THE COLLECTED WORKS OF

F·A·HAYEK

VOLUME

5

GOOD MONEY
Part I

The New World

Edited by

Stephen Kresge

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F. A. Hayek

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F. A. Hayek

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The New World

EDITED BY

STEPHEN KRESGE

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EDITORIAL FOREWORD

The essays collected in *Good Money, Part I: The New World* include the earliest pieces written by F. A. Hayek on any economic subject, but notably on the still-unresolved controversies to which he made a significant contribution: on monetary theory and policy, trade cycles, and the theory of intertemporal equilibrium. The essays have lost none of their original interest; if anything, the resistance to fixed answers to the questions Hayek addresses—for example, what should determine the level of interest rates set by central bankers—leaves extensive portions of these essays as timely as tomorrow's headlines in the financial press.

Published here for the first time is Hayek's first essay on the subject, "Exchange Rate Stabilization or Price Stabilization?" Two other essays are published here for the first time in English translation, as is the complete text of his meticulous investigation into the formation of US monetary policy, "Monetary Policy in the United States after the Recovery from the Crisis of 1920". A revised English translation of his most original contribution to the theory of economic equilibrium, "Intertemporal Price Equilibrium and Movements in the Value of Money", leaves no doubt as to the importance of this work and the visit to the United States in 1923 which provoked it.

Looking back on this visit to the New World (as he referred to it), Hayek recalled that what was new and troubling about the debate over monetary policy was the displacement of gold from its central role in the control of bank reserves. "Until some sixty years ago", Hayek recalled in 1981, "monetary policy simply meant securing a gold equivalent or silver equivalent of a particular money in circulation. My interest in monetary policy began when I found in the 1923 Annual Report of the US Federal Reserve Bank a statement which said that the control of the quantity of money could be used to assure the stabilization of economic activity. At that time, that was a new idea". Hayek challenged this idea in his subsequent work. But the predicament in which the US Federal Reserve found itself at the end of the First World War was unprecedented; so much gold had found its way to the United States that postwar move-

ments in gold between the United States and the rest of the world were not large enough to affect gold reserve requirements for money and credit. (Keynes accused the Federal Reserve of "burying" its gold.) Thus the question, If the gold reserve ratio could not be used as a guide to interest rate policy, what should take its place?

To the present generation of economists, this may seem like a purely historical question. It is not. The displacement of gold during the First World War was a Humpty-Dumpty predicament which led to destructive nationalistic economic and trade policies in the 1930s. When the gold standard was abandoned, the world gave up not only the physical use of gold for measuring the relative value of separate currencies; the world lost the use of a *standard* for comparing the monetary value of everything. Without a common standard, central bankers of the world are left to pore over data without end, searching for some consistent link between the issuance of credit and what the recipients of that credit do with it to make things better or worse for everyone else, most urgently for their political servants or masters.

The New World and the Federal Reserve System were still in the process of inventing themselves when Hayek arrived for his first visit—changing "the rules of our own making", as W. C. Mitchell characterized the process. The process was both promising and alarming: "constructivism" was the term which Hayek later used to describe this approach to institutional change. Is it possible, we may well ask along with Hayek, to have rules without standards? In the present disarray of the world's currencies, with banks failing on almost every shore, this is not merely an academic question.

The essays collected in this volume are important for understanding the development of Hayek's ideas. They are just as important for understanding the development of contemporary monetary policy.

The editor of this volume would like to express his great appreciation to Dr. Grete Heinz for her translations from the original German of most of the essays in this collection. To Alan Jarvis of Routledge, and Penelope Kaiserlian and Geoffrey J. Huck of the University of Chicago Press, my gratitude for their continuing enthusiasm for this project. I would like to thank Denis O'Brien for his careful reading and criticism of the text. Bruce Caldwell receives both my appreciation and my sympathy for his patient review and tactful help with both early and final versions of this volume. Without the resourceful effort of our research assistant Elisa Cooper and manuscript preparation by the assistant editor Gene Opton, this volume would not have materialized.

Finally, we would again like to express our gratitude for the financial support of the original sponsors, without which this project could not have been carried through.

Stephen Kresge
Big Sur, California

INTRODUCTION

One of F. A. Hayek's first discoveries in the New York Public Library in 1923 was that the war in which he had fought for Austria—the First World War—had been very different from the one reported in the censored Viennese press. Of the many delusions that led to that war, perhaps the most foolish was the assumption that it would be brief and that the vanquished would pay for it. The source of this delusion was the Franco-Prussian War of 1870, which had been quick and tidy, and the losing French had paid a sizable indemnity.

The delusion that the 'Great War' would not last long (had the European military leaders paid more attention to the Civil War in the United States they might not have been so eager to fight) meant that governments saw no reason to raise taxes, particularly if it meant upsetting labour parties that had vowed to resist any European war except, as it turned out, one against Czarist Russia.

Governments first drew upon their financial reserves, confiscating international assets of their citizens, shipping gold to neutral countries and borrowing abroad, particularly from the United States. When the United States market was closed to Germany and Austria, their governments raised money with domestic borrowing, providing reserves to banks to purchase bonds which were then sold to patriotic citizens.

Austria lost everything in the war; Vienna became a capital without an empire. The French were determined to make Germany pay reparations for the entire cost of the war; England as well wanted to pass the burden of its debt to the United States on to Germany; the United States refused to forgive any debt. The United States was the only country to remain on the gold standard; even neutral Sweden, fearing inflation from an influx of gold, abolished coinage privileges. At the end of the war there was no way to measure effectively the cost of all the conflicting financial claims; in effect, the world had moved from the gold standard to a dollar standard but with no recognition of what that meant.

The result was rampant inflation—hyperinflation in Germany and Austria which ruined the holders of bonds, particularly the class to which

Hayek belonged—followed by a steep deflation, especially in the United States, which left commodity prices and costs of production in disarray throughout the world. 'Stabilization' became the elusive goal of both central bankers and economists.

Hayek later observed that "one of the first conclusions at which I remember I had arrived towards the end of 1923 was that stabilization of national price levels and stabilization of foreign exchange were conflicting aims. But before I could anywhere submit for publication the short article[1] I had written on the subject, I found that [J. M.] Keynes had just stated the same contention in his *Tract on Monetary Reform*."[2]

Hayek had recognized a conflict in the need to stabilize both domestic price levels and foreign exchange rates. Most authorities believed that to stabilize one would more or less automatically stabilize the other. The degree of dependence on foreign trade would determine which variable should be dominant. But the emphasis on trade left out of account the weight of debts and the claims for reparations. The dislocations of war finance had created a high level of short-term borrowing financed by capital movements that were sensitive to currency and interest rate changes. While the real world economy recovered rapidly, albeit unevenly—indices of production of most commodities were higher in 1928 than they were in 1914—the international financial structure remained shaky. Gold coins no longer circulated, and while the full return of the gold standard was a consummation most devoutly to be wished, actual redemption of currencies for gold remained severely circumscribed except for the dollar.

The divergence of theory and practice in the 1920s and 1930s is a matter of more than passing interest. The conflict between domestic price levels and foreign exchange rates, which meant a disequilibrium between internal and external prices, having been observed by both Hayek and Keynes, was largely excluded from their controversy over monetary theory and trade cycles. And they were not the exceptions. Economists for the most part treated exchange rate problems only as cases of individual aberration caused by governmental intransigence or profligacy. But the difficulty of finding a determinant solution to the problem of achieving

[1]An article by Hayek, "Exchange Rate Stabilization or Price Stabilization?" is translated and published here for the first time as an Addendum to chapter 1, this volume.

[2]*Hayek on Hayek*, Stephen Kresge and Leif Wenar, eds (Chicago: University of Chicago Press, and London: Routledge, 1994), p. 89. Hayek added that this disappointment did not lead to his later opposition to Keynes, as Keynes was then one of his heroes, as he was to many on the Continent because of his criticism of the peace settlement. See John Maynard Keynes, *A Tract on Monetary Reform* [1923], reprinted as vol. 4 of *The Collected Writings of John Maynard Keynes* (Cambridge: Macmillan for the Royal Economic Society, 1971).

both stable domestic prices and foreign exchange rates, without resorting to limits on trade, comes from the inconvenient fact that capital transfers between economies can only be made through the transfer of real goods and services.[3] This was the obstacle to the payment of reparations and debt after the war. Germany would be forced to export real goods; England and France were not prepared to accept imports at the expense of their own industries.

Currencies do not travel, they do not cross borders. Taxes paid in German marks could not be converted to British pounds without driving up the value of the pound, a conversion to which there were definite limits. Indeed, while other controversies of this period such as theories of the trade cycle have receded to the periphery of economic investigations, problems of reconciling internal price levels with external exchange rates have remained very much at the center of the choices facing central bankers. "[W]hen capital is free to move internationally, governments have to choose between an exchange-rate policy or an independent monetary policy; they cannot have both".[4]

In retrospect it is curious that the conflict did not occupy the center of attention of economists, since it was clear that what was at stake following the costly end of the war was the wealth of nations. A new virulent strain of nationalism threatened the old empires and their established links of trade and finance. Nationalism revived mercantilism which exposed the tenuous hold that economic principles had on bankers and politicians. In the event economic theory had little to offer beyond the first formulation of the mechanism of the gold (or silver) standard made by David Hume in 1752. This model, which came to be known as the "price-specie flow model", assumed that coins of a common metal circulated in different countries which traded goods. The model also assumed free coinage so that coins received in payment in one country could be melted down and the metal shipped to another to be coined into that currency. This mechanism made possible a self-correcting process to balance trade: the

[3]"Capital holds a unique position in one respect: It can move from one region to another only in the form of goods or services". Bertil Ohlin, *Interregional and International Trade* (Cambridge, Mass.: Harvard University Press, 1933), p. 180.

[4]So sayeth *The Economist,* October 7, 1995, "Survey, the World Economy", p. 10. Since the end of the First World War, US policy has consistently placed domestic concerns above exchange rate stability. As the World Economic Conference was informed in 1933, "We [the US delegation] are interested in American commodity prices. What is to be the value of the dollar in terms of foreign currencies is not and cannot be our immediate concern". Quoted in Barry Eichengreen, *Golden Fetters, The Gold Standard and the Great Depression, 1919–1939* (New York and Oxford: Oxford University Press, 1992), p. 333. As the dollar became the dominant reserve currency for the world, this policy was certain to lead to difficulties.

increase or decrease of money led to price changes which attracted either imports or exports.[5] In fact, the actual workings of international trade and finance were always more complex than the model suggests and governments always more devious in protecting national interests. Indeed, had the model worked with anything near its conceptual simplicity, England would have remained on a silver standard.[6]

Hayek began his investigations of monetary effects with two firm beliefs: that an international gold standard (even with all its imperfections) was necessary, and that it would function essentially as Hume had described it. It was the self-correcting characteristic of the price-specie flow model that Hayek prized. He extended the self-correcting or self-reversing characteristic to all purely monetary phenomena and although he later revised or even abandoned many of his hypotheses—including his belief in the gold standard—the idea that all purely monetary effects in an economy are self-reversing remained with him to the end.

Hayek's decision to visit the United States in 1923 was prompted in part by a promise of employment he received from Professor Jeremiah W. Jenks of New York University, whom he had met when Jenks was in Europe to serve on a commission to advise the German government on budgetary difficulties. (Another member of the commission was John Maynard Keynes.) The work as a research assistant to Jenks left Hayek

[5]On the genesis of the gold standard and David Hume's contribution to monetary theory see F. A. Hayek, "Genesis of the Gold Standard in Response to English Coinage Policy in the 17th and 18th Centuries", in *The Trend of Economic Thinking,* W. W. Bartley III and Stephen Kresge, eds, being vol. 3 (1991) of *The Collected Works of F. A. Hayek* (Chicago: University of Chicago Press, and London: Routledge). See also Barry Eichengreen, *Globalizing Capital, A History of the International Monetary System* (Princeton: Princeton University Press, 1996), pp. 25–26.

[6]Hume assumed that "money is not, properly speaking, one of the subjects of commerce; but only the instrument which men have agreed upon to facilitate the exchange of one commodity for another". But silver and gold are traded as commodities; the overriding fact of England's trade with the Far East was the drain of silver whence it was largely hoarded. Hume observed this vexing predicament: "The skill and ingenuity of Europe in general surpasses perhaps that of China, with regard to manual arts and manufactures; yet are we never able to trade thither without great disadvantage. And were it not for the continual recruits, which we receive from America, money would soon sink in Europe and rise in China, till it came nearly to a level in both places". England replaced silver with gold and developed a system of banking and credit that would economize on the use of gold. Later controversies in monetary theory largely stemmed from the uncertain connection of credit to specie and its effect on prices and trade balances. Hayek addressed a number of the implications of this evolving controversy in the essays collected in *Good Money, Part II: The Standard.* (The first quotation from Hume is the first sentence of his celebrated essay, "Of Money" [1752}; the second is from "Of the Balance of Trade" [1752]. See David Hume, *Essays,* Eugene F. Miller, ed. (Indianapolis, Ind.: Liberty*Classics,* 1985), p. 281 and p. 313. —Ed.]

enough time to pursue his own studies. He registered at New York University for work towards a PhD (it would have been his third) in monetary theory and policy. The title of the thesis—never completed—was, "Is the function of money consistent with an artificial stabilization of its purchasing power?"

The subject matter was a complete departure from his preparatory studies at the University of Vienna, where the subject of the thesis for his second doctorate degree was the theory of *Zurechnung*, the imputation of value. His approach to economics was firmly rooted in the Austrian tradition of the subjective theory of value and marginal utility, where the value of any good was derived from the necessarily subjective demand of individuals. But, as Hayek wrote in an essay published in 1926, "The doctrine of marginal utility makes it possible to equate the subjective value of economic goods with a certain level of utility yielded by them if the good yields this utility directly and in isolation. . . . However, this principle is not immediately applicable to those goods which cannot by themselves satisfy certain needs and wants but which are able to do so only in combination with other economic goods. . . . [T]he problem of the derivation of the value of the individual producer goods from the jointly produced level of utility has entered into the economic literature under the name of *Zurechnung* (in English, imputation). . . ." And, not to underestimate the difficulty, Hayek announces, "Consequently, the whole of economic theory rests on the explanation of the value of producer goods and thus on the theory of imputation".[7] It is not then surprising that Hayek consistently finds the consequences of monetary imbalances in adverse changes in the relative prices of producer and consumer goods.

In this tradition the function of money remained problematical, since money must only serve as a proxy for the values of real goods that were the object of individual economic exchanges; thus the value of money as money was ambiguous since it was unclear how a standard of value would be maintained. Fluctuations in the supply of money could only muddy the pure stream from which the marginally preferable was sieved from the marginally inferior. Money was fool's gold. An artificial stabilization of money's purchasing power might reward the fool and punish the prudent.

Hayek brought to the stabilization debate the methodological impera-

[7]F. A. Hayek, "Some Remarks on the Problem of Imputation", in *Money, Capital, and Fluctuations, Early Essays*, ed. Roy McCloughry (London: Routledge & Kegan Paul, 1984), pp. 33–34. First published as "Bemerkungen zum Zurechnungsproblem" in *Jahrbücher für Nationalökonomie und Statistik* (Jena, Band 124, Folge III, Band 69, 1926), pp. 1–18. Translated as "Some Remarks on the Problem of Imputation", in McCloughry, ed., *Money, Capital, and Fluctuations*, op. cit., pp. 33–54.

tives of the theory of subjective value and marginal utility. He also brought with him to America introductions provided by Joseph Schumpeter to many of the leading economists. The ideas of Austrian economists were not unknown in America; Schumpeter had lectured at Harvard in 1913 and John Bates Clark had engaged in controversy with Eugen Böhm-Bawerk over capital theory. (Hayek was privileged to read the last paper in Clark's last seminar.)[8]

For their part, the Austrians knew the work of some of the American economists, most notably Irving Fisher, whose revival and extension of the quantity theory of money was at the core of the debate over stabilization. But the one man whom Hayek had not heard of until he was given a letter of introduction to him was Wesley Clair Mitchell. A somewhat perplexed Hayek observed that Mitchell, whose path-breaking work on business cycles had been published in 1913,[9] was the center of attention of most of the younger economists. They were drawn by the research possibilities opened up by Mitchell's statistical work which made empirical observations of economic activity comparable over varying time periods.

By 1926 Schumpeter observed that among these young economists a new *Methodenstreit* was brewing. "'Change the relative emphasis put upon statistical and historical materials in this picture', Schumpeter summed up, 'and we have, even to details, the position that Schmoller held throughout his life'". Mitchell did not agree.[10] His argument rested on the obser-

[8]For a full account of Schumpeter and of his elegant letters of introduction, as well as Hayek's obituary note on John Bates Clark, see *The Fortunes of Liberalism* (1992), ed. Peter G. Klein, being vol. 4 of *The Collected Works of F. A. Hayek,* op. cit.

[9]Wesley Clair Mitchell (1874–1948), whose *Business Cycles* (Berkeley: University of California Press, 1913) was considered by many to be the most influential work of its time on economic thinking, was one of the founders of the National Bureau of Economic Research, where in 1920, in addition to teaching at Columbia University, he assumed the position of Director of Research, which he held until 1945.

[10]Quoted by Mitchell in W. C. Mitchell, "The Present Status and Future Prospects of Quantitative Economics", Round Table discussion at American Economic Association meeting, December 1927. Reprinted in W. C. Mitchell, *The Backward Art of Spending Money* (New York and London: McGraw-Hill, 1937), pp. 37–38. Gustav von Schmoller (1838–1917), Professor at the Universities of Halle, Strasbourg, and Berlin, was the leader of the German 'younger historical school' with whom Carl Menger (1840–1921), the founder of the school of Austrian economics, engaged in heated controversy about the methodology of economic theories. Of the German school Hayek wrote, "Through the study of historical development it hoped to arrive at the laws of development of social wholes, from which, in turn, could be deduced the historical necessities governing each phase of this development. This was the sort of positivist-empiricist approach which was later adopted by American institutionalists (differing from similar more recent efforts only in that it made little use of statistical

vation that there was more uncertainty in economic behaviour than 'qualitative' theories—neo-classical theories relying on concepts of marginal utility and equilibrium—could account for. "Our qualitative theory has followed the logic of Newtonian mechanics; our quantitative work rests on statistical conceptions. . . . The mechanical view involved the notions of sameness, of certainty, of invariant laws; the statistical view involves the notions of variety, of probability, of approximations. . . . Hence, we must put our ultimate trust in observation. And as fast as we can raise our observations to a scientific level we must drop the cruder, yet not wholly valueless, approximations attained by the mechanical type of work".[11]

Hayek attended many of Mitchell's lectures, primarily on the history of economics, at Columbia University. When he returned to Vienna he used his newly acquired knowledge of time series to establish, with the help of Ludwig von Mises, the Österreichisches Institut für Konjunkturforschung (the Austrian Institute for Business Cycle Research), which earned him a mention in Mitchell's 1927 opus.[12] Still, Hayek was not convinced of the value of Mitchell's methods. In 1926 he wrote to Mitchell about the new direction of his work:

> The other thing that I take the liberty to ask from you [after politely requesting the return of a book by Wieser[13]] is whether you could help me in some way to get—at least for some time—a copy of your article on "The Role of Money in Economic Theory". The wartime issues of all

technique), and which is better described (as by Popper) as historicism". F. A. Hayek, *The Fortunes of Liberalism*, op. cit., p. 78. However, Mitchell, while adopting a positivist-empiricist approach to economics, was not noticeably historicist. His methodological views were influenced by Thorstein Veblen and retained a strong institutionalist bias, but the stronger influence on Mitchell was the pragmatism of John Dewey. The American pragmatists were fallibilists unlikely to accept any theory of historical inevitability.

[11] W. C. Mitchell, "Quantitative Analysis in Economic Theory", Presidential Address delivered at the Thirty-seventh Annual Meeting of the American Economic Association, December 29, 1924. Reprinted in Mitchell, *The Backward Art of Spending Money*, op. cit., pp. 33–36.

[12] *Ibid.*, p. 202.

