82	+1.66	+ .18	— .40
November	+1.03	+ .06	— .42	+1.11	— .34	— .04	+1.27	+ .31	— .52
December	+1.14	+ .21	— .43	+ .93	— .13	+ .45	+ .88	+ .44	— .25

1906									
January	+1.44	+ .80	— .13	+ .64	+ .42	— .36	+ .88	+ .81	+ .11
February	+1.15	+ .75	— .28	+ .75	+ .27	— .46	+ .73	+ .72	+ .12
March	+ .80	+ .63	— .47	+ .70	+ .66	— .09	+ .83	+ .64	— .04
April	+ .95	+ .48	— .62	+ .43	— .15	+ .06	+1.43	+ .67	+ .15
May	+1.01	+ .51	— .65	+ .38	+ .86	— .96	+1.38	+ .64	— .07
June	+1.38	+ .53	— .61	+ .28	+ .73	—1.03	+1.18	+ .85	— .14
July	+ .82	+ .59	— .69	+ .39	+ .34	— .60	+ .63	+ .59	— .12
August	+1.27	+ .47	— .75	+ .79	+ .67	— .33	+ .47	+ .66	— .51
September	+1.29	+ .42	— .87	+ .53	— .14	— .23	+ .76	+ .63	— .73
October	+1.01	+ .60	— .61	— .13	+ .41	—1.47	+ .22	+ .78	— .99
November	+ .82	+ .82	— .85	+ .51	+ .58	—1.64	+ .21	+ .80	— .95
December	+ .66	+1.25	— .80	+ .67	+ .03	— .97	+ .57	+ .78	— .78
1907									
January	+ .50	+1.40	— .33	+ .20	+1.46	—1.07	+ .37	+1.09	— .56
February	+ .45	+1.33	— .52	+ .15	+1.07	— .71	+ .04	+1.06	— .55
March	+ .57	+1.31	— .71	— .38	+1.20	—1.28	+ .25	+1.05	— .71
April	+ .04	+1.28	— .40	— .35	+1.71	—1.59	— .43	+1.06	— .43
May	— .04	+1.48	— .36	— .53	+1.21	— .29	— .42	+1.07	— .33
June	— .44	+1.44	— .43	— .93	+ .67	— .95	— .46	+ .99	— .28
July	— .18	+1.54	— .76	— .60	+1.24	—1.22	— .67	+1.09	— .70
August	— .44	+1.33	—1.01	—1.21	+ .79	—1.25	—1.03	+1.00	— .05
September	— .69	+ .74	— .99	— .96	+ .09	— .85	— .96	+ .97	— .35
October	—2.54	+ .74	—1.02	— .93	+ .99	— .14	— .86	+ .86	— .58
November	—1.44	+ .52	— .85	—1.01	+ .74	—2.47	—1.11	+ .77	— .88
December	—1.64	— .59	— .66	— .55	— .01	—1.62	—1.29	+ .50	—1.89

TABLE K—Continued

	American Investm't Comp.	American Indus. Comp.	American Banking Comp.	British Invesm't Comp.	British Indus. Comp.	British Banking Comp.	German Investm't Comp.	German Industrial Comp.	German Banking Comp.
1908									
January	—1.24	—1.05	— .22	— .76	+ .42	— .32	—1.02	+ .61	— .83
February	—1.25	—1.27	— .17	— .73	+1.01	+ .37	—1.18	+ .56	— .92
March	— .83	—1.52	+ .17	— .86	— .06	+ .55	—1.13	— .01	— .57
April	— .95	—1.42	+ .46	— .83	— .45	+1.06	—1.11	— .34	— .26
May	— .15	—1.61	+ .56	— .68	— .96	+ .88	— .58	— .43	+ .19
June	— .43	—1.52	+ .64	— .49	— .45	+1.38	— .73	— .66	+ .19
July	— .32	—1.50	+ .67	— .62	— .54	+1.17	— .83	— .55	+1.33
August	— .39	—1.30	+ .79	— .45	—1.27	+ .94	— .61	—1.02	+1.32
September	— .29	—1.16	+1.14	— .13	— .28	+1.19	— .25	—1.07	+1.60
October	— .25	—1.15	+1.18	— .23	— .79	+1.49	— .60	—1.24	+2.16
November	+ .41	—1.04	+1.31	— .02	—1.30	+2.00	— .41	—1.23	+2.33
December	+ .41	— .67	+1.24	— .07	— .69	+1.44	— .65	— .98	+2.21

CHAPTER IV

THE THEORY OF PROSPERITY CYCLES

A. Introduction

Theories of prosperity cycles may be divided into two main classes: first, those which hold that prosperity and depression are due to economic relations growing out of the modern industrial system of production and exchange, and second those which hold that these cycles are based on crop-yield cycles which are due in turn to cyclical fluctuations in temperature and rainfall.

In this chapter will be treated those theories which find the causal factors of prosperity cycles within the industrial and business mechanism itself and not in meteorological phenomena. These theories may be classified under three main heads: (1) those that place the emphasis upon producers' goods; (2) those that place the emphasis upon consumers' goods; (3) those that place the emphasis on money, credit, prices and capitalization.

Those theories which are concerned mainly or wholly with financial panics are here passed over entirely. They have in fact nothing to do with economic or industrial fluctuations proper. A financial panic is merely the seething foam of an industrial storm, and makes its appearance only in those countries which have a totally inadequate banking system. A panic obtains when thoroughly sound business firms are unable to get credit because of an inelastic system of currency and reserves. Such a situation has not obtained for a generation in any advanced European country.

The older and now obsolete theories of crisis are also passed by. The two categories into which they generally fell are indicated by the two formulae in which their arguments were put—over-production and under-consumption. Several modern theories may likewise be classed under these two general

heads, but modern theories have analyzed over-production and under-consumption with much greater detail and discrimination. The one finds the causal factor of crises in the under-consumption of producers' goods, the other in the under-consumption of consumers' goods. Only the newer formulations of the production and consumption theories will be dealt with here.

We have then the following classification:

A. Economic Theories.
   I. Those that emphasize Producers' Demand.
   II. Those that emphasize Consumers' Demand.
   III. Those that emphasize Money, Credit, Prices and Capitalization.

B. Meteorological Theories.

That modern economic theories of industrial fluctuations may be classed under three main heads may at first seem dubious. Mitchell describes modern theories under the following numerous heads: Competition Theory, Discrepancy between Wages and Productivity, Over-saving, Theory of Diminishing Utility, Over-capitalization, Ill-balanced Production of Industrial Equipment and Complementary Goods, Changing Costs of Construction, Variations in Prospective Profits, Discrepancy between Prospective Profits and Current Capitalization, Uneven Expansion in the Production of Organic and Inorganic Goods, Dissimilar Price Fluctuations of Producers' and Consumers' Goods, Theory of Lagging Adjustment of Interest, Theory of Impair Savings.[1] But when we come to look at the matter closely we find that one group finds the key to the situation in the over-production and under-consumption of producers' goods, another finds it in the over-production and under-consumption of consumers' goods, while a third group finds it in money, credit, prices and capitalization.

[1] Mitchell, *Business Cycles*, pp. 6-18.

