THE PURCHASING POWER OF MONEY

ITS DETERMINATION AND RELATION TO CREDIT INTEREST AND CRISES

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To

THE MEMORY OF

SIMON NEWCOMB

GREAT SCIENTIST, INSPIRING FRIEND,

PIONEER IN THE STUDY

OF

"SOCIETARY CIRCULATION"

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PREFACE TO THE FIRST EDITION

THE purpose of this book is to set forth the principles determining the purchasing power of money and to apply those principles to the study of historical changes in that purchasing power, including in particular the recent change in "the cost of living," which has aroused world-wide discussion.

If the principles here advocated are correct, the purchasing power of money — or its reciprocal, the level of prices — depends exclusively on five definite factors: (1) the volume of money in circulation; (2) its velocity of circulation; (3) the volume of bank deposits subject to check; (4) its velocity; and (5) the volume of trade. Each of these five magnitudes is extremely definite, and their relation to the purchasing power of money is definitely expressed by an "equation of exchange." In my opinion, the branch of economics which treats of these five regulators of purchasing power ought to be recognized and ultimately will be recognized as an exact science, capable of precise formulation, demonstration, and statistical verification.

The main contentions of this book are at bottom simply a restatement and amplification of the old "quantity theory" of money. With certain corrections in the usual statements of that theory, it may still be called fundamentally sound. What has long been needed is a candid reëxamination and revision of that venerable theory rather than its repudiation.

Yet in the voluminous literature on money, there seems to be very little that approaches accurate formulation and rigorous demonstration, — whether theoretical or statistical.

In making this attempt at reconstruction, I have the satisfaction of finding myself for once a conservative rather than a radical in economic theory. It has seemed to me a scandal that academic economists have, through outside clamor, been led into disagreements over the fundamental propositions concerning money. This is due to the confusion in which the subject has been thrown by reason of the political controversies with which it has become entangled.

As some one has said, it would seem that even the theorems of Euclid would be challenged and doubted if they should be appealed to by one political party as against another. At any rate, since the "quantity theory" has become the subject of political dispute, it has lost prestige and has even come to be regarded by many as an exploded fallacy. The attempts by promoters of unsound money to make an improper use of the quantity theory — as in the first Bryan campaign — led many sound money men to the utter repudiation of the quantity theory. The consequence has been that, especially in America, the quantity theory needs to be reintroduced into general knowledge.

Besides aiming to set forth the principles affecting the purchasing power of money, this book aims to illustrate and verify those principles by historical facts and statistics. In particular, the recent rise in prices is examined in detail and traced to its several causes.

The study of the principles and facts concerning the purchasing power of money is of far more than academic interest. Such questions affect the welfare of every inhabitant of the civilized world. At each turn of the tide of prices, millions of persons are benefited and other millions are injured.

For a hundred years the world has been suffering from periodic changes in the level of prices, producing alternate crises and depressions of trade. Only by knowledge, both of the principles and of the facts involved, can such fluctuations in future be prevented or mitigated, and only by such knowledge can the losses which they entail be avoided or reduced. It is not too much to say that the evils of a variable monetary standard are among the most serious economic evils with which civilization has to deal; and the practical problem of finding a solution of the difficulty is of international extent and importance. I have proposed, very tentatively, a remedy for the evils of monetary instability. But the time is not yet ripe for the acceptance of any working plan. What is at present most needed is a clear and general public understanding of principles and facts.

Toward such an end this book aims to contribute: —

1. A reconstruction of the quantity theory.
2. A discussion of the best form of index number.
3. Some mechanical methods of representing visually the determination of the level of prices.
4. A practical method of estimating the velocity of circulation of money.
5. The ascertainment statistically of the bank deposits in the United States which are *subject to check*, as distinct from "individual deposits," as usually published.
6. An improved statistical evaluation of the volume of trade, as well as of the remaining elements in the equation of exchange.
7. A thorough statistical verification of the (reconstructed) quantity theory of money.

As it is quite impossible to do justice to some of these subjects without the use of mathematics, these have been freely introduced, but have been relegated, so far as possible, to Appendices. This plan, which is in accordance with that previously adopted in *The Nature of Capital and Income* and *The Rate of Interest*, leaves the text almost wholly nonmathematical.

Most of the statistical results review and confirm the conclusions of Professor Kemmerer in his valuable *Money and Credit Instruments in their Relation to General Prices*, which appeared while the present book was in course of construction. I am greatly indebted to Professor Kemmerer for reading the entire manuscript and for much valuable criticism throughout.

My thanks are due to Professor F. Y. Edgeworth of All Souls' College, Oxford, and to Professor A. W. Flux of Manchester for kindly looking through the manuscript of the Appendix on index numbers and for suggestions and criticisms.

To Dr. A. Piatt Andrew, now Assistant Secretary of the Treasury, my thanks are due for his kindness, as Special Assistant to the National Monetary Commission, in putting the resources of that Commission at my disposal, and in working out, from the records of the office of the Comptroller of the Currency, the volume of deposits subject to check at various dates in the past. For coöperation in carrying out these same calculations, I am likewise indebted to Mr. Lawrence O. Murray, Comptroller of the Currency. These valuable figures are the first of their kind.