[13] Friedrich von Wieser (1851–1926), who is credited with bringing the term "marginal utility" and the concept of opportunity cost to the Austrian theory of subjective value, was Hayek's teacher at the University of Vienna. For Hayek's appreciation of Wieser, see chapter 3 of *The Fortunes of Liberalism*, op. cit. Mitchell published a sympathetic review of Wieser's *Theorie der Gesellschaftliche Wirtschaft* in 1915 (reprinted in *The Backward Art of Spending Money*, op. cit.) and also wrote a preface, for which Hayek provided some assistance, to the English translation, *Social Economics*, trans. A. Ford Hinrichs (New York: Greenberg, 1927, and London: Allen & Unwin, 1928).

> American periodicals are yet missing in our libraries and a request to the AEA has remained without answer.
>
> I need this article of yours in connection with my present work which shall embody some of the slowly ripening fruits of my sojourn in the United States. It is only now that I feel how much I have really learnt during that year. While my theoretical predilections have remained unchanged, I realize now the weak points of abstract economic theory which seem to most of you to make the pure theory more or less useless for the explanation of the more complex phenomena of the money economy. It seems to me now as if pure theory had actually neglected in a shameful way the essential differences between a barter economy and a money economy and that especially the existing theory of distribution needs a thorough overhauling as soon as we drop the assumption of barter and pay sufficient regard to *time*. I hope however to be on the way to supply some of the missing links between orthodox economic theory and one applicable to the explanation of the processes of modern economic life. If my memory is correct, you have already pointed out some of the discrepancies in your article mentioned above which I read when in New York. Since then I have studied with the greatest interest Foster and Catchings's *Money*, who certainly deserve credit for insisting in their admirable book on this point.[14]

It is not too extreme to say that the encounter with Wesley Clair Mitchell shaped the direction of much of Hayek's later work. An inductive methodology allowed Mitchell to reintroduce historical processes and institutional constraints into economic relationships to show that individual behaviour was as much determined by institutional effects as vice versa. In attempting to counter the generalizations of statistical inference, Hayek realized that "complex phenomena" (which makes its appearance in the above quoted letter) was not just a descriptive term but the locus of the problems which characterized the social sciences.[15]

Discrediting Stabilization

Hayek surveyed some of the more important writing in the stabilization effort in an omnibus review for an Austrian audience which is now translated for the first time in chapter one of this volume. The debate had begun with Irving Fisher's proposal for a "compensated dollar", first pre-

[14]Letter from Hayek to Mitchell, June 3, 1926. The original is preserved in the Mitchell collection at the Columbia University Libraries. Hayek's review of Foster and Catchings's *Money* appears in this volume, chapter 1.

[15]See Hayek's later essay, "The Theory of Complex Phenomena", particularly section 4. In F. A. Hayek, *Studies in Philosophy, Politics, and Economics* (Chicago: University of Chicago Press, 1967), pp. 22–42.

sented in 1911.[16] Fisher's argument rested on the contention that the dollar was fixed by weight and not by purchasing power and that what was desirable for the economy was a fixed measure of value in terms of purchasing power.

Prices in the United States had suffered a long decline from the end of the Civil War until 1896; prices then rose—following a new surge of gold production—until 1914. The war brought more inflation, the recession of 1920 brought deflation. Much of the controversy centered on what was responsible for the fluctuations in prices. Fisher provided empirical evidence for the quantity theory of money by constructing indices which demonstrated that only changes in the quantity of money could account for fluctuations in the general price level. Prices of individual commodities might fluctuate in response to changes in supply and demand, but changes that affected all commodities at once could come only from changes in the supply of money.

The success of Fisher's demonstration depended on surmounting the logical limitations of the quantity theory of money, of which more below, and on the reliability of his indices. His objective was to stabilize the purchasing power of the dollar, which meant attempting to maintain some sort of constant value for money over time. But the only truly constant value of money as measured in exchange for any commodity or service would require unchanged prices for each commodity. An index is only a means of comparing an average of selected prices obtained at one instant with an average of the same selection of prices at another instant of time. The question is, how might such a comparison be used to regulate the supply of money? The justification for its use is entirely practical. There are no theoretical grounds for any of the choices which have to be made in order to reduce the myriad of transactions which take place over time to a fixed number of prices obtainable at any one time. Fisher and Mitchell could not agree, for example, on the selection of formulas. Fisher rejected Mitchell's claim that the purpose "to which an index number is put" would influence the choice of the formula used to compute the number, arguing that a good formula "which will not be freakish" is good for any purpose.[17] But part of Mitchell's concern was that the choice of a formula should not merely displace the problem of finding a standard

[16]Irving Fisher, assisted by Harry Gunnison Brown, *The Purchasing Power of Money* (New York: Macmillan, 1911). Fisher extended and refined the proposal in *Stabilizing the Dollar* (New York: Macmillan, 1920). Hayek's review of *Stabilizing the Dollar* appears in chapter 1, this volume.

[17]See Irving Fisher, *The Making of Index Numbers* (Boston and New York: Houghton Mifflin, 1922), pp. 229 ff.

for measuring the value of money to a choice of base periods and the weighting of components.[18]

Given that there are no logical or empirical tests for the selection of items in any index, any given index must reflect an institutional bias which may favor some producers or consumers over others. Fisher proposed, on little more than an ad hoc basis, annual changes in the components and their weighting, thus weakening the claim that indices could measure changes in the value of money *over time*. The problem continues unresolved into the present.[19] Milton Friedman has noted, in another context, "the impossibility of a complete solution of the index-number problem".[20]

In the interwar period, the choice of a base period for stabilization was particularly contentious and in the end was left undetermined. Agricultural producers wanted prices to return to 1913 levels, and the British were at loggerheads over whether the pound-dollar parity should be returned to its prewar value.

Hayek reviewed Fisher's—and Mitchell's—proposals for the usefulness of index numbers in the omnibus review in chapter one of this volume. He was clearly impressed by Fisher's technical achievement and did not on this occasion express the reservations about the use of averages and aggregates in economic theory that would become prominent in his later thinking. Those reservations had less to do with the continuing degree of bias in the construction of any index and more to do with the conclusions that might be drawn about individual behavior from statistical averages. For as Mitchell observed, "More important still was the discovery by statis-

[18]Mitchell had had a hand in compiling the data which Fisher used to test his formulae, data which for the first time linked prices to quantities. These price changes covered the volatile period of the First World War and were compiled by the Price Section of the War Industries Board. Mitchell continually emphasized the difficulty of obtaining reliable data. See Wesley C. Mitchell, "The Making and Using of Index Numbers", in US Bureau of Labor Statistics, *Index Numbers of Wholesale Prices in the United States and Foreign Countries* (Washington, D. C.: Government Printing Office, 1921).

[19]It is asserted by no less an authority than the chairman of the US Federal Reserve System, Alan Greenspan, that the consumer price index provided by the Bureau of Labor Statistics overstates what Greenspan believes to be the true rate of inflation in the United States. Those who share Greenspan's view rest their case on changes in "quality": Stain-resistant fabrics added to furniture count as a price reduction if prices remain unchanged. (See the report "Study Criticizing Consumer Price Index Is Disputed by Labor Statistics Bureau", *The Wall Street Journal*, Dec. 20, 1996, p. A2. On Greenspan's position and the effect that altering the CPI would have on social security and tax payments see the article "Greenspan Seeks Panel on Cost of Living", *The Wall Street Journal*, Jan. 31, 1997, p. A2.)

[20]Milton Friedman, "Commodity Reserve Currency", *Essays in Positive Economics* (Chicago: University of Chicago Press, 1953), p. 214. Hayek's proposal for a commodity reserve currency may be found in *Good Money, Part II*.

ticians that social phenomena of most kinds, though seeming to result from the uncontrolled choice of individuals, yet reveal a striking regularity when studied in large numbers."[21] Were this to prove correct in a way that made future behaviour predictable, the institutionalists would have a powerful weapon to use in their *Methodenstreit.*

Fisher, having disposed at least to his own satisfaction of all objections to his price index, advanced a specific proposal to stabilize the value of money. His specific proposal was to replace gold dollars of a fixed weight with certificates representing gold dollars that would be redeemed by the United States Treasury with amounts of gold that varied with changes in the price index. Some difficulties were immediately apparent: Fisher did not pretend to know just how much the gold in each dollar would have to vary to bring the price index back to 'par'. The adjustment would have to be made by trial and error. That raised the spectre of speculation. To prevent that, Fisher would charge a fee called "brassage" to depositors of gold, and no single change in the dollar's weight would exceed that fee. But would not such a fee limit the usefulness of the varying gold content on the price index? Keynes criticized the proposal for placing the burden of change on the exchange rate.[22] And overall there was the concern that because the system operated with long lags it would be useless in times of rapid changes.

More troubling was the revelation of how the scheme was to be paid for. As Fisher owned up in a footnote: "It will be noted that, if gold is depreciating, the value of the gold reserve diminishes and taxation (or other financing) is required to keep it up to 100 per cent. . . . It taxes the public to provide for the depreciation. . . . Under our present system the loss falls on the individual holder of gold certificates. . . . The same principle applies to the opposite case. . . ."[23]

This admission by Fisher that the taxpayer would have to assume the cost, or realize any benefit, from changes in the price level driven by external events betrays an uncertainty about the use of gold in the international financial system. Gold was relied upon to perform two functions which were not always compatible, and therein lay the difficulty. Having currencies fixed by weight of gold provided a common standard for exchange, but the actual transfer of gold was used as the final balancing

[21] Wesley C. Mitchell, *ibid.*, p. 11.

[22] "In particular, the proposals of Professor Irving Fisher for a compensated dollar amounted, unless all countries adopted the same plan, to putting into practice a preference for stability of internal price level over stability of external exchange". J. M. Keynes, *A Tract on Monetary Reform,* op. cit., p. 126. Of course, if all countries did adopt the same plan, it would mean the equivalent of floating exchange rates.

[23] Fisher, *Stabilizing the Dollar,* op. cit., p. 129, note 1.

item of international payments, thus affecting reserve positions of central banks and through this reserve the availability of credit. Any attempt to alter either function of gold, as Fisher proposed, would shift international capital transfers to other commodities and revive arbitrage and speculation. This in turn would render the use of a general price index based on a "composite commodity" unreliable as a guide to stabilization.

The germ of what would be Hayek's continuing criticism of the use of the quantity theory of money appeared in his review of Fisher's proposal and in the outline of his proposed thesis on stabilization. The key question which appears both in the outline and his review is: "Are not sometimes changes in the price level necessary to re-establish the equilibrium between demand and supply?" And in the review Hayek also wondered, "Should the aim not be, instead, to have the share of the social product assigned to each entity of the money in circulation vary in line with the expansion or contraction of the social product?"[24] This question reveals that Hayek was not prepared to separate value theory from monetary theory, certainly not with an ad hoc proposal that relied on indices.

There were logical difficulties with the quantity theory as well. Although Mitchell and Fisher were methodological mates, Mitchell found the tautological character of the quantity theory less than informative:

> Time, then, is of the utmost consequence in considering the relations between prices and 'the quantity of money'. Relations which hold in long periods do not hold in short ones. . . . Nor is the present discussion inconsistent with the celebrated theorem: 'Other things being equal, prices vary directly as the quantity of money in circulation.' That theory is formally valid. Equally valid are a number of other theorems similar in form: for example, 'Other things being equal, the quantity of the circulating medium varies directly as prices.' 'Other things being equal, the quantity of the circulating medium varies directly as the physical volume of trade.' Any of these propositions can be developed into an adequate theory of the 'relations between money and prices' by analyzing the 'other things' which are supposed to remain equal. Yet it is an awkward way of working to start with a proposition which suggests so limited a view of the problem, and it is misleading to end with a proposition which contains so limited a version of the truth. The orthodox formulation of the quantity theory owes its prominence to the fact that economists have given most attention to the long-period relations between gold-supply and prices at wholesale. For that particular problem, the proposition 'other things being equal, prices vary directly as the quantity of money

[24]See chapter 1, this volume, p. 43. The outline for the thesis Hayek began at New York University in 1923 but never completed may be found in the Hayek papers at the Hoover Institution Archives, Stanford University.

> in circulation' is both valid and important. But for the periods with which the theory of business cycles is concerned, we need a far more discriminating statement of the relations among prices, the physical volume of trade, the quantity and the velocity of the circulating medium—a statement which takes into account changes in these relations produced by depression, revival, prosperity, and recession.[25]

In short, the trade cycle was to be moved to the center of concern.

At this point it would not be inappropriate to wonder just how it came about that monetary theory became intertwined with the notion of trade cycles. The historical concern over money was with distributional effects, the gain or loss to debtors and creditors from inflation and deflation. Prices rose and fell, but there had been no agreement that fluctuations occurred with the regularity of a cycle. Central banks were obliged only to secure a banking system that could sustain commerce and provide a market for government debt. As Hayek later recalled, "Until some sixty years ago, monetary policy simply meant securing a gold equivalent or silver equivalent of a particular money in circulation. My interest in monetary policy began when I found in the 1923 Annual Report of the US Federal Reserve Bank a statement which said that the control of the quantity of money could be used to assure the stabilization of economic activity. At that time, that was a new idea. It is only over the last sixty years that money has come to be regarded as one of the prime instruments of economic policy in general and a useful way by which political authority could contribute to prosperity".[26]

The idea did not originate with the central bankers. Even more peculiar was the thought that the bankers would entertain such a prospect. Although some economists may have argued for modifications to the apparatus of the gold standard, in 1923 no one seriously expected that the standard itself would be abandoned. Only the timing of its return and the parities of the individual currencies were uncertain.

Equally peculiar is the lack of concern on the part of the stabilization advocates for the distributional effects of their proposals. Fisher acknowledged that US taxpayers would be at risk for any losses to the Treasury from the costs of his 'compensated' dollar. But that this might affect the Treasury's borrowing requirement—and thus interest rates—or that poli-

[25] W. C. Mitchell, *Business Cycles, The Problem and Its Setting,* op. cit., pp. 138–139.

[26] F. A. Hayek, "The Future Unit of Value" [1981], now reprinted in *Good Money, Part II,* being vol. 6 of *The Collected Works of F. A. Hayek.* The statement is not actually in the report but was inferred by some observers, notably J. R. Commons. See chapter 2, this volume, p. 126.

ticians might not enjoy making the required fiscal accommodation does not seem to have dissuaded the advocates of stabilized currencies.

The return of a universal gold standard would once again place money beyond the control of individual central banks. At that point, central bankers would once again have to choose between domestic monetary policy and the stability of the foreign exchange rate. It was the political inability to make that choice that led to the debacle of the 1930s. In his article "The Fate of the Gold Standard", which appears as chapter 3, this volume, Hayek accused Keynes of the primary responsibility for the belief that the choice could be evaded. However, it was not only Keynes, but the whole of the economic literature devoted to the concept of the trade cycle that encouraged the belief that somehow or other the cycle could be minimized through monetary policy.

The business cycle had come to the fore of economists' investigations largely through the efforts of W. C. Mitchell. That there were fluctuations in business activity was undeniable; that these fluctuations sometimes resulted in financial crises was also undeniable; but that these fluctuations constituted a recurring *cycle* was not, and is not, undeniable.[27] The concept of a cycle requires a high degree of regularity; that, in turn, raises the troubling question of inevitability. Was there some sort of natural event—like sunspots—whose regular occurrence drove the economic cycle?[28] Sunspots and other weather-related phenomena, because of effects on agricultural production, had been identified as possible causes of trade cycles since the nineteenth century, notably in the work of W. S. Jevons. Or was it that people regularly made the same mistakes which led to boom and bust?

Financial panics and business crises had been a prominent feature of European economics since the eighteenth century and earlier. But the theory that a succession of periods of prosperity followed by crises and de-

[27]As Hayek points out, "Perceptive observations about the alternation of periods of prosperity and stagnation had already been made nearly a hundred years ago to proponents of the 'currency school', but it was only in the last decade that economists, especially in English-speaking countries, shifted their focus from isolated recession phenomena to these fluctuations". See this volume, chapter 2, page 101.

[28]Hayek's review of a contemporary thesis, H. L. Moore's *Generating Economic Cycles,* appears in chapter 1, this volume. Moore was one of the first economists to appreciate the general equilibrium theory of Leon Walras and he set himself the task of producing inductive verification of that theory. Ironically, his statistical studies produced a theory of cycles, not equilibrium, based on the rise and fall of agricultural production which he traced to changes in rainfall caused by sunspots. It is a lesson in the difficulty of introducing causality into the equations of exchange. On Moore's life and work see George J. Stigler, "Henry L. Moore and Statistical Economics", *Essays in the History of Economics* (Chicago and London: The University of Chicago Press, 1963).

pression constituted a recurring cycle did not receive much attention until late in the nineteenth century, and then, as Mitchell points out, it was forced into prominence by men who were largely critics of the orthodox economics which had been shaped by Smith, Ricardo, Mill, and Marshall. The first writer to whom Mitchell gives credit for addressing the cycle in what was to become its recognized form was J. C. L. Simonde de Sismondi, who put forth several suggestions to explain the phenomenon, one of which was that commercial organization was somehow at fault. "The business man, as Sismondi phrases it, caters to a 'metaphysical public'—customers whose numbers, tastes, consumption, and purchasing power are all unknown to him, and all variable. The only guide he has in planning how much to produce is prices. By comparing present prices with costs, he decides whether to increase or restrict his output in the near future. 'Unfortunately this comparison is made by all the producers at the same time . . . and all of them together, ignorant of how much their competitors will undertake, nearly always exceed the limit which they had in view'".[29]

Fisher challenged the concept of a cycle: "I see no more reason to believe in 'the' business cycle. It is simply fluctuations about its own mean. And yet the cycle idea is supposed to have more content than mere variability. It implies a regular succession of *similar* fluctuations, constituting some sort of *recurrence,* so that, as in the case of the phases of the moon, the tides of the sea, wave motion, or pendulum swing, we can forecast the future on the basis of a pattern worked out from past experience, and which we have reason to think will be copied in the future. We certainly cannot do that in predicting the weather, or Monte Carlo luck. Can we do so as to business? Not so long as business is dominated by changes in the price level!"[30]

Mitchell responded with a defence of his statistical methodology that conceded more than it gained. The time series which he relied upon to demonstrate the cyclical nature of business fluctuations could not provide empirical evidence that similar causes were at work in all cases.[31] Without

[29]See W. C. Mitchell, *Business Cycles, The Problem and Its Setting,* op. cit., pp. 5–6. Mitchell quotes from J. C. L. Simonde de Sismondi, *Nouveaux Principes d'Economic Politique* [1819], 2nd ed. (Paris: Delaunay, 1827).

[30]Quoted in W. C. Mitchell, *Business Cycles, The Problem and Its Setting,* op. cit., p. 466.

[31]The use of indices, particularly of average price and production levels, provides no explanation for any rate of change from one level to another. Mitchell was aware of the difficulties. "Economic theorists, like economic statisticians, have been prone to argue from chronological priority to causal relationships, without intensive analysis of the way in which the causal influence is exerted. To illustrate the danger of drawing hasty conclusions: A decline in one activity generally precedes, and so seems to cause, a decline in a second activity; but changes in the volume of the first activity may be controlled by changes in the rate of growth in the second. In that case, throwing the second time series into the form of first derivatives will show that changes in its rate of growth regularly precede the changes

this evidence, one could not be sure that the observed fluctuations were not each one a unique event—here a crop failure, there an insurrection; here the discovery of gold mines, there a bank failure. Mitchell's investigations rested on ad hoc assumptions—largely about institutions—which resisted critical scrutiny from a coherent theory. In this his work is very much in the tradition of the German historical school. "We must be ready", he pleaded, "to consider concrete events such as historians treat; but we must array them in groups after the fashion of statisticians, and interpret them in the light of what we know about economic behaviour, after the fashion of economic theorists. Similarly, we must be ready to apply the mathematical technique of statisticians; but we must guide our statistical investigations by rational hypotheses, and eke out our statistical investigations by recourse to historical records. So, too, while we must be ready on occasion to analyze imaginary cases with the theorists, these cases should be arranged whenever possible with an eye upon the historical and statistical data by which speculative conclusions may be tested".[32]

The case for trade cycles remained unproven, yet the possibility of an alternate explanation of fluctuation is observable even in Mitchell's own work. Mitchell observed that fluctuations spread from one community to another and from one country to another—but not always, and rarely with the same intensity. This observation ought to have led to an investigation of the means by which fluctuations are transmitted and to the hypothesis that the means might itself be the cause of fluctuations. Instead, Mitchell was content to suggest a parallel development in separate economies. "Whatever the causes of the recurrent fluctuations in economic activity may be, the annals suggest that these causes become active in all communities where there has developed an economic organization approximating that of Western Europe. There appears to be a rough parallelism between the stage attained in the evolution of this organization by different countries, and the prominence of business cycles as a factor in their fortunes".[33] A "rough parallelism" is in fact all that Mitchell's inductive methodology would ever discover. Without an understanding of the transmission of economic effects from one community to another, central bankers and monetary policy makers could well end up behaving like the leaders of a cargo cult.[34]

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observed in the first series, and reverse the inference concerning cause and effect. No feature of business cycles presents more misleading cues than does the apparent chronological order among the cyclical fluctuations of different processes, and no other feature requires from the investigator a finer blend of theoretical insight with statistical skill". *Ibid.*, p. 289.