B. Economic Theories of Prosperity Cycles

1. Theories emphasizing producers' demand

(a). Minnie T. England[2]

Mrs. England's theory places the emphasis definitely and entirely on the demand for producers' goods. Promotion is the cause of prosperity. Promotion implies the investment of social savings. When this investment is going on good times obtain; when it slows up depression appears. It is not a question of the "under-consumption" of consumers. It is a question of the "under-consumption" of investors. Increased prosperity is merely an increased demand for goods, but the goods in question are not consumers' goods but producers' goods. This increased demand for capital goods causes increased prices in capital goods, which results in larger profits for their producers. Higher wages are paid in these industries, more men are employed and there results an increased demand for consumers' goods. But this is a result and not a cause.

Promotion is carried on largely with borrowed funds obtained chiefly from banks. Thus promotion results in an increase in bank loans and bank deposits. This expansion of credit results in the demand which produces the rise in prices mentioned above. Hence the sequence runs as follows: increased promotion, expansion of credit, rise in prices. The important point to notice in this theory is that the increased loans leading to higher prices are primarily due to the purchase and production of capital goods which results from promotion, and not due to the purchase of consumption goods. This conclusion is substantiated by the fact that the prices of producers' goods rise before a rise occurs in the prices of consumers' goods; and also by the fact that the rise is higher for producers' goods.

[2] M. T. England, "Fisher's Theory of Crises," *Q. J. Econ.*, XXVII, 95-106; "Promotion as the Cause of Crises," *Q. J. Econ.*, XXIX, 631-41; "Economic Crises," *J. Pol. Econ.*, XXI, 345-54; "Analysis of the Crises Cycle," *J. Pol. Econ.*, XXI, 712-34.

Likewise when depression sets in the prices of producers' goods fall before the prices of consumers' goods, indicating that the check to prosperity is due to a falling off of promotion activity. Depression is brought on by the reverse of the forces which produced prosperity. Business failures occur which result in a loss of confidence in further investment. The demand for capital goods falls off, credit is contracted, and prices fall. Forced economy in consumption results, but the reduced demand for consumption occurs as a result of the falling off in the demand for producers' goods.

(b.) George H. Hull[3]

Hull offers the theory that prosperity and depression are nothing more or less than a variation in the amount of construction work. He holds that there are certain classes of goods that do not admit of any great fluctuations in demand. These are the necessities of life. Agriculture, commerce and finance are the departments of economic life that supply these necessities. In industry alone do we find a department of economic activity capable of sudden expansion or contraction. Three-fourths of industrial operations, it is claimed, consists of construction. Two-thirds of this construction consists of repairs, replacements and such extensions as are required by the steady growth of population. Therefore a large proportion of industrial operations are also incapable of any great extension or contraction. The other industrial operations are what Hull calls "extra" construction, or "investment" construction. Extra construction is undertaken only in a period of low prices when far-seeing investors enter upon a large amount of construction work. Others follow these leaders and the result is a great demand for iron and steel, lumber, cement, brick and stone. This creates a boom in the industries producing these products. Labor and raw materials are demanded on a large scale, and neither can be secured to the required extent. The inevitable result is a rise in wages and the price of raw materials, and with that high prices for con-

[3] George H. Hull, *Industrial Depressions* (New York, 1911).

struction goods. Far-seeing industrial leaders now cease the extension of construction work. The demand for construction material drops off. Laborers engaged on constructional enterprises suffer from unemployment and reduction in wages. Prices and wages fall until the low costs again make construction work profitable, and a new era of prosperity follows.

Prosperity then has nothing to do with the variation in the demand for consumers' goods. That remains relatively constant. But the waves of prosperity and depression are the result of variations in the demand for construction work.

(c). D. H. Robertson[4]

Robertson in his *Study of Industrial Fluctuations* aims to present a complete statement of all the factors affecting prosperity waves. He discusses these factors under the two headings of supply and demand. With regard to supply he discusses the following points: (1) the influence of the time required to construct instruments of production; (2) the influence of the length of life of the instruments of production; (3) the influence of fluctuations in the cost of construction; (4) the influence of invention. Under "demand" he discusses: (1) changes in demand due to fashions, tariffs and wars; (2) the influence of the volume of crops on the demand for railroad equipment, shipping, constructional work, and iron and steel exports. Other points of less importance are also discussed.

Production begins to increase under one or more of the following influences: (1) a general increase in the physical productivity of effort due to the adoption of improved methods under the stimulus of depression; (2) an increase in the exchange value of industrial products against the products of agriculture due to an increased bounty of nature; (3) an expansion due either to an increase of confidence or an increased supply of gold or credit currency, which affords an additional bonus to business men because of the relative fixity of wages and interest rates; (4) an increase in the expected future pro-

[4] D. H. Robertson, *Study of Industrial Fluctuations* (London, 1915); "Study in Trade Fluctuations," *J. R. S.*, LXXVI, 159-78.

ductivity of constructional goods due either to a wearing out of an exceptionally large number of existing instruments, or to the discovery of the industrial possibilities of a new country or to some physical or legal invention.

In the course of time the physical productivity of effort declines owing to the relapse into wasteful methods of production and to the operation of the law of increasing cost; agricultural shortage turns the ratio of exchange against industrial products; the monetary stimulus to increased production is reversed by a depletion of gold reserves and an increase of interest and wages in accordance with the rising price level; and a decline in the demand for construction goods occurs because of over-investment in these goods.

Here are many points familiar to crisis theories. The contribution made by Robertson is his discussion of the influence of the time required to construct instruments of production, and the influence of the length of life of these instruments.

The longer the time required to construct new instruments the greater will be the over-production of capital goods. An increased demand for certain producers' goods will make the production of these goods profitable because of their high price. But this high price will continue until the new batch of instruments is brought on the market. The longer the time required to bring this new batch on the market, the longer will be the period during which the production of these goods is stimulated, and the greater will be the quantity of capital goods finally produced. This discussion is borrowed largely from Aftalion, whose theory will be developed later.

The influence of the length of life of the instruments of production is the distinctive contribution of Robertson. During the rising price period a great quantity of industrial instruments are produced. These wear out simultaneously producing an appreciable shortage. This leads to high prices and a fresh burst of investment. Thus once started the cycles tend to be self-perpetuating. Meager statistics are presented in support of this theory. The longevity of iron rails, ships, cotton-spinning machinery, coal mines, etc., is considered. The facts do not seem to fit the theory very successfully.

Robertson's theory is by no means clean cut. On the whole, however, he places the emphasis on the demand for producers' goods. Depression is caused by the cessation of demand for producers' goods resulting from an over-production of these goods due to the length of time required to construct them. Prosperity is caused by the increased demand for producers' goods growing out of the shortage due to the simultaneous wearing out of the instruments of production constructed in a previous period of prosperity.

2. THEORIES EMPHASIZING CONSUMERS' DEMAND

(a). Aftalion[5]

Aftalion's explanation of crises places the emphasis on the demand for consumers' goods. Assume as a starting point an insufficient satisfaction of wants obtaining because of under-production of consumers' goods. This results in high prices for consumers' goods, and a great increase in productive effort to supply more of these goods. But the great increase of production resulting fails to supply the wants of consumers or to weaken prices. The reason for this strange anomaly lies in the fact that the increased productive effort is not applied to the production of consumers' goods directly, but rather indirectly by a round about method which necessitates the production of capital goods before there can be an increase in consumers' goods. Until the new capital goods can be finished and put to work producing consumers' goods the demand for the latter remains unsatisfied.

