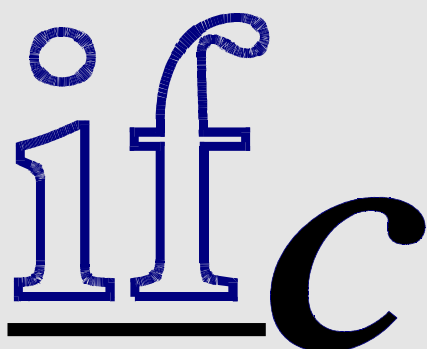

IRVING FISHER COMMITTEE
ON CENTRAL-BANK STATISTICS

ifc Bulletin

Nr. 2 • June 1998



The Irving Fisher Committee is part
of the International Statistical Institute

Contents

**Capital and Cash-Flow
Performance Measurement**

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Helsinki Meeting 1999

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Fisher's "Short Stories on Wealth"

ifc Bulletin

Nr. 2 – June 1998

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Gathering momentum

A substantial part of this second issue of the IFC Bulletin is devoted to the contribution of the Irving Fisher Committee to the 52nd Session of the International Statistical Institute, to be held during 10-18 August 1999, in Helsinki. As announced by Mr. Emerico Zautzik, Chairman of the Committee, in his letter accompanying the first issue of the IFC Bulletin,¹ the following topics have been selected:

1. Globalisation of Markets and Cross-Border Holdings of Financial Assets;
2. The central bank's function in the field of statistics.

There has been a very positive response to the call by Mr. Zautzik for contributions, and many individuals and organisations have indicated that they will provide papers for the session.² Several authors have already sent an abstract of their promised paper; these abstracts are presented in this issue of the Bulletin. We intend to continue the publication of abstracts in the next issue.

According to information received so far, there will be three sessions on central-bank statistics in Helsinki: one for invited papers (on the first topic) and two for contributed papers (on both topics).

Readers with an interest in the theoretical aspects of indices might benefit from an article by Dr. Arthur Vogt on "Two New Formulae for Performance Measurement based on Irving Fisher's Price Index"; these formulae have been derived by simultaneously investigating capital and cash-flow performance measures.

We are also obliged to Dr. Vogt for his suggestion that the IFC Bulletin serve as the vehicle to re-print a series of articles on economics, written by Irving Fisher in the late twenties and early thirties for trade union members. This series comprises more than 80 articles that were discovered by Mr. Vogt in the Archives of Yale University Library. We intend to publish all of them in successive batches. The first seven of these "Short Stories on Wealth", prefaced by a short introduction, can be found in the present issue.

1) *See page 9.*

2) *See page 8.*

Two New Formulae for Performance Measurement based on Irving Fisher's Price Index

Arthur Vogt

An index number of the prices of a number of commodities is an average of their price relatives. This definition has, for concreteness, been expressed in terms of prices. But in like manner, an index number can be calculated for wages, for quantities of goods imported or exported, and, in fact, for any subject matter involving divergent changes of a group of magnitudes.

Fisher (1922:3)

C'est prolonger la vie des grands hommes que de poursuivre dignement leurs entreprises.

Fontenelle (1717)

Two new formulae for performance measurement are presented. They were found by applying principles Irving Fisher used in price index theory. That is, they were derived by simultaneously investigating capital and "cash flow" performance measures.

1 Introduction

(Capital) performance measurement depends not only of the capital income R but also of the net cash flow S . The situation can be compared to the price index problem: to calculate a price index one uses information about the quantities. Fisher's (1922) merit was to *simultaneously* investigate price and quantity indices. This opens the eye for symmetries as the factor reversal test (formula (4.2) in Barta (1997), formula (2.7) in the present paper). In this sense we here simultaneously investigate capital performance measures and *cash flow* performance measures. We propose for both two kinds of Fisher measures. These measures are symmetric and fulfil the factor reversal test.

It is to mention here that our capital performance measure is also called "return measure" (Sharp et al. 1995). We prefer the terminology of AIMR (1993:appendix A). Performance measures in Sharp's terminology are called "risk adjusted performance measures" in the AIMR terminology.

2 Theory of Multiplicative Causal Analysis

In section 6.2 of Vogt and Barta (1997) a function f which is investigated in the base situation 0, giving the value $f(\bar{x}^0)$, and in the observed situation 1, giving the value $f(\bar{x}^1)$ a multiplicative causal analysis of the ratio $f(\bar{x}^1)/f(\bar{x}^0)$ is performed. In the present context we need only 2 variables instead of the n components of the vector.

$$\Pi = \frac{f(x_1^1, x_2^1)}{f(x_1^0, x_2^0)} \quad (2.1)$$

Formula (2.1) has to be split up in the factors $\Pi_i, i=1, 2$.

$$\Pi = \Pi_1 \cdot \Pi_2 \quad (2.2)$$

and Π_i gives the relative contribution of cause number i to the total factor Π . The formula corresponding to Laspeyres' price index (formula (3.1) in Barta (1997)) is

$$\Pi_1^{Laspeyres} = \frac{f(x_1^1, x_2^0)}{f(x_1^0, x_2^0)} \quad (2.3)$$

and the formula corresponding to Paasche's index (formula (3.2) in Barta (1997)) is

$$\Pi_1^{Paasche} = \frac{f(x_1^1, x_2^1)}{f(x_1^0, x_2^1)} \quad (2.4)$$

The geometric mean yields exactly (2.1) even with a general function f :

$$\Pi_1^{Fisher} = \sqrt{\Pi_1^{Laspeyres} \Pi_1^{Paasche}} = \sqrt{\frac{f(x_1^1, x_2^0)}{f(x_1^0, x_2^0)} \frac{f(x_1^1, x_2^1)}{f(x_1^0, x_2^1)}} \quad (2.5)$$

$$\Pi_2^{Fisher} = \sqrt{\Pi_2^{Laspeyres} \Pi_2^{Paasche}} = \sqrt{\frac{f(x_1^0, x_2^1)}{f(x_1^0, x_2^0)} \frac{f(x_1^1, x_2^1)}{f(x_1^1, x_2^0)}} \quad (2.6)$$

because

$$\Pi_1^{Fisher} \Pi_2^{Fisher} = \frac{f(x_1^1, x_2^1)}{f(x_1^0, x_2^0)} = \Pi \quad (2.7)$$

This formula expresses the fact that Fisher's performance measure satisfies the famous factor reversal test (Barta (1997:63)).

The mathematical index theory shows that the geometric mean is not the only compromise between the indices of Laspeyres and Paasche which satisfies the factor reversal test for two factors. In section 5 we will "force" the modified Dietz measure by rectifying to satisfy this test.

3 Application of the Multiplicative Causal Analysis to Performance Measurement

We start from the discrete form of the corresponding continuous equation by Kaiser (1974). The time unit considered of the discretisation may be a month, a quarter or a year:

$$I + R = O + (K_1 - K_0) \quad (3.1)$$

This equation holds for any economic unity: for a household, a company, a pension fund, an investment fund etc.

I means the inflow (without capital return),
R the capital return.

The sum $I+R$ is equal to the

outflow O (without negative capital return)
plus the capital increase $K_1 - K_0$.

For a household I is the labour income and O the consumption, for a pension fund I are the contributions and O the benefits.

The inflow I minus the outflow O is our

cash flow S.

Thus (3.1) reads

$$S + R = (K_1 - K_0) \quad (3.2)$$

or

$$K_1 = K_0 + S + R \quad (3.3)$$

The problem now is to decompose the factor

$$\frac{K_1}{K_0} = \frac{K_0 + S + R}{K_0} \quad (3.4)$$

in a S-factor (cash flow performance measure Π_S) and in a R-factor (capital performance measure Π_R).

In section 2, a generalisation of the price index problem was presented. Here we re-specialise this generalisation in the following sense. We use the following 4 argument combinations of the function f

$$\begin{aligned} f(x_1^0, x_2^0) &= K_0 & f(x_1^1, x_2^0) &= K_0 + R \\ f(x_1^0, x_2^1) &= K_0 + S & f(x_1^1, x_2^1) &= K_0 + R + S \end{aligned}$$

4 Some basic performance measures

Historically it may be mentioned here that in Leibniz's time two measures were used (without cash flow):

$$\Pi_R^{Carpzow} = \frac{K_0}{K_0 - R} \quad (4.1)$$

and

$$\Pi_R^{Hoffmann} = \frac{K_0 + R}{K_0} \quad (4.2)$$

The important numerical divergencies between these two formulas was a reason for Leibniz to set of the formula for compound interest used till nowadays! (Vogt 1997)

Laspeyres' capital performance measure (2.3) yields

$$\Pi_R^{Laspeyres} = \frac{K_0 + R}{K_0} \quad (4.3)$$

It assumes that the cash flow is at the end of the time unit considered. It corresponds to the above formula by Hoffmann.

Paasche's capital performance measure (2.4) yields

$$\Pi_R^{Paasche} = \frac{K_0 + R + S}{K_0 + S} \quad (4.4)$$

It assumes that the cash flow is at the beginning of the time unit considered.

In the sense of Fisher's "crossings" of index formulas we can cross Laspeyres' and Paasche's capital performance measures as follows. It yields the formula by Dietz (AIMR 1993, Schweizerische Bankiervereinigung 1996).

$$\Pi_R^{Dietz} = \frac{K_0 + R + \frac{1}{2}S}{K_0 + \frac{1}{2}S} \quad (4.5)$$

It assumes that the cash flow is in the middle of the time unit considered. Thus in the sense of the price index theory it can be called the “Edgeworth-Marshall solution”.

Now we want to present the new formula which corresponds to Fisher’s index (2.5):

$$\Pi_R^{Fisher I} = \sqrt{\Pi_R^{Laspeyres} \Pi_R^{Paasche}} = \sqrt{\frac{K_0 + R}{K_0} \frac{K_0 + R + S}{K_0 + S}} \quad (4.6)$$

Analogously Laspeyres’ cash flow performance measure yields

$$\Pi_S^{Laspeyres} = \frac{K_0 + S}{K_0} \quad (4.7)$$

and Paasche’s

$$\Pi_S^{Paasche} = \frac{K_0 + R + S}{K_0 + R} \quad (4.8)$$

and Fisher’s

$$\Pi_S^{Fisher I} = \sqrt{\Pi_S^{Laspeyres} \Pi_S^{Paasche}} = \sqrt{\frac{K_0 + S}{K_0} \frac{K_0 + R + S}{K_0 + R}} \quad (4.9)$$

The product of (4.6) and (4.9) yields the capital ratio (3.4). Thus Fisher’s performance measures fulfill the factor reversal test.

The above basic measures are especially suitable for private households and small companies which do not have time and pleasure to use the measures below.

5 Time weighted formulae

Often the formula by Dietz is modified to

$$\Pi_R^{Dietz mod.} = \frac{K_0 + R + pS}{K_0 + pS} \quad (5.1)$$

where p is the average time of the cash flow. Dietz formula (4.5) assumes that the average time of the cash flow is in the middle of the time unit, i.e. $p=1/2$.