To Mr. Gilpin of the New York Clearing House, my thanks are due for his kindness in furnishing various figures asked for and cited specifically in the text.

To Mr. Richard M. Hurd, President of the Lawyers Mortgage Co., I am indebted for reading parts of the manuscript and for valuable criticism.

To Mr. John O. Perrin, President of the American National Bank of Indianapolis, I am indebted for statistics of the "activity" of bank accounts in his bank, and for similar figures I am indebted to the officers of the National New Haven Bank and the City Bank of New Haven.

My thanks are due to the *Economic Journal* for permission to use unaltered some parts of my article on "The Mechanics of Bimetallism," which first appeared in that journal in 1894.

My thanks are due to the *Journal of the Royal Statistical Society* for similar permission with reference to my article on "A Practical Method for estimating the Velocity of Circulation of Money," which appeared in December, 1909.

A number of my students have rendered valuable service in gathering and coördinating statistics. I would especially mention Mr. Seimin Inaoka, Mr. Morgan Porter, Mr. N. S. Fineberg, Mr. W. E. Lagerquist, now instructor at Cornell University, Messrs. G. S. and L. A. Dole, Dr. John Bauer, now assistant professor at Cornell University, Dr. John Kerr Towles, now instructor at the University of Illinois, Dr. A. S. Field, now instructor at Dartmouth College, Mr. A. G. Boesel, Mr. W. F. Hickernell, Mr. Yasuyiro Hayakawa, Mr. Chester A. Phillips, and Mr. R. N. Griswold. Mr. Griswold performed the lengthy calculations involved in ascertaining an index of the volume of trade.

There are two persons to whom I am more indebted than to any others. These are my brother, Mr. Herbert W. Fisher, and my colleague, Dr. Harry G. Brown.

To my brother my thanks are due for a most searching criticism of the whole book from the standpoint of pedagogical exposition, and to Mr. Brown for general criticism and suggestions as well as for detailed work throughout. In recognition of Mr. Brown's assistance, I have placed his name on the title-page.

IRVING FISHER.

YALE UNIVERSITY, February, 1911.

PREFACE TO THE SECOND EDITION

THE second edition is a reprint of the first with the following changes: —

1. Correction of occasional misprints.
2. Addition of data for 1910, 1911, and 1912, in the tables on pages 304, 317, and the diagram between pages 306 and 307.
3. A change in Figure 1 (page 13) to make it conform to the facts for 1912.
4. Changes in the table on page 147 with accompanying text to make the data correspond to the facts for 1912.
5. The insertion of an addendum on pages 492–493, giving the revised figures for deposits subject to check as calculated by Professor Wesley Clair Mitchell.
6. An appendix to the second edition (page 494 ff.) on "standardizing the dollar."

For corrections of misprints and various helpful criticisms of the first edition I am under great obligations to a number of friends and correspondents and particularly to Major W. E. McKechnie, of the Indian Medical Service, Etawah, United Provinces, India; Professor Warren M. Persons, Colorado College, Colorado Springs, Colo.; Mr. J. M. Keynes, Editor, *Economic Journal*, Kings College, Cambridge; Carl Snyder, author, New York City; James Bonar, Deputy Master of the Royal Mint, Ottawa, Canada; Professor Allyn A. Young, Washington University, St. Louis, Mo.; Professor Stephen Bauer, Director, International Office of Labor Legislation, Basle, Switzerland; Professor Wesley Clair Mitchell, New York City; Professor O. M. W. Sprague, Harvard University.

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I have endeavored to avoid disturbing the plates of the first edition more than was absolutely necessary. Otherwise I should have been glad to incorporate some changes to make use of some valuable but general criticisms. In particular I should have liked to modify somewhat the statement of the theory of crises in Chapter IV and in Chapter XI to make use of the helpful criticism of Miss Minnie Throop England, of the University of Nebraska, in *The Quarterly Journal of Economics*, November, 1912; also to meet a criticism of Mr. Keynes' to the effect that, while my book shows *that* the changes in the quantity of money do affect the price level, it does not show *how* they do so. To those who feel the need of a more definite picture of *how* the price level is affected by a change in the quantity of money I refer the reader to my *Elementary Principles of Economics*, pages 242–247, and to other writers on this subject, particularly Cairns.

IRVING FISHER.

SUGGESTIONS TO READERS

1. The *general reader* will be chiefly interested in Chapters I–VIII.

2. The *cursory reader* will find the gist of the book in Chapter II.

3. *Objectors to the quantity theory* will find their theoretical and statistical objections discussed in Chapters VIII and XII respectively.

4. *Students of financial history* should read Chapter XII.

5. *Currency reformers* should read Chapter XIII.