The fluctuations in the prices of consumers' goods give rise to still greater fluctuation in the prices of producers' goods. In fact a relatively small change in the demand for consumers' goods may produce a very large proportionate change in the demand for producers' goods. If for example 10 per cent of a certain commodity is produced by new equipment every year, an increase of 10 per cent in the demand for this commodity would result in an increase of 100 per cent in the demand for new equipment. Thus an increase in the demand for con-

[5] A. Aftalion, *Les crises periodiques de surproduction* (Paris, 1913).

sumers' goods stimulates a still greater increase in the production of fixed capital. But while this production is going on, consumers' goods are no more numerous than before, and therefore the demand for consumers' goods persists which in turn induces the demand for producers' goods. These producers' goods are not immediately forthcoming. Statistics are presented showing that the horse power of machinery in various industries does not increase notably until a considerable time after the beginning of a boom period. It is only when the new instruments of production begin to pour out consumers' goods that the consumers' demand becomes satisfied and prices begin to drop. That affects the value of producers' goods, the demand for new construction falls, and prosperity wanes.

Thus the demand for both consumers' and producers' goods is prolonged by the fact that it requires a considerable length of time before the new instruments of production can be completed. And not only is prosperity prolonged by the long time required to produce new capital goods, but depression as well is prolonged by the same fact. Instruments already in process of production must be completed. Therefore the production of fixed capital continues even after the crisis period. Aftalion presents statistics to show that the horse power of machinery in various industries continues to increase from one to three years after the break in prices. Thus the curve of the production of capital goods lags behind the curve of general production and general prices one to three years.

But this overly large supply of industrial equipment continuing to be poured on the market for a considerable time after the drop in prices, must be put to use in order to get something out of it. Hence consumers' goods are poured out in greater and greater quantities, and depression is prolonged and aggravated. This state of affairs continues until the time has arrived when the demand for consumers' goods has again outstripped the industrial equipment. Then the rise in the prices of consumers' goods stimulates a new demand for producers' goods and another period of prosperity is launched.

It is therefore the fluctuation in the prices of consumers' goods which is at the bottom of economic cycles.

(b). Carver[6]

Professor Carver's theory resembles Aftalion's in many respects. He holds that a small increased difference between selling prices and expenses results in a large increase in profits. This large increase in profits results in a much higher capitalized value of the industrial equipment. The industrial equipment produces finished products which are either consumers' goods or at least much farther forward in the march toward consumers' goods than is the industrial equipment. A relatively small increase in the value of the finished product results in a much greater increase in the value of the fixed capital. This means that the value of producers' goods tends to fluctuate much more violently than the value of consumers' goods.

The enhanced value of the producers' goods due to larger profits stimulates the production of producers' goods much more than of consumers' goods since the value of the latter does not rise nearly as much proportionally. Less energy is therefore devoted to the production of consumers' goods. They become relatively scarcer and a still greater rise in prices results. That in turn leads to still larger profits and higher capitalized value of producers' goods. This condition of affairs continues to obtain until the new stock of producers' goods begins to pour out consumers' goods. Then prices drop, profits fall more than prices, and the value of producers' goods declines in proportion to the decline in profits. The production of capital goods is then checked and depression appears.

Here, as in Aftalion's theory, prosperity and depression grow out of fluctuations in the prices of consumers' goods.

(c). Hobson[7]

Hobson's theory is a modification and improvement of the socialistic theory of under-consumption. He believes that the fundamental cause of crises may be found in the existence of surplus incomes. Wealthy people with very large incomes are

[6] T. N. Carver, "A Suggestion for a Theory of Industrial Depressions," *Q. J. of Econ.* (May, 1903), pp. 497-500.
[7] J. A. Hobson, *The Industrial System* (London, 1909).

unwilling to consume it all by themselves. They desire to invest a considerable share of their incomes in producers' goods in order to increase their fortunes. These producers' goods necessarily emerge ultimately in the form of consumers' goods. The masses of the people with their limited incomes are unable to purchase all these consumers' goods. The inevitable result is a congested market, which leads to lower prices, less profits, and smaller incomes for the very rich. These reduced incomes force the wealthy classes to spend a greater proportion of their incomes and less is invested in capital goods. Thus consumption is given a chance to catch up with the capacity of the industrial equipment, surplus goods are worked off, and prices again rise. With the return of higher prices, profits are increased, incomes are greater, a larger and larger proportion of the surplus incomes are invested in capital goods, which are used in the production of consumers' goods. Thus production again outruns consumption.

This argument obviously disposes effectively of Mill's answer to the theory of under-consumption. Mill claimed that there could be no such thing as over-production because the doubling of the supply of commodities in every market would by the same stroke double the purchasing power. The means of purchase would always be present. Hobson does not deny that the means of purchase is present but he denies that the recipients of surplus incomes would ever be willing to spend enough of their income to prevent the over-production of consumers' goods. No matter how much production is directed toward the things that would appeal to the rich, even their ostentatious wants are so amply provided for that always will they desire in periods of prosperity to invest too large a proportion of their incomes in further production. Since they themselves are unwilling to spend the proper proportion of their incomes on consumers' goods, this investment must necessarily result in the production of goods intended for the masses. Because of the limited incomes of the masses this leads to the over-production of consumers' goods.

Thus there is a reserve of capital just as there is also a reserve of labor. Surplus incomes cause the incessant attempt

to employ capital in excess of the demand of the ultimate consumer.

One of two things must be done. Either the rich will have to abandon their excess investments and resort to greater spending, or else surplus incomes must somehow be reduced and greater equality of incomes attained. This would raise the standard of spending and thus limit saving. This end may be accomplished by the taxation of large incomes, by raising wages, and shortening the working day. These measures would result in greater purchasing power on the part of the masses and a balance would result between demand and supply.

3. THEORIES EMPHASIZING MONEY, CREDIT, PRICES AND CAPITALIZATION

(a). Mitchell[8]

Mitchell finds the persistent and recurring causes of business cycles in the fact that the industrial process of making and the commercial process of distributing goods are thoroughly subordinated to the business process of making money. Industry expands actively when business men find the prospect of profit-making good, and contracts when the money-making outlook is discouraging. It is the changes in business men's demand with which Mitchell is chiefly concerned. It may therefore be said that he also emphasizes the demand for producers' goods. But the important thing is his analysis of the origin of this demand. That is found in the profit margin; in the spread between selling prices and costs.

Profits are made on the margins between buying prices and selling prices on the one hand and the volume of transactions on the other.[9] The margin between the prices at which goods are bought and sold is the more fundamental of the two, and "forms a tolerable business basis for making profits. . . ."[10] Industrial activity is guided by the prospect of profits, and the prospect of profits depends on price-margins.

[8] W. C. Mitchell, *Business Cycles* (Berkeley, 1913).
[9] *Ibid.*, p. 26.
[10] *Ibid.*, p. 27.

A brief description of the different phases of the business cycle will indicate more clearly Mitchell's analysis. He begins with a description of the trough of the wave when a revival of prosperity is beginning to cumulate. Low selling prices, low costs, a narrow margin of profits, large bank reserves, low capitalization, conservatism in granting credits, moderate stocks of goods, and cautious buying obtain. Then expansion begins for some reason or other; it may be good harvests, heavy purchases by the government or an increase in the demand for exports. Expansion spreads to other fields because of the interrelated interdependence of the modern industrial society. Selling prices rise. Costs in the form of wages, interest rates and rents lag behind; raw material alone of buying prices rises higher than selling prices. The increased margin between costs or buying prices and selling prices as well as the greater physical volume of sales leads to larger profits. This increase in profits leads to an expansion of investments, heavy orders for new machinery, large contracts for new construction. Business is booming.