We now want to rectify this formula in the sense of Irving Fisher (cf. Fisher (1922:chapter 7) Vogt and Barta (1997:45)). To do so, we calculate the modified Dietz cash flow performance measure

$$\Pi_S^{Dietz mod.} = \frac{K_0 + S + pR}{K_0 + pR} \quad (5.2)$$

Then we define the factor antithesis of (5.1) by (cf. Barta’s (1997) formula (4.5))

$$\Pi_R^{Dietz mod. anti} = \frac{\frac{K_1}{K_0}}{\frac{K_0 + S + pR}{K_0 + pR}} \quad (5.3)$$

By crossing (5.2) and (5.3) we arrive to Fisher’s capital performance measure II

$$\Pi_R^{Fisher II} = \sqrt{\Pi_R^{Dietz.mod.} \cdot \Pi_R^{Dietz.mod. anti}} = \sqrt{\frac{K_0 + R + pS}{K_0 + pS} \cdot \frac{\frac{K_1}{K_0}}{\frac{K_0 + S + pR}{K_0 + pR}}} \quad (5.4)$$

The corresponding cash flow performance measure reads

$$\Pi_S^{Fisher II} = \sqrt{\Pi_S^{Dietz.mod.} \cdot \Pi_S^{Dietz.mod. anti}} = \sqrt{\frac{K_0 + S + pR}{K_0 + pR} \cdot \frac{\frac{K_1}{K_0}}{\frac{K_0 + R + pS}{K_0 + pS}}} \quad (5.5)$$

It is easy to prove that the Fisher II measure satisfies the factor reversal test, i.e. the product of the above formulae yields the capital ratio (3.4).

6 Numerical Illustrations

Evaluating the performance measures yields the following performances (performance numbers):

<i>Input</i>	<i>Example 1</i>	<i>Example 2</i>	<i>Example 3</i>
K0	100	100	100
R	20	20	-20
S	10	-10	-10
K1	130	110	70

Capital performances

<i>Output</i>	<i>Example 1</i>	<i>Example 2</i>	<i>Example 3</i>
Carpzow	1.25	1.25	0.8333
Laspeyres	1.2	1.2	0.8
Paasche	1.1818	1.2222	0.7778
Dietz	1.1905	1.2105	0.7895
Fisher I	1.1909	1.2111	0.7888

Cash flow performances

<i>Output</i>	<i>Example 1</i>	<i>Example 2</i>	<i>Example 3</i>
Carpzow	1.1111	0.9091	0.9091
Laspeyres	1.1	0.9	0.9
Paasche	1.0833	0.9167	0.8750
Dietz	1.0909	0.9091	0.8889
Fisher I	1.0916	0.9083	0.8874

Product of the above performances

It should yield the capital ratio K1/K0.

Only Fisher's performances fulfil this test!!!

<i>Output</i>	<i>Example 1</i>	<i>Example 2</i>	<i>Example 3</i>
Capital Ratio	1.3	1.1	0.7
Carpzow	1.3889	1.1364	0.7576
Laspeyres	1.3200	1.0800	0.7200
Paasche	1.2803	1.1204	0.6806
Dietz	1.2987	1.1005	0.7018
Fisher I	1.3	1.1	0.7

7 Conclusion

The method Fisher used in price index theory is applied in one more field: in financial performance measurement (which consists of capital performance measurement and cash flow performance measurement). Fisher's method is applied in the system theoretical sense: Occam's Razor is used and all ballast of modern portfolio theory (for solving the present problem) is neglected. The result is a new measure for capital performance and a matching one for cash flow performance. The former is slightly better than the commonly used measure by Dietz and the latter seems to be new.

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The IFC's Initiatives

Following the discussions held at the administrative meeting in Istanbul, the Chairman of the Irving Fisher Committee has announced, in a letter which was distributed together with the first issue of the IFC Bulletin, that during the meetings which will take place in the framework of the 52nd Session of the International Statistical Institute, on 10-18 August 1999 in Helsinki, the following two subjects relating to Central-Bank Statistics will be dealt with:

- 1. Globalisation of Markets and Cross-Border Holdings of Financial Assets;**
- 2. The central bank's function in the field of statistics.**

The letter is reprinted on the next two pages.

So far the following institutions have announced their intention to submit a paper:

Topic 1

Banco de España
Bank of England
Bank of Finland
Bank of Japan
Central Bank of Nigeria
De Nederlandsche Bank
International Monetary Fund
National Bank of Belgium
Ufficio Italiano dei Cambi

The Office has received abstracts of most of these papers. These can be found on pages 11-16.

Topic 2

Banco de España
Bank for International Settlements
Bank Markazi Iran
Bank of Botswana
Banque de France
Central Bank of Nigeria
National Bank of Belgium
Österreichische Nationalbank

Authors are requested to submit their papers not later than 10 April 1999, in order to assist the organisers in co-ordinating the contents of the papers for their meeting. It would be helpful if the authors submit a draft version of their papers by 10 February 1999.

According to ISI rules, papers should not be more than four pages in length. However, we encourage authors to submit a more comprehensive version of their papers at the meeting itself. This version, which has no limits in length, will be published in one of the subsequent issues of the IFC Bulletin.



IRVING FISHER COMMITTEE ON CENTRAL-BANK STATISTICS

Emerico A. Zautzik
Chairman

Dear Madam, Dear Sir,

10 December 1997

It has been a pleasure in sending you a copy of the first issue of the IFC Bulletin, the newsletter of the Irving Fisher Committee on central-bank statistics. This special issue contains the papers and other documents produced on the occasion of the first meeting of the Committee, which took place in Istanbul, within the framework of the 51st Session of the International Statistical Institute (ISI), in August 1997.

The establishment of the Irving Fisher Committee was proposed during the 50th ISI Session in Beijing by a number of central bank statisticians who had the impression that monetary, financial and balance of payments statistics could benefit from a more rigorous theoretical treatment. Their aim was to create, within the ISI, a forum for discussing statistical topics which are of special interest to central banks.

Subsequently, Mr. Bart Meganck (National Bank of Belgium) offered to organise the first meeting of the Irving Fisher Committee to be held under the umbrella of the 51st ISI Session in Istanbul. For that purpose he appealed to a large number of central banks and some other potentially interested institutions. Although it was felt that the Committee should start its activities on a modest scale, the Bulletin shows that some very interesting documents were presented.

On that occasion it was concluded that it would be valuable for both the ISI and the central banks to continue the activities of the Committee and to consolidate its position by attracting support from a wider range of institutions. It was decided to start preparations for the next meeting.

Against the background of the successful Istanbul meeting I am asking for your support. **I would appreciate it very much if you or one of your senior statisticians and/or eventually an economist from an other department would act as the official representative(s) of your institution on the Irving Fisher Committee.** It is my ambition to create in this way an extended group of "members" which could be consulted, by written procedures, on the structure and organisation of the Committee and on the topics to be discussed at its meetings. The IFC Bulletin could, in this respect, be a means of communication between all interested parties.

As decided in Istanbul, any central bank would be entitled to participate in the Committee, but in order to avoid too restrictive a field of interest, it was considered essential to open the Committee to representatives of other institutions and to individual ISI members.

I hope that this letter, and the information contained in the IFC Bulletin, will convince you of the usefulness of our venture and that you will accept my proposal to participate in the activities of the Committee.

I take advantage of this opportunity to start the discussion on the organisation of the next meeting, which, as we agreed, should take place within the framework of the August 1999 ISI conference in Helsinki. The organisation of the conference has already started, and we have been asked about our plans.

From our discussion in Istanbul, one topic seemed to be of interest to most participants. I refer to the issue of the globalisation of financial markets and of its consequences for statisticians trying to keep track of capital flows. As markets become more integrated and electronic communication more widespread, measuring international capital flows becomes harder and harder.

A large number of central banks are trying to find solutions to this problem, and sharing experiences will probably be of interest to us all. In addition, the IMF co-ordinated Survey on investment in securities issued by non-residents should take place in a few months, and central banks may gain additional useful insight from its results. A more detailed presentation of this topic is included in the Annex.

During our meeting, we also set ourselves an additional goal, that of the enlargement of the committee. We saw that central banks face different tasks in their statistical work, and that interesting information can be gained just by learning more about each other. It may therefore be useful to adopt a second, more general topic for discussion, which we could call "What is a central bank's function in the field of statistics?" Under this heading central banks could present the scope of their statistical responsibilities, their methods and their instruments, their publications and dissemination policies.

In conclusion, this letter also represents **a call for papers under the two headings mentioned above**. Any central bank interested in one or both is asked kindly to notify the Secretariat of the Committee at the National Bank of Belgium. This invitation will be sent to central banks and to a wider range of potentially interested institutions.

I am looking forward to a favourable response. The future of the Committee hinges on the efforts of all of us. I hope to see you in Helsinki.

Best regards,

(Signed) Emerico A. Zautzik (Banca d'Italia),
Chairman

Annex: **Theme for 1999 ISI Conference**

"Globalisation of Markets and Cross-Border Holdings of Financial Assets"

The globalisation of financial markets is distinctive trait of the last 15 years. It stems from two driving forces; on the one hand, a large number of countries removed foreign exchange controls and deregulated foreign investment; on the other, improved communication technology and electronic trading facilitated investment in distant places. Globalisation poses problems for policy makers and statisticians alike. The former encounter problems in their effort to control some intermediate and final targets. The latter find more and more difficulty in ascertaining the magnitude and destination of investment flows by residents, or the amount and actual source of inbound funds. Given the tradability of most assets, the possibility of investing through intermediaries located in third countries and the possibility of restructuring financial products via derivatives, in a number of cases a full and clear picture can only be obtained through co-operation among countries. The IMF Survey on Cross-Border Holdings, to be held at the end of 1997, will shed some light on the issue.

It would be interesting to propose to central banks, and to interested international organisations, to report on a number of related topics):

- Old or new methods that are, or are planned to be, used to collect the relevant information (for the IMF Survey or for related topics).
- Comparison of such methods on the basis of their practical and theoretical implications (for instance, stocks vs. flows)
- Results and applications of such methods. Is new technology helping to solve some of the problems it created?
- Efforts at international co-operation.
- International comparisons and trends regarding the extent of foreign financial asset holdings.

GLOBALISATION OF MARKETS AND CROSS-BORDER HOLDINGS OF FINANCIAL ASSETS

Abstracts of papers

Internationalisation of Financial Markets in the UK and Implications for Data Collection and Statistics

Philip Turnbull—Bank of England

The past two decades have seen far-reaching changes to financial markets the world over. Rapid advances in information technology, widening acceptance of the benefits from deregulation, and major changes to the politico-economic map of Europe and beyond have all played a part in bringing about radical change to the financial products on offer; the institutions which provide them; and the markets in which they are traded.