[32]*Ibid.*, p. 470.

[33]*Ibid.*, p. 446.

[34]The cargo cults were apocalyptic millennarian religious movements of Melanesia that appeared following the two world wars; the millennium would arrive with cargo from ships,

Designing a Credible Monetary Policy

Mitchell had criticized Fisher's use of the quantity theory and Fisher had challenged Mitchell's concept of the trade cycle. Yet the Federal Reserve Board was expected to navigate with the assumption that the effects of their decisions would conform to both. The Annual Report of the Federal Reserve Board for 1923 acknowledged that the Board had departed from traditional discount policy governed by the level of the gold reserve to attempt to manage the money supply with respect to changes in business activity. Hayek's extended review of the 1923 report and the controversy it provoked appears as chapter two of this volume, translated in full for the first time. The review was written to acquaint an Austrian and German audience with the new departure in banking and monetary policy taking place in the United States. It was intended to be the centerpiece of a larger work on the Federal Reserve system. The description in the report of how the US economy actually responded to changes in monetary policy stimulated Hayek's theoretical investigations into the interaction of interest rates, prices, and production. It should have been read in the context of the essays in the history of monetary theory which were begun during the same period.[35]

Much of the world's gold had found its way to the United States during and after the war for two reasons, neither of which had been factors in the international movement of gold since the end of the Napoleonic wars. The first was to pay for the means of waging war. The second reason was to obtain dollar credits; the United States was the only country prepared to accept gold at par for dollars throughout the war.

This predicament exposed the Achilles's heel of the gold standard: Gold was not money. To become money, gold needed to be coined at a fixed weight per unit. However much it was regarded as a 'store of value', and though it might be used as the common measure—by weight—of the value of coins, it was still not money. Whatever money was—and dollars, pounds, and *kronen* might all be money, but they were not interchangeable—it was in the control of governments. Capital might move in the

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airplanes, or sometimes just washed up on the beach. Faith in the arrival of the cargo was demanded "and in many cases it is held to show sinful disbelief in the coming to work or cultivate or even to continue to hold stocks of food. Therefore the movement often is accompanied by a rapid squandering, or even deliberate destruction, of stocks of food, goods, and money to demonstrate faith in, and to prepare for, the millennium". See I. C. Jarvie, *The Revolution in Anthropology* (London: Routledge & Kegan Paul, 1964), p. 58. It will not escape notice that the cargo cult is the antithesis of the Protestant ethic which Max Weber found at the heart of capitalism.

[35]Unfortunately these were not published until their translation for *The Collected Works of F. A. Hayek*. See *The Trend of Economic Thinking*, op. cit., Part 3.

form of gold, but it still needed to be exchanged for money. It was a lesson the United States had learned well before their independence from England but had apparently forgotten sometime between the panic of 1907 and the establishment of the Federal Reserve system in 1913.

It was an anomalous historical development that the United States, a country which had been mostly ambivalent and at times actively hostile to gold, should end up with the lion's share of the world's monetary gold. The currency in use when the Europeans arrived in North America was wampum. Later, in Virginia, tobacco was used for money. After the Dutch made an adventitious trade of wampum for the real estate later to be called New York, coins of all sorts began to circulate in the colonies. The move towards autonomy was forced on the colonies when Charles II in 1652 forbade the establishment of a mint in Massachusetts.[36] Forced to rely on local resources, the colonists began to appropriate Spanish gold, as the English had before them. In thus insisting on a monopoly that was a royal prerogative—there is a lesson here—Charles forced the colonies onto a dollar currency, the beginning of a separation the consequences of which need not be elaborated.

From the beginning there was never enough money to meet the demand. Most of the difficulties in the US banking system came from the seasonal nature of the financing for agricultural and other commodities. Local banks could not afford to keep idle the reserves necessary to handle the seasonal shifts from loans to deposits and cash. Thus by the end of the nineteenth century the US banking system found its liquidity largely in the New York call money market, where local bank reserves could earn interest.[37] Periodic tightness in this market led to repeated demands for an 'elastic' currency that could meet the seasonal demands of trade, preventing the ruin that filled so much nineteenth-century literature.

The rapid growth of the US economy combined with an inefficient distribution of gold meant that the United States was commanding an ever-increasing percentage of the world's gold reserves. London had been hard pressed to find the gold to relieve the panic of 1907 in the United

[36]"Another grievance [in the American colonies] was the near-critical shortage of currency: England was constantly besieged with complaints on this score from her American colonies. No steps were taken to remedy the situation: The mother-country intended to maintain a positive trade balance with the colonies and therefore to extract currency from them, not to dispatch it to them". Fernand Braudel, *The Perspective of the World,* vol. 3, *Civilization and Capitalism 15th–18th Century,* trans. Sian Reynolds (New York: Harper, 1984), p. 401.

[37]"[I]t was the market for short-term loans on securities, the call money market, that served as the central reservoir for credit, not the discount market, which predominated in Europe. It was the call money market in which changes in supply and demand initially worked themselves out and which the various segments of the credit market used for intercommunication". F. A. Hayek, this volume, chapter 2, p. 149.

States. This brush with disaster provided the motivation for the reform of 1913–14 which established the Federal Reserve system.

The structure of the Federal Reserve system was an uneasy compromise: District banks with the power to set individual discount rates were established to prevent New York (and London) from dictating rates; hard-money advocates were pacified with regulations that required a minimum percentage of gold 'cover' for the issuance of notes. Thus responsibility for liquidity of the monetary reserve was both dispersed and restricted, a tension that was to prove calamitous in 1932–33.[38]

With a more efficient use of reserves, credit might well multiply. As Hayek observed, "[T]he reform of 1913–14 deserves to be reevaluated from a different aspect, which has hardly ever been brought out in the entire discussion on this matter. While it is true that the banking reform facilitated the development of a systematic credit policy by a central authority, it also created the very situation that made such a credit control indispensable as a counterweight to the increased inflationary potential arising from the existence of such an institution".[39]

The Federal Reserve banks had accommodated monetary demand during the war largely with the issue of Federal Reserve notes. After the war, member (commercial) banks used the influx of gold to repay their borrowings from the reserve banks. The reserve banks replaced Federal Reserve notes with gold certificates. Thus a de facto replacement of gold by certificates was accomplished which absorbed the influx of gold without expanding the issue of notes.

At the end of the First World War, the United States ceased to be a debtor nation, but no one then expected that the influx of gold could continue. American bankers assumed that sooner or later gold would return to Europe and the United States would manage its reserves much as it had before. Thus the policy shift which was required of a creditor nation did not take place—particularly to develop a domestic money market that could accommodate foreign lending.[40] The debate over Fed-

[38]Walter Bagehot had earlier pointed out the dangers of a fixed percentage of reserves even in the dispersed system of the US national banks which preceded the Federal Reserve system. "It will waste profits by over-provision against ordinary danger, and yet it may not always save the banks; for this provision is often likely enough to be insufficient against rare and unusual dangers. . . . If you say that the Bank shall always hold one-third of its liabilities as a reserve, you say in fact that this one-third shall always be useless, for out of it the Bank cannot make advances, cannot give extra help, cannot do what we have seen the holders of the ultimate reserve ought to do and must do". *Lombard Street* (New York: Charles Scribner's Sons, 1883), pp. 332–334.

[39]Chapter 2, this volume, p. 109.

[40]Keynes did understand this difference, which provoked much of his irritation with US policies. As he wrote in his first book about an earlier and parallel situation with Britain, "To guard against a possible drain of gold abroad, a complicated mechanism has been de-

eral Reserve policy that took place after the publication of the 1923 report assumed both historical relationships that no longer applied and a freedom of action on the part of the Federal Reserve that was an historical accident. It was not understood that at times of financial crisis the strength of the reserve position of a creditor nation may be more necessary and more vulnerable than the position of a debtor nation.

The American demand for an elastic currency that led to the organization of the Federal Reserve system arose from the conflict over the maintenance of reserves by individual banks and the varying demands for cash by the whole financial system. No one thought it unreasonable to demand cash for immediate payments; no one found it profitable to maintain a reserve of cash that earned no interest simply to meet that demand. Thus what appeared to be an organizational problem overlay the more difficult problem of the value of money.

The notion of elasticity applied to currency is in its own way as problematical as the concept of a cycle applied to fluctuations. If money were taken to be a standard of value and prices the measure of the value of goods, then, in its most rigid form, asking for an elastic currency would be akin to asking for the hours of the day to vary depending on the demand for more time. Hayek approached the matter of an elastic currency with all due scepticism; the criticism of this notion occupied the center of his developing theory of economic fluctuations.[41]

The First World War had made plain that gold was not money; yet little effort had been made to reconsider a system where credit could fluctuate,

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veloped which in the details of its working is peculiar to [Great Britain]. A drain of gold can only come about if foreigners choose to turn into gold claims which they have against us for immediate payment, and we have no counter-balancing claims against them for equally immediate payment. The drain can only be stopped if we can rapidly bring to bear our counterbalancing claims. When we come to consider how this can best be done, it is to be noticed that the position of a country which is preponderantly a creditor in the international short-loan market is quite different from that of a country which is preponderantly a debtor. In the former case, which is that of Great Britain, it is a question of reducing the amount lent; in the latter case it is a question of increasing the amount borrowed. A machinery which is adapted for action of the first kind may be ill suited for action of the second". J. M. Keynes, *Indian Currency and Finance* [1913], vol. 1 of *The Collected Writings of John Maynard Keynes*, op. cit., pp. 12–13.

[41] Hayek's full statement of the problem is to be found in Lecture 4 of *Prices and Production*, 2nd ed. (London: Routledge & Kegan Paul, 1935), p. 108. "I suppose that, to most economists, the idea of a circulating medium which does not vary in amount will seem perfectly absurd. We have all been brought up upon the idea that an elastic currency is something highly to be desired, and it is considered a great achievement of modern monetary organization, particularly of the recent American Federal Reserve system, to have secured it".

but the issuance of currency was fixed at two points: a 40 per cent gold reserve backing and a fixed weight of gold per dollar. Banking crises in the United States had almost always occurred when businesses needed to convert bank deposits into cash, thus forcing banks to increase reserves by liquidating loans.[42]

Consider the following conditions as enunciated in the Tenth Annual Report of the Federal Reserve Board:

> Gold is the tangible and conventional basis of bank lending and currency issuing power. . . . Gold received by a member bank is in ordinary course deposited with its reserve bank. Its first effect is to add both to the reserve balance of the member banks and to the gold reserves of Federal reserve banks. The reserve bank has no control over the use made of its free reserve balance by its member banks. . . . In the experience under the reserve system, changes in the demand for currency in the absence of gold imports have been the principal factor accounting for fluctuations in the total volume of borrowing.[43]

And, as though the picture were not yet coming into focus, "Federal Reserve banks, therefore, from the point of view of the chief use made

[42]As Hayek observed, "The main weakness of the old system in the United States was that favourable economic prospects could trigger unrestricted creation of bank credit, which could proceed at a feverish pace until this limit was reached and credit expansion was forced to a sudden halt only then. There was no way in which individual banks could, by their own restraint, forestall the unavoidable negative consequences for the whole economy". But he raises the important question: "Did the adoption of the central banking system really offer the best possible remedy for the known weaknesses of the credit organization in the United States, as was asserted at the time, or did its adoption actually conjure up new dangers to economic stability?" See this volume, chapter 2, pp. 145–146.

[43]Tenth Annual Report of the Federal Reserve Board, covering operations for the year 1923 (Washington, D.C.: Government Printing Office, 1924), pp. 18–19. Continuing, the Report reads (p. 24): "While the Federal Reserve banks during 1923 continued to function as the source from which the public obtained the currency required to transact the larger volume of business, the increased use of currency did not result in an increased use of Federal Reserve bank credit. The reason for this was that the gold received from abroad and deposited with the reserve banks furnished member banks with funds to meet the increased currency demand. The relation between gold imports and currency demand in 1923 was similar to that in 1915 and 1916, which was also a period of gold imports and increasing currency requirements. In those years also the inflow of gold from abroad supplied member banks with credit in sufficient volume to finance a business expansion with little resort to the Federal Reserve banks. The experience of 1923 is in contrast, however, to that of 1919–20, when there were no net gold imports and when business expansion led to heavy borrowing at the reserve banks to meet the large and increasing demand for currency".

of their credit, may be regarded as currency supplying banks".[44] And "[c]hanges in deposit liabilities, on the other hand, have been but a minor influence in their effect upon the reserve ratio".[45] What is important to note here—because the link was later abandoned and plays no part in our present monetary system—is the direct link between gold and *currency,* whereas the link between gold and credit was indirect; liquidity needs played the major part in member banks borrowing from reserve banks.

The reason why all this deserves attention is that we now know that the Titanic of the US financial system in 1923 was even then on course for the iceberg of 1929. Something had gone wrong with the steering mechanism of Federal Reserve policy and it behooves us to know why. At several points in his review of US monetary policy in the early 1920s (chapter 2, this volume), Hayek raised warning flags, particularly in section six, which points to the lack of a coherent theoretical foundation.

What went wrong? The Reserve Board was no longer able to use changes in the reserve ratio as the steering mechanism. "Under the present conditions, with gold embargoes in force in most foreign countries and the United States practically the only free gold market of the world, the movement of gold to this country does not reflect the relative position of the money markets nor does the movement give rise to corrective influences, working through exchanges, money rates, and price levels, which tend to reverse the flow. The significance which movements in the reserve ratios formerly possessed rested upon the fact that they were the visible indicators of the operation of the nicely adjusted mechanism of international finance. With this mechanism now inoperative, the ratios have lost much of their value as administrative guides. It has therefore been necessary for banking administration even in those countries that have been most successful in maintaining a connection with the gold standard to develop or devise other working bases".[46]

In short, what the Federal Reserve now had in the place of the reserve ratio, that "visible indicator", was the invisible effect of a badly maladjusted mechanism of international finance. But instead of ignoring the inadequacy of the gold reserve ratios, the Board ought to have given it increased attention. Gold moved internationally in lieu of the transfer of real capital; which meant that, as the final balancing item, it would only be transferred when other forms of capital transfers would or could incur a loss. It is at this point that the use of capital as money and the use of

[44] *Ibid.,* p. 28.
[45] *Ibid.,* p. 29.
[46] *Ibid.,* p. 30.

capital for trade meet and potentially conflict. The old problem that had plagued the call money market had not really gone away: How could a demand for liquidity be anticipated and who would bear the cost of maintaining the cash reserve?[47] But instead of looking for the effects of trade and currency account balances where they might be found, the Federal Reserve chose to look where the light was, at various indices of production and consumption.

All of these indices suffered from the same flaw: They recorded only past activity.[48] Thus the report concludes that "No statistical analysis can ever be a substitute for judgement in matters of credit administration, but such analyses of economic conditions are indispensable as furnishing the factual basis for credit judgement and for the development of credit policy".[49]

In so many words: Since the (gold) reserve ratio is no longer reliable, we are forced to rely on our own judgement. But the report does not say on what assumptions—theoretical or even rule of thumb—their judgement rests; that is, in what way the Board understands the consequences of their decisions.

Hayek criticized the Board for adopting a passive stance towards credit demand that relied too much on what he believed to be discredited arguments of the Banking School; that is, that credit could not be harmful as long as it financed real business transactions.[50]

On the need for timely action there was no dispute. On this matter the report did not equivocate: "Good credit administration in times of active business expansion should not encourage or assist the excessive accumu-

[47]The reckless instability of the call money market reached a peak in 1929. "In 1928, *The Wall Street Journal* wondered about a world in which industrial corporations could invest their surplus cash at 9 per cent in the call-loan market yet earn just 4 or 4–1/2 per cent in their own lines of business. 'Bootleg loans' was the name given to this nonbank business on Wall Street, and that was the title of a cautionary essay in the June, 1929, *Atlantic Monthly*. 'The most conservative bank in my town has a million dollars lent in Wall Street raising the prices of stocks which it advises its clients not to buy because they are too high,' wrote Howard Douglas Dozier, thereby neatly identifying the chief financial paradox of the day". James Grant, *Money of the Mind* (New York: Farrar Straus Giroux, 1992), p. 196.

[48]Quite sensibly, the 1923 report pointed to the methodological flaw in the use of a general price index: "Credit administration must be cognizant of what is under way or in process in the movement of business before it is registered in the price index. The price index records an accomplished fact".

[49]Tenth Annual Report of the Federal Reserve Board, op. cit., p. 36.

[50]For Hayek's account of the controversy between the Currency and Banking schools in England, 1821–1848, see *The Trend of Economic Thinking*, op. cit., chapter 12. Hayek and von Mises shared many of the same views of money and credit with the Currency School, but they also attempted to correct what they saw as certain errors and omissions, particularly the role played by bank deposits in addition to the circulation of bank notes.

lation of forward commitments in business and banking which only later on will definitely reflect the rate at which they have been taking place in resulting changes of credit volume and changes of price levels; and in times of business reaction should discourage enforced liquidation of past commitments which also will only later on reflect the rate at which it has been taking place in altered credit volume and price levels. The problem of efficient credit administration is, therefore, largely a question of timeliness of action".[51]

Thus began the search for 'leading indicators' that could signal the right moment for changes in the discount rate.[52] Even Hayek in his review of the 1923 report joined in the effort to find a reliable replacement for the reserve ratio, though with a critical difference: He rejected the usefulness of a general price index, indicating once again his reluctance to separate monetary theory from value theory. "The fact that the phases of the business cycle manifest themselves much more clearly in the relative movement of the prices of different types of commodities than in the fluctuations of the general price level strikes us as a much more serious objection, since under these circumstances the general price index could not possibly be a suitable and, above all, a timely indicator of economic trends". Thus, "From the welter of statistical observations, a manageable, unambiguous, and simple method must be derived for determining automatically what are the most effective credit policy measures at any given time. Since there is general agreement in the United States that the most important task of any credit policy geared to prevent recessions is to restrict credit just when its further expansion would lead to a disproportionality between the creation of capital goods and the demand for consumer goods, the most urgent goal is to find the right indicator for determining at which precise moment credit restrictions should be put into effect".[53]

Hayek focused on finding a balance of employment and inventories with the output of finished products and consumption.[54] With that ap-

[51]Tenth Annual Report, 1923, op. cit., p. 32. See chapter 2, p. 134, note 75, this volume.

[52]The search still continues. It is reported that the favorite indicators of the present Chairman of the Federal Reserve Board, Alan Greenspan, are inventory levels, supplier delivery times, and a measure that relates wages and benefits to productivity. *Business Week,* July 14, 1997, p. 48.

[53]Chapter 2, this volume, p. 115.