But stresses soon begin to accumulate within the business system. Costs begin to increase. Higher money wages are paid with extra pay for overtime. Efficiency of labor declines because of weariness due to overtime, the employment of undesirables, and the slowing up of work due to the knowledge on the part of the worker that jobs are numerous. Old leases expire, and new ones are made under less favorable terms. Interest rates rise because of the increased demand for loans and the depletion of cash reserves. Trade outstrips its capacity, and antiquated equipment and poorly located plants are brought into operation. The price of raw materials gains on the price of the finished products. Selling prices cannot rise indefinitely in all industries; in the public utility field rates are fixed by commissions; organic prices depend on harvests; production in some lines exceeds demand because of mistaken investment and this group widens and affects all the rest with a resulting decline in prices.

Two effects result from the foregoing: first, the price-margin is narrowed by the rising costs and the falling off in the rise

of selling prices; second, the demand for industrial equipment is affected by the stringent condition of the money market and the high cost of construction. Orders for steel mills, foundries, machine factories, copper smelters, quarries, lumber mills, cement plants, raw material, and supplies are cut off, and thus the volume of trade in producers' goods is diminished. This narrowing of the price-margin and the reduction in the volume of trade reduce profits.

The declining profits lessen the security of outstanding credits. Capitalization is scaled down both because of lower profits and also because of higher interest rates which affect the rate of capitalization. Inadequate security results in refusal to renew old loans. Settlement of old accounts is pressed and liquidation of huge credits results. Bankruptcy of large concerns ensues. Banks are hard pressed. An effort is made to replete reserves by the importations of gold, the increase of note circulation and the issue of clearing-house certificates. Stock and bond prices fall to an extremely low level. Business contracts, and workmen are discharged.

Depression is now in full swing. Workmen are unemployed, past savings are exhausted, all classes of incomes are reduced, and hence the consumers' demand for goods falls off. Prices drop owing to keener competition to make sales, and every reduction in price facilitates reduction in other prices.

Finally costs are reduced to a low level. Poorly located and ill-equipped plants are no longer used. The efficiency of labor is increased by the discharge of the poorer grade of workers and the fear of unemployment on the part of those retained. The price of raw material drops. Rentals are reduced. Loans are refunded at lower interest rates. Bank loans are readily obtainable. With closer economy on the part of managers and lower capitalization, earnings gradually become more satisfactory. The demand for goods returns with the exhaustion of the accumulated stocks, the constant growth of population and the development of new tastes and products. Low interest rates encourage borrowing and the investment in industrial equipment returns. Thus the price-margin is again widened,

the volume of trade is increased, profits grow and prosperity returns.

(b). Veblen[11]

Mitchell's theory corresponds in many respects to Veblen's theory. Veblen finds that modern industry is guided by business principles. Under the old order industry was a quest for a livelihood; under the new order industry is directed by the quest for profits. Formerly times were rated as good or bad according as the industrial processes yielded a sufficient output of the means of life; now, good or bad times depend on the rate of business profit. The controlling end at present is pecuniary considerations and not abundance of satisfying goods.

In modern times therefore the potent factor which serves as an incentive to the acceleration of business is a rise in prices. This rise in prices may be due to an increased demand growing out of governmental expenditures for war or preparations for war; or it may be due to an increased supply of the precious metals, an inflation of the currency, or a larger use of credit instruments as subsidiary currency. Money and prices, far from being negligible factors, as frequently stated by those who consider crises as the phenomena only of production and consumption, are in fact the primary factors. It is all a question of prices, business profits and capitalization.

Thus an era of prosperity is an era of increased earnings growing out of rising prices. These increased earnings consist of a differential gain in the increased selling price of the output over the expenses of production. When this differential advantage ceases the era of prosperity is on the wane.

This differential gain arises mainly from two causes. In the first place, certain outlying industries are not affected appreciably by the upward movement and the supplies drawn from these industries do not rise in price to any considerable extent. In the second place, wages advance slowly during an era of prosperity. The latter is the chief and most secure differential advantage.

[11] T. B. Veblen, *Theory of Business Enterprise* (New York, 1904).

These increased earnings or expected earnings lead to a higher market capitalization of industrial equipment. This higher capitalized market value increases the value of the property as collateral. Increased borrowing may take place on the basis of this higher value. Or contracts for the purchase of supplies may be entered into which are in effect an extension of credit. Thus the heightened market capitalization becomes the basis of a greatly extended credit either in the way of orders or formal loans.

But this period of increased earnings upon which the higher market capitalization is based finally comes to a close. The differential advantage mentioned above terminates because the necessary expenses of production presently overtake or nearly overtake the selling price of the output. "Increasing wages cut away the surest ground of that differential price advantage on which an era of prosperity runs."[12] The rate of earnings then falls off, the enhanced market capitalization proves to be too great for present earnings, the collateral consequently shrinks to a point where it will not support the credit extension resting on it in the form of outstanding contracts and loans. Loans are called or additional collateral is demanded, and liquidation ensues. Because of the interrelation of creditors and debtors such a movement once started has far-reaching effects.

Depression as well as prosperity is a product of pecuniary considerations. The pecuniary exigencies of the situation inhibit industrial activity. Depression means that business men do not derive a satisfactory gain from letting industrial activity continue at full capacity. There is an excess of the means of producing goods above what is expedient on pecuniary grounds. There is under-production in the sense that the supply of goods which finds its way into the hands of consumers is too scant for comfort, but there is over-production in the sense that there is more of an output offered than can be carried off at a fair price and an ordinary profit. It is a question of "fair prices" and "reasonable profits."

[12] *Ibid.*, p. 212.

A reasonable profit means a satisfactory return on the capitalized value of the enterprise. But a discrepancy arises between the high capitalization based on former high earnings or anticipated earnings and the present diminished earnings. Not only is the capitalization too high for present earning capacity, but it is also too high to fit the lowered cost of industrial equipment. Thus the capitalization is too high both from the standpoint of cost and earning-power. But interest bearing securities cannot be reduced except by reorganization, and other forms of capitalized wealth are reduced or scaled down with extreme reluctance. Some concerns are forced into bankruptcy, and are reorganized and capitalized on the basis of the reduced earnings. New competing concerns are coming in with plants built at lower cost, and fixed charges carrying lower rates of interest. These unemcumbered competitors are making "reasonable profits" at current prices because their capitalization is based on lower cost and present earning-capacity. Their competition precludes an advance in prices to a point which would afford a "reasonable profit" to the other establishments paying interest and dividends on overcapitalized property.

Veblen advances the novel theory that under the fully developed régime of the machine industry chronic depression tends to become normal. Under fully developed machine production a persistent divergence arises between the past cost of production of a given equipment and the current cost of an equivalent equipment at a subsequent date. This discrepancy results from the gradual but uninterrupted progressive improvements of industrial processes. This discrepancy requires a progressive readjustment of capitalization to correspond with the continuously decreasing cost and lowered earning power. Therefore a "fair" rate of profit is not permanently attainable on the basis of the old capitalization. Depression is therefore the normal situation.