In the light of these changes, the paper will :

- Review the principal financial market developments in the United Kingdom during this period; and their very close links to global market developments.
- Illustrate some of the associated statistical measurement problems, and possible approaches, from the practical and pragmatic perspective of current project work undertaken within the statistics division at the Bank of England. Examples are likely to include work on: repurchase transactions (repos); spread earnings on dealing in financial instruments; financial derivatives; risk transfer in international banking statistics, and surveys of holdings of assets by economic sector (including the UK contribution to the IMF international portfolio investment survey).
- Draw out the implications for the future development of financial statistics in the United Kingdom and elsewhere; highlighting the implications of global financial developments for all financial statisticians seeking to classify and record economic activity.

Implementation of the New International Guidelines for the Measurement of Financial Derivatives in the Balance of Payments and the International Investment Position

R.F.D.D. Chaudron—De Nederlandsche Bank

The expansion of cross border holdings of financial assets during the last ten to twenty years has not only created problems for national and international banking supervisors. Compilers of financial statistics have also increasingly been forced to reckon with the increasing size of international financial markets, both in terms of the number of transactions and the amount of capital involved. On top of this, the range of securities has come to include more and more complicated instruments. The most obvious example of this is the increased use of financial derivatives.

The widespread adoption of financial derivatives by market participants led to the recognition at the IMF, as the leading organisation for the determination of international statistical guidelines, that these needed to be developed for the measurement of derivatives. Subsequent documentation produced by the IMF and the EMI have provided the necessary guidance. On the basis of these guidelines, De Nederlandsche Bank will change its method of data collection with respect to cross border transactions in financial derivatives for the purpose of compiling the balance of payments and the international investment position. The major concern in the design of the new collection method is limiting the amount of additional data needed from reporters (by using as many concepts as possible from existing surveys, i.e. prudential and BIS) while maintaining the possibility of its use for balance of payments statistics. On the other hand, as the trade in financial derivatives is international almost by nature, the selected collection method has to take account of the magnitude and the volatility of the funds involved. Another important consideration from a more methodological viewpoint is, for example, the possibility to correct the value of the assets traded in connection with derivative contracts for the difference with market prices. The paper describes the solutions to these problems as chosen by De Nederlandsche Bank and the way in which they are incorporated into the reporting system.

Globalisation of Financial Markets: Implications for Domestic Macroeconomic Management

P.I. Obaseki and C.M. Okafor—Central Bank of Nigeria

The rapid integration of the world economies and financial markets is a process that has come to stay. It is being increasingly embraced by all players in the global economy, and no one wants to be left out as that could spell a disaster in future.

The arguments favouring globalisation include its potentials for raising global welfare through improved quality products at reduced prices. The adverse effects include rapid outflow of capital from an economy, once market fundamentals/sentiments turn adverse, indicating that the economy is losing creditworthiness. Capital flows into and out of developing economies have been enormous, exceeding in most cases 200 per cent of recorded trade.

Given the increasing importance of private capital flows in the context of the rapid globalisation of the world economy, private sources of capital need to be identified, their transmission mechanisms understood in order to be able to come up with useful recommendations on how to tack them. When capital flows cannot be adequately monitored and tracked, macroeconomic management becomes difficult.

As a prelude to a co-ordinated approach, national governments must devise appropriate methods to define and present their external trade and financial data on the basis of agreed international format. Thereafter, serious efforts should be made to identify most of the items classified under errors and omissions in the balance to payments accounts.

The paper is structured into five parts. After the introduction, theoretical concepts and review of relevant literature are discussed, followed by trend analysis of global capital flows, problems with tracking capital flows and implications for macroeconomic management. The paper ends with a summary, conclusions and recommendations.

The Effects of the Globalisation of Financial Markets on the Obtaining of Cross-border transactions Statistical Information: the Spanish experience

Maria Perez-Jurado and Ana Sanchez—Banco de España

The abolition of exchange controls and the development of information technologies and telecommunications has given rise to an extraordinary increase in the number of cross border transactions, in a context of financial innovation and growing bank disintermediation. In wider and more transparent markets, with lower information and transactions costs, economic agents react more rapidly to changes in the return on their assets—including those deriving from its tax treatment and fiscal opacity—and in their perception of the risk of the different instruments and borrowers, with a consequent increase in the difficulties of measurement of cross border holdings of financial assets.

In the Spanish case, the amount of the gross flows recorded in the financial account of the Balance of Payments—excluding bank deposits—has multiplied almost a hundred times between 1990 and 1997. These flows are in the form of financial instruments which, a decade ago, were practically non-existent in cross border transactions.

Undoubtedly the increase in the number of transactions and in their complexity leads to greater measurement errors. But it is argued in this paper that a significant part of what data analysts and compilers may perceive as greater errors, are not such, but rather reflect rational behaviour by economic agents.

From the point of view of the compilation of statistics, this also means that more caution is required in the application of the statistical techniques of error detection and correction based on the stochastic behaviour of time series. This is because their greater apparent volatility and the increase in the number of “outliers” may correspond to certain phenomena which the analyst must understand and interpret.

This paper illustrates these problems and difficulties analysing the behaviour of certain series extracted from the financial account of the Spanish Balance of Payments, to which error detection techniques based on the analysis of time series have been applied. In particular, the program TRAMO—Time Series Regression with AREMA Noise, Missing observations and Outliers—is applied.

The Organisation of a first Portfolio Survey in Belgium and the Problem of the Household Sector

G. Melis—National Bank of Belgium

Because of the discrepancies observed at world level between liabilities represented by securities and assets in the form of securities, the International Monetary Fund has decided to conduct a survey on the assets in foreign securities held by the residents of each country.

The main purpose of the survey is to make available to the authorities responsible for balance of payments statistics reliable information permitting better corroboration of the data contained in the balance of payments with regard to investment in securities. The data provided by the survey will also be usable for establishing the overall external position of each country.

Furthermore the results will provide the International Monetary Fund information about cross-border holdings of securities and associated income data.

As it is common knowledge, portfolio investment in securities comprises purchases of and subscriptions for equity and debt securities, money market instruments and derivative instruments. The essential characteristic which makes a financial asset an investment in securities is its degree of negotiability. However, securities acquired for direct investment, i.e. with a view to having a significant influence on the running of an enterprise, are not to be regarded as investment in securities.

The Belgian survey relates to all investments in securities issued by non-residents in the form of equity securities, debt securities and money market instruments—except for derivative instruments—which has been carried out by all institutional investors and other important commercial companies. Neither the other companies nor the household sector are questioned since they are less significant or too numerous. Therefore, their impact has to be estimated.

Questionnaires have been drawn up for end-investors and for custodians. Custodians are also questioned to obtain probable indications about the holdings of securities by individuals and by those companies that are not covered by the questionnaires for end-investors. However, their holdings of securities occur, in contrast to other countries, in the form of bearer paper, which is moreover usually kept in own custody. This means that it is unlikely that these holdings will be mentioned on the questionnaires of the custodians. Therefore, these figures will have to be estimated for the greater part.

For foreign shares, bought on the Belgian stock market, bearer certificates are issued by specialised firms. The Exchange Commission publishes each year the total value issued. Since all these certificates can be considered as being held by individuals only, such might be a first indication. Figures about assets in the form of foreign shares purchased on foreign stock markets are not available but can be assumed to be negligible.

As far as bonds or notes are concerned, no relevant external data seem to be available. Although some research has been carried out in the past with regard to the holdings of financial assets by the household sector, it was always derived from the national accounts and balance of payments data. Since no external data can corroborate this item, the estimations for bonds and notes will probably be derived from balance of payments figures accumulated during the last years.

Nonetheless, a certain tendency towards a generalised use of nominative securities instead of bearer paper is observed, the latter being more and more penalised from a fiscal point of view. An expected fiscal harmonisation within the European Union might accelerate this process.

The Relationship between FoF and BoP

Saturo Hagino—Bank of Japan

With the globalisation of financial market, Flow of Funds statistics (FoF) as well as Balance of Payments statistics (BoP) have become important tools in analysing international capital flow. In particular, FoF has a merit of providing the data on cross-border transactions, sector by sector. FoF and BoP are closely related comprehensive statistics, that are part of the social accounting system, and some data of FoF are originated from BoP data. Nevertheless, the basic philosophies of these two statistics are not necessarily consistent. The conformity should be further discussed. From FoF's perspective, it might be stated that BoP statistics attach too much importance to analytical purposes. How can we insert functional categories such as foreign direct investment in FoF? Why are some statistical treatments, such as reinvested earnings and accrued interests, to be emphasised only in international transactions? Taking several problems that we have encountered in the revision process of Japan's FoF statistics, we advocate improvement in the consistency between the BoP framework and the FoF framework in the social accounting system.

Accruals Methodology: Statistical problems in the Estimation of Interest for new Financial Instruments in the context of Globalisation of Financial Markets

A. Gentilini and V. Pellegrini—Ufficio Italiano dei Cambi

The recording of accrued interest on the basis of the rules defined in the 5th edition of the IMF-Balance of Payments Manual has raised specific methodological problems for BoP and Financial Accounts compilers, still outstanding to date.

In this respect, some studies have been published by Central Banks and Groups of Experts¹, showing a lack of consensus on a common theoretical framework relating to the full accrual recording.

Technological progress has had a direct impact on the functioning of the market through the acceleration of trading and the introduction of techniques for automatic portfolio management. All this had led to an increasing globalisation and efficiency of markets, that is to increasing integration of the domestic financial markets.

The context in the Euro-market of low or declining nominal interest rates and subdued inflation has increased the demand for higher returns. This and other factors have drawn new categories of investors and issuers to the international market-place.

The resilience of international issuance has resulted in financial innovation, thus extending the range of financial services and products offered. The facilitated market access enabled intermediaries to unbundle and repackage underlying risks, by means of the introduction of equity/index-related issues, securities with coupons linked to the credit rating of issuers or "synthetically" based on baskets of outstanding emerging market issues.

These new categories of financial instruments give evidence of the difficulties to distinguish between capital gain/loss and interest income. Thus, the accrual recording methodology, as recommended in the 5th edition of the IMF-Balance of Manual, reveals some unsolved problems.

1) *Banque de France*: "Accrued coupons on transactions in bonds", October 1996; *EMI-Sub-Group 1 of the BoP FFSTF, Recording of income on an accrual basis for collective investment institutions, money market instruments and other bonds*", September 1997; *Group of Financial Statisticians (UK)*, "Income accrual; interpreting and implementing the new statistical standards", March 1998.

In this paper, starting from a comparison exercise between conventional cash-based accounting and accrual basis recording, the authors intend to highlight the asymmetries due to the recording method. The conventional cash-based accounting recording will be based on the current data collection system (on a settlement basis), while the experimental accrual basis recording will make reference to the security-by-security portfolio stocks, on the basis of a securities database implemented for this analysis. Further, the authors intend to analyse some recording aspects concerning new financial instruments and to devise a theoretical approach of accrued interest estimation.

The Decomposition of the Factors contributing to the Variations of the Finnish International Investment Position during the 1990s with the Analysis of Variance

Heikki Hella and Jorma Hilpinen—Bank of Finland

The Finnish economy has experienced a severe recession and a period of vigorous growth during the 1990s. Accordingly, the cross border financial flows and the IIP have fluctuated considerably leading to a remarkable structural change in the Finnish IIP.