[54]"Suppose that capital goods industries, manufacturers of semi-finished products, and wholesalers are generally expanding their output and inventories, while no corresponding expansion occurs in the output of finished products, retail trade, and consumption; suppose that at the same time, savings do not grow vigorously enough to justify such an increase in the economy's capital equipment. This constellation would then be the surest possible indication that excessive bank credit is redistributing the available productive re-

pears to come a full endorsement: "Self-regulating currencies secured by their convertibility into a precious metal often bring their compensatory mechanisms into play too slowly to prevent severe economic fluctuations and create additional disturbances in the economy because of frequent variations (due to extra-monetary factors) in the value of their underlying metallic standard. The utilization of suitable statistical data on the current economic situation may prove to be the first step in solving this old problem and in creating a more stable exchange medium. This is at present the problem whose solution holds the greatest promise and also offers the greatest interest in the field of monetary theory".[55]

However, elsewhere in the review, Hayek expresses considerable ambivalence about the possibility of using statistics towards any desirable end; a revival of the *Methodenstreit* is not far beneath the surface. "A serious obstacle from the statistical point of view is the fact that the theoretical categories that must be applied in explaining economic fluctuations do not always coincide with the customary demarcations between the different economic sectors, not even with the way in which various activities are reported in the individual enterprises. Consequently even the most accurate production statistics cannot provide reliable information about the way balance shifts between the production of higher-order and lower-order goods, nor can they prove that this relationship corresponds to the capital accumulation that is actually taking place. . . . The naive optimism on the subject shared even by many of the most eminent American scholars can best be explained by their frequently derogatory attitude towards theory, which deprives them of insights into the inescapable interactions of economic phenomena revealed only by theory". For an example, Hayek cites a passage from Mitchell which he had previously quoted in his omnibus review, which contains the offending sentiment: "For since the money economy is a complex human institution, it is subject to amendment. What we have to do is to find out just how the rules of our own making thwart our wishes and to change them in detail or change them drastically as the case may require".[56]

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sources between current and future production of commodities in a way that threatens the stability of production, and it would make a restriction of credit seem advisable. Conversely, if employment in the basic industries (raw material production, construction, machine manufacturing, etc.) is below average, inventories are shrinking, demand for bank credit is declining, and the price of capital goods is falling below the general price level, this combination of circumstances, unless it comes right on the heels of a sharp downturn, is a sure indication that the easing of credit conditions is appropriate". F. A. Hayek, this volume, chapter 2, pp. 138–139.

[55] *Ibid.*, p. 139.

[56] *Ibid.*, p. 118. For the complete passage from Mitchell, see chapter 1, this volume, p. 40.

As Hayek continued to reflect on this proposition he came to see it as something more than "naive optimism". It was an expression of the belief that society could be shaped to satisfy our own desires, an attitude which he later termed 'constructivism'.[57] Hayek's growing objections to this belief went beyond economic theory, but his theoretical 'predilections' were grounded in the fundamental proposition that only individuals could have values and that the expression of these values in society as a whole were not amenable to the sort of control implied by Mitchell's invitation to change the rules 'of our own making'. As Hayek noted, "It becomes obvious, at the same time, that the practical questions arising in this context cannot be solved in any unequivocal fashion by science alone. To some extent they are also philosophical questions and their solution is, in the broadest sense, a matter of judgement, as to which opinions can sharply diverge".[58]

On Intertemporal Price Equilibrium

Hayek produced his first response to the pragmatic approach of Mitchell and the institutionalists of the Federal Reserve Board in his remarkable essay of 1928, "Das intertemporale Gleichgewichssystem der Preise und die Bewegungen des 'Geldwertes'", which is translated as "Intertemporal Price Equilibrium and Movements in the Value of Money", chapter 5, this volume. At the outset we are alerted to the need for what was then an unprecedented undertaking: "As soon as we abandon the elementary but fictitious presentation of simultaneously formed prices and turn to the actual monetary economy, where prices are necessarily set at successive points in time, a problem arises for whose solution it is vain to seek in the existing corpus of economic theory".

Hayek's view of prices and their function in an economy did not sharply diverge from Mitchell's in so far as both accepted the interdependence of all prices. Mitchell's statement is the more explicit: "The prices ruling at any moment for the infinite variety of commodities, services, and rights which are being bought and sold constitute a system in the full meaning of that term. That is, the prices paid for goods of all sorts are so related to each as to make a regular and connected whole".[59] Hayek uses

[57]He later wrote that he "first heard and was greatly impressed by this formula in a lecture by W. C. Mitchell at Columbia University in New York during the year 1923. If I had even then some reservations about this statement it was mainly due to the discussion of the effects of 'non-reflected action' in Carl Menger, *Untersuchungen über die Methoden der Sozialwissenschaften und der politischen Ökonomie insbesondere* (Leipzig, 1883)". See *New Studies in Philosophy, Politics, Economics and the History of Ideas* (London: Routledge, and Chicago: University of Chicago Press, 1978), p. 3 & note 3.

[58]This volume, chapter 2, p. 119.

[59]W. C. Mitchell, *Business Cycles, The Problem and Its Setting,* op. cit., p. 108.

the term *Abstufung* to describe the interconnection of prices, which has the sense of differentials, a spectrum as well as a system. Where they differ is in their views of how this system of prices is formed and how it responds to changes. Mitchell had discarded any attempt to measure utility, and to take account of any divergence between prices and utility, maintaining that the economist has no choice but to begin with prices as they are formed in markets over time.[60] Mitchell believed that changes generated cycles; Hayek clung to the concept of an equilibrium.

Hayek's direct criticism of Mitchell came later in *Prices and Production:* "If we want to explain fluctuations of production, we have to give a complete explanation. Of course this does not mean that we have to start for that purpose *ab ovo* with an explanation of the whole economic process. But it does mean that we have to start where general economic theory stops; that is to say, at a condition of equilibrium when no unused resources exist. The existence of such unused resources is itself a fact which needs explanation. It is not explained by static analysis and, accordingly, we are not entitled to take it for granted. For this reason I cannot agree that Professor Wesley Mitchell is justified when he states that he considers it not part of his task 'to determine how the fact of cyclical oscillations in economic activity can be reconciled with the general theory of equilibrium or how that theory can be reconciled with facts.' On the contrary, it is my conviction that if we want to explain economic phenomena at all, we have no means available but to build on the foundations given by the concept of a tendency towards an equilibrium".[61]

But Mitchell's argument against the applicability of equilibrium theo-

[60] Part of Mitchell's presentation is worth quoting as it succinctly reveals the strengths and weaknesses of the Paretian system: "It is clear, at once, that this type of theory eliminates the problem of valuation from economics. That is, it does not concern itself with the way in which men find out what relative importance different goods have for their purposes. Instead, it assumes that this process of valuation has been completed before they come to market by each of the men with reference to each of the goods, and furthermore that the process has yielded in each man's mind definite quantitative results. Not until that state has been reached does the pure theorist begin his work. His first step is to cast the finished individual valuations into the form of indifference curves, scales of preference, objective expressions of choice, or value functions. That gives him a set of what [P. H.] Wicksteed terms 'ideal prices' as data for analysis. Then the theorist develops a logical scheme of conceiving the process by which mutually interdependent market prices result from the 'ideal prices'. He does not, of course, profess to show what the market prices will be (for (1) the 'value functions' are as yet arbitrarily assumed, (2) the whole discussion presupposes static conditions, and (3) when many men and many goods are involved the number of equations to be handled becomes too great for solution), but he does demonstrate more adequately than any other type of economist the complex interrelationships logically involved in the determination of prices in modern markets". W. C. Mitchell, "The Role of Money in Economic Theory," in *The Backward Art of Spending Money,* op. cit., pp. 162–163.

[61] F. A. Hayek, *Prices and Production,* op. cit., p. 34.

ries pushed Hayek to attempt a revision of the concept, to concede, as Mitchell had argued, that static analysis was inadequate. Mitchell wrote: "Doubtless it was a mechanical analogy which gave its vogue to the notion of economic equilibria. Everyone admits that analogies, though often most suggestive in scientific inquiries, are dangerous guides. The usefulness of the analogy in question was greatest and its danger least when economists were treating what they called 'static' problems. Such problems can be given a quasi-mechanical character, for they are not taken from life, but made in an inquirer's head to suit his purposes, and mechanical analogies are appropriate to mechanical problems. But the problems of business cycles are the opposite of 'static'".[62]

Hayek's departure is logically unassailable: An equilibrium conceived of as static may persist for any length of time as long as the initial conditions are known at the outset and continue as expected. "Hence, to conclude that an economy can persist in a static condition it is not at all necessary to assume that, at every point of time within the economic period under consideration, wants and production possibilities remain the same. All that needs to be assumed for such a static equilibrium to occur is that the wants and the means of production existing at every point in time are known to the individual economic subjects at the time at which they frame their economic plan for the period as a whole".[63] A static equilibrium need not result in an unvarying economy; but whatever variations do occur must be foreseeable at the outset.

If this were the full extent of Hayek's insight, the essay would provide only a modest, though not trivial, extension of the concept of equilibrium

[62]W. C. Mitchell, *Business Cycles, The Problem and Its Setting*, op. cit., p. 186. Hayek's quotation from Mitchell is found on p. 462.

[63]Hayek's evolving conception of equilibrium has been the subject of controversy. Hayek's emphasis here on the link between knowledge of means and the desired ends of individual plans foreshadows the later development of the concept of equilibrium in his 1937 essay, "Economics and Knowledge". This view can find its antecedents in Wieser. As Mitchell wrote, approvingly, "For the mathematical economists and their theory of static equilibrium, on the contrary, Wieser has little use. He will not allow his system of logic to be turned into a system of mechanics. To him the central element in economics is man's planning, and he becomes uneasy when a mathematician replaces human nature by a set of equations. Besides, he argues, nature yields some goods abundantly, some moderately, some scantily; while this fact remains it is vain to talk about establishing an equilibrium in all branches of production. Similarly, the differences between the satiation scales of various wants prevents our reaching an equilibrium in all branches of consumption. Marginal boundaries, not equilibria, represent the facts and should therefore be represented by the theory. . . ." W. C. Mitchell, "Wieser's Theory of Social Economics", in *The Backward Art of Spending Money*, op. cit., p. 252. For some perspective on the development of Hayek's conception of equilibrium, see Bruce Caldwell, "Hayek's Transformation", *History of Political Economy*, vol. 10, Winter 1988, pp. 513–541.

beyond the abstraction of simultaneity. What Hayek was at pains to demonstrate, and thereby to argue against an artificial stabilization of the purchasing power of money,[64] was that even though the conditions of intertemporal exchanges could be foreseen, the terms of future exchanges, the marginal utilities involved, would have to change from those of otherwise identical present exchanges. This insight opens the door to a revision of value theory that verges on the radical.

Hayek's departure is the easily grasped logical equivalence of exchanges which are separated by space and those which are separated by time. "Strictly speaking, goods which are technically equivalent but available only at different points in time ought to be considered different goods in an economic sense, just as can be said of goods which are technically the same located at different places".[65] However, Hayek does not isolate the logical inference that the equilibrium conditions for goods separated in space may be reduced to an intertemporal equilibrium, which follows from the inescapable limitation that time is required to move goods from one place to another.[66] Nonetheless, he demonstrates the primacy of intertemporal equilibria:

> In summary, it may therefore be concluded that what follows from the difference in conditions that must always exist at different points in time at least so far as it involves the supply of a number of goods, together with what is only a limited possibility of transferring goods from one point in time to another, must be the formation of definite exchange

[64]"More specifically, we are interested in whether the intertemporal differential in money prices generally has a definite and necessary function and—in the affirmative case—what will be the effect of any deviation from the 'natural level' of the price differential caused by external interventions". F. A. Hayek, this volume, chapter 5, p. 198.

[65]On this point Hayek offers a reference to Mises: "It has already been mentioned that two economic goods, which are of similar constitution in all other respects, are not to be regarded as members of the same species if they are not both ready for consumption at the same place. . . . No institution can make it possible for coffee in Brazil to be consumed in Europe. Before the consumption good 'coffee in Europe' can be made out of the production good 'coffee in Brazil', this production good must first be combined with the complementary good 'means of transport'". Ludwig von Mises, *The Theory of Money and Credit,* op. cit. , pp. 195–196.

[66]To do so clarifies what Hayek means when he refers to the "structure of production". As Ohlin points out, "Production, of course, always includes much transportation—in a sense is nothing else. . . ." (Bertil Ohlin, *Interregional and International Trade,* op. cit., p. 231.) The economic problem to be solved in any given structure of production is to find the intertemporal equilibrium of the marginal utilities of the more or less durable; or, to use a later abstraction of Hayek's, labour which is invested for relatively long or short periods. See *Contra Keynes and Cambridge* (1995), Bruce Caldwell, ed., being vol. 9 of *The Collected Works of F. A. Hayek,* op. cit., p. 215.

> ratios for intertemporal exchange between goods of all kinds available at separate points in time, in the same way as exchange ratios are formed between goods which are simultaneously available. Moreover, neither of these two groups of exchange relationships is explicable in isolation from the other; both can be understood only as component parts of a unitary system, which must incorporate intertemporal exchange ratios. The exchange ratios for goods which are simultaneously available thereby constitute at most a subordinate system of limited independence, in the same way as this can be asserted of prices ruling at one point in space as compared to the price system which prevails for the country as a whole, or of the latter in relation to international prices.[67]

Hayek's objective in this 1928 essay was to provide a theoretical argument against a monetary policy of stabilization, to provide an affirmative answer to the question he raised in his review of Fisher's stabilization proposal: Are not sometimes changes in the price level necessary to reestablish the equilibrium between demand and supply? He identifies three intertemporal conditions for which he believes price changes would be necessary to establish equilibrium: "Such changes in data as are predictable, which can as such be taken account of in the economic plan, and whose effects can therefore be handled with equilibrium analysis, can be divided essentially into three groups: those which recur with precise periodicity; those which are of uniform tendency in both direction and extent; and finally, those whose unique occurrence can be confidently expected for a definite point in time, as the result of developments which are currently observable or of known human decisions".[68] An example of the first would be the price of a tramway ticket during the day and the price of the same ticket for travel at night; the seasonal nature of agricultural crops is a further example. The other two situations arise from an expected increase in productivity, one example being improved soil fertility owing to the drainage of a swamp; but inventions—unspecified—that increase productivity would have the same effect.[69]

[67]This volume, chapter 5, p. 197.

[68]This volume, chapter 5, p. 200.

[69]There is a certain difficulty in Hayek's contention that technically equivalent goods may have varying economic values at separate points in time. Whether night travel on a tramway is equivalent to the same trip during the day depends on the nature of the travel undertaken by each passenger; those who are indifferent as to the time of travel would consider the day and night tickets technically equivalent, thus opting for the less expensive. The traveller who must make the trip by a certain time would suffer entirely different opportunity costs, as does the tram operator, who can never recover the loss of a ticket unsold. The problem of the economic and technical equivalence of time-dependent services is very different from

Hayek contends that these conditions require an intertemporal price differential without which production would shift either to an increase in present or future output for which demand would be lacking. "[A]n attempt is made to prove that . . . only one quite particular relative level of prices at successive points in time ensures the maintenance of equilibrium, and that any other pattern of prices leads to shifts in the structure of production which ultimately must call forth a disparity between supply and demand and thereby induce further price changes which as a rule involve losses. This conclusion constitutes the essential point of the present analysis and provides the most important basis for the thesis as to the relations between movements in the 'value of money' and the natural gradation of prices. . . ."[70] This proposition is the core of Hayek's later theory of the trade cycle.

Hayek would maintain that there will be both spot and future prices for the same good where future demand and supply is as certain as that in the present, and that these prices will nonetheless differ; even stronger is his claim that these prices must differ if equilibrium of supply and demand is to be maintained. This assumption rests on a contention that the cost of supplying technically equivalent goods at separate times may rise or fall owing to predictable changes in production possibilities. With this new assumption about costs, Hayek is introducing a quite different condition into the static equilibrium model which had assumed a given, stable production constraint. For Hayek, the difference between a spot and future price is accounted for by an opportunity cost which will be measured not in terms of present alternatives but in terms of the utility of present versus future alternatives. However, it is not immediately obvious how this intertemporal utility is to be determined; Hayek assumes the continuation of subjective evaluations, but the opportunity cost which accounts for the difference between spot and future prices arises from a real change in the cost of production. "Here as elsewhere, of course, exchanges between individuals presuppose that the persons participating in the trade have a relatively different valuation of the commodities at hand. Such a situation can arise because differential valuations with respect to time are of a subjective nature, so that different persons may well have opposite valuations. Thus some persons will be prepared to ex-

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the same problem applied to durable inventories of goods, as the resources airlines devote to their price structure will attest. The continuing effort of the airlines to maximize their return from a time-dependent service demonstrates the importance of the intertemporal price relationship which Hayek identified.

[70]This volume, chapter 5, p. 205.

change goods available at a given point in time for goods of the same type available at another point in time, and in general they will find that there are others who are willing to undertake this exchange with them".[71] The difficulty here is the degree of foresight that would be required to make these assumptions logically defensible, since at this stage Hayek does not justify opposing valuations with any appeal to risk or uncertainty.[72]

Hayek's fundamental insight, that an increase in productivity must result in falling prices if equilibrium between supply and demand is to be maintained, can be demonstrated by abundant empirical evidence for individual industries.[73] But to claim that a fall in the price *level* must take place to preserve equilibrium in conditions of increasing productivity is more difficult to prove.[74] One would have to revisit all of the hazards of attempting to use an index of prices to measure changes in the value of money, particularly if entirely new products or services came to market to absorb the purchasing power obtained from increasing productivity. When the inertia of an economic system is disturbed by inventions which increase productivity, any weighting given to individual components of an index becomes entirely arbitrary unless and until inertia resumes. Even more disquieting is the latent implication in Hayek's thesis that increases in productivity, by affecting prices, may lead to 'imperfect' compe-

[71]This volume, chapter 5, p. 194.

[72]Hayek wrestled with the complexity of the problem in later works. In *The Pure Theory of Capital* he retained the concept of equilibrium but conceded that all that could be covered by general equilibrium analysis were "actions based on the knowledge possessed at one moment of time". Thus in order to find the conditions of intertemporal equilibrium of values, "We shall have to conceive of a structure of n-dimensional indifference surfaces where n includes the number of commodities considered plus the number of different points of time (or periods) for which the person plans. Similarly the different rates of transformation between the different commodities, or between commodities at different points of time, can be represented by a corresponding system of n-dimensional displacement surfaces. The relative values of the commodities, and their individual time rates of increase, will then be formally determined on exactly the same principles as those determining the relative values of a number of commodities that are assumed to be simultaneously available". F. A. Hayek, *The Pure Theory of Capital* (Chicago: The University of Chicago Press, 1941), pp. 243–244.

[73]The outstanding contemporary example is known as "Moore's Law" (after Gordon Moore, one of the founders of the Intel Company) which held that the capacity of semiconductors—the number of transistors that could be placed on a silicon chip—would double every eighteen months. But there is also the concept familiarly known as 'the learning curve' which occurs in any new process or project.

[74]A cogent argument that this should be so is made by George Selgin, *Less Than Zero, The Case for a Falling Price Level in a Growing Economy* (London: The Institute for Economic Affairs, 1997).

tition, thus vitiating the simultaneous solution to finding equilibrium.[75] If, on the other hand, the measure of intertemporal utility could be made in terms of a standard good or commodity the utility of which does not change at different points of time, opportunity cost could be determined without engendering either the circularity or contradiction that arises from an attempt to directly compare the cost of spot and future prices of the same good.[76]

Hayek does not argue for the need for such a standard; indeed, the point of the essay is to argue that money cannot be that standard and any attempt to make it serve as a standard of value will only make matters worse. His conclusion is that the use of money—any money—makes intertemporal disequilibrium inevitable. "Any currency policy which seeks to arbitrarily influence the 'value of money' will prevent the establishment

[75]Hayek's refusal to abandon his insight on productivity and prices led him instead to redefine both the meaning of equilibrium and the meaning of competition, the latter in a lecture of that title in 1946. A variant of Hayek's thesis discussed under the rubric 'increasing returns to scale' was acknowledged by Alfred Marshall and played a key role in the literature about monopolies and imperfect competition in the 1920s and 1930s, initiated by Piero Sraffa's essay, "The Laws of Returns under Competitive Conditions", *Economic Journal*, December 1926, vol. 36, pp. 535–550. See Neil Hart, "Equilibrium and Time: Marshall's Dilemma," *Journal of Economic Methodology*, vol. 3, no. 2, December 1996, pp. 285–306.