6. The appendices are addressed mainly (though not exclusively) to *mathematical economists*, for whom the chief interest will probably lie with the Appendix to Chapter X, on Index Numbers, (which should be read as a whole,) and § 6 of the Appendix to Chapter XII, on the Method of Determining Velocity of Circulation.

7. The remainder of the Appendix to Chapter XII is supplied chiefly in order that *statistical critics* may be enabled to verify the processes described in the text.

8. Chapter X and its Appendix are of chief interest to *students of index numbers*, a subject as fascinating to some as it is dry to others.

9. The analytical table of contents, the index, and the running page headings have been constructed with especial reference to the varying needs of different classes of readers.

The book is, however, designed to constitute a complete whole, and it is hoped that as many as possible of those who approach it from special viewpoints may, in the end, read it all.

ADDENDUM

(In this revised edition figures for 1910–1912 are given on pages 304, 317. See also page 492.)

Data have just become available by which to bring down through 1910 the statistics of Chapter XII. The results are as follows:

MAGNITUDES IN THE EQUATION OF EXCHANGE FOR 1910*

	M	M'	V	V'	P	T	$MV+M'V'$	PT
As first calculated	1.64	7.24	21	52.8	103.7	397	416	412
As finally adjusted	1.64	7.23	21	52.7	104.0	399	415	415

The table shows that the figures, as first calculated, conform admirably to the equation of exchange. The adjustment needed, to produce perfect conformity, in only one case reaches the half of one per cent!

From the adjusted figures we may calculate the percentages of cash and check transactions ($MV \div MV + M'V'$ and $M'V' \div MV + M'V'$). These are 8% and 92%, which may be added to the table on page 317. The ratio of deposits to money (M'/M) is 4.4, which shows

* The above figures may be inserted by the reader in the tables on pages 280, 281, 284, 285, 290, 292, 293, 304. The methods of deriving the figures are in general the same as those explained in the Appendix to Chapter XII. The antecedent figures on which the above table depends may be inserted by the reader as follows:

M. On page 432 add (to the bottom of columns 1–8 incl.) in the table the following: 1910, 3.42, 3.42, .32, 1.41, 3.3%, 1.46, 1.64.

M'. It is not necessary to complete the table on page 435, as the Comptroller's Report for 1910 (p. 54) gives for the first time deposits subject to check (7.82 billions). To this 7.82, however, three corrections are needed: (1) subtract .29 for "savings accounts" improperly included (estimated for me by the Comptroller's Office at half of the figure in note *a*, lower table, p. 54, Comptr. Rpt.); (2) subtract .54 as "exchanges for clearing house" (= $\frac{5}{4}$ times those for national banks); (3) add .25

a great increase over 1909. The disproportionate growth of deposits relatively to money and the excessive velocity of circulation (52.7) of deposits, substantially equal to the unprecedented figure for 1909, are disquieting symptoms and serve only to confirm the forebodings in the text.

For aid in working out the figures in this addendum I am indebted to three of my students, Mr. H. A. W. Duckert, Mr. J. M. Shortliffe, and Mr. M. G. Hastings.

as the Comptroller's Office estimate, for me, of unreported deposits subject to check. By applying these corrections we obtain 7.24.

V. I have simply taken 21 as a safe approximate estimate on the basis of the previous statistics of *V* (p. 478) and its assumed relation to V'.

$M'V'$ and V'. Add to columns 1–7 of table on page 448 the following: 1910, 97.3, 66.4, 429.3, .89 (by extrapolation, an unsafe guide), 382, 52.8.

P. This is obtained (on the principles of the table on page 487) from the index number 131.6 of wholesale prices for 1910 (kindly supplied in advance of publication by the Bureau of Labor) and the average price 96.2 of stocks as given by the *Commercial and Financial Chronicle*, both being compared with the respective figures for 1909, viz. 126.5 and 97.5. They are combined by "weighting" the wholesale prices 10 and the stock prices 1 and reducing the results so that the average for 1909 shall be 100.

T. This is obtained: (*a*) by continuing columns 1–5 of the table on page 479 by inserting: 1910, 160, 113, 162, 154; (the extension of column 2 for 1910 is made by means of somewhat more complete data than those enumerated on pages 480–482); (*b*) by combining the result, 154, obtained for column 5 with the figures for railway cars handled. These were 19.8 millions for 1909 and 22.3 for 1910. Column 5 being weighted 10 and the car figures 1, we get as indices of trade: for 1909, 1718, and for 1910, 1763, showing an increase of 2.6%, which, applied to the (corrected) estimate of the absolute trade of 1909, viz. 387 billions, gives 397 as the absolute trade in 1910.

(The opportunity is here taken to correct an inadvertence on pp. 480 ff. It should have been there stated that, of the 44 categories mentioned, some are *alternative* and not independent items, viz. those having the same names and differing only in the number of cities; also that the dates given do not imply that the items opposite are in all cases used for *all* the intervening time, but only for such periods as the items were actually available.)

It is noticeable that the changes in business in 1910 as compared with 1909 are somewhat irregular; the sales of stocks have declined; exports and imports (both of them) have declined about 10%.

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