This paper looks at the recent developments of the foreign stability employing the monthly Balance of Payments and International Investment Position statistics compiled by the Bank of Finland. This monthly survey system and compiling procedures are briefly characterised as well.

The main objective of this paper is to investigate the sources of fluctuations of the monthly IIP using analysis of variance i.e. by decomposition of the total variance induced by various items (factors) of the BoP and the IIP. In the study, the aim is to identify private sector, central government and central bank flow effects as well as asset price and exchange rate effects to the IIP. Time specific factors (trend & cyclical) are also taken in the consideration. In addition, the errors and omissions of BoP will be taken into account in the decomposition. The comparison of the relative power of the main factors is of special interest. In the framework of the chosen statistical approach we can also study the interaction effects of different factors.

We emphasise that our goal is to search and identify the most important sources of variation which in the framework of the BoP and the IIP identities. We will render exercises employing both traditional and robust analysis of variance. The so-called robust procedures are recently applied more frequent also in the area of analysis of variance as in linear regression analysis and time series analysis. We will use the application of the modified Levene test (Levene, 1960; Neter et al., 1996).

Fisher's Short Stories on Wealth, 1926-1933

Fisher is widely regarded as the greatest economist America has ever produced. Furthermore, he was not a scientist living in an ivory-tower but he enthusiastically tried to educate people.

Dr. **Arthur Vogt** has drawn our attention to a series of simple explanations of elementary principles of economics which Fisher wrote in an agreement with the Worker's Education Bureau. Fisher called them "Short Stories of Wealth". The bureau issued them monthly for publication in any union newspaper that desired to print them. They appeared in the "Brotherhood of Locomotive Firemen and Enginemen's Magazine", "Trade Union News", "Labour Herald" etc.

When the series started appearing (in 1926), the editor of these magazines wrote: "Like all true scientists, Professor Fisher is very glad to have his views questioned and criticized. Readers may address him in care of the Workers' Education Bureau of America." Fisher's first Story was published in February 1926. The last, 86th one in April 1933. In this last Story he resumed them all as follows:

"This completes our study in Economics. It has covered four parts corresponding roughly in Anatomy, Physiology, Pathology and Therapeutics. Under Anatomy we studied the bookkeeping of capital and income and their relations. Under Physiology we studied the influences of the price level and of individual prices, including the rate of interest and the influences on the distribution of income relatively to its capital sources and of capital income relatively to its owners. Under Pathology and Therapeutics we studied inflation, deflation, poverty, vanity, degeneration, inequality of distribution and the various plans of coping with these evils."

The stories had never been reprinted and had not been included in "The Works of Irving Fisher" (General Editor W.J. Bates, Consulting Editor J. Tobin), which was published in 1997. However, the Stories are worth to be read up to the present day. Besides the scientific and historical interest they are of didactical use as they are models of explaining economic phenomena to the public. The IFC Bulletin decided to publish all these "Short Stories of Wealth". The titles of the Stories are given below. They are grouped according to portions planned to be published in the IFC Bulletin.

1. The Main Idea, February 1926
2. Capital Accounts, March 1926
3. Income Accounts, April 1926
4. The Relation between Capital and Income, May 1926
5. What Money Is Not, June 1926
6. What Money Is an Is For, July 1926
7. Credit Currency, August 1926

8. The Purchasing Power of Money, September 1926
9. What Fixes the Purchasing Power of the Dollar? October 1926
10. How Inflation and Deflation Work, November 1926
11. The Flowing Stream of Money and Goods, December 1926
12. Bullion and Currency - What Free Coinage of Silver Would Mean, January 1927

13. Supply and Demand, February 1927
14. Supply and Demand - Continued, March 1927
15. Changes in Supply and Demand, April 1927
16. "What's Back of Demand?", May 1927
17. The Relation of Want and Demand, June 1927
18. The Influences Behind Supply, July 1927
19. Monopoly Prices, August 1927
20. Cut-Throat Competition, September 1927
21. Cut-Throat Competition Leads to Monopoly, November 1927

22. The Future, not the Past, Rules Value, December 1927
23. The Riddle of Interest, January 1928
24. Is Interest-Taking Wrong? February 1928
25. b1 Some Wrong Explanations of Interest, March 1928
26. b2 Real Interest and Money, April 1928
27. b3 Impatience to Spend, May 1928
28. b4 The Personal Reasons for Impatience, June 1928
29. b5 The impersonal Factors in Impatience, July 1928
30. b6 How Impatience Influences Interest, August 1928
31. b7 Opportunity for Investment, September 1928
32. b8 Before Leaving the Subject of Prices, October 1928

33. b9 Distribution, November 1928
34. b10 Rent, December 1928
35. b11 Land Rent, January 1929
36. b12 Wages, February 1929
37. c1 The Demand for Labour, March 1929
38. c2 Wages and Total Earnings of Labour, April 1929
39. Labour Efficiency, May 1929

40. c4 Wages and Employers' Profits, June 1929
41. c5 Profits and Wages, July 1929
42. c6 The Capitalist-Employer (I), August 1929
43. c7 The Capitalist-Employer (II), September 1929
44. c8 Personal Distribution, October 1929
45. c10 National Wealth or Poverty, November 1929
46. c11 Population and Poverty (I), December 1929
47. c12 Population and Poverty (I), January 1930
48. c13 Population and Wealth, February 1930

49. Distribution, March 1930 2
50. The Effect of Thrift and Thriftlessness on Distribution, March 1930
51. Causes of Unequal Distribution, April 1930
52. How Rich can a Man Become, May 1930
53. The Limits of Accumulating Fortunes, June 1930
54. Mobility of Distribution, July 1930
55. A "Word Picture" of Distribution, August 1930

56. Inflation and Deflation an Economic Disease, October 1930
57. Big Harm from Unstable Dollar, November 1930
58. Evils of Inflation, December 1930
59. Too Much Money, January 1931
60. *(not yet available)*
61. How Inflation and Deflation Affect Investors, February 1931
62. The Unstable Dollar and Unstable Employment, March 1931

63. Stable Money Important for Labour, April 1931
64. Review of Harm Done by Inflation and Deflation, May 1931

65. How Business Men can Safeguard against Unstable Money, June 1931
66. (*not yet available*)
67. Stabilizing the Dollar
68. Banks and Government can help Stabilization, August 1931
69. How to Stabilize
70. Summary on Unstable Money, December 1931

71. Peace and Prosperity, January 1932
72. The Economic Importance of World Peace and Disarmament, February 1932
73. Disease as Economy Waste, March 1932
74. Conservation, April 1932

75. Science and Invention, May 1932
76. Saving Waste in Industry, June 1932
77. The Tariff, July 1932
78. The "Single Tax"
79. Social Insurance, September 1932

80. Minimum Standards
81. The Relation of Health to Work
82. Socialism and Communism, January 1933
83. Inequality of Distribution
84. Remedies for Wrong Distribution
85. Economics is the Science of Wealth, March 1933
86. Concluding Summary, April 1933

In the present volume we start with the first seven Stories. The first four deal with capital and income in a popular way. Fisher treated this subject in depth in 1906: *The Nature of Capital and Income* (Macmillan Company, New York and London). The last three deal with money. It is to mention here that Fisher is regarded as the first monetarist.

May the readers of the IFC Bulletin enjoy Fisher's "Stories" as much as the editor did!

Short Stories on Wealth

Irving Fisher

1. The Main Idea¹

MANY people are talking about the farmer's demand for relief, about proposed tariff changes, the rise in the cost of food, the anthracite coal strike, Trotsky's prophecy of world war, the fall of the franc in France, the proposed German bond issue, the British control of rubber and the prices of tires, Mr. Mellon's tax proposals, "the bull stock-market," the gold surplus, inflation, deflation, stabilization, index numbers, "real wages," and many other topics of the day—all implying economic problems. Yet most of us have very hazy ideas about the economic laws involved.

There are many big books written concerning these laws of economics. I have written several myself. But less than one person in a hundred can take the time to read such books.

I am now going to attempt to boil down this subject into a dozen short articles. I hope the most important truths will stand out clearly.

The first and most fundamental idea is that of "wealth." What makes wealth? To study wealth—for instance, to study the conditions which help or hinder in production or to try to get at the reasons why some people have so much wealth and others so little, or what are the causes of the high cost of living, the reasons for the rise and fall of wages—all this is the business of economics.

What Is Wealth?

Wealth consists of owned material objects. Among examples of such are: a hat, a loaf of bread, a piano, a pick-axe, a lathe, a house, an automobile, a farm, a city lot, a public park, a gold coin. Although these are very unlike each other, yet all of them are wealth, because, first, they are material objects, and secondly, they are owned—whether privately or publicly does not matter.

Almost everybody owns some wealth, even if only a crust of bread or a ragged suit of clothes. A person who has a great deal of wealth is said to be wealthy, or rich; while a person who has only a little is said to be poor. But "rich" and "poor" are relative terms. The average American workman, whether he thinks so or not, is rich compared with the average European workman, while the average millionaire, however puffed up he may feel, is poor compared with Rockefeller or Ford.

There are two ways of measuring the wealth a man owns. One way is by counting. We just count up the quantity of each of his separate kinds of wealth. The other way is by reckoning the money-value of all these different kinds put together. Take a farmer, for instance. If we want to measure his wealth in the first way, we list all he has; such as

a hundred acres of first class wheat-land;
ten acres of woodland;
fifteen tons of hay;
one thousand bushels of corn;
fifty pounds of cheese;
twenty head of cattle;
two barns;
one house;
three carts.

1) *Brotherhood of Locomotive Firemen and Enginemen's Magazine*, Vol. 80, No. 2, February 1926, pp 101-102.

Editor's Note at the time of the first publication: Professor Fisher is one of the greatest of living economists. This is the first of a series of short articles by him on which he will tell, in straightforward, interesting manner, the ideas which he has been teaching for many years at Yale University. Whether we agree with what Professor Fisher says or not, we cannot help but find his articles well worth our reading, for they represent a very good sample of American economic thought. And the author invites every reader, after having perused an article and formed his own judgments about it, to write him, making any comments or criticisms which may seem pertinent. Like all true scientists, Professor Fisher is very glad to have his views questioned and criticized. Readers may address him in care of the Workers' Education Bureau of America, 476 West 24th Street, New York City.

Different Kinds of Measures

Notice how many kinds of measures we have used. The unit of measure was the acre, ton, bushel, pound, head (of cattle), barn, house, cart.

But to measure this same farmer's wealth in the second way we need only use one measure, the dollar, so that taken all together, these various items of wealth are measured at, perhaps, twenty thousand dollars.

What, then, is this common measure, the dollar? The laws of Uncle Sam will tell you what it is. They define it as 25.8 grains of standard gold, nine-tenths fine. The pure gold (23.22 grains) contained in this amount of standard gold is almost exactly a twentieth of an ounce. So a dollar is a certain amount of gold. Uncle Sam, if he had wanted to, could just as well have made the dollar a certain amount of silver, or a certain amount of copper, or a certain amount of wheat, or a certain amount of any other kind of wealth.