[76]Later attempts to produce a formalized solution to the problem of intertemporal equilibrium such as those by Arrow and Debreu do not escape certain of the same dilemmas found in Hayek; indeed, Hayek's presentation is the more informative in that it attempts to preserve a link between individual values and prices. While an equilibrium solution may be found through simultaneous equations lacking a standard of value—any commodity may serve—it is improbable that a finite set of axioms can be found that would permit both simultaneous and intertemporal prices that are different for the same good without engendering a contradiction (the value of a good cannot be both higher and lower than another at the same time) or the fallacy of composition (to say that there must be some value which will equilibrate the supply and demand of any good is not to say that values can simultaneously be found for all goods; further, a high degree of specificity must be attained in order to demonstrate that no trader would be simultaneously buying and selling from himself). Debreu displaces the problem to the enumeration of lists: commodities, consumers, producers, resources, events, with the difficulty of transforming lists into indices without producing false identities. "A commodity", so Debreu stipulates, "is characterized by its physical properties, the date at which it will be available and the location at which it will be available. . . . It is assumed that there is only a finite number l of commodities; these are indicated by an index h running from 1 to l". See Gerard Debreu, *Theory of Value, An Axiomatic Analysis of Economic Equilibrium* (New York: John Wiley, and London: Chapman & Hall, 1959). Here we approach one of Zeno's paradoxes: Every event is separable from every other event by an infinite number of events. At some level of discrimination any comparison of utilities becomes impossible, and recourse to some sort of 'technical unit' for common measurement a la Walras or Wicksell will not do. For further explication, see George J. Stigler, "The Development of Utility Theory" [1950], *Essays in the History of Economics*, op. cit.

of that natural structure of prices through time corresponding to the intertemporal exchange relations originating from barter, and alone able to ensure undisturbed self-reproduction in a monetary economy as well. Furthermore, the same is true of the mechanism of any monetary system at all, either actually existing or merely conceivable".[77] Hayek argues that as long as there is any elasticity at all in the money supply—and this he contends cannot be prevented—price changes, even of non-monetary origin, will call forth changes in the supply of money that will exaggerate the direction of change until some point of inevitable reaction. Although a gold standard will in his estimation do the least damage, it will not prevent some disequilibrium.[78]

This view of the disturbing role of money led Hayek in later work to argue in terms of 'neutral' money; he did not advocate a *policy* of neutral money as is sometimes supposed so much as he recognized the virtual impossibility of fixing the quantity of money to some unvarying measure.[79] By 1933 he had begun to distance himself from the more radical implications of his 1928 essay. In the brief essay "On Neutral Money", chapter 6, this volume, he wrote in a footnote, "The concept of changes in the value of money would then have to be replaced by that of deviations from the problematic intertemporal prices equilibrium. Although I

[77]This volume, chapter 5, p. 210.

[78]"In particular, it must be assumed that the immanent tendency of the gold currency towards stabilization in fact also administers an excessive stimulus to the expansion of output as costs of production fall and thus regularly makes a later fall in prices with a simultaneous contraction of output unavoidable". F. A. Hayek, this volume, chapter 5, p. 216. Hayek believed that the effect of a managed monetary policy would be much worse than gold, thus he deplored the abandonment of the gold standard and the arguments which encouraged it. See chapters 3 and 4, this volume.

[79]The harshest criticism came from Piero Sraffa, who argued that an economy employing Hayek's neutral money would be equivalent to an economy without the use of money at all. This does not necessarily follow, though Sraffa raised a legitimate question, that if money were not used, would not one or several commodities function in the same respect, thus leading to the same effects Hayek deplored. (See Sraffa and Hayek's reply in *Contra Keynes and Cambridge*, op. cit.) Yet Hayek's neutral money is in fact one of the theorems which follows from the identity or tautology of the quantity theory of money. As with any theory which takes this form, its explanatory content is zero when all factors of the equation may vary independently and simultaneously. If, however, one or another of the factors is held constant, the explanatory content rises. In the conventional expression of $MV = PQ$, Hayek proposes to hold M constant; this would require that all changes in PQ be expressed by changes in V, the velocity of circulation. This is not only entirely possible but is consistent with Hayek's view that shifts in prices and production reflect changes in the preferences of individuals for current or future consumption; without an increase in M, changes in V could only occur through saving or dissaving. However, Hayek's model of neutral money stands in opposition to the conventional 'monetarist' view, which holds V constant in order to demonstrate the effect of changes in M.

can no longer adhere to all that I wrote on that occasion, I still believe that an approach to a solution of the problems arising in this context is to be found in my [1928 essay]". When Hayek included an English version of the brief essay on neutral money as an appendix in the second edition of *Prices and Production,* he omitted the final paragraph of the original essay containing this footnote.

"Das intertemporale Gleichgewichtssystem der Preise and die Bewegungen des 'Geldwertes'" ("Intertemporal Equilibrium") did not find its audience.[80] In retrospect one can understand why it failed to attract the attention it deserved but also in retrospect observe that this was a great pity. It is an original and pioneering attempt to address the limits of equilibrium theory and much of what is difficult or inadequate in Hayek's essay derives not from Hayek's own contribution but from the limits of the theory he was attempting to rescue.[81]

In a brief appendix to the essay Hayek raises the question as to why interest rates alone would not be sufficient to maintain intertemporal equilibrium. The answer, that interest rates and prices affect different aspects of equilibrium adjustments, is all too brief and by his own admission hardly more than an invitation to further study. In the event, 'stabilization' as both a theoretical prospect and an international condition was, in the decade of the 1930s, proving to be all too chimerical; the rough beast of monetary nationalism was by then slouching towards Berlin.

Hayek continued to insist on the need for some concept of equilibrium in his investigations of the trade cycle, particularly in *Geldtheorie und Konjunkturtheorie,* written in 1929. A full discussion of this work belongs to another chapter in Hayek's career; what may be said here is that the emphasis Hayek gave to the concept of equilibrium in the 1929 essay was to provide content for his primary assertion that *theory* must play the leading

[80]Hayek sent a copy of the essay to Keynes, but there is no record of any response. Keynes's German would probably not have been up to the task. Only John Hicks appears to have been influenced by it, though he quickly rejected any notion of neutral money and he was not satisfied by the requirement in Hayek's model of perfect foresight. See John R. Hicks, "The Formation of an Economist", *Banca Nationale del Lavoro Quarterly Review,* no. 130, September 1979, p. 199.

[81]On Hayek's place in the development of the theory of intertemporal equilibrium see Bruna Ingrao and Giorgio Israel, *The Invisible Hand, Economic Equilibrium in the History of Science,* trans. Ian McGilvray (Cambridge and London: MIT Press, 1990), which also provides an account of the difficulty of establishing formal proof for the existence, uniqueness, and stability of equilibrium. Also see M. Milgate, "On the Origin of the Notion of 'Intertemporal Equilibrium'", *Economica,* vol. 46, February 1979, pp. 1–10. Reprinted in *Friedrich A. Hayek, Critical Assessments,* John Cunningham Wood and Ronald N. Woods, eds (London and New York: Routledge, 1991), pp. 111–123.

role in the investigation of economic phenomena rather than statistics. Thus it was a theory of equilibrium that would have to explain the anomalies revealed by statistical investigation, but the very presence of anomalies—which present simultaneous confirming and disconfirming evidence—meant that some revision of the theory of static equilibrium would be necessary.

Hayek's first statement of the direction the revision would take came in a lecture delivered in 1933, included in this volume as the final chapter.[82] He returned to the difficulty of reconciling static equilibrium with processes which take place in time; the solution of assuming foresight of future conditions which he presented in "Intertemporal Equilibrium" is now questioned, though on grounds that he had already introduced in "Intertemporal Equilibrium":

> In addition, if there is any change in the external conditions for the whole of the period within which it falls there is naturally only one way of allocating the goods available. . . which offers. . . the highest satisfaction. If the individual could foresee the change in question, he would make the appropriate decisions at the very outset of the period. If he could not have foreseen it, he will become aware only subsequently that he could have achieved a better result through carrying out a different allocation of his resources, and so he has in comparison suffered a loss. Only in the former case will the outcome of the allocation of resources among individual uses be successful in the sense that it corresponds to the expectations which gave rise to them, and hence there is no occasion to change the decisions that have already been made.[83]

In his 1933 lecture Hayek expands the role of expectations to include other individuals:

> It is evident that the various expectations on which different individuals base their decisions at a particular moment either will or will not be mutually compatible; and that if these expectations are not compatible those of some people at least must be disappointed. It is probably clear also that expectations existing at a particular moment will to a large extent be based on prices existing at that moment and that we can con-

[82]The essay, "Price Expectations, Monetary Disturbances and Malinvestments," reproduces the main argument of a lecture delivered on December 7, 1933, in the *Sozialoekonomisk Samfund* in Copenhagen. It was first published in German in the *Nationaloekonomisk Tidsskrift,* vol. 73, no. 3, 1935, and in French in the *Revue de Science Economique,* Liege, October 1935. It first appeared in English in the collection of essays, *Profits, Interest and Investment* (London: Routledge, 1939).

[83]This volume, chapter 5, p. 191.

> ceive of constellations of such prices which will create expectations inevitably doomed to disappointment, and of other constellations which do not bear the germ of such disappointments and which create expectations which—at least if there are no unforeseen changes in external circumstances—may be in harmony with the actual course of events.[84]

In this first sketch of the new model of equilibrium Hayek had begun to develop, the strict condition of foresight that characterized "Intertemporal Equilibrium" has given way to the more realistic existence of expectations which individuals must coordinate through the "constellations" of prices. Thus some expectations may be disappointed by prices which are unreliable: an anomaly within a framework of static equilibrium, but not within a framework of monetary uncertainties.

In his later work on monetary theory, collected in *Good Money, Part II,* Hayek appeared to adopt the very stance he had criticized in his early work; securing the stability of the value of money became the object of a radical proposal to admit competing currencies into circulation. It is important to note the way in which the early and late work do *not* stand in opposition. Most of this discussion must wait for the context of the work collected in Part II of *Good Money;* but the important point is that Hayek's new model of equilibrium introduces the role of knowledge into economic processes, a knowledge that is subject to change. In this context, competition plays an active and critical role and it was in this new context of competition that Hayek argued for the desirability of a stable value of money. The way was prepared in his lecture of 1968, "Competition as a Discovery Procedure".[85] For "it is salutary to remember that, *wherever* the use of competition can be rationally justified, it is on the ground that we do *not* know in advance the facts that determine the actions of competitors. . . . I propose to consider competition as a procedure for the discovery of such facts as, without resort to it, would not be known to anyone, or at least would not be utilized".[86]

Two adjustments—and there are obstacles to a formal presentation—

[84]This volume, chapter 7, p. 235.

[85]Reprinted in F. A. Hayek, *New Studies In Philosophy, Politics, Economics and the History of Ideas* (Chicago: University of Chicago Press, and London: Routledge, 1978). The theory and methodology of Hayek's early work on equilibrium was contained for the most part within the context of the *Methodenstreit,* the debate between the Austrian theorists and the German—and by proxy, American—institutionalists. In the 1930s, Hayek's thinking took a new direction, stimulated by his participation in the 'socialist calculation debate' and his editing of Menger's work. For more on these influences, see *Socialism and War,* Bruce Caldwell, ed., being vol. 10 of *The Collected Works of F. A. Hayek.*

[86]*Ibid.,* p. 179.

are required to place the new concept of competition within the framework of a monetary intertemporal equilibrium model. Unforeseen discoveries may lead to the increases in productivity which require lower prices to ensure the equilibrium of supply and demand; but those prices will be expressed in a currency, the standard for which will itself be subject to competition. Thus opportunity cost acquires yet a further dimension in its crucial role in the decisions individuals must make in weighing present versus future utility of both money and goods. Hayek would leave us with no easy measure for the value of money; that is, perhaps, how it must be.

Seventy years after Hayek's first visit to New York and the Annual Report of the Federal Reserve system which caught his interest, much has changed in the world and little has changed in the conduct of monetary policy. One line of succession remained in place: W. C. Mitchell's student, Arthur Burns, was Chairman of the Federal Reserve Board in the 1970s when the decision was made to suspend all convertibility of the dollar into gold; the present chairman, Alan Greenspan, is a student of Arthur Burns. Greenspan has been luckier; the end of the so-called Cold War has opened the financial borders of many formerly closed economies and the dollar circulates as the preferred currency of 'off the books' markets everywhere. On the official side, the books of all central banks are studies in circularities. Who or what determines the value of money? That is the question for *Good Money, Part II: The Standard.*

Stephen Kresge

ONE

A SURVEY OF RECENT AMERICAN WRITING: STABILIZATION PROBLEMS IN GOLD EXCHANGE STANDARD COUNTRIES[1]

It may seem surprising to Europeans, who envy the United States for the solidity of its gold currency, that the imperfection of the existing monetary organization is felt more strongly there at present than in any other country. Yet it is a fact that the best American economists are devoting themselves primarily to the task of circumventing the dangers with which these flaws confront the country. In most European countries, where gold currencies have collapsed, the problems created by monetary instability could be attributed to deviations from the gold standard. In the United States, however, where, in contrast to most other countries, gold currency has remained intact, the intrinsic weaknesses of the gold exchange system have manifested themselves most clearly. The relative stability of the gold currencies in the prewar period, which rested on the free movement of gold and on the competition of central banks for gold, has now vanished. As long as the gold standard is maintained in its present form, the United States will continue to be faced with a steady influx of gold, which threatens to overwhelm them with enormous price increases. This could easily lead to the opposite reaction, once European economies have recovered sufficiently to reverse the flow of gold in their direction. Only halfhearted and purely provisional measures have been mounted against this threat. In the face of present conditions, a decisive change must soon be introduced. It is in any case highly unlikely that the relative stability of the prewar period will ever again be attained. American economists are therefore actively pursuing more or less radical plans to reform the obsolete gold exchange system.

The true center of this attack and criticism is not the specific form of the gold exchange system but the organization of the monetary system as such. Therein seems to lie the seed for serious economic disruptions and business crises, as long as it is kept in its present guise. Reform must

[1][Published as "Das Stabilisierungsproblem in Goldwährungsländern" in *Zeitschrift für Volkswirtschaft und Sozialpolitik,* vol. 4, 1924, pp. 366–390. The translation is by Dr. Grete Heinz.—Ed.]

concentrate on this target if human production is to stabilize and the abundance of goods is to be increased to its maximum. According to Foster and Catchings,[2] the shortfall of production below its maximum because of fluctuations caused losses to the United States in excess of the combined income of all millionaires between 1877 and 1922, perhaps even in excess of the combined income of the 250,000 wealthiest people (to wit, persons with annual incomes in excess of $10,000). For many years these periodic disruptions of the economy and the period of depression that followed in their wake were accepted as unavoidable. Once their causes came to be understood, the search for a remedy was set in motion. As Wesley Clair Mitchell, probably the most prominent economist in this field, has stated:

> For since the money economy is a complex of human institutions, it is subject to amendment. What we have to do is to find out just how the rules of our own making thwart our wishes and to change them in detail or change them drastically as the case may require. Not that this task is easy. On the contrary, the work of analysis is difficult intellectually and the work of devising remedies and putting them into effect is harder still. But one has slender confidence in the vitality of the race and in the power of scientific method if he thinks a task of this technical sort is beyond man's power.[3]

Even without fully sharing Mitchell's optimistic views, one must give full credit to the great practical and theoretical advances in understanding and controlling business fluctuations that have taken place since the publication in 1913 of Mitchell's basic work on *Business Cycles*,[4] which ushered in a new stage in this sphere of research. The impetus given this branch of research by the severe postwar crisis of 1920–21 has been so great that today many American economists devote themselves primarily to its problems. A significant factor in its expansion was its close connection with practical business concerns, which in turn awakened businessmen's interest in related scholarly research. The theoretical studies on the business cycle fuelled the search for practical applications of the knowledge that had been gained and led to the establishment of commercial eco-

[2]William Trufant Foster and Waddill Catchings, *Money*, Research Publication No. 2 of the Pollak Foundation for Economic Research (Boston and New York: Houghton Mifflin, 1923).

[3]The quoted passage is a contribution by Wesley Clair Mitchell, which refers to proposed plans to mitigate business fluctuations, now that their causes are beginning to be known. In Lionel D. Edie, ed., *The Stabilization of Business*, with an introduction by Herbert Hoover (New York: Macmillan, 1923), p. 52f.

[4]Wesley Clair Mitchell, *Business Cycles* (Berkeley: University of California Press, 1913).

nomic forecasting services, whose function it is to help businessmen with their business planning. These services are already in wide use. Banks and large business concerns have also set up their own economic and statistical divisions to supplement by their own research data that is available for the public at large. With generous funding at their disposal, a number of independent economic research institutes have been founded and are doing excellent work, among them the National Bureau of Economic Research in New York, the Pollak Foundation for Economic Research in Newton, Mass., the Institute of Economics in Washington, D.C., and the Harvard Committee on Economic Research, which are already very productive.

We shall begin with a work that has been the object of lively discussion not only within the narrower circle of specialists but among a wider audience as well and that has served as the basis of a proposed bill[5] that has been seriously considered by the competent committee of the House of Representatives: Irving Fisher's *Stabilizing the Dollar.*[6] The basic features of Fisher's plan, which are developed in this book, have been popularized by his earlier work, *The Purchasing Power of Money,*[7] where it was outlined in the appendix. Meanwhile Fisher has offered improved versions in a number of articles, which in turn have led to an extensive discussion of his ideas in the United States and have contributed to shoring up many of Fisher's weak points. The present volume contains a plan to implement the proposed bill worked out in full technical detail and may therefore be considered Fisher's final version, since the proposed bill incorporates verbatim the text presented in the book.

This book, like all Fisher's other works, is composed with admirable pedagogic skill and has a very clear structure. The arguments in favour of stabilizing the purchasing power of money are marshalled so convincingly and the proposed remedy seems so compelling in Fisher's presentation that one sincerely regrets not being fully convinced of its flawless operation. Fisher's basic idea is well known: to counter movements in the value of money by changes in the gold content of the monetary unit. As he states in the introductory words to his legislative proposal, the dollar

[5]Known as the "Goldsborough Bill" after its sponsor. [Thomas A. Goldsborough (1877–1951), Representative from Maryland.—Ed.] See Hearings before the Committee on Banking and Currency of the House of Representatives, Sixty-seventh Congress, Fourth Session, on the Bill H. R. 11788 to stabilize the purchasing power of money, December 18, 19, 20, and 21, 1922, and January 29, 1923 (Washington, D.C.: Government Printing Office, 1923).

[6]Irving Fisher, *Stabilizing the Dollar. A Plan to Stabilize the General Price Level without Fixing Individual Prices* (New York: Macmillan, 1920).

[7]Irving Fisher, assisted by Harry Gunnison Brown, *The Purchasing Power of Money. Its Determination and Relation to Credit, Interest, and Crises* (New York: Macmillan, 1911).

should cease to be a constant quantity of gold with a variable purchasing power and become a variable quantity of gold with a nearly constant purchasing power. On the basis of an officially ascertained index number, a change in the weight of the gold unit should be decreed at regular, perhaps monthly, intervals, thereby reestablishing its purchasing power. If the index number were to increase by about 1 per cent during such an interval, the gold content of the unit would increase by 1 per cent and the converse. To avoid having to keep minting new coins to put into circulation, gold is to be replaced completely with notes, which can at any time be converted to the corresponding quantity of gold. To eliminate the possibility of speculation, conversion of gold into notes and of notes into gold would not be done at exactly the same exchange rate. In the latter case, the amount of gold would be slightly less, perhaps 1 per cent less, so that the span between these two relations would set an upper limit to the change in gold parity at any given time. Longer-term speculation would be minimized by the magnitude of the risk and by the failure to earn interest, at least with respect to speculation on a rising value of gold. The problem of keeping adequate reserves for the circulating notes with changes in the conversion ratio could be handled, to mention just one of Fisher's proposed alternatives, by the government's depositing a certain amount of notes with the banks and when the weight of the dollar rises, withdrawing and destroying an equivalent amount, so that the total remaining notes are still covered by gold when the new conversion rate takes effect. Conversely, when the gold content of the dollar is decreased, new notes will be put into circulation by deposits with the banks, until the full value of available reserves is reached. The change of the money in circulation immediately effected thereby would considerably increase the effectiveness of the intervention.

We cannot engage here in the lengthy theoretical disquisition that would be needed to deal critically with this seductive proposal. The feasibility or desirability of such a change in the modern monetary system hinges on the most complex and still unresolved questions of monetary theory. Suffice it to state here that Fisher's presentation fails to deal with the question whether an artificial stabilization of this sort is compatible with the role played by money.[8] This omission is all the more mystifying because Fisher insists that his proposal not only eliminates all monetary causes of price level fluctuations but goes so far as to emphasize[9] that the mechanism he envisages would be effective, whether or not price fluctu-

[8][Whether the stabilization of money is compatible with its functions was the subject of the thesis which Hayek undertook while at New York University in 1923, but which was not completed.—Ed.]