But this state of affairs did not obtain during the early part of the nineteenth century. Not until about the decade of the seventies did the efficiency of the machine industry in the pro-

duction of capital goods become so great that the cost of their production was lowered too rapidly to permit the progressive reduction of capitalization to keep pace with it. In other words up to the period of the seventies the shrinkage of capitalization following a crisis would be sufficient to maintain an appreciable under-capitalization for a considerable length of time before reduced cost of capital goods would again leave the capitalization too high. This period of under-capitalization would permit of "reasonable" profits and prosperity. But since the seventies the machine industry has become so efficient and the cost of producers' goods has been lowered so rapidly that any under-capitalization which might follow a crisis would quickly disappear without allowing time for recovery and boom. Hence depression is normal to the modern industrial situation.

(c). Fisher[13]

Fisher's theory places still greater emphasis on the monetary and credit aspects. Assume as a starting point a slight initial disturbance such as an increase in the quantity of money. This results in a rise in prices. The profits of business men increase greatly because, while prices rise, expenses such as interest on past loans, rent, wages, and salaries remain unaffected or are little affected. Larger profits encourage business men to expand their businesses by increased borrowings. These borrowings are mostly in the form of short time loans from banks. Such loans engender deposits, and deposit currency is therefore increased. Thus in spite of greater activity in trade and increased production prices continue to rise because of the expansion of deposit currency.

The period of prosperity obtains as long as enterprisers' profits continue abnormally high. But these profits are finally cut into from both sides. Interest rates, rent, wages and salaries ultimately rise, and costs are greatly increased. On the other hand prices are checked by the fact that deposit currency is contracted through the refusal of banks to extend loans except on hard terms if at all. Banks are compelled to dis-

[13] Irving Fisher, *The Purchasing Power of Money* (New York, 1911); *Why is the Dollar Shrinking?* (New York, 1914).

courage loans because they cannot permit a too abnormal expansion of loans relatively to reserves. Loans thus cease to expand and prices are checked on the one side while costs mount up on the other and profits are reduced. Bankruptcies and business failures ensue. Enterprises which were started by borrowing expect to be continued by renewed borrowing. When borrowing becomes more and more difficult insolvency necessarily follows. These bankruptcies tend to spread because the creditors of the insolvent firms necessarily are affected. Contracted loans, low prices, high costs, and small profits continue and depression rules.

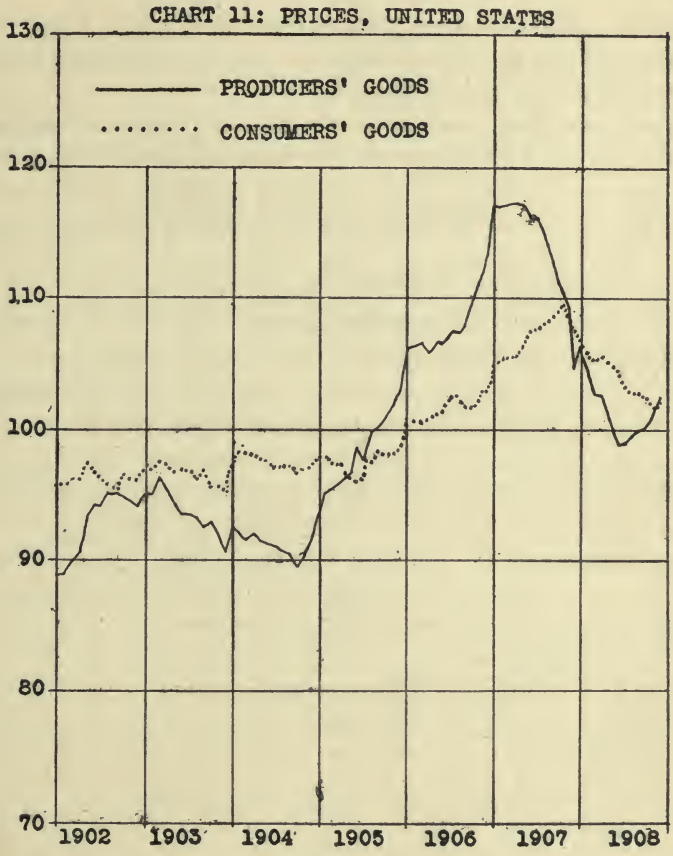
This contraction becomes self-limiting, as soon as loans are easier to get. When reserves accumulate banks are led to make loans on easy terms. Borrowers again become willing to take ventures, loans are again demanded, prices begin to rise, business becomes profitable, and there occurs a repetition of the upward movement.

C. Criticism of Theories

The vital point of conflict between the first two classes of theories discussed is found in the insistence on the part of one group that the trouble which results in crises begins with a lessening of demand on the part of the consumers, while on the other side it is claimed that the initial diminution of demand is on the part of business men for producers' goods. This conflict leads us to a comparison of the fluctuations of the prices of consumers' goods and producers' goods.

The available monthly data is for the United States and Germany. For the United States the relative prices of consumers' goods were obtained by averaging the monthly relative prices of food, clothing and house furnishings as given by the Bureau of Labor Statistics.[14] The relative prices for producers' goods were obtained by averaging the monthly relative prices of metals and implements, lumber and building material. These relative numbers were in turn reduced to the monthly bases used throughout this discussion. The rel-

[14] U. S. Department of Labor Bulletin, 1912, pp. 520-23.



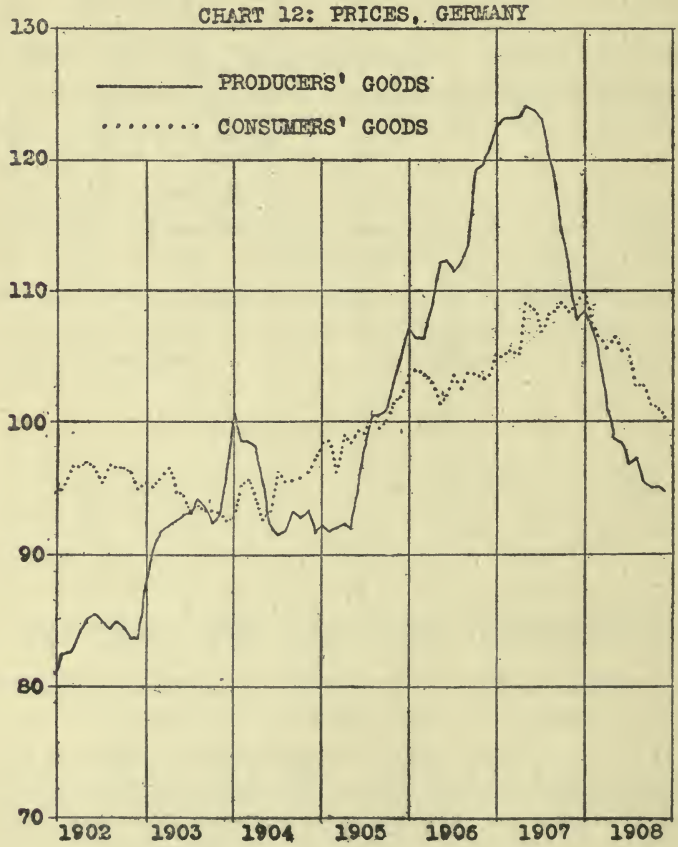
ative prices of producers' and consumers' goods for Germany were calculated from original data by the writer.[15] The price

[15] *Vierteljahrsheften,* 1902-1909. Sixteen commodities are included in the producers' goods series, as follows: Häute und Felle, Wolle, Baumwolle, Baumwollengarn, Leinengarn, Rohseide, Hauf, Mexikaneskhe Faser, Rohjute, Eisen, Blei, Kupper, Zink, Zinn, Steinkohlen, Petroleum. The method used in computing the index numbers is similar to that used by Bradstreet. Bradstreet simply added together the prices per pound of the various articles used. The method here used was to add together the prices per 100 kg. of most of the commodities named but in some cases a different unit was used. Thus for Rohseide the prices of 1 kg. were used, and for Eisen and Steinkohlen the prices of 1,000 kg. were used. The summations thus obtained were reduced to index numbers with the monthly averages used as bases.