It is true that the dollars we ordinarily see and handle are made of paper or silver and not of gold; but the principal reason why paper or silver dollars are considered to be dollars at all is that Uncle Sam, if we asked him, would give us a gold dollar for each paper or silver dollar.

When you stop to think of it, it is quite wonderful, that one single kind of measure can be used to measure such widely different things as land, hay, corn, cheese, and all the other kinds of wealth. And in fact this could not be done if people did not trade, that is, buy and sell in dollars.

Exchange Value of Dollars

What, then, is trade? Trade is the exchange of one article for another; and usually one item in the trade is money, or dollars. Suppose, for instance, you sell corn for dollars; the dollars you get are the exchange value of the corn, just as the corn is the exchange value of the dollars. If the gold used in this corn-trade is 100 ounces—which means about 2,000 dollars—and if the corn is 1,000 bushels, then the 2,000 dollars is the exchange value of the 1,000 bushels; that is, dividing by 2,000, two dollars per bushel is the price of corn.

So if the farmer knows what his land, hay, corn, cheese, etc., would fetch in the market, when exchanged for dollars, he can measure all his wealth of every description in one sum.

Sometimes the ownership of wealth is divided. Two brothers may own a farm equally, as partners. In that case, each brother has what is called a property right in the farm. Neither brother owns the farm alone, though they own it together. In the same way a thousand stockholders may own a railroad together, in a corporation. Each stockholder has a property right in the railroad. No one stockholder owns the railroad, yet all the stockholders, taken together, do own it.

Behind all these property rights, like bonds, stocks, mortgages, etc., there must be actual physical wealth. Behind the railroad stock is the railroad. Behind the mortgage is the land. Behind the Liberty Bond is the wealth of the entire United States. A property right which is based on nothing is, like a bogus check, worth nothing.

Human Wants

The reason why any one wants to own wealth, whether individually or jointly with other individuals, is in order that he may get some use out of the wealth—some benefit out of it. That is what a property right really is. It is a right to some of the uses or benefits of wealth. These uses or benefits of wealth include the eating of food, the wearing of clothes, the shelter from houses, the selling or otherwise using wealth. To sum up, the entire subject of uses, we may say that the ultimate use of all wealth is to satisfy human wants.

The ideas we have been describing are very common. The words expressing them are on the lips of everybody. Most people use them in loose and inexact ways. But no science, when it starts out, can hope to get anywhere unless it starts with exact, copper-fastened definitions, and then sticks to them all the way.

In this short article we have mentioned the six main ideas of economics—wealth, property-rights, uses, wants, prices, dollars. On these six foundation stones we can build the other articles in this series.

2. Capital Accounts²

THE first of these short stories was about the fundamental ideas of wealth; that is, wealth itself, property-rights, uses, wants, satisfactions, prices, values and dollars. The next two stories will have to do with keeping accounts or records of some of these things.

In business there are two main kinds of accounts—capital accounts and income accounts. This particular article will have to do with capital accounts only.

Capital is a stock of wealth existing at a point of time. A farmer's capital on June 1st may be twenty acres, two barns, and so on, and if these are worth \$20,000 he may say he has a capital of \$20,000.

Of course, this does not mean that he has twenty thousand dollars in actual money. Many people make the mistake of thinking of capital as money, but capital seldom consists of very much actual money, but is merely measured in money.

Farmer's Balance Sheet

Consider the farmer's capital account. If he is in debt, his debts, or "liabilities," as they are called, must be subtracted from his "assets" or gross capital, both measured in money, to give his net capital. For instance, suppose his farm is mortgaged for \$5,000 and suppose he has other debts amounting to \$3,000, making \$8,000 worth of debts in all. Then his net capital is not \$20,000. It is \$20,000 less \$8,000, which leaves \$12,000. This \$12,000 is all that he himself really owns out of his gross assets; for the other \$8,000 belongs, in a sense, to his creditors.

So a capital account, or balance sheet, has two sides; assets and liabilities. The farmer's balance sheet would look something like this:

Assets	Liabilities
Land \$10,000	Mortgage \$5,000
Buildings 5,000	Notes due bank. 2,000
Live Stock 3,000	Bills payable <u>1,000</u>
Miscellaneous <u>2,000</u>	Total Liabilities \$8,000
Gross Capital. \$20,000	
Subtract Liabilities <u>8,000</u>	
Net Capital \$12,000	

A poor man does not usually make out a balance sheet. But if he did it might look something like this:

Assets	Liabilities
Furniture. \$100	Debt to friend <u>\$ 25</u>
Clothes 50	Total Liabilities \$ 25
Food on hand. 10	
Liberty Bond. 50	
Savings in bank 50	
Money on hand <u>10</u>	
Gross Capital \$270	
Subtract Liabilities. <u>25</u>	
Net Capital \$245	

Nature of Debts

If we are willing to stretch the meaning of capital a little, we can include the man himself among his gross assets. A man who works is an earning machine. His muscles and brain are worth a great deal to him in dollars and cents; and when a man insures his life, it is because of his value to his family as an earning machine.

But it is difficult to place any accurate value on a human being, and, as a practical matter, no bookkeeper ever included human beings in a balance sheet—except in the days of slavery. Since men are not now bought and sold, there is no practical need of measuring them in dollars and cents.

Every debt is also a credit to someone; the \$25 owed to a friend means \$25 added to that friend's

2) *Brotherhood of Locomotive Firemen and Enginemen's Magazine*, Vol. 80, No. 3, March 1926, pp. 206-207

capital. That is, it adds just as much to his capital as it takes away from the debtor's capital. This principle applies to Government debts. A Liberty bond means that Uncle Sam has borrowed of a citizen. Uncle Sam is the debtor; the citizen is the creditor. But, of course, Uncle Sam is simply you and I and all our fellow-citizens. So what it amounts to is that the country owes itself, or, let us say, the citizens owe themselves—the sums represented in the various Liberty bonds. So the bonds add nothing to the country's capital and subtract nothing from the country's capital.

What about a corporation? A man, or a government, owes some of his or its wealth to others, is owed by others some of their wealth, and holds some wealth by a clear title. But while men and governments owe only part of what they hold, a corporation owes all of what it holds. Everything it owns it turns around and owes again. What it does not owe to bondholders or to other creditors it owes to its stockholders. So it has no capital of its own beyond the "capital and surplus" which belongs to its stockholders. These are real persons. The corporation is an artificial or fictitious "person," a bookkeeping dummy set up to keep track of the part ownerships in the property—to nominally own the entire property and then account for it to the real persons by owing them the same amount but sub-divided in small fractions.

Our savings in savings banks are the debts which the savings bank corporation owes us. These debts represent our share, our part-ownership in the country's physical capital. We are part-owner of whatever the savings bank owns (or part owns), of the railway or of the mill or of the mortgaged house. These are our real savings—these physical things. The savings bank account only represents our savings.

Suppose we could look down from an airplane and see the whole world at one time. Shall we add railroad bonds and stocks to the capital that we see in the world? No, nor shall we add any other debts or credits—neither bonds, stocks, notes, mortgages, nor any other kind of debt. All these are merely owed by the world to the world. So that all that we need to count when we want to know the capital of the world is the physical wealth we see from that airplane.

Total Capital of United States

The census tells us what we would see if we looked down on the United States. The total capital of the United States in 1922 was estimated to be worth 321 billion dollars, made up mostly of the following items:

Real Estate	176 billion dollars
Live Stock	6 billion dollars
Farm Implements and Machinery	3 billion dollars
Gold and Silver Coin and Bullion	4 billion dollars
Machinery, Tools, etc.	16 billion dollars
Railroads and their equipment	20 billion dollars
Motor Vehicles.	5 billion dollars
Street Railways	5 billion dollars
Telegraph and Telephone Systems.	2 billion dollars
Ships and Canals.	3 billion dollars
Privately owned Central Electric and Power Stations.	4 billion dollars
Agricultural Products	5 billion dollars
Stocks of Manufactured Products	28 billion dollars
Stocks of Imported Merchandise	2 billion dollars
Stocks of clothing, personal ornaments, furniture, etc.	40 billion dollars

We notice how important are real estate, stocks of manufactured products, railways, machinery and tools. These make up 240 out of the 321 billions of our capital. We also notice how unimportant is the stock of actual money, as compared with the total capital of the country. Out of the 321 billions only four billions are in gold and silver, including all the gold and silver money in the country.

To the above physical capital is to be added, of course the net debts which are owed to the United States or to the people of the United States from foreign countries or people. This might add ten billions more. But all the internal debts, those from Americans to Americans cancel themselves out just as, for the world as a whole, all debts whatever cancel themselves out.

So the world is very different from a man. We measure a man's capital by looking first at the physical things he owns; then at the debts other people owe him; and then at the debts he owes other people. But in measuring the world's wealth, you forget all about debts and look only at the physical articles of wealth in the world.

3. Income Accounts³

THE last story was about Capital Accounts. This one is about Income Accounts. We have seen that capital is the value of a stock of wealth at a point of time. Income, on the other hand, is the value of a flow of services through a period of time.

A service rendered by any person or thing is any desirable change effected by that person or thing. For instance, a plow performs a service to the farmer by turning the soil.

Services are of two classes: Services rendered by wealth (external to man) and services rendered by human beings. Most services are rendered jointly by both wealth and human beings.

The income of the idle rich largely comes from selling the services of wealth. In England, for instance, it often comes from the rent of land or houses. In America rich people usually own stocks and bonds of, say, railway or telephone systems. Their income then comes from selling railway service or telephone service.

A laborer, on the other hand, receives all, or most, of his income, as wages, in exchange for his own services. A farmer often gets income of both sorts, income from human beings, such as from his own or from his children's services, and income from wealth—the services of his farm, farm machinery, horses and cattle.

“Income in Kind”

Much of the two classes of income already mentioned may also be subdivided into money income and income in kind. In America most income is received in the form of money, so that we are likely to forget the existence of income in kind. Examples of “income in kind” are the use of a parsonage as part of the income of a clergyman, lodging as part of the income of house servants, farm produce consumed as part of the income of the farmer and his family.

The opposite of a service is a disservice. It is an undesirable change effected by a person or a thing. The value of disservices may be considered as negative income.

If a man could keep account of the value of every service rendered to him from every source, whether wealth or persons, and of the value of every disservice, he would have an exact record of all his income.

To get such a record he would have to watch all income sources and notice when they rendered a service and when a disservice, estimate their money values, and then take the net total. He would thus not only take account of all money received (after subtracting all expenses involved in getting it), but he would also have to reckon the value of every automobile ride, and of all services rendered to him every time he wore a hat or sat in a chair. He would have to keep accounts for every item of wealth he owned, including even the stock of food in the pantry. In his account book, he would “credit” that stock with all the services it gave him and “debit” it with all the disservices it cost him. But, of course, such a complete accounting would be too difficult for practical purposes.