[9]*Stabilizing the Dollar,* op. cit., p. 215.

ations were triggered by irregularities in gold production or by problems on the commodity side. That is why it is difficult to imagine how his plan would work when a change in the production costs of a commodity requires a price change to reestablish equilibrium.[10] Both the accumulation of large stocks of goods at the end of a period of speculation, which calls for a liquidation, and a sudden general shortage of goods arising from an extremely poor harvest worldwide exemplify situations where the only feasible rapid adjustment is an abrupt price change. Might not the attempt to maintain the price level artificially, under these circumstances, merely postpone the unavoidable balancing of supply and demand, so that with each change in the gold content of the dollar new price movements would be required, and the system would have to be abandoned in the end? And in truth, would perfect stability in the purchasing power of money really be an ideal state of affairs? Should the aim not be, instead, to have the share of the social product assigned to each entity of the money in circulation vary in line with the expansion or contraction of the social product? Are average wholesale prices really an adequate expression of the value of money, whose stabilization is to be desired? Would such a change in the gold content of the primary money have a sufficient influence on the credit instruments based upon it in order to be effective? Fisher's book hardly clarifies any of these questions.[11] Although we cannot

[10][Keynes pointed out that Fisher's proposal would lead to instability of external change rates. This possibility would follow from the difficulty of simultaneously stabilizing both internal and external price levels. "If the external price level is unstable, we cannot keep *both* our own price level *and* our exchanges stable. And we are compelled to choose. In prewar days, when almost the whole world was on a gold standard, we had all plumped for stability of exchange as against stability of prices, and we were ready to submit to the social consequences of a change of price level for causes quite outside our control. . . . Nevertheless, there were powerful advocates of the other choice. In particular, the proposals of Irving Fisher for a Compensated Dollar, amounted, unless all countries adopted the same plan, to putting into practice a preference for stability of internal price level over stability of external exchange". J. M. Keynes, *A Tract on Monetary Reform* [1923], vol. 4 (1971) of *The Collected Writings of John Maynard Keynes,* Austin Robinson and Donald Moggridge, eds. (Cambridge: Macmillan for the Royal Economic Society, 1971), p. 168.—Ed.]

[11][Another question might be added to this list: How would the burden of cost from Fisher's stabilization scheme be paid for? Fisher himself was not unaware of the problem. It is worth quoting his footnote in full: "It will be noted that, if gold is depreciating, the value of the gold reserve diminishes and taxation (or other financing) is required to keep it up to 100 per cent. Under such circumstances the government is in the position of the holder of the perishable commodity. Its gold is like ripe fruit spoiling on its hands and the Treasury suffers a loss accordingly. It taxes the public to provide for the depreciation.

"The loss from gold depreciation is not, however, due to stabilizing the dollar and maintaining the reserve. The same loss, in some form, occurs whenever gold is depreciating and whether or not the dollar is stabilized. Under our present system the loss falls on the individual holder of gold certificates instead of on the government treasury. Every dollar of these certificates now in our pockets shrinks in purchasing power whenever gold depreci-

pursue them any further here, we feel that our ignorance about money is too great to give unqualified approval to Fisher's plan. Fisher's proposal will certainly give a strong impetus to the discussion of these problems, and the book, which contains not only the proposal but a very valuable compilation of material, is in any case a most significant contribution to economic knowledge.

In view of the importance attributed by Fisher to index numbers for the new regulation of the monetary system, it is natural that he set out next to refine this instrument for measuring the value of money and to investigate and present the methods used in determining index numbers. It is Fisher's reiterated conviction—a conviction shared by many others—that the newly developed index for measuring price, output, employment, etc., movements offers a suitable basis for accurately determining the quantity of money the economy needs to advance steadily and to maintain price level stability. We shall therefore turn our attention next to research in index numbers, which are the underpinnings of this conviction. Before we come to Fisher's work on this subject, we must first examine an earlier and more comprehensive work than Fisher's monograph, which is limited to statistical methods for determining index numbers, in fact to one specific aspect of the question, in line with the overriding importance he attaches to their use. In "The Making and Using of Index Numbers",[12] on the other hand, Wesley Clair Mitchell deals with the entire question, discusses its history and importance, and rightly introduces his presentation of the methods for determining index numbers with the comment that the method must be compatible with their purpose and that no single index number can be adequate for all purposes.

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ates. To stabilize the dollar simply affords a specific measure of this loss, and the operation of maintaining the reserve translates that loss into taxes.

"The same principle applies to the opposite case. Under our present system, when gold appreciates every individual holder of gold certificates receives an increment of value. The gold certificates grow in value in our pockets. Under the system of a stabilized dollar, and a constant 100 per cent reserve, the government treasury would reap this advantage and bestow it back on the public by lightening, by that much, the tax burden.

"Thus, maintaining the reserve constant at 100 per cent merely changes the form of the gain or loss always involved when the gold in existence varies in value. Any gain or loss, under the stabilization plan, would simply be more conspicuous than at present, entering as it would into government accounts.

"Such gain or loss must, of course, not be confused with the gains and losses of contracting parties which would be annihilated altogether by stabilization". *Stabilizing the Dollar,* op. cit., p. 129n.—Ed.]

[12]W. C. Mitchell, "The Making and Using of Index Numbers" in *Index Numbers of Wholesale Prices in the United States and Foreign Countries,* US Department of Labor, Bureau of Labor Statistics Bulletin No. 284 (Washington, D.C.: Government Printing Office, 1921).

Here he intentionally rejects Fisher's and C. M. Walsh's view that index numbers serve mainly to measure changes in the general purchasing power of money and that the object is to create a generally applicable index number. Since Mitchell, on the contrary, considers index numbers as the instrument of choice for the investigation of business cycles, he emphasizes that specific index numbers are valuable for specific purposes and believes that the problem of measuring the purchasing power of money has been too little investigated. In his view, it would impede further progress to insist on a single interpretation and therefore on a single 'best' solution to this problem. Mitchell dwells fully on the selection of data for constructing the index number, the nature of the prices and commodities to be included, demonstrating by means of the various American index numbers how the choice of data affects the path of the index curves. His personal experiences in studying the business cycle enable him to turn this section into what is probably the most valuable part of the book. He then takes up the mathematical and statistical problems connected with index numbers—weighting, averaging, periodicity of the index numbers thus obtained—with characteristic restraint and a critical mind. This part of the book will not be considered here in detail, as this topic is treated much more fully in Fisher's book, to which we shall turn next. We will also postpone Mitchell's evaluation of the 'ideal formula' evolved by Bowley-Pigou-Walsh-Fisher until we reach the corresponding part of Fisher's book. Mitchell concludes his work with a discussion of the most important wholesale commodity price index numbers published in the United States. The second part of this volume contains a very useful compilation of worldwide wholesale price indexes and a bibliography.

Mitchell's treatise on the whole question of price index numbers must be considered the best available general treatment of the subject, but for the narrower topic treated by the book we are considering here, Fisher's *The Making of Index Numbers,*[13] the latter work deserves this commendation. Fisher's book concentrates almost exclusively on finding the most appropriate mathematical formula for calculating index numbers and might be better viewed as a treatise on statistical averages as applied to prices than as a complete presentation of the method for determining index numbers. This topic has never before been treated with this degree of thoroughness and completeness. Starting out with the six basic formulas for average values, five of which, the arithmetic, harmonic, and geometric means, the median, and the mode, are more or less widely used,

[13][Irving Fisher, *The Making of Index Numbers. A Study of Their Varieties, Tests, and Reliability,* Research Publication of the Pollak Foundation for Economics Research, No. 1 (Boston and New York: Houghton Mifflin, 1922).—Ed.]

and a sixth, the newly introduced 'aggregative' average, which is the index of the price sums, Fisher studies 134 different formulas—some familiar, some new—for determining average values and tests their reliability. He applies the formulas to the data for 36 wholesale commodities for the years 1913 to 1918 selected from statistics compiled by Mitchell for the War Industries Board on prices and quantities of 1474 commodities.[14] Since these numbers included not only prices but annual sales of the commodities in question, Fisher had the data he needed to test all the different theoretically conceivable methods of weighting individual factors. In addition to the two most obvious methods, weighting of commodities in terms of their relationship to the total value of commodities sold either in the initial year or in the particular year, he introduces two additional combinations by combining the prices in the initial year with the quantities of the particular year and the quantities of the initial year with the prices of the final year. He thus obtains four weighting systems, which he combines with all six average values (except the aggregative average, which can be used only with the first two). He thereby obtains 28 different 'primary' formulas including the unweighted, or, as he more accurately designates them, simply weighted, formulas, which serve as the foundation for his subsequent research. When these formulas are applied to the wartime data, where fluctuations in prices and quantities are admittedly far more marked than in peacetime years, the various formulas display significantly divergent results within this five-year interval. There is a maximum discrepancy of 24 per cent between the simply weighted median value (190.92) and the harmonic mean weighted by the last-mentioned method (166.85). And this analysis was limited to series in which all numbers referred to a specified initial year; the divergence would have been even more pronounced if series determined by the chain system had been included.

In view of this marked difference in results, Fisher seeks a standard for establishing the relative utility of the individual formulas. This standard proves to be the ranking of each formula by the 'reversibility test', which can show the presence of a disruptive deviation tendency, though it cannot establish the correctness of a formula. The first of these, which he and others had already applied previously, is based on the assumption that the order in which each link in the chain is determined does not affect the relationship of the results. Thus, if one assumes that a given index number refers to the initial rather than the particular year and

[14]History of Prices during the War. War Industries Board, Bulletin 1–57 (Washington, D.C.: Government Printing Office, 1919).

calculated back from it, the result should be the reciprocal value of the index number initially obtained. Fisher's examination demonstrates that neither the arithmetic nor the harmonic mean passes this test, and that the geometric means, the median, and the mode, as well as the 'aggregative' mean pass the test only when they are not weighted. Fisher's interesting new second test leads to even more unfavourable results. To distinguish it from the first test, the test for time reversibility, Fisher calls this second test the test for factor reversibility. This test can be applied only where not only prices but quantities are known for all years under consideration, as was true for the data examined by Fisher. This test is based on the recognition that the relation between the total price for a given year of the commodities sold included in the index and the total price for the initial year of these commodities must be the same as the relationship between the product of the price and quantity indices of the initial year and that of the given year. The test consists in reversing the order of prices and quantities in the formula for the price or quantity index, multiplying the result of the original formula with the derived formula and comparing the product with the relationship of the total values, with which it should coincide. All of the above formulas fail to comply with this requirement to a greater or smaller extent. Neither the result of the first nor that of the second test gives any indication about the magnitude of the deviation of the index numbers computed by these formulas; the tests only indicate the sum of the deviation of the pair of formulas used in the test. In the course of his investigation, however, Fisher succeeds in demonstrating that 18 of the formulas under consideration have an inherently positive or negative bias and explains why. He also points out that ten of these 18 and four of the remaining formulas are also highly irregular and 'freakish', which is true to some extent for all the formulas.

Just as the index numbers obtained by the reversibility tests 'which differ from the original index numbers' can obviously be expressed in terms of the initial index numbers and will then reflect an inverse deviation from the ideal value as the original index number, this newly derived index number can also be calculated directly from the initial one by a formula derived from the previous formula by the same reversal and reduction process. Thus each of the previous formulas has an 'antithetical' formula. For the time reversibility test, as can easily be proved algebraically, the new formula will be one of the familiar formulas, such as the different formulas for the harmonic mean from the arithmetic mean, and the converse. For the factor reversibility test, on the other hand, a new formula is created for each of the existing primary formulas, so that the

number of formulas, after the elimination of duplicates (certain weighted formulas for the arithmetic and harmonic mean and the 'aggregative' mean are identical), is raised to 46. The deviations confirmed by the two tests and which are the inverse for each of the antithetical formulas can now be corrected by calculating both averages and deriving a geometrical mean therefrom. The result thus obtained meets the requirements of the reversibility tests. By 'cross-breeding' and possibly even double 'cross-breeding' the geometrical mean of the antithetical formulas, which Fisher views as new formulas, he obtains formulas that comply with either one or both tests and thus creates a series of derived formulas that rises first to 96 and finally, through further combinations, to 134, which we shall not discuss here.

The derivation we have presented already allows some judgement about the value of specific formulas, since some clearly suffer from inherent deviating tendencies, which may even be doubled because of the combination of a given type of average with a given method of weighting, while other formulas pass at least one of the two tests. All the formulas can be corrected by cross-breeding that eliminates any sort of deviating tendency. Fisher further verifies this result by applying all 134 formulas to the data for the years 1913 to 1918 and comparing the resulting values. These values confirm his theoretical findings to a surprising extent and lead to an additional sifting of formulas. Some of the formulas that fail to meet both tests often show markedly different and irregular values, notably the unweighted averages and the formulas derived from the mode and the median. The index numbers obtained from the corrected formulas, which meet both tests, on the contrary yield curves that are in nearly complete agreement. Fisher considers not only these 13 formulas but no less than 39 formulas as very good, excellent, and superlative in the nearly complete coincidence of their results. Fisher selects formula 353 as the one that most fully complies with the test. Formula 353 is the geometric mean of the 'aggregative'

$$\sqrt{\frac{\Sigma p_1 q_0}{\Sigma p_0 q_0} \times \frac{\Sigma p_1 q_1}{\Sigma p_0 q_1}}$$

for the initial and the particular year, where p_0 and q_0 refer to prices and quantities in the initial year and p_1 and q_1 to those in the particular year. The value yielded by this formula turns out to be the one around which all others cluster most tightly. However, as many as eleven curves are in such good agreement that there would be little reason to give preference to formula 353, were it not for the fact that the latter is also by far the simplest to obtain. In addition to the 39 formulas Fisher classifies as very good, there are another 45 formulas that agree well enough to be per-

fectly acceptable for most purposes. The remaining formulas are designated as bad or worthless, among them both the unweighted arithmetic mean and the unweighted mode as well as the unweighted aggregative mean. All the unweighted averages qualify as poor, but Fisher concludes that in the absence of weighting data, the median, the geometric mean, and the formula derived from combining the arithmetic and the harmonic mean are the least objectionable. He rejects the simple arithmetic mean unconditionally as capricious and subject to a double deviating tendency.

The largest probable error for the ideal formula and the almost equally accurate other formulas is estimated by Fisher not to exceed one in a thousand. He therefore feels, quite rightly, that all difficulties in selecting the appropriate mathematical formula for computing index numbers have been surmounted. In his opinion the inherent error connected with the index number computation is negligible when the right formula is used and no larger than the error incurred for many physical measurement methods. He stresses, furthermore, that the ideal formula is superior for all purposes and rejects the possibility that for other purposes than the measurement of the overall price level, other formulas might be more appropriate. Mitchell, on the other hand, points out (see above) that this formula is best suited for measuring the value of money in general, which Fisher had in mind, but that it is not always suitable for observing the price movement of specific groups of commodities because the weight assigned to individual commodities often changes from year to year, so that comparisons over longer periods would not be feasible. Others have also noted this difficulty.

In the course of his investigation, Fisher rejects the so-called 'circular test', which he and others had previously supported. This test requires that index numbers calculated indirectly for an intermediate year coincide with the index numbers calculated directly. He now asserts that this test, which requires that index numbers calculated from a fixed basis and those calculated by the chain method show the same relationship for specific years, has no theoretical justification. He notes, however, that the formulas classified as superior by his classification largely comply with this stipulation as well. Perfect coincidence can be expected only when weighting remains constant.

Fisher has also looked into the question of computation speed for the different types of index numbers. On the basis of his findings, he concludes that the 'ideal formula' would require 14.3 hours for the data in question, compared to 9.6 hours for formula 2135. He therefore recommends this formula, which ranks 16th for computation speed rather than the "ideal formula", which ranks 28th, for practical applications. Formula

2135, which ranks fourth for accuracy, is closely related to the ideal formula and has this form:

$$\frac{\Sigma(q_0 + q_1)p_1}{\Sigma(q_0 + q_1)p_0}$$

In the next to the last chapter, Fisher briefly discusses the problem of selecting representative commodities and prices and tests the relative significance of using data differing in number and kind of items for four commonly used index numbers. He then compares the impact of data selection with the effect of using different formulas in the computation of the index numbers and concludes that the impact of using unreliable formulas on the resulting values is much greater than the influence of using wrong data. The Sauerbeck index numbers published in the *Statist,*[15] for example, have a 31 per cent deviation for the years 1913 through 1920 because they use a bad formula, whereas a flawed data selection would contribute a maximum of 1 to 2 per cent error.

Fisher's book is easy to read and use as a reference work because of its systematic structure and a very practical memnotechnic system for identifying the different formulas. The voluminous appendix contains not only detailed, mainly mathematical, annotations to the text and the complete tabulated data for the formulas examined and their results, but also a short history of index numbers with a list of the most important ones ever utilized in practice, as well as a short bibliography. The tremendous amount of work that has gone into this book and the successful completion of the task the author had set himself give this book its monumental character and make it for years to come the most complete and fundamental book on the narrow topic to which it confines itself. It is to be hoped that the purported preparation of a German translation will soon be confirmed and that the book can then be more extensively reviewed in this journal by a qualified specialist with more space at his disposal than is available in this kind of collective review.

The book to which we turn next, like the two previously discussed works, does not deal primarily with price and business fluctuations, though this field remains its ultimate target. It too is conceived as a supporting study which focuses on a separate, self-contained area. The book to which we refer is the second volume in the publications of the Pollak Foundation, Foster and Catchings's *Money.*[16]

[15][Wholesale price index established by Augustus Sauerbeck for the period beginning 1846, published monthly in the *Statist,* London.—Ed.]

[16]William Trufant Foster and Waddill Catchings, *Money,* Pollak Foundation Research Publication No. 2 (Boston and New York: Houghton Mifflin, 1923).

Any new book on monetary theory tends to arouse strong misgivings in the specialist, more so than is true in most other fields of economic research. The fact that this new book contains a profusion of diagrams illustrating the circulation of money and other graphics tends to fuel even greater suspiciousness. The reviewer is therefore particularly happy to be able to express unconditional approval for such a work.[17] The book by Foster and Catchings achieves its explicit purpose of providing an easily accessible introduction to the monetary system in a felicitous way. At the same time, the book makes a valuable contribution to the scholarly literature, which lies less in presenting new ideas than in portraying the role of money in the economy in terms of recognized principles and in highlighting problems suitable for further research. The authors accomplish the rare feat of combining harmoniously theoretical and practical insights in one volume. That is why the book promises to appeal to a wide circle of readers in the United States and to serve as an effective weapon in the educational campaign directed against reform projects with a built-in inflationary bias that still have wide support. The collaboration of a scholar and a businessman—Mr. Foster is a former university professor and currently heads the Pollak Foundation, Mr. Catchings heads several industrial firms—largely explain its success. As was true of the above-discussed work by Fisher, this book went into a second edition less than a year after its publication.

The book, which does not cover purely technical aspects about the organization of the monetary system, concentrates on the laws governing the purchasing power of money and on the impact of changes in the value of money. The basic concepts are cogently defined in the first few introductory chapters, which also trace changes in the value of money and their impact. These chapters reveal the skill with which the authors use the findings of research in price theory as a key to the understanding of all economic problems. In line with the newer American school, the authors use a dynamic perspective in which money is viewed not as an unessential element, as is the case from the standpoint of a static economy, but as a key feature: A good understanding of its operation constitutes an indispensable starting point for understanding all economic phenomena. In subsequent chapters the authors assail all types of inflationary policies on the basis of this analysis. They focus on the various methods of war financing, either through direct inflation or by govern-

[17][Hayek's praise for this work contrasts sharply with his later attack on Foster and Catchings in "The Paradox of Saving", *Contra Keynes and Cambridge,* Bruce Caldwell, ed., vol. 9 of *The Collected Works of F. A. Hayek* (Chicago: University of Chicago Press, and London: Routledge, 1995), chapter 2.—Ed.]

ment borrowing, all of which result in the debasing of money. Edison-Ford's "commodity money"[18] is singled out for detailed criticism as one of the latest inflationary schemes. A stable value is consistently stressed as the crucial feature of an ideal monetary standard, and the gold exchange standard falls short in this respect, as the authors demonstrate. The first part of the book contains an excellent chapter on the "balance of trade fallacy", with respect to which the authors rightly point out that the only advantage of a positive trade balance is that it enables the country to maintain a negative trade balance at a later time.