Fourteen commodities are used in the consumers' goods series as follows: Kartoffeln, Rindvieh, Schweine, Kälber, Hammel, Roggenmehl, Weizenmehl, Butter, Zucker, Rüböl, Kaffee, Tee, Pfeffer, Schmatz. The prices were summated as before. One hundred kg. was used as the unit in most cases with the following exceptions: Kartoffeln 1,000 kg., Roggenmehl 1,000 kg., Weizenmehl 1,000 kg. Index numbers were computed by dividing the monthly averages into each of the foregoing summations.

fluctuations of the two groups for the United States are given in Chart 11, and for Germany in Chart 12. The relative numbers are given in Table XI.

From the charts and table the following facts become evident: (1) In both countries the prices of consumers' goods



begin to decline about seven months after the decline in the prices of producers' goods. (2) In both countries the prices of producers' goods fluctuate more violently than the prices of consumers' goods. In Germany producers' goods fluctuate 150 per cent more than do consumers' goods, while in the United States the fluctuation is 100 per cent greater. (3) The prices

of both consumers' and producers' goods fluctuate more widely in Germany than in the United States. The fluctuation of consumers' goods is 25 per cent greater, and 50 per cent greater for producers' goods.

These facts would then seem to prove conclusively that the initial disturbance arises in a diminution in the demand for producers' goods.

It has been suggested however by both Aftalion and J. M. Clark[16] that the apparent conclusion is exactly the opposite of the truth. The change in the demand for consumers' goods is in reality the cause of the change in the demand for producers' goods even though the maximum and minimum points of the latter precede the maximum and minimum points of the former. The reason for this may be indicated by distinguishing between a change in absolute demand, and a change in the *rate* of increase in demand. There are two distinct demands for producers' goods: first, the demand for the maintenance and replacement of existing capital goods; second, the demand for new construction. The first demand depends upon the life of producers' goods, or the rate of depreciation, and the amount of consumers' goods continually needed. The second demand depends upon the *increase* in the demand for consumers' goods. Suppose 10 per cent of the existing capital goods has to be replaced every year, and suppose the increase in demand is so great that an additional 10 per cent of the present supply of producers' goods must be forthcoming in order to meet the increased demand. Then the equipment for the production of capital goods must be large enough to supply 20 per cent of the existing capital each year. Now any lessening in the *rate* of increase in demand for consumers' goods would result in an absolute diminution in the demand for producers' goods. Suppose the increased demand for consumers' goods is reduced to a point which will require only an additional 8 per cent of capital goods over and above replacement. Then the total demand for producers' goods is reduced from 20 per cent of the existing equipment to 18 per cent, an absolute de-

[16] J. M. Clark, "Business Acceleration and the Law of Demand: A Technical Factor in Economic Cycles," *J. of Pol. Econ.*, XXIV, 217-35.

TABLE XI—INDEX NUMBERS OF WHOLESALE PRICES OF PRODUCERS' AND CONSUMERS' GOODS IN THE U. S. AND GERMANY

		Producers' Goods— U. S.	Consumers' Goods— U. S.	Producers' Goods— Ger.	Consumers' Goods— Ger.
	January...	88.8	95.9	81.1	94.7
	February..	88.8	95.9	82.5	94.9
	March....	89.8	96.1	82.7	96.6
	April.....	90.6	96.1	84.1	96.6
	May.....	93.3	97.4	85.2	96.9
1902	June.....	94.2	96.4	85.5	96.6
	July.....	94.2	96.3	84.9	95.4
	August....	95.1	95.8	84.3	96.7
	Sept.....	95.0	95.3	85.0	96.4
	October...	94.6	96.3	84.4	96.4
	November.	94.5	96.0	83.7	96.1
	December.	94.0	96.1	83.7	94.9
	January...	95.7	97.1	87.9	95.4
	February..	95.6	96.8	90.1	95.1
	March....	96.4	97.5	91.9	95.7
	April.....	95.6	97.2	92.2	96.4
	May.....	94.1	96.4	92.7	94.7
1903	June.....	93.8	96.9	93.1	94.4
	July.....	93.5	96.5	93.2	93.2
	August....	92.8	96.2	94.1	93.7
	September	92.4	96.9	93.3	93.3
	October...	92.8	95.8	92.4	93.3
	November.	91.6	95.8	93.0	93.2
	December.	90.9	95.6	95.9	92.6
	January...	92.5	97.0	100.6	92.8
	February..	92.0	98.0	98.6	95.2
	March....	91.6	98.0	98.5	95.6
	April.....	91.8	97.9	98.1	94.1
	May.....	91.6	97.7	95.2	92.7
1904	June.....	91.5	97.7	92.4	93.2
	July.....	91.3	96.9	91.6	96.2
	August....	90.9	97.1	91.9	95.4
	September	90.7	97.1	93.3	95.6
	October...	89.7	96.5	92.8	95.8
	November.	90.3	96.7	93.4	96.1
	December.	91.5	96.8	91.7	97.0
	January...	93.8	97.7	92.2	98.2
	February..	95.3	97.7	91.9	98.5
	March....	95.7	96.9	92.0	96.1
	April.....	96.1	96.9	92.3	98.9
	May.....	96.5	96.2	92.0	98.4
1905	June.....	98.3	96.0	94.8	99.3
	July.....	97.6	96.6	98.6	99.1
	August....	99.6	97.6	100.3	100.6
	September	100.0	98.1	100.4	99.4
	October...	100.8	97.9	101.1	100.1
	November.	102.0	98.1	103.2	101.5
	December.	102.4	98.3	105.1	102.0