Double Entry Bookkeeping

One complication which often confuses the student of income is that a service from one source may be a disservice with respect to some other source. For instance, when a man paints his house or repairs his automobile or when a woman mends or washes clothes, such an act does not immediately add to the family income, but it does represent a service of the man or woman and also represents a disservice of the house which has to be painted or of the automobile which has to be repaired or of the clothes which have to be washed or mended, because it requires arduous toil. The only real benefits come later from the better and longer-lasting services rendered by the repainted house, the repaired automobile, and the mended and cleaned clothes.

Such interactions between one source and another are kept track of through “double entry bookkeeping.” In fact, most items in a bookkeeper's account occur in such pairs. The painter is “credited” and the thing painted “debited.” Or a dividend yielded by a United States Steel stock is credited to that stock and debited to the “cash” fund which absorbs it; later “cash” is credited with what it yields in turn and something else debited.

The final net total, after all additions, cancellations and subtractions, will be found to consist of the value of all satisfactions less the value of all the efforts in getting them. Everything else on the books, such as money payments, disappears. In our present-day complicated economic life we are apt to be confused by the many money transactions. But net income still remains exactly what it

3) *Brotherhood of Locomotive Firemen and Enginemen's Magazine*, Vol. 80, No. 4, April 1926, pp. 306-307

was to primitive "Robinson Crusoe" on his island—the pleasure from the berries we pick, so to speak, less the pain of the labor of picking them. The only difference is that today the picking is not so hand-to-mouth, but is done by means of complicated apparatus and after the frequent exchange of money. That is, a long chain of middlemen, capital, and money transactions intervenes between the labor of picking at the start and the satisfaction of eating at the end. So, in the last analysis, income is not money but the final services, in the form of satisfactions, for which money is spent. Real wages, for instance, are not money wages, but the satisfactions purchased by the money wages.

Real income includes the value of the shelter of the house we live in, the wear of our clothes, the use of our food, our amusements, and other miscellaneous satisfactions, after deducting the value of the cost to us, in labor and sweat, of getting those satisfactions.

Since we cannot measure all these elements with any great accuracy, we usually, in statistics, count only the money income.

The National Bureau of Economic Research has, in the last few years, estimated the income of the people of the United States. These figures show that in 1921, the latest year estimated, the per capita income was \$779. Before the war the per capita income was \$335. At that time in England it was \$243; France, \$185; Germany, \$146; Italy, \$112, and Japan, \$29. (These figures, however, would not show so great contrasts if the differences in the purchasing power of money were taken into account.)

About one-third of our real national income is enjoyed as food, while one-tenth is in the form of shelter (rent) and one-tenth in clothing.

Income is the most important concept in economies. But in this article we are interested only in defining it and keeping account of it, not in discussing why it is high or low or how it may be increased, diminished, or redistributed.

In the next article we shall discuss the relation between income as here described and capital as described in the previous article.

4. The Relation Between Capital and Income⁴

THE last two articles were about capital and income. Capital was defined as the value of a stock of wealth at a point of time. Income was defined as the value of a flow of services during a period of time.

Income may be saved and so turned back into capital. Or capital may be spent and so turned back into income. In the first case capital accumulates; in the second case capital is diminished. In the first case the man is living inside of his income; in the second case he is living beyond his income.

On the border line between the two, he neither accumulates nor diminishes his capital, nor does he live either beyond or inside his income, but exactly on his income. Such a man receiving, say, fifty dollars a week, also spends fifty dollars a week and enjoys fifty dollars' worth of real income—food, shelter, amusements, and so forth.

A man may live beyond his income, not only by living on his own capital, but by living on somebody else's capital, by going into debt or by buying too much on the instalment plan.

But the normal way is to save and so add a little to capital each year rather than subtract from it. Corporations often save half their income and put it back into the business. About 10 per cent of the total income of the people in the whole United States is saved on the average every year, or about \$80 per capita.

Get An Account Book

To help us decide how much to save, we ought to keep accounts. For this purpose some good sort of account book is necessary. Such a book can be gotten from a number of sources, such as a savings bank, a life insurance company, or from the National Thrift Committee, 347 Madison Avenue, New York, N.Y.

Savings, then, are accumulation of capital taken out of income. The capital thus accumulated may be in the form of money put away in a stocking, or of canned tomatoes or other food stored up

4) *Brotherhood of Locomotive Firemen and Enginemen's Magazine*, Vol. 80, No. 5, May 1926, pp. 409-410

in the pantry, or of more durable goods, such as pianos, automobiles, houses, or of property rights accumulated such as deposits in a savings bank, bonds or stocks. But in all cases savings come out of income and go into capital.

Since capital merely stands for future enjoyment, savings come out of immediate income and go into future income—with interest. Whether to spend a given dollar or to save it “for a rainy day,” is one of the most vital questions of home economics which confronts us every day. We cannot do both—have our cake and eat it, too.

There is always the temptation to enjoy today and neglect tomorrow. It takes self-control to save, but there is also such a thing as saving too much. We may, for instance, stint ourselves so much as to injure our health and earning power. What we should aim to do is so to distribute our available income between having a good time today and providing for future needs that, in the end, there may be no reason to be sorry for the way we decided to distribute it.

One of the inducements to save is the interest to be obtained on the savings. On the other hand, one of the deterrents from using up savings or going into debt is the loss of interest. Sometimes this deterrent doesn’t work, because the loss of interest is concealed in the form of a higher price paid for something. For instance, there is often a concealed loss to those who buy on the instalment plan equivalent to 10 per cent of interest per year. If the public realized this more clearly there would be less buying on instalments.

But we are not ready to study interest. For the present, we merely accept interest as a fact. If a man saves \$100 today and puts it at interest at 5 per cent, he gets \$105 at the year’s end. The \$5 is then called the “interest,” as reckoned on the \$100 at the beginning. As reckoned on the \$105 at the end, this \$5 is called “discount.” The \$100 is the discounted value of the \$105. In much the same way we can get the discounted value of any sum of money or series of sums, due at any time or times in the future.

Most people think of income flowing from capital. It is true that services flow from wealth. But the value of the services does not come from the value of the wealth. On the contrary; the value of the wealth comes from the value of the services expected of that wealth. In other words, capital comes from expected income.

For instance, the value of a phonograph is the discounted value of its future expected services, its entertaining music. If we know in advance the exact values of those future services and also know the rate of interest, or discount, we can calculate exactly the discounted value today.

Value of Bonds

As a matter of fact, however, we seldom do know exactly the value of future services. Almost the only case in which we have such exact knowledge is the case of bonds. Humanly speaking, we know that a safe 5 per cent \$1,000 bond will yield \$50 a year, or \$25 every six months when we cut off the coupon and take it to the bank. Knowing this in advance, and knowing also the market rate of interest, we can calculate exactly what such a bond is worth.

This is actually done in brokers’ offices. In fact, they use tables already calculated out with great accuracy. For instance, a safe bond yielding \$50 a year for three years and then redeemed for \$1,000 will sell for exactly \$1,000 today, if interest is 5 per cent; but if interest is 4 per cent such a bond (i. e., yielding \$50 a year for three years and then \$1,000 of principal) will sell for more than \$1,000. To be exact, it will sell for \$1,027.76, since this is calculated to be the discounted value today, of the following sums, reckoned at 4 per cent, per annum, thus:

The discounted value of \$ 50 due in 1 year is	\$ 48.08
The discounted value of \$ 50 due in 2 years is	46.23
The discounted value of \$ 50 due in 3 years is	44.45
The discounted value of \$1000 due in 3 years is	<u>889.00</u>
Total:	\$1027.76

These calculations are puzzling at first, because (the bond being called a 5 per cent bond) it would seem that the interest must always be 5 per cent. How can it be a 5 per cent bond and yet the interest rate be 4 per cent? The answer is simple. The nominal interest is 5 per cent because the bond is first thought of as issued at par, \$1,000. But if, afterward, in the open market, the bond can be sold for \$1,027.76 or \$27.76 above par, that fact shows that the people who buy it for that sum and hold it till maturity do not make the full 5 per cent, but only 4 per cent.

What Capital Value Is

On the other hand, if interest is 6 per cent, the bond will sell for \$973.27, this being the discounted value, at 6 per cent, of the same four sums (\$50, \$50, \$50 and \$1,000).

If we do not know what the future services of an article of wealth or property will be worth, the element of chance, or risk, will complicate these calculations and guesswork will enter. But the general principle remains true; that the value of anything whatever is the discounted value of the income expected from it. In other words, any capital value is simply the discounted value of the income. Sometimes the word "capitalized" is used instead of "discounted." So we may say capital is merely income capitalized.

For instance, an apple orchard may be worth \$1,000, this being the capitalized value, say at 5 per cent, of its net income (from the sale of apples) of \$50 a year indefinitely. In like manner, a house may be worth \$18,300, this being the discounted value of \$1,000 a year, as net expected annual income for 50 years, the lifetime of the house. An automobile may be worth \$508, the discounted value of its services reckoned at \$100 a year for 6 years. A suit of clothes may be worth \$28, as the discounted value, say, of \$20 worth of wear the first year and \$10 worth of wear the second year.

So we see once more that income is the essential thing and capital is merely future income translated into present cash value.

When we change the rate of interest or discount, the capitalized income changes. We have already seen that when interest is reduced from 5 per cent to 4 per cent the bond rises from \$1,000 to \$1,027.76. In the same way, the value of anything whatever rises as the rate of interest falls (other things remaining equal). Suppose interest falls to half—from 5 per cent to 2½ per cent. Then the land which, on a 5 per cent basis, was worth \$20,000, becomes worth \$40,000 on the new 2½ per cent basis. Similarly the value of the house rises from \$18,300 to \$28,400. The value of the automobile rises from \$508 to \$551. The value of the suit of clothes rises from \$28 to \$29.

Values Change As Interest Changes

We notice that things which yield services for a long time (like houses or land) change more when interest changes than things which wear out in a few years, like automobiles or clothes. If interest were 1 per cent the farm which yields \$1,000 a year indefinitely would be worth \$100,000 instead of \$20,000. If the rate dropped to one-half of 1 per cent the same farm would shoot up to \$200,000. If the rate dropped to 1/10 per cent, the value of the farm would shoot up to a million dollars. But the suit of clothes which wears out so quickly could never rise much. Even if the interest were reduced to nothing at all the suit would rise only to \$30, the full value of all its future services.

The chief relations between capital and income are, then:

1. Capital is income capitalized or discounted.
2. If the rate of interest falls, the capital (capitalized value of the income) rises.
3. This rise in capital is great for durable things like land and small for perishable things like clothes.
4. Capital is increased by savings out of income, the income being decreased by the same amount that the capital is being increased.
5. These savings thus diverted from income and turned back into capital will, except for mischance, be enjoyed later with interest.