The book then takes up the determinants of the value of money and the connection between business-cycle phenomena and the value of money. The authors' views on the difference between the laws governing a non-monetary and a monetary economy, which we mentioned earlier, are expounded in this context. Money is visualized here as postponed purchasing power. Whereas in a non-monetary economy supply and demand must always be exactly balanced, the intervention of money disrupts this perfect balance. In the long run, a given level of production can be maintained only if money spent on consumption matches expenditures on production. Money's circulation from one consumption cycle to the next emerges as the pivotal economic problem, which must be investigated in order to understand the determinants of the fluctuations in the value of money and the decisive factors in business cycle fluctuations. Graphic representations in the form of diagrams are used to clarify the forces determining this cyclical process. The authors' position on the quantity theory of money follows from this perspective. Fisher's equation of exchange is accepted as a fact, but a fact without explanatory significance. The authors substitute the time lag between the first and the second use of a monetary unit for the velocity of money in their value theory. The theory of money expounded in the book is very much along the same lines as that of Wieser and his school,[19] though no trace of this

[18][During the depression of 1920–21 in the United States, there was a strong movement to introduce a "managed currency" by using fiat money. Henry Ford (1863–1947) urged the federal government to finance completion of the Muscle Shoals dam by issuing paper money which could gradually be retired from the rent he would pay to lease the dam. Thomas Alva Edison (1847–1931) supported Ford and made a more general proposal of a "commodity money" or fiat money plan. Edison's proposal was a version of an idea which had surfaced in the platform of the Populist movement and was later to be given a more articulate argument in Benjamin Graham's *Storage and Stability* (New York and London: McGraw Hill, 1937), which Hayek supported in his essay, "A Commodity Reserve Currency", for which see *Good Money, Part II,* vol. 6 of *The Collected Works of F. A. Hayek,* op. cit.—Ed.]

[19][Friedrich von Wieser (1851–1926) was Hayek's teacher in Vienna. See Hayek's memorial essay in *The Fortunes of Liberalism,* ed. Peter G. Klein, vol. 4 of *The Collected Works of F. A.*

similarity transpires in the otherwise carefully done bibliographic annotations. Notwithstanding the cautious and restrictive formulation of the quantity theory of money and certain critical comments on it, the authors fully recognize its practical value. The chapters on this subject are useful reading for anyone inclined to dismiss the quantity theory as simplistic.

The second major insight derived from examining the cyclical movement is the connection between its determinants and the course of the business cycle:

> Money spent in the consumption of commodities is the force that moves all the wheels of industry. When this force remains in right relation to the volume of commodities offered for sale, business proceeds steadily. When money is spent faster than the commodities reach the retail markets, business booms forward. When commodities continue to reach the retail markets faster than money is spent, business slackens. To move commodities year after year without disturbing business, enough money must be spent by consumers, and no more than enough, to match all the commodities, dollar for dollar.[20]

Taking the basic ideas expressed in this passage as their starting point, the authors investigate the individual factors that are inclined to speed up or slow down the circulation of money and thereby disrupt the balance between the supply of money and commodities. A general overproduction which would be inconceivable in a non-monetary economy may manifest itself within a monetary context when in times of expanded production the increased gross income of the producers is spent too slowly to raise consumer purchasing power to the same level as the expanded production. It is rightly objected against several crisis theories in vogue that an increase in the earnings of entrepreneurs or an intensified investment activity is not enough to trigger a crisis, as long as the money collected is reutilized without a time lag. The true explanation is claimed to lie in the fact that profits, especially profits by business enterprises, can be disbursed only after all the goods have been sold and often after considerable delay.

It would be very difficult to do justice in a few sentences to the business cycle theory that the authors deduce with great care from their exposition of the circulation of money. Since the next in the series of the publications

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Hayek, op. cit., chapter 3. At this time, Hayek was providing assistance to W. C. Mitchell for an introduction to a translation of Wieser's *Social Economics.* In 1915, Mitchell had written an appreciative review of *Social Economics,* later reprinted in W. C. Mitchell, *The Backward Art of Spending Money* (New York and London: McGraw Hill, 1937).—Ed.]

[20]Foster and Catchings, *Money,* op. cit., p. 277.

by the Pollak Foundation[21] happens to develop this same basic idea at greater length, we will postpone a fuller discussion of it here and only say a few words about the authors' constructive proposals in the last chapter of their book. In their view, Fisher's proposal discussed earlier does not act with sufficient speed to alleviate fluctuations in prices within a phase of the business cycle and particularly to ward off the imminent threat of inflation in the United States as a consequence of its enormous stock of gold. They also raise the above-mentioned objection that in the case of a general stagnation of trade, a sudden drop in prices, which Fisher's plan is supposed to prevent, may be the only way to avoid a persistent stagnation of production. They make the counterproposal that all the forms of money circulating at this time in the United States be merged into one currency[22] and that the quantity of money in circulation, without eliminating its convertibility into the specified weight of gold, be regulated on the basis of the wholesale price index. In the face of rising prices, the government would sell securities in the open market, and in times of falling prices, it would buy securities in the same way, thereby either withdrawing or bringing into circulation the requisite amount of currency, which would consist exclusively of United States notes.

One of the latest issues of the *American Economic Review* contained a more detailed description of a similar plan by Carl Snyder:[23] In Snyder's plan, all circulating paper money would become the only legal tender and the only reserve held by the banks, but it would be fully convertible into gold, while gold itself would lose its property as money. The total hoard of gold held in the banks, the Treasury, and as reserves in the banks (over four billion—nearly half the entire gold reserve worldwide) would be collected as a reserve in the Treasury, with which to redeem notes in circulation. The quantity of notes in circulation, however, should not be at the mercy of chance inflow of gold or the presentation of notes offered for redemption. The quantity of notes should be regulated on the basis of the wholesale price index, which at most might be adjusted for production, employment, and sales index numbers. Alternatively, or additionally, the discount rate and the purchase and sale of treasury bills and bonds by the Federal Reserve Banks on the open market might be used to regulate the quantity of money in circulation. These measures would be set in motion under the law so that a price level rise of 1 per cent

[21][Hudson Bridge Hastings, *Costs and Profits. Their Relations to Business Cycles,* Pollak Foundation Research Publication No. 3 (Boston and New York: Houghton Mifflin, 1923).—Ed.]

[22][At this time, there were ten kinds of 'dollars' in circulation in the United States, including gold coins, silver dollars, and Federal Reserve notes.—Ed.]

[23]Carl Snyder, "The Stabilization of Gold: A Plan", *American Economic Review,* June 1923, pp. 267–285.

would automatically raise the discount rate by 1 per cent and possibly also or instead compel the Federal Reserve Banks to reduce their holding of bonds and bills by about 100 million dollars, and the converse. Should prices increase more drastically, the same measures might be taken with increasing vigour, though in Snyder's opinion this would rarely be necessary. He believes that these steps would bring an inflationary process to a halt within three to four months at most. His plan provides for a registration of all gold imports and exports and American bank notes, to enable banks to compensate for this change in the quantity of money in circulation by the appropriate purchases or sales, as mentioned above.

Objections to all proposals of this sort are self-evident. The proposals assume that the United States is willing to purchase the entire world surplus of gold during a period of rising prices and to keep it until a decline in gold production triggers a fall in world prices and thus induces export of gold from the country with stable prices. If a period of declining prices should persist for a longer period, however, thereby putting the gold reserves of the United States under a more severe strain than seems compatible with its own security, and should this outflow of gold not produce a sufficient rise in prices in other countries, the system could hardly be maintained without abandoning the gold standard, since in the unlikely case that the United States bought large quantities of gold, say with a loan, this would result in a further escalation of gold prices and an enhanced export of gold from the United States. Such a possibility seems rather farfetched at this point. Hence it does not seem implausible that the prospect of further rises in prices in the near future, the enormous current American gold reserves, and the widespread desire to attain greater price stability will lead to the implementation and longterm maintenance of such a plan. Quite possibly American experiences will later enable us to abandon completely this perilous gold exchange standard, before this hybrid creature, on which we are relying temporarily, collapses.[24]

We mention here Carl Strover's little book *Monetary Reconstruction,* which also exists in a German edition,[25] only because it is symptomatic of the widespread interest in the stabilization of the purchasing power of

[24]An investigating committee of the National Monetary Association including most of the American economists concerned with the reform projects is currently working on the draft of a stabilization plan. This draft is attempting to meet all possible objections and to represent the views of all its members, so that its immediate implementation can be recommended. The committee's report is eagerly awaited.

[25]Carl Bernhard Wittekind Strover, *Monetary Reconstruction* (Chicago: published by the author, 1922); *Neugestaltung des Geldwesens,* trans. H. O. W. Strover (Berlin: Deutsche Verlagsgesellschaft für Politik und Geschichte, 1923).

money. The work offers an unpolished, unprofessional version of a proposal known for decades regarding the use of non-convertible paper money and the regulation of its quantity in circulation in order to preserve a stable price level. The basis for this proposal is a hazy theory about taxes as the foundation for the value of money, a theory that is difficult to reconcile with the quantity theory of money, which is accepted as self-evident. The fact that this booklet was printed at the author's own expense may vouch for his self-confidence and may do its share to propagate the notion of stabilizing the value of money in circles not prone to read scholarly writings, but it will hardly do much to clarify any of the complicated scientific problems linked with this question.[26]

H. B. Hastings's *Costs and Profits, Their Relations to Business Cycles*[27] and Foster and Catchings's *Money*[28] are both components of a unified system. Hastings's book relies heavily on the monetary theory expounded in the book by Foster and Catchings, which for its part builds on the business cycle theory presented in Hastings's work. Hastings's basic thesis is that globally the amount of money spent by the commodity-producing industries must be equivalent to the price of all the products globally brought to market, if production is to be maintained at a steady pace. Hastings proceeds to examine in detail what causes disrupt this equilibrium. He first describes the well-known sequence of events when both demand and prices rise and both merchants and producers increase their orders. They do so not only to meet the increased consumer demand but also to expand their inventory and to prevent further rises in prices and bottlenecks in subsequent deliveries. As a result, production rises disproportionately faster than consumer demand, and as soon as this demand abates, it becomes apparent that there is inadequate demand for the volume of production attained. This leads to an oversupply, which induces a drop in prices, which could trigger a commercial crisis all on its own.

The accumulation of surplus inventories is aggravated by a further circumstance, to wit, the ultimate consumers' lagging capacity to keep up with the torrent of finished products reaching the market. According to Hastings, there are three main reasons for this occurrence. Part of the blame lies with the way certain cost elements are handled in periods of growing prosperity. When purchases increase, the balance between the

[26][Hayek's preference for a gold standard at this time leaves his criticism of Strover unduly harsh and notably unprescient. After 1973, the value of the US dollar could only be maintained by tax revenues.—Ed.]

[27]Op. cit.

[28]Op. cit.

value of the current product and expenditures for material is disturbed by buying materials on credit and neglecting repair and improvement of fixed capital, thereby impeding the disbursement of the full costs and its utilization for consumption. Applying funds to the expansion of the production apparatus and other investments in fixed capital does not lead to the use of earnings for the coverage of the costs of consumption goods before they have passed through the hands of consumers and therefore the balance between the flow of purchasing power to consumers, and the stream of goods to the market is not affected thereby. However, when amounts budgeted for repair, etc., are used to produce consumption goods, there results a 'short circuit' in the circulation of money and the relationship between the supply of goods and purchasing power on the consumption goods market becomes less favourable for the latter. But probably the major share of the blame lies in the way profits are put to use to pay for additional production costs. Aside from these two factors, which definitely disrupt the balance between the commodities and disposable money on the consumption goods market, a whole set of other business practices also contribute to increasing the lag between the time that the sums paid out by firms as costs or profits reach the hands of the consumers, thus leading to an accumulation in the inventory of consumption goods. The most important reason in this respect is the interlocking ownership of shares and bonds within various companies. The combined impact of all these elements is first elucidated by Hastings by means of schematic bookkeeping illustrations and then verified by the financial statements of three randomly picked firms in the boom year of 1919. Even external sources such as bank loans are incapable of compensating indefinitely for the purchasing power deficit in terms of the currently produced commodities when all the above influences are at work. Any expansion of the money supply, in fact, accelerates the process of inventory accumulation by causing prices to rise and thus delays the flow of money to the consumer. When bank credit has reached its maximum expansion, the point is generally reached when the discrepancy that has arisen between production and actual demand culminates in a crisis. The author cites one additional explanatory factor. Because speculation affects only physical commodities and because of other reasons, production of commodities can expand faster than production of services. Since part of the demand derived from this surplus production is directed not towards commodities but towards services, demand for the surplus commodities is insufficient and a drop in prices must finally make itself felt. No matter which of these causes induces prices to drop, the decline is accelerated by panic selling, retailers cancel all but their most essential orders in view of their large stocks and of the expected further decline in

prices, and the period of depression will continue until the accumulated inventories are exhausted. As industrial activity gradually regains momentum, the purchasing power of the population also rises again.

Hastings's crisis theory is actually a new version of the overproduction theory, but, contrary to most theories of this kind, it contains no logical contradictions. The conditions described in this volume undoubtedly have a substantial influence on the course of the business cycle. Nevertheless, it can hardly be considered a complete and satisfactory explanation of business cycles. The fact that the research is largely based on the assumption of constant prices and that it fails to take into account differences in the elasticity of demand for different commodities introduce unrealistic elements. Important aspects of the conclusions are valid only if complete vertical consolidation existed in the different branches of industry. Nevertheless this study is far more painstaking in its analysis of the relevant factors than any previous investigation of the subject. The author can hardly be blamed for the arduous and tiring work that is demanded of the reader—the brunt of the responsibility must be borne by the unusually arid yet complex subject matter. Any specialist willing to devote his full attention to the book will be rewarded by a wealth of stimulating ideas and a glimpse of many new problems, even if he fails to go along completely with the author's findings.

An additional volume (volume 5), O. W. M. Sprague's *Bank Credit and Business Cycles,* will supposedly round out the Pollak Foundation's series on business cycle theory. Although this publication has been promised for 1923 and should in many respects be the most interesting contribution of the series in terms of subject matter and the author's qualifications, it is not yet available for review as this article is being completed (February 1924).[29]

W. A. Berridge's *Cycles of Unemployment,*[30] volume 4 in the Pollak Foundation's series and the recipient of one of the Foundation's awards, is essentially an examination of the statistical tools for keeping track of changes in unemployment. Since there exists no comprehensive statistical record of unemployment in the United States, Berridge attempts to evaluate its relative magnitude by constructing an index number from the available local data. When his curve for the changes in unemployment is compared with the changes in the index numbers of industrial activity, it appears

[29][The Sprague volume was not published.—Ed.]

[30]William Arthur Berridge, *Cycles of Unemployment in the United States, 1903–1922,* Pollak Foundation Research Publication No. 4 (Boston and New York: Houghton Mifflin, 1923).

that the former is less variable than the latter. The difference is largely attributable to deficiencies in the data used for the construction of the employment index and evaporates almost completely when this error is rectified, so that the employment index may be used as a reliable index for changes in production.

The works discussed so far have on the whole been specialized theoretical studies which give some idea of the scholarly contribution economic research into the swings of American business activitiy has made, but they give no indication of the direct practical impact of the research. The two works to be examined next exemplify the great impact of the advances in economic knowledge on American business practices. Several large and progressive-minded companies have been surprisingly successful in adapting their production to business fluctuations and in maintaining a large measure of stability even during the severe convulsions of the 1920 slump, as can be seen from various contributions both to Edie's *Stabilization of Business*[31] and to *Business Cycles and Unemployment.*[32] Both volumes were stimulated, at least indirectly, by the experiences of that year. Edie's collection caters to the business community's interest in stabilization methods aroused by these events, and *Business Cycles and Unemployment* came into being in response to a resolution passed at the Conference on Unemployment convoked in 1921 by President Harding to remedy the prevailing high level of unemployment.[33] The volume consists of a report by the committee named by this conference and of the findings of an investigation conducted by the National Bureau of Economic Research under the direction of Professor W. C. Mitchell.

The numerous interesting articles contained in the two volumes cannot be discussed individually in this review, so that only a few will be singled out to characterize the two publications. Professor Mitchell's contributions deserve particular mention, all the more since his main work on this

[31][*Cycles of Unemployment in the United States,* op. cit.—Ed.]

[32]*Business Cycles and Unemployment,* Report and Recommendations of the President's Conference on Unemployment, including an investigation made under the auspices of the National Bureau of Economic Research, with a Foreword by Herbert Hoover (New York: McGraw Hill, 1923).

[33][In 1921, then-Secretary of Commerce Herbert Hoover suggested convening a conference to study the problems of unemployment. President Harding and Secretary Hoover were against the use of federal subsidies and urged voluntary and local action. The conference divided into ten committees. Each made a report to the whole conference. From these reports, recommendations were drawn and submitted to the President and were eventually made public. To implement the recommendations, Harding created a Bureau of Unemployment in the Commerce Department.—Ed.]

topic has been out of print for many years and is therefore completely unavailable. His chapter in *Stabilization of Business* in particular exemplifies his masterly skill in presenting the complex phenomena associated with the swings of the business cycle. The chapters may well constitute the best available summary of his analytical method. Characteristically, Mitchell shows the interaction of all the elements involved in the recurrence of periods of prosperity and depression rather than focusing on a single cause. The second volume under discussion here also contains an introductory chapter by Mitchell that gives the essence of his theory; elsewhere he gives an overview of all proposed reforms and an evaluation of global economic losses due to business cycle phenomena written in collaboration with the statistician W. I. King.[34] Among other contributions by economic theorists, I. Fisher's briefly outlined proposal for stabilizing the dollar and E. R. A. Seligman's discussion of international problems of economic stability in the Edie volume[35] deserve special mention.

There are a number of contributions on statistical problems, notably in *Business Cycles and Unemployment,* the discussion on unemployment statistics by W. A. Berridge,[36] the author of the above-mentioned book on unemployment cycles. O. W. Knauth's article in the same volume on statistical indices on the economic situation and their usefulness is a very precious source of information.[37] Here Knauth reviews and evaluates all the reports on economic conditions and business forecasts regularly published in the United States. The article by L. D. Edie, "The Coordination of Production and Marketing" contained in the volume published under his editorship, fulfills a similar purpose by discussing the relevance of available data to the problems of individual businessmen. Most of this article, however, deals with the stabilization techniques in use and therefore really belongs more properly in the group of contributions on practical stabilization proposals which fill most of the two volumes.

[34][Willford Isbell King (1880–1962), a professor of economics and statistics at the University of Wisconsin, also served as a statistician for the US Public Health Service and advisor to the Bureau of Agricultural Economics.—Ed.]

[35][E. R. A. Seligman, "International Problems in Business Stability", in Edie, *The Stabilization of Business,* op. cit. Edwin Robert Anderson Seligman (1861–1939) was McVickar Professor of Political Economy at Columbia University. He was founder and president of the American Economics Association, president of the American Association of University Professors, and editor-in-chief of the Encyclopedia of the Social Sciences.—Ed.]

[36][W. A. Berridge, "What the Present Statistics of Unemployment Show", in *Business Cycles and Unemployment,* op. cit., pp. 43–66.—Ed.]

[37][Oswald Whitman Knauth, "Statistical Indexes of Business Conditions and Their Uses", in *Business Cycles and Unemployment,* op. cit., pp. 361–377. Knauth (1887–1962), an American economist and businessman, was a founder of the National Bureau of Economic Research.—Ed.]

The need for continued improvement of statistical information and support of economic research are strongly emphasized in the *Report of the President's Conference on Unemployment,* which organizes its proposals under the following headings: bank control of credit expansion, inflation control by the Federal Reserve System, control of expansion in individual industries by heads of firms, reduction of private and public building in periods of peak prosperity, regulation of public utilities (railroads, gas companies, etc.) to adapt to economic fluctuations, unemployment reserve funds and employment agencies. These topics give a rough idea of the measures proposed for the mitigation of business cycles. With respect to the first two types of measures, several articles mention the proposal made elsewhere by Professor Sprague[38] that banks can exert a restraining influence on economic fluctuations and at the same time protect themselves against losses by introducing the following guidelines. Contrary to prevailing practice, banks should ask their clients to maintain a higher ratio of readily available assets to short-term indebtedness in periods of rising prices than in normal periods, and they should lower this ratio in periods of depression with lower prices.