TABLE XI—Continued

		Producers' Goods— U. S.	Consumers' Goods— U. S.	Producers' Goods— Ger.	Consumers' Goods— Ger.
	January...	106.0	100.6	107.2	103.7
	February..	106.4	100.5	106.4	104.0
	March....	106.6	100.4	106.3	103.8
	April.....	105.9	100.6	109.0	103.2
	May.....	106.6	100.8	112.2	101.5
1906	June.....	106.5	101.2	112.3	102.2
	July.....	107.7	102.3	111.6	103.7
	August....	107.1	102.4	112.1	102.7
	September	108.1	101.7	113.4	103.9
	October...	110.3	101.7	119.3	103.9
	November.	111.9	103.1	119.8	103.5
	December.	113.8	103.6	120.9	103.8
	January...	117.1	104.9	122.4	105.2
	February..	117.0	105.4	123.0	105.0
	March....	117.2	105.8	123.2	105.5
	April.....	117.2	105.6	123.3	105.3
	May.....	117.0	106.4	124.0	109.1
1907	June.....	116.3	107.5	123.8	108.6
	July.....	116.2	107.8	123.2	106.8
	August....	114.5	108.1	120.3	108.2
	September	113.7	108.4	118.9	108.3
	October...	111.1	109.6	114.6	109.1
	November.	109.2	108.6	111.6	108.4
	December.	104.6	107.3	107.9	108.9
	January...	106.1	106.8	108.4	109.9
	February..	104.4	105.7	107.3	107.5
	March....	102.7	105.4	105.5	106.6
	April.....	102.5	105.7	100.9	105.8
	May.....	100.6	105.2	98.7	106.5
1908	June.....	99.0	104.3	98.4	105.4
	July.....	99.2	103.8	96.9	105.7
	August....	99.8	102.7	97.2	102.8
	September	100.0	102.6	95.6	102.9
	October...	100.4	102.4	95.1	101.5
	November.	100.7	101.6	95.1	101.1
	December.	102.6	102.1	94.8	100.4
	January...	125.4	112.8	1,795	1,743
	February..	126.7	112.9	1,800	1,740
	March....	127.1	112.9	1,811	1,722
	April.....	127.6	112.5	1,810	1,718
	May.....	128.8	111.8	1,822	1,720
Base	June.....	128.1	111.8	1,820	1,714
	July.....	127.4	112.0	1,818	1,746
	August....	127.4	112.2	1,816	1,777
	September	127.2	112.8	1,804	1,793
	October...	127.0	113.3	1,805	1,810
	November.	127.6	113.9	1,814	1,806
	December.	127.5	114.3	1,824	1,776

crease. Thus part of the equipment prepared to produce capital goods must remain idle. The demand for consumers' goods is still increasing but the *rate* of increase is less than before. A reduction in the rate of increase in the demand for consumers' goods produces an actual decrease in the demand for producers' goods. Thus while the curve of demand for consumers' goods is still rising, though at a diminished *rate,* the curve of demand for producers' goods is actually falling. The change in the demand for consumers' goods is the causal factor, but the fact that the curve for producers' goods falls while the curve for consumers' goods is still rising gives the false impression that the initial trouble begins with the demand for producers' goods.

Is there then any evidence to show that the prices of producers' goods fall because of a diminution in the rate of increase in the prices of consumers' goods?

The index numbers given above indicate that there is not any such evidence. The high point in the prices of producers' goods is reached in April, 1907, in the United States, and in May, 1907, in Germany. If the theory just referred to were true, the rate of increase in the prices of consumers' goods should show a decline before this point is reached. No such decline is indicated. On the contrary the prices of consumers' goods continue to rise in a remarkably even course until October, 1907, in the United States, and until January, 1908, in Germany. The following table gives the average monthly rate of increase in the prices of consumers' goods in each country by periods of five months.

United States		Germany	
Period	Average Rate of Increase	Period	Average Rate of Increase
	Pct.		Pct.
March–July, 1906	0.4	June–October, 1906	0.5
August–Dec., 1906	0.3	November, 1906 – March, 1907	0.3
January–May, 1907	0.5	April–August, 1907	0.5
June–October, 1907	0.6	September, 1907 – January, 1908	0.3

There clearly is no evidence of any decline in the rate of increase in the prices of consumers' goods. In fact, so far as the United States is concerned, the rate of increase appears if anything to increase after the fall in the prices of producers' goods. It may also be profitable in this connection to examine the curves given in Charts 11 and 12. So far as the evidence goes it does not appear that the prices of producers' goods fall because of any decline in the rate of increase in the prices of consumers' goods. In short, the theories emphasizing consumers' demand do not appear to harmonize with the statistical facts.

Aside from the question as to whether the initiatory demand begins with consumers' goods or producers' goods, is the question as to the fundamental nature and cause of increasing and decreasing demand. It is the contention of the third group of theories discussed that the real basis of demand cannot be found in questions relating to production and consumption alone, but must in the modern business economy be sought in price margins and capitalization, in monetary and credit phenomena.

D. Conclusions from the Study of Monthly Data

The writer believes that the conclusions derived from this study of monthly data bring support on the whole to the third group of theories.

Demand is based on purchasing power. The source of purchasing power is income, and the source of income is the production of material goods and services. Production gives rise to income, income means purchasing power, purchasing power is the basis of demand, and demand in turn regulates production. In short goods and services are exchanged against goods and services. On this basis one would expect production to run an even course, and not to run in cycles. And indeed in the barter economy there were no business cycles. But modern purchasing power functions largely through bank credit. We shall now consider the phenomenon of bank credit and its effect on purchasing power.

The nominal purchasing power obtaining in any society at any given moment may be measured substantially by the amount of money in hand to hand circulation and the volume of bank credit in the form of deposit currency. Doubtless it exceeds the above somewhat because individuals, firms, corporations and governmental units are able to make use to a certain extent of their personal credit directly without exchanging it for bank credit. Thus purchases may be made against personal notes, secured or unsecured, and time drafts or bills payable, without the purchaser making use for the time being of money or bank credit. Such personal credit, however, is ordinarily converted into bank credit sooner or later. The personal notes or time drafts received against sales may be discounted at a bank, and the individual or firm heavily loaded with bills receivable will probably be compelled to borrow on its own notes at some bank.

In one sense it might be argued that the total purchasing power of a nation is equivalent to its total wealth. But as an actual fact this is untrue. The extent to which wealth represents purchasing power depends on the extent to which it can be used against purchases, or the degree of its acceptability as a

means of payment. In as far as barter is an unacceptable economy, just so far most forms of wealth become utterly useless as means of payment against purchases. Money is the only form of wealth which is generally acceptable. All other forms of wealth have varying degrees of acceptability ranging all the way from coupon government bonds to real estate. These forms of wealth can be said to have real purchasing power only in so far as they may be converted into bank credit. Only that portion of the wealth of a nation which has been or can readily be hypothecated at a bank and converted into bank credit in the form of bank deposits or bank notes may be said to have effective purchasing power.

Now it is impossible for all the wealth of a nation to be thus converted into purchasing power at once, because banks are limited in the extent to which they may extend their credit by the supply of their reserves. These reserves in turn are dependent in volume largely upon the quantity of lawful money in the given country, and ultimately in the world. But a more fundamental reason lies in the fact that a definite relation must always exist between the money value of a nation's wealth and its supply of money and bank credit. A nation could never have a supply of circulating media equal to the money value of its property because with every increase in the supply of circulating media the value of property would rise. Actual purchasing power, therefore, in the form of bank credit could never overtake the nation's wealth for two reasons: first, because the volume of bank credit is restricted by law or banking prudence to a certain proportion of the money available for reserves; and second, because property values would themselves be inflated by any increase which might occur in bank credit.

Personal credit measured in terms of the total wealth can therefore never all be converted into bank credit or ready purchasing power. According to Fisher's estimate the wealth of the United States is normally about twenty times the average amount of deposit currency. Up to the time of the establishment of the federal reserve system, deposit currency would fairly measure the bank credit in the country.

It is therefore obvious that the possible extension of bank credit has no limits so far as personal credit is concerned. It is limited, however, by two things: first, by the quantity of reserves; second, by the desirability of converting personal credit into bank credit, and this depends upon the discount rate and the profitableness of the employment of capital in industry.