5. What Money Is Not⁵

WE have seen that both capital and income are measured in money though they are not themselves (to any great extent) in the form of money. An automobile may be a thousand dollars' worth of capital, but it is not a thousand dollars. It is simply measured by a thousand dollars, in the sense that it will exchange, or has exchanged, for that amount of money. In the same way, two hundred dollars' worth of shelter a year is not two hundred dollars. It is simply measured by two hundred dollars, in the sense that it is paid for by two hundred dollars of rent money. In short, money measures everything, whether capital or income, but money itself is not everything.

It will help us understand what money is, if first we understand what it is not. This is very important because everybody, without any exception, at first confuses money with the things which money measures. Money is a thing we are too familiar with to understand easily. We simply take it for granted from the early days of our childhood. Just because it is such a practical and universal

5) *Brotherhood of Locomotive Firemen and Enginemen's Magazine*, Vol. 80, No. 6, June 1926, pp. 506-507

convenience, money is the greatest stumbling block to students of economics.

The confusion of wealth, property, capital, services, income, etc., with money has led to all sorts of false ideas. Some people seem to imagine that a millionaire is a man who has a million dollars of actual money stored away somewhere in his cellar or in the bank. Even some business men imagine that when one man is "making money" somebody else must be "losing money." I can myself remember, as a child, getting caught in this fallacy and telling my mother my "discovery." I said, "There is just so much money in the world and so whatever money one person gains must reduce what the rest have." I learned later, of course, that gain in trade and industry is not usually gain of money at all, but of capital or income.

Some people wonder how the world is ever going to pay off its debts, when more "money" is owed than there is money in existence. These people must learn that debts are often paid without the use of money at all and that even when money is used it may be used over and over again and so, given plenty of time, may pay many more debts than all of the money in existence.

Some people who see that wealth and money are different, nevertheless fancy that, somehow, all wealth is "represented" by an equal amount of real money. A grown man confessed to me that he had supposed that all the money in the world must be equal to all the wealth in the world. As a matter of fact, money, in the strictest sense, is only one or two per cent of all wealth.

I remember a muddle-headed man, claiming to be a banker, who appeared at a meeting of the American Economic Association in 1895 and tried to prove that there was not enough money in the country. He said that there were "twenty dollars of wealth for every dollar of money" and, "therefore" there was only "one chance in twenty for a debtor to pay his debts." He declared: "I will give five dollars to anyone who can disprove that statement." No one tried, but someone sarcastically asked, "What's the use? According to what he says himself, there's only one chance in twenty of his paying that five dollars!"

Money Is Not Wealth

Some people fear that "there may not be enough money to do the business of the world with." They do not realize that *any* quantity of money will be enough if prices are adjusted.

Some people believe that, though money is not exactly the same thing as wealth, nevertheless, it is the one and only means of getting wealth. They say, for instance, that the discovery of gold in California in 1849 gave us the means of paying for the construction of railways. But the world does not get its wealth by buying it. An individual may get wealth by buying it from another individual; but the world, as a whole, buys nothing, for there is no other world to buy from. So the world gets its railways not by buying them, but by building them. The gold of California enriched those who discovered it and dug it out, because it enabled them to buy wealth from others; but it did not provide the world with railways any more than Robinson Crusoe's discovery of money in the ship provided him with food. On the contrary, it took away that much energy from producing railways, food, and other things.

If mere money could make the world rich, we should not need to wait for gold discoveries. We could simply make paper money with the printing press. This in fact has often been tried. France tried it in the French Revolution. Russia tried it under the Bolsheviki. Germany tried it a little later. But no country which ever tried it grew richer thereby. Those who manufactured the money did get richer, but only at the expense of others, just as counterfeiters may get rich at the expense of others. It is natural to think that, since each of us is made richer in money by printing it and circulating it more, the world would be enriched by more money. If this were really so, it would be right and proper to let everybody counterfeit money and enrich himself!

The French Assembly, in 1790, printed four hundred million paper francs ("assignats") and publicly declared that they "would bring back into the public treasury, into commerce and into all branches of industry, strength, abundance, and prosperity." The results were disastrous. So were the results of similar experiments in Germany and Russia after the World War, although, in these cases, the ideas were different; in Russia the idea was to make the money worthless and so help abolish capitalism; it did make the money worthless but, instead of abolishing capitalism, it helped reinstate it.

Many people, who ought to know better, have the notion that a nation gets richer by getting money from other nations, that is by selling abroad more than it buys abroad, thus making a so-called "favorable balance of trade." They think every dollar which goes out of the country is impoverishing us that much; that every dollar that comes in is enriching us that much; that, therefore, we should sell as much as possible abroad but buy as little as possible from abroad, in fact put up a tariff wall to keep goods from coming in and money from going out:

So insidious are these money fallacies that I have scarcely found a student in my classes wholly free from them. Let no reader of these articles flatter himself that he is already fully free from them.

There are many catch phrases which are misleading. "Making money" is such a phrase. Only the man in the mint literally "makes" money. The rest of us *gain money's worth* of capital or income. The "money market" is not really a money market, but a *loan market*.

I suggest as a good way of avoiding the ever-present pitfalls in statements about money, to test out every doubtful statement by substituting the word "collars" for "dollars." When we measure things in dollars we begin to imagine that those things *are* dollars just because we think all the time in dollars. But if we measure everything in the very unusual term of collars we are far less likely to get confused. To say "Mr. Ford has a billion dollars" suggests that he literally has them instead of having factories, machinery, automobiles, and so forth, *measured* by that many dollars. But if we say, "Mr. Ford has a billion collars," a literal meaning is at once recognized as absurd. To mean anything it must be that Mr. Ford has wealth worth in exchange a billion collars. As a matter of fact, some little of that wealth is doubtless in actual collars, just as some little is in actual dollars. But most of it is in neither collars nor dollars.

Absurd Statements About Money

Let us go over some of the questions already mentioned and express each in terms of collars, just to see how absurd they sound.

If a man owns a thousand collar automobile, does he have a thousand collars? When one man is "making" collars (getting richer) must another be "losing" collars (getting poorer)? Since there are only so many collars in the world, when one man grows richer (worth more collars) must others grow poorer? How can the world ever pay its debts! Can we "pay more collars" than there are collars in the world? Must all the collars in the world equal all the wealth in the world? If there is only one collar for every twenty collars' worth of wealth, does it follow that there is only one chance in twenty for a debtor to pay his debts? Did the discovery of collars give America the means of paying for the construction of railways? Would America grow richer if it sold much to foreigners for collars and bought little from foreigners with collars and so accumulated collars at home? Would that be a "favorable balance of trade?"

The very first task of the student of economics is to tear away the money veil covering up real wealth and to look at the actual wealth underneath. It is not for dollars that people work, invest, and do business and that nations engage in international trade, any more than for collars, but for what the dollars will buy. Wealth, not money, lies at the center of all economic efforts.

6. What Money Is and Is For⁶

IN the last article we saw how, at first, men always get confused over the word "money."

What, then, is money? *Money is any wealth or property which is generally acceptable in exchange.*

This definition is a little vague, but purposely so. We can not draw an absolutely hard and fast line between money and other things; and before modern civilization developed, the line was even more vague than it is today. Originally there was no line at all. Any kind of wealth could be bartered for any other kind. Little by little, however, some kinds were found to be more easily exchanged than others.

How Things Became Money

Among the American Indians there were certain attractive shells called "wampum." At first wampum was used only for ornament or jewelry and only those Indians who wanted it for this purpose of jewelry would take it in exchange. Then other Indians who did not want the wampum for themselves for jewelry were willing to accept it in exchange, because they knew they could resell it to someone else who did want it for jewelry. In this way, little by little, everybody came to accept wampum as a thing that could always be passed along. They did not even stop to think whether they could find any one who wanted to keep it. Everybody wanted it because they knew everybody else would take it; and the jewelry-use from which the custom started, was almost forgotten. Of course, anybody could still use the wampum for jewelry if he wanted to, but few actually did. Unlike other

6) *Brotherhood of Locomotive Firemen and Enginemen's Magazine, Vol. 81, No. 1, July 1926, pp. 24-25*

wealth, it *circulated* continually, instead of ever stopping to rest in the hands of ultimate consumers. In a word, wampum had become *money*, something to buy other things with, rather than something to use for its own sake.

Things Which Have Been Money

At various times and places many different sorts of things have passed through these same stages and become money. In the colony of Virginia tobacco became money; in the colony of Massachusetts, wheat; among the Zulus, cattle; in Russia, fur and leather; in Abyssinia, saltbricks; in Newfoundland; codfish; in Scotland, nails; in ancient Sparta; iron. In some places even today such things are used as money.

But in most places metals, like copper and nickel, and especially the “precious” metals, like silver and gold, have become the favorite forms of money today.

Five Essential Qualities of Good Money

The chief reasons why gold has survived to this very day as the favorite basic money are five, as follows : It is precious; it is durable; it is transportable; it is uniform; it is divisible. Note how gold compares with some other things as to these five qualities:

“Precious”: In large transactions, cattle as money would be too clumsy, and inconvenient. But gold contains more value in less weight.

“Durable”: Salt-bricks, cattle, or wheat die or wear out. But gold does not.

“Transportable”: In large transactions, the iron money of ancient Sparta was too heavy to carry. Houses or furniture can scarcely be carried at all. But gold is easily carried and shipped even over the ocean.

“Uniform”: Potatoes, leather or wood are hard to standardize; they vary, in quality. But standard gold is practically uniform in quality.

“Divisible”: If we cut a steer in two or a chair or a diamond we spoil it. But gold bullion can be cut into any size desired without harm.

Primary Money

In modern civilization money has become almost completely separate and different from other wealth. It has three chief forms: primary money (mostly gold coins and bars), token money (minor coins like dimes, nickels and pennies), and paper money.

Except in China and a few unimportant places, the only kind of primary money today is gold. There are two chief varieties of such gold money. These are gold coins, and gold bars uncoined.

To those who have never used them, it may seem strange to call uncoined gold bars money. But they are used extensively in international trade. England today does not coin gold as she did before the war, but uses uncoined bars, which she stores chiefly in various bank vaults.

But for ordinary use, coined gold is better. It bears the stamp of the mint certifying its weight and fineness and giving a milled edge to insure against counterfeiting. A ten dollar gold piece weighs 258 grains and is nine-tenths gold. The other tenth is alloy, such as copper, and is put in to keep it hard. In America any one can take such standard gold bullion to the mint and get it coined without charge.

The government stamp does not, however, add any value to the gold. A ten dollar gold piece is always worth uncoined gold of the same weight. Take out the alloy, and you have 232.2 grains of raw gold.

A gold dollar is exactly one-tenth of this. That is, fundamentally *a dollar is simply 23.22 grains of pure gold* with a little alloy to keep it hard. All other dollars are merely equivalents of, or substitutes for, this basic dollar of gold.

Paper Money

Passing by other metal money for the moment, let us now consider paper money. There are three chief kinds of paper money in the United States: Gold certificates, redeemable notes, and irredeemable paper money.