Individual industries have obtained great practical successes in adjusting to swings in economic conditions, as mentioned earlier. For this reason, reports by several heads of companies on their experiences with long-range production plans based on scientific studies of economic fluctuations are of greatest interest and deserve careful scrutiny by European businessmen. Several large firms have abandoned normal business practice regarding replacements, expansions, credit, and sales organization on the strength of years of experimentation. Findings on seasonal and cyclical fluctuations in the economy have enabled them to reap great financial rewards for their new policies, as is reported in H. S. Dennison's article[39] on applied stabilization techniques in the Edie volume and analogous articles by N. I. Stone and S. E. Thompson in *Business Cycles and Unemployment.*[40] Various proposals for mitigating periods of depression by

[38][In his article "Bank Management and the Business Cycle" in *The Harvard Business Review,* October, 1922, pp. 19–23. Sprague was an expert on fiscal problems of nations and the Edmund Cogswell Converse Professor of Banking and Finance in the Harvard Graduate School of Business Administration, 1913–41. He was chief economic advisor to the Bank of England, and an advisor to the Reichsbank of the German Republic, the Bank of France, and the League of Nations. He participated in efforts to maintain the gold standard as a member of the gold delegation to the League of Nations.—Ed.]

[39]Henry S. Dennison, "The Applied Technique of Stabilization", *The Stabilization of Business,* Edie, ed., op. cit., pp. 367–396.

[40]Nahum Isaac Stone, "Methods of Stabilizing Production of Textiles, Clothing, and Novelties", in *Business Cycles and Unemployment,* op. cit., pp. 116–133. Sanford Eleazar Thompson, "Methods of Stabilizing Production and Distribution", in *Business Cycles and Unemploy-*

public works and greater railroad construction activity and postponing these activities during periods of prosperity are analyzed in detail in both volumes. Professor F. H. Dixon of Princeton University in particular contributes a very interesting chapter in *The Stabilization of Business* on the impact of means of transportation on the business cycle.[41]

Unemployment problems naturally occupy a large part of both volumes. Although until recently the United States has lagged behind European countries with respect to this area of social policy, readers will find a number of interesting observations, notably accounts of the way that firms have set up unemployment funds in their own companies and what measures have been taken to reduce costly labour turnover to a minimum. Although unemployment insurance has not been legalized in any of the states so far, proposed laws in various states seek not only to alleviate existing unemployment but above all to prevent avoidable firing of workers. The proposals concentrate on providing incentives to the employer to stabilize the work force not only by making the employer bear the full insurance costs but by adjusting each firm's insurance premiums largely on the basis of current labour turnover rather than on the size of the work force. The concepts underlying this approach are excellently presented in "Unemployment Prevention and Insurance" by J. R. Commons, the greatest American expert on the labour question.[42] In his view, private industry is in a better position to take effective measures against unemployment than any other institution and only needs a sufficient financial incentive to do so. On the basis of experiences in other areas such as workers' accident insurance, he concludes with the comment that "it is amazing what business can accomplish when it has a sufficient inducement".

Finally a few words on an area where, according to one author [W. D.

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ment, op. cit., pp. 139–169. [Stone (1873–1966), a consulting economist, government official, and businessman, was a founder of the National Bureau of Economic Research. A tariff expert for the Department of Commerce and commercial attache to the US delegation to the Pan-American Congress of 1906, he became chief economist of the US Tariff Board. Thompson (1867–1949), an engineer and management consultant, served as an advisor to the government and wrote several textbooks.—Ed.]

[41] F. H. Dixon, "Transportation and the Business Cycle", in *The Stabilization of Business,* op. cit., pp. 113–163. [Frank Haigh Dixon (1869–1944), American authority on government regulation and operating economics of railroad transportation, was a professor at Princeton (he also taught at Michigan and Dartmouth) and served as Chief Statistician of the Bureau of Railway Economics and was an expert advisor for the US Shipping Board during World War I.—Ed.]

[42] In *The Stabilization of Business,* op. cit., pp. 164–205. [John Rogers Commons (1862–1945), a Professor of Economics at the University of Wisconsin, drafted social legislation for the State of Wisconsin and later at the federal level. He wrote *The Distribution of Wealth* (1893) and *A Documentary History of American Industrial Society* (1910–11).—Ed.]

Scott][43], the greatest strides should be anticipated since the advent of the new era of industrial development in 1914: human engineering. Various forms of applied psychology and group motivation, job placement, and personnel selection techniques are discussed under this heading. Systematic efforts to enhance workers' interest in their jobs through professional counselling, industrial training, and work motivation are playing an increasing role in the American economy. Scott even claims that businessmen are becoming more inclined to hire college men—which seems unlikely to the reviewer from his own experiences—and considers this evidence of increasing respect for academic training. It is worth noting that in these newly developing fields of psychotechnology, women are gaining increasing representation.

The final section of this collective review is devoted to a peculiar and penetrating work, to which no economist can perhaps do justice unless he is also a trained meteorologist, astronomer, and physicist. We refer to H. L. Moore's *Generating Economic Cycles.*[44] Researchers have always been intrigued by the regular periodic recurrence of economic crises. Ever since Jevons endeavoured and then later abandoned the attempt to relate this periodicity to the periodic recurrence of sunspots, the inclination to relate economic crises to astonomical phenomena has been thoroughly discredited among economists, without dying out altogether. And now Professor Moore has introduced a new astronomical theory for the causes of economic crises with so much documentary support and established connections so meticulously and with such mathematical precision that one is forced to reconsider an idea that had long been discarded as untenable. To preclude any further misunderstanding, Professor Moore makes no claim to have found the exclusive cause of business cycle phenomena, but only one possible important contributing cause, whose impact may well be cancelled out by other circumstances. The book's title, *Generating Economic Cycles,* is already a clue to the author's self-imposed limitation. On the basis of his own observations, Moore already set out in an earlier volume[45] to establish the influence of periodic cycles in annual rainfall and related cycles in agricultural production on economic conditions.

[43]W. D. Scott, "The Psychological Factors in Stabilization", in *The Stabilization of Business,* op. cit., pp. 342–366. [Walter Dill Scott (1869–1955), a psychologist who taught at Cornell and then Northwestern University, where he later became President. A professor of advertising, he wrote the first American book on advertising (*The Theory of Advertising: A Simple Exposition of the Principles of Psychology in Their Relation to Successful Advertising* (Boston: Small, Maynard, & Company, 1903).—Ed.]

[44]Henry Ludwell Moore, *Generating Economic Cycles* (New York: Macmillan, 1923). [Reprinted, New York: Kelley, 1967.—Ed.]

[45]Henry Ludwell Moore, *Economic Cycles, Their Law and Cause* (New York: Macmillan, 1914).

Here he focuses largely on the causes and laws governing these fluctuations in the climate and in agricultural yield. He supports his claim that agricultural yield has a major influence on business cycles, in agreement with Sombart[46] and Mitchell, by observing that agricultural products, whose price fluctuations are particularly large, make up the largest proportion of raw materials used in industry.

Moore applies the tools of mathematical statistics to eliminate secular tendencies and smaller perturbations so as to highlight the residual periodicity in rainfall and harvest yield in the United States in the last eighty years and to point out the interrelation between the two phenomena. He demonstrates that within three- and twelve-year time spans, the two curves display an eight-year periodicity and that this periodicity far outweighs all other observed periodicities. He shows, furthermore, that both curves peak in the years 1882, 1890, 1898, 1906, and 1914. A similar comparison of agricultural yield and grain prices shows that the latter regularly vary inversely with the former and on the whole coincide in the length of the periods and in their apex. His investigation of coal and pig iron production for the same time span discloses the same periodicity and a slight time lag for their highest prices compared to the peak prices of agricultural products. This seems to confirm and justify the approximately eight-year periodicity in business cycles observed previously by Aftalion and Bresciani-Turroni.[47] Moore extends his research beyond the American economy to reinforce his hypothesis. An analysis of English and French price and agricultural statistics, particularly Sauerbeck's index numbers and Professor J. H. Poynting's index numbers for English wheat prices[48], which go back as far as 1762, reveals a marked coincidence both between the harvest and price cycles in these countries and between the periodicity of these cycles in England and America. Professor Moore supports his views on the causes of these phenomena by supplementing his data on rainfall periodicity in America with the very interesting observations of the American astronomer Douglass[49], who derives a seven- to

[46][Werner Sombart (1863–1941) was a German writer on capitalism whose early Marxist views gave way to a later conservatism.—Ed.]

[47][Albert Aftalion (1874–1956), a Bulgarian-born French economist, taught at Lille and later at the University of Paris. Constantino Bresciani-Turroni (1882–1963), a professor at Milan, later advised the Berlin office of the Allied Reparations Commission.—Ed.]

[48][John Henry Poynting, "A Comparison of the Fluctuations in the Price of Wheat and in the Cotton and Silk Imports into Great Britain", *Journal of the Royal Statistical Society,* vol. 47, pp. 34–64.—Ed.]

[49][Andrew Ellicott Douglass (1867–1962), American astronomer and archaeologist, established the principles of dendrochronology (dating and interpreting of past events by studying tree rings) and was professor and administrator at the University of Arizona and director of the university's Steward Observatory.—Ed.]

eight-year periodicity of the rainfall in Arizona over the last hundred years, and even approximately for the last 500 years, from tree growth, as reflected in the number of rings in their wood. The periodicity is exactly 7.3 years between 1818 and the present and thus, surprisingly, coincides almost exactly with the 7.38-year periodicity determined as one of two constituents in Sauerbeck's index numbers, which, combined with another 8.73-year periodicity, resulted in roughly an eight-year cycle. All other data for rainfall in America also point to an almost exact eight-year cycle. This cycle happens to coincide with the maximal air-pressure cycle in the United States, which was already discovered in 1901, independently of the other investigations, and has since been confirmed. Winter air pressure in Europe supposedly followed a similar periodicity, according to Mauer[50].

It therefore seems highly likely that there exists a parallel periodicity between agricultural yield, grain prices, and global prices in America and Europe. The possibility of a causal nexus between them cannot be rejected out of hand. But what can be the cause of this periodicity? While it is tempting to look for cosmic causes, the eleven-year periodicity of the popular sunspots precludes using them as an explanation, since all the phenomena in question display an eight-year cycle. Does any other cosmic phenomenon manifest eight-year cycles coinciding with our periods and can it possibly have a causal connection with the meteorological phenomena? Professor Moore believes that he can answer both questions affirmatively and offers at least a hypothetical explanation for their connection. For this he relies on the passage of the planet Venus, which recurs at eight-year intervals. The dates for this passage over the last 150 years have coincided almost precisely with peaks in English grain price cycles, whose record goes back farthest among cyclical economic data. In his quest for a conceivable causal explanation, Moore draws the following conclusion that relies on the distinctive character of the planet Venus:

> The consequence of the long rotation period of Venus with the one face always turned towards the Sun is that the planet is in a constant state of violent meteorological commotion on a vast scale; and this planet, which is about the size of the Earth, thrusts itself at intervals of eight years almost exactly in the direct path of radiation from the Sun to the Earth. Is it not probable that the storm-racked planet creates a disturbance in the interplanetary medium which affects the Sun's radiation on its way to the Earth? If that is the case, then the cause of the eight-year generat-

[50][Hans Theodor Julius Christian Karl Mauer (1868–), a physicist, wrote *Graphische Tafeln für meteorologische und physikalische Zwecke* (1894).—Ed.]

ing cycle is the planet Venus in its eight-yearly periodic motion with respect to the Earth and the Sun.[51]

The final chapter, in which Moore attempts to prove this connection, involves a highly technical astronomical and physical analysis which is difficult for the layman to follow and which cannot be presented here in detail. His basic assumption that Venus has an electric or magnetic field is confirmed by various observations and other expert opinions. New observations on the enhancement of cloud formations by radiation-induced ionization makes it plausible that a connection exists betwen meteorological and electromagnetic phenomena. Since it is quite likely that Venus has an observable magnetic effect on the sun, it cannot be rejected out of hand that the planet exerts an influence of this sort on terrestrial meteorological phenomena, either directly or by interference with solar radiation. Moore supports his assertion with numerous quotations from various astronomers who have made similar assumptions about such connections.

This brief summary of the contents of Moore's book aims merely to draw this work to the attention of German researchers working on related problems. In view of the character of this book, the reviewer makes no claim to discuss it in the ordinary sense of the word. We venture only one or two observations about the economic and statistical part of the presentation. Convincing as the parallelism between agricultural yield and grain prices appears to be at first glance, it seems to us that this particular link in the argument is not altogether trustworthy. In this respect the author must rely on the short time span of about thirty years for a direct comparison; as to the eight-year periodicity in grain prices as such, the evidence is somewhat shaky. Aside from the contrived nature of the method by which the English professors Schuster and Turner[52] ascertained this periodicity by the use of the so-called Fourier analysis, in the case of English grain prices, which is the most important, the eight-year periodicity can be established only after the elimination of several assumed cycles of longer duration which seem somewhat arbitrary. It is also not quite clear how Moore obtains an average eight-year cycle from the combination of the resulting cycles of 7.38 and 8.73 years. But in the face of such an original and erudite work, such minor criticisms should

[51] H. L. Moore, *Generating Economic Cycles,* op. cit., p. 102. [The quotation serves to show why the planet Venus, by its trajectory, influences the climate on Earth. —Trans.]

[52] [Arthur Schuster (1851–1934), German-born English physicist and specialist in applied mathematics, was a professor at Owens College, Manchester, and later the University of Manchester. Herbert Hall Turner (1861–1930), an English astronomer, was chief assistant at the Royal Observatory and Savilian Professor of Astronomy at Oxford.—Ed.]

not be taken too seriously; all the more when, as was the case here, full justice could not be done to its many merits.

Addendum: Exchange Rate Stabilization or Price Stabilization?[53]

Since early autumn of last year, both the cost of living and wholesale prices in Austria have been rising steadily, and at least from this distance it looks as though no efforts would be made to halt this upward trend in prices until full parity with world market prices had been attained in all areas. It is perfectly natural that the full stabilization of the Austrian *Krone* with respect to the gold-standard currencies, hard-won as it was, has aroused a measure of complacency in Austria, which stands in the way of further improvements in the foreign exchange policy now in effect. From the perspective of a country with an intact gold currency, but one that has undergone quite sharp price fluctations and in which all the experts in recent years have concentrated their thinking on how to prevent fluctuations in the value of a gold currency, it is less obvious why Austria is neglecting its opportunity to stabilize its price level.

At the beginning of the stabilization period, the *Nationalbank* was wise enough to refrain from driving up the *Krone*'s exchange rate by means of 'deflation', as might have been feasible. The resulting drop in the internal price level would only have aggravated the industrial stabilization crisis. As long as the end of the inflationary cycle was reflected in declining prices, strict adherence to the ongoing stabilization policy was of the essence. But when the price level began to rise or at the very least when this rise in prices assumed the dimensions that it did last fall, things changed. The *Nationalbank* should then have taken the lead in preventing any further rise in prices with all the means at its disposal. Price stability has the highest priority from a social and fiscal viewpoint. A stable dollar exchange rate is of relatively secondary importance.

There are two ways in which the Bank can influence the price level. It can use its discount policy, a possibility even in the case of a full-fledged gold currency. This possibility seems to be excluded for Austria, however, since its interest rates are already so high that a further increase of the magnitude required to counteract the increase in prices would for various reasons be out of the question. Another approach can be used in the special case of a currency whose exchange rates are set not by a legally specified gold parity, at which notes must be traded in and delivered, but by the exchange rate policy of the central bank. In this case, an effective method is an appropriate manipulation of the buying and selling price of foreign currencies by the central bank. For a gold currency, the internal value of money is determined by the available quantity of gold, which underlies the value of the currency unit. For a country like Austria, the internal value of money is determined by the exchange rate at which the local currency is ex-

[53][This article remained in typescript. The date indicates New York, February 1924. This translation is by Dr. Grete Heinz.—Ed.]

changed for foreign currency, since it sets the price at which additional amounts of money can be obtained and what will be paid for the withdrawal of money in circulation (with the exception of money obtained by borrowing at the prevailing discount rate).

If the Bank raises the price of foreign currencies (or, in other words, if it lowers the price of the *Krone*) at a time when local and foreign prices are in equilibrium, purchases in Austria will become more advantageous for foreigners and money will continue to flow to Austria until this advantage is eliminated by a compensatory price rise there. If the Bank lowers the price of foreign currencies, money will continue to flow out of the country and imports will rise until a compensatory decline in Austrian prices restores equilibrium. In normal times such manipulations would inevitably affect the price level, but as matters now stand in Austria, where parity with world market prices has obviously not yet been reached, it should be possible under the present circumstances to avert the otherwise unavoidable rise in the price level.

There is no way to determine by direct comparison whether the price level in a given country matches the world price level. It will not do to compare prices directly, since transportation costs and many other factors are also involved. It is equally inappropriate to compare both sets of prices with those of the last years during which the prevalence of an international gold currency guaranteed such a price equilibrium. This is because the natural relationship between the price level of the different countries may in the interim have shifted completely as a result of the establishment of new industries, changes in the means of transportation, and the raising of new tariff barriers. Even if the index number of gold prices in two countries indicates the same price rise with respect to prewar prices, this does not prove in the least that prices in the two countries are in mutual equilibrium, nor does it guarantee that, if on both sides a gold currency had been maintained or fixed foreign exchange rates were in effect, there would be no further price movements in this situation.

The only indication we have that prices in a given country have reached parity with the world market is the movement of its price level in relation to the movement of its gold and foreign currency holdings and the note circulation of its central bank. If, as is currently the case in Austria, a progressive price rise accompanies an increase in foreign currency holdings, this demonstrates that parity with the world price level has not yet been attained. Under these circumstances, the Bank has the capacity to counteract further price increases by stepwise lowering of the foreign exchange rate, and it should make use of this possibility to align Austrian prices with world market parity by means of an increase in the international value of the *Krone* rather than by a rise in the internal price level.

The *Nationalbank* could lower the price at which it sells dollars rather than selling dollars at a fixed rate, whenever the price index shows by its upward movement that the *Krone* is currently undervalued in terms of its purchasing power by the exchange rate, with a concomitant inflow of foreign funds exerting an upward pressure on Austrian prices. The increased value of the *Krone* would then stem the influx of funds and prevent further price rises or, if the influx had already come to a natural end, reverse previous price rises. The latest wholesale price

index number issued by the Austrian Statistical Bureau (*Bundesamt für Statistik*) is a much more sensitive indicator than the available retail price and cost of living indexes and is therefore a very suitable basis for such a policy. Let us assume that in the next month this index number again shows an increase of, say, 2 per cent. The Bank should then in turn raise the selling rate for the dollar and for other currencies by about 2 per cent and continue to do so in the same relationship as long as the index number keeps rising and has not yet reverted to the level it had when the policy was initiated.

There is no need to emphasize how welcome such a stabilization of the price level would be for employees and the working classes, and how much it would facilitate balancing the state budget. Stability of foreign exchange rates, on the other hand, is a much less urgent concern. It is valuable only insofar as it contributes to a measure of price stability both in absolute magnitude internally and in relation to prices elsewhere. But, as matters now stand, Austrian prices are not in equilibrium with foreign prices, so that shifts between these two sets of prices are unavoidable. The fact of the matter is that the rigidity of the exchange rates actually threatens the stability of internal prices and therefore a planned, stepwise lowering of the exchange rates is undoubtedly a better policy than their stability. This action would not affect the situation of Austrian exporters as a group, since it is all the same for them whether exchange rates remain stable while the local prices of commodities rise, or whether the latter remain nearly stable and foreign exchange rates fall.

Even if it were not intrinsically desirable to prevent any further rise in Austrian prices, the policy proposed above would have much in its favour on other grounds. The influx of foreign funds over the last months probably was largely due to speculative investments induced by foreigners' expectation that the gold value of their Austrian holdings would go up. Increased exports were only a minor factor in this influx. For a variety of reasons, the expansion of Austrian exports is taking place at a very slow pace, and that fraction tentatively attributable to it in the price rise is a very modest one. The influx of foreign currency for speculative reasons, on the other hand, while it has been a major factor in the rapid growth of gold reserves, is not without risks: These investments are likely to be withdrawn as soon as the world price level is reached and a further increase in gold prices becomes unlikely. A sudden shrinking of notes in circulation will be its immediate consequence. A further result would be that the reduction in gold reserves will lead of necessity to a restrictive loan policy on the Bank's part