There are therefore limits to the extent to which property can be converted into immediate purchasing power through the issuance of bank credit. But to the extent that bank credit *is* extended it appears that a portion of the purchasing power of the community comes from sources other than income. But this addition to the total purchasing power of the community is nominal rather than real. To the extent that present purchasing power is nominally increased through the issuance of bank credit, to that extent there is also an addition to the circulating media. The effect is an increase in prices and therefore no increase in real purchasing power. The nominal incomes of people generally are as before, but their real purchasing power is reduced because of the increase in prices. The issuance of bank credit simply re-distributes purchasing power, reducing the real purchasing power of income receivers generally, and increasing the purchasing power of entrepreneurs able to secure bank credit. It is this redistribution of purchasing power, accomplished through the instrumentality of banking institutions, that changes demand, upsets prices, affects the profit margin, and therefore production. Here in short, may be found the fundamental cause of the business cycle.

Bank credit may be likened to a spiral spring which may be stretched within certain limits of safety. These limits depend upon the amount of reserves needed to maintain the solvency of the banking system. The magnetic force which draws out the extensible bank credit is the entrepeneur's anticipation of profit. When accumulated stocks have run out, when costs are falling, when labor is easily obtainable, when loanable funds are plentiful and interest rates run low, then prospects for profit-making are bright and entrepreneurs apply for bank credit. The issuance of bank credit increases

the purchasing power of entrepreneurs. The result is increased bidding for raw materials, capital equipment, construction work, etc., with a consequent increase in prices. The effect is increased profits for entrepreneurs producing raw materials and equipment. They in turn will apply for bank credit with which to expand their business. Thus in turn their purchasing power is increased, adding further force to the upward movement of prices. So long as bank credit continues to be capable of further expansion, prices continue to rise. This upward movement comes to a close only when bank credit can no longer be further extended for the reason that it has already reached the limit of banking safety.

The demand for bank credit continues to be strong while prices are rising owing to the resulting margin between costs and selling prices. But rising prices result in more money being drawn out into hand to hand circulation. The effect is an actual diminution in bank reserves in the very period when bank credit is being extended. It therefore becomes necessary not merely to stop the expansion of bank credit, but actually to reduce the outstanding volume. The demand for bank credit is not lacking, but the supply is strained to the limit of safety. The banks protect themselves by raising the discount rates and scrutinizing more carefully the solvency of borrowing firms. A gradual reduction in outstanding bank credit is forced. This movement results in the forced sale of securities because of the inability of borrowers to renew their loans. The stock market begins to decline, trading on the stock exchange is reduced, and bank clearings fall off. New securities are issued with difficulty, which, coupled with the inability to obtain loans at the bank, reduces the purchasing power of business enterprises. Presently building falls off, then production, imports and commodity prices. Thus the limitation in the volume of bank credit gradually drags down stock prices, shares traded, bank clearings, building, employment, imports, production, prices and earnings. When the diminution in profits appears, the downward movement is further accelerated by the letting up in the *demand* for bank

credit. Thus the downward movement like the upward movement tends to become self-perpetuating.

But as the upward movement culminates because of the strain placed upon bank reserves through an undue extension of bank credit, so the downward movement comes to a close because of the great accumulation of bank reserves due to the reduction of outstanding bank credit and the return of money from hand to hand circulation following the decline of prices. This continued accumulation of reserves leads bankers progressively to lower discount rates to a point low enough to make the employment of bank credit again profitable. New securities are freely issued, bank loans are readily obtainable, and the purchasing power of business enterprises increases. Thus the upward swing returns and the cycle repeats itself.

The increased demand which results from the extension of bank credit soon shows itself in a rising stock market, greater production, more imports, larger employment of labor, increased immigration, and rising prices. Rising prices and the increased volume of production result in increased earnings and profits. Thus the movements of reserves, bank credit and discount rates pull up after them first, the investment series, stock prices, shares traded, bank clearings, etc., and second, the series which represent industrial conditions *per se,* commodity prices, production, imports, employment, immigration, and earnings.

That the above analysis finds verification in the monthly data presented in this study may be seen from a reference to the charts and tables given in Chapter II. The first movement takes place in bank reserves, loans, deposits and discount rates. In the United States reserves began to accumulate late in 1903. With the upward swing of reserves, loans and deposits were extended. The banking group as a whole began to rise in December 1903. The extension of bank credit increased the demand for securities. The stock and bond market began to rise in the early part of 1904. Building began to increase in May, the production of pig iron began to increase

in earnest in September, imports started upward in August, commodity prices in July, and railroad gross earnings in August. The average of the Industrial group started upward in August. It will be noticed that in nearly every case there was a short preliminary rise which, however, received a setback, and was disregarded in the above statements. Thus the upward swing of reserves, bank deposits and loans, the easing up of discount rates, pulled up, one by one, first the various series connected with the security market, and then the series associated with industrial activity itself.

The downward movement again began with reserves, deposits, loans and discount rates. This group began to decline in the first half of 1905. The reduction of bank credit affected the security market and stock prices began to drop. The average of the investment series began to turn down in the early part of 1906. Industrial activity still continued to increase for a time, but gradually the inability to float new securities or to get bank credit had its effect. Building began to decline in May, 1907, unemployment in July, and the industrial barometer, composed of production of pig iron, imports, commodity prices, railroad gross earnings and immigration, in August.

Similar facts appear in the upward movement following the crisis of 1907. Reserves, deposits and loans started upward in September, 1907. Discount rates eased up. Stock prices followed in the early months of 1908. Building increased in March, and the industrial barometer started on the upward movement in June, 1908.

The movements for Great Britian and Germany correspond with remarkable closeness of detail to those in the United States, and verify the conclusions stated. No economic phenomena are so international in their interrelation and interdependence as are the movements of the money market. That fluctuations of prosperity and depression are world-wide, at least so far as the advanced countries of the world are concerned, would certainly bring some support to the conclusion that these fluctuations are, at bottom, movements of money,

credit and prices. Certainly no other economic factors can be claimed to be so international in scope as the movements of the money market. Crops, favorable or unfavorable legislation, governmental demands, local catastrophes, etc., all modify the course of the fluctuations in the several countries, but the dominant factors are the great international movements of money, credit and prices.

That the cycle of prosperity and depression is at bottom a question of money, credit and prices is also supported by the historical fact that during the long period of declining prices from 1873 to 1897 depression was chronic both in the United States and Great Britain, and to some extend in all countries. Continued depression was broken only by two brief periods of prosperity. Since 1897 prosperity has been chronic, so to speak, broken only by temporary periods of depression. The reason lies in the fact that the period from 1873 to 1897 was a period of falling prices broken only at short intervals by temporarily rising prices. The period from 1897 to the present has been a period of continually rising prices, broken by short intervals of falling prices. Falling and rising prices are generally conceded to be mainly monetary and credit phenomena.

The analysis of monthly data presented in the foregoing pages would indicate the following points:

1) That the first movement in the prosperity cycle begins with reserves, loans, deposits and money rates.

2) That the movement of reserves, loans, deposits and money rates is the causal factor working out its influence on stock and bond prices, transactions on the stock exchange, bank clearings, business failures, building, employment, production, imports and exports, prices and profits.

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