Gold certificates, nicknamed “yellow backs,” are completely tied to gold. Every ten dollar gold certificate in circulation has behind it in the government vaults exactly ten dollars in gold. On May 29, 1926, there were \$1,668,688,159 in gold coin or bullion lying in government vaults with which to redeem them if necessary. So even if all the gold certificates were presented at the same time, Uncle Sam would have that gold actually on hand in his warehouses—every ounce of it.

The second kind of paper money may be said to be only *partially* tied to gold. The best example of this kind is the Federal Reserve note. The holder of a ten dollar Federal Reserve note is entitled to gold just as much as is the holder of a gold certificate and is, humanly speaking, just as sure to get it if he wants it. But, unlike the gold certificate, it does not have 100 per cent of gold always on hand behind it. The Federal Reserve Bank is obliged to keep in its vaults only 40 per cent of the face of all its outstanding Federal Reserve notes. The other 60 per cent it may keep in some other form, such as Liberty Bonds. So if all the Federal Reserve notes were presented at the same time, the bank could not pay them all in gold, although it could pay in *other* property, such as Liberty Bonds. Holders of Federal Reserve notes need not worry—only a few people will ever want actual gold at any one time. A forty per cent gold reserve is ample. Another example of a note is a national bank note. This is a promise of a national bank just as a Federal Reserve note is a promise of the United States Government. Another example is the United States note (nicknamed “greenback”), another promise of Uncle Sam.

Of the third kind of paper money—irredeemable paper money—we have no example in America today. In Europe there are plenty of examples: the French paper francs, for instance. These are not redeemable in gold, and indeed a paper franc is worth only a seventh as much as a gold franc. It is depreciated—that is, worth less than a gold franc.

Token Money

We have left one other important kind of money to describe—“token” money, sometimes called minor coins, such as half dollars, quarters, dimes, nickels and pennies. (Silver dollars are very similar although they were once primary money.) This token money is very much like the second kind of paper money, redeemable notes. A dime, for instance, is practically a note printed on silver instead of on paper. It is practically a promise to pay the bearer a tenth of a gold dollar. It is not the silver of which it is made which gives its value to the dime but the gold it can be exchanged for, just as it is the gold which gives value to a paper note, not the paper of which it is made. That is, the paper in a dollar bill is not itself worth a dollar, neither is the silver in the dime. Nor is the silver in a quarter, a half-dollar or a dollar. Nor is the nickel in a five cent piece, nor the copper in a cent, worth the value it says. Yet in practice, all these coins are accepted at their face values in gold, just as paper money is.

You will find it interesting to read the inscription on the various kinds of money which pass through your hands, especially paper money. You will be surprised to find how many distinct kinds of money you handle. Very few people, even those busily engaged in the “money market,” ever stop to understand the real nature of their money.

“Legal Tender”

We have seen that money first came into existence merely as an economic convenience and not at all by governmental action. But in all civilized countries, the government eventually had to regulate money just as it regulates weights and measures. Under our Constitution, Congress is empowered to do this.

By a law of 1837, Congress declared a dollar to be 23.22 grains of gold, with a little alloy. By other laws, known as “legal tender,” Congress prescribed what money may legally be tendered—that is offered in payment for a debt. It made all gold coins (and also silver dollars) *unlimited* legal tender—that is, good for any debt, no matter how big. But, other coins are only limited legal tender. If you owe a thousand dollars, don't offer to pay it in dimes! The creditor is not obliged to accept more than ten dollars in that form. Nickels and cents he is not obliged to accept beyond 25 cents.

Laws regulating money are justified only so far as they protect the public. Unfortunately the laws have often defrauded the public. Sometimes a king reduced the weight of the primary money in order to pay his debts with it when thus depreciated. In the last war and after it, even democratic governments did practically the same thing, though in less direct ways.

In the next story we shall see the relation of money to banking.

7. Credit Currency⁷

LAST month we discussed the meaning of money. We saw, among other things, that some money, like banknotes, is dependent on other money, gold. A banknote for ten dollars is worth ten gold dollars because the bank is always ready to give ten dollars in gold for it.

In almost the same way, the bank is ready to give gold (or other) money for checks of its depositors drawn against their deposits in the bank.

These two are the chief liabilities of an ordinary bank. It is liable for its notes and for its deposits. It keeps a reserve in gold (or other money permitted by law) with which to meet these liabilities. But the bank does not keep the full reserve which would be needed if all the notes and deposits had to be paid at one and the same time.

This brings us to the so-called "mystery of banking." How is it possible, and is it right and proper, for a bank to keep in its vaults only part of what it owes its noteholders and depositors?

But the "mystery" is not really any more mysterious than the fact that if you lent Smith \$50, Smith would not keep that \$50 all the time in his pocket or in a safe.

He would be a fool if he did. In fact, he wouldn't have borrowed the \$50 of you unless he were free to spend it as he saw fit—provided only he stands ready to pay you back an equal sum, as agreed.

Bank Not a Safe Deposit Vault

In exactly the same way, the bank need only stand ready to pay its creditors as agreed. Since the banknotes and deposits are payable on *demand*, the bank must always keep *some* cash reserve on hand, and a certain minimum is usually prescribed by law.

Probably the word "*deposits*" is what misleads people most. A "*deposit*" does not suggest simply a debt; it suggests a bag of gold or roll of bills specially "deposited" in the safety vaults of the bank. The reason the word "deposits" is used is that originally a bank was little more than a safety deposit building. We can best understand modern banking by tracing the steps by which it grew up out of this safety deposit business.

The Bank of Amsterdam three centuries ago was practically a safety deposit bank. Funds were left there for safekeeping, and sometimes transferred from one depositor to another. Suppose that such a simple bank starts with a deposit of \$100,000 in actual gold. The bank's balance sheet would be:

Assets	Liabilities
Gold. \$100,000	Due depositors \$100,000

The right-hand side of the statement is, of course, made up of smaller amounts owed to individual depositors. Assuming that there is owed to Smith \$10,000, to Jones \$10,000, and to all others \$80,000, we may write the bank statement as follows:

Assets	Liabilities
Gold. \$100,000	Due depositor Smith . . . \$ 10,000
	Due depositor Jones 10,000
	Due other depositors <u>80,000</u>
	\$100,000

Now assume that Smith wishes to pay Jones \$1,000. Smith could go to the bank with Jones, present certificates or checks for \$1,000, obtain the gold, and hand it over to Jones, who might then re-deposit it in the same bank, merely handing it back through the cashier's window and taking a new certificate in his own name.

Transfer of Deposits

Instead, however, of both Smith and Jones visiting the bank and handling the money, Smith might simply give Jones a check for \$1,000. Jones would then send the check to the bank and the bank would simply reduce Smith's credit on its books by \$1,000 and increase Jones' by the same

7) *Brotherhood of Locomotive Firemen and Enginemen's Magazine*, Vol. 81, No. 2, August 1926, pp. 119-120

amount. The transfer in either case would mean that Smith's holding in the bank's gold was reduced from \$10,000 to \$9,000, and that Jones' was increased from \$10,000 to \$11,000. But the gold itself need not be disturbed. The statement would then read:

Assets	Liabilities
Gold. \$100,000	Due depositor Smith \$ 9,000
	Due depositor Jones 11,000
	Due other depositors <u>80,000</u>
	\$100,000

But such a hypothetical bank would soon find—much as did the Bank of Amsterdam—that it could make profits by lending at interest some of the gold on deposit. This could not offend the depositors; for they do not expect or desire to get back the identical gold they deposited. What they want is simply to be able at any time to obtain the same *amount* of money. So the bank finds itself free to lend out part of the gold that otherwise would lie idle in its vaults. Let us suppose that the bank decides to lend out half the gold which it has in its vaults. Let us suppose that the borrowers of this \$50,000 actually draw it out of the bank in gold. The bank hands this gold to the borrowers in exchange for their promissory notes. Its books will then read:

Assets	Liabilities
Gold \$50,000	Due depositor Smith \$ 9,000
Promissory notes <u>50,000</u>	Due depositor Jones 11,000
	Due other depositors <u>80,000</u>
\$100,000	\$100,000

It will be noted that now the gold in the bank is only \$50,000, while the total deposits are still \$100,000. In other words, the depositors now have more “money on deposit” than the bank has in its vaults—twice as much! Is there any mystery about this?

Promissory Notes “Deposited”

Next, suppose the borrowers re-deposit the \$50,000 of gold which they just borrowed. The bank's assets will thus be enlarged by \$50,000, and its obligations will be equally enlarged. The balance sheet will become:

Assets	Liabilities
Gold. \$100,000	Due depositor Smith \$ 9,000
Promissory notes <u>50,000</u>	Due depositor Jones 11,000
	Due other (old) depositors . . 80,000
\$150,000	Due new depositors, i.e., the borrowers <u>50,000</u>
	\$150,000

The bank's gold is still fifty thousand dollars short of its liabilities. It is \$100,000 while the liabilities are \$150,000.

Evidently the same balance sheet would have resulted if each borrower had merely handed in his promissory note and received, in exchange, a right to draw. As this operation most frequently puzzles the beginner in the study of banking, we repeat, in summary, the figures representing the conditions before and after these loans

BEFORE THE LOANS

Assets	Liabilities
Gold. \$100,000	Due depositors \$100,000

AFTER THE LOANS

Gold. \$100,000	Due depositors \$150,000
Promissory notes <u>50,000</u>	
\$150,000	

We thus see that the bank may receive not only deposits of gold but also “deposits” of promissory notes. In exchange for these promises it gives a right to draw checks. But, even when the borrower has “deposited” only a promise to pay money, by fiction he is still held to have deposited money.

The Bank’s Stockholders

The above tables give the most essential facts about banking operations except that a fully fledged bank has some of its assets from stockholders. The stockholders of course own what is left of the asset after subtracting what is due its depositors and other creditors. The stockholders put in the original money. Let us suppose they put in \$10,000 in gold and that then all the other transactions happen exactly as above described. Then \$10,000 will need to be added on both sides of the last balance sheet. It will therefore read:

Assets	Liabilities
Gold. \$110,000	Due depositors \$150,000
Promissory notes <u>50,000</u>	Due stockholders <u>10,000</u>
\$160,000	\$160,000

This brings us pretty close to an actual modern bank. We need only suppose banknotes to be issued and other miscellaneous assets and liabilities to be included. A well managed bank will also be earning interest and profits to be added from time to time (as surplus or undivided profits) to its capital, due to the stockholders. The following summarizes a recent balance sheet of a typical modern bank:

BALANCE SHEET

of the Brotherhood of Locomotive Engineers’ Co-operative National Bank, Cleveland, Ohio,
January 23, 1926

ASSETS

Gold and other cash or due from other banks	\$ 4,125,234.22
Promissory notes	9,138,517.54
Securities	\$13,979,754.20
Miscellaneous assets	<u>1,322,324.08</u>
Total	\$28,565,830.04

LIABILITIES

Due depositors	\$26,414,496.02
Due noteholders	769,000.00
Miscellaneous liabilities	86,948.11
Balance left as due to the stockholders	<u>1,295,385.91</u>
Total	\$28,565,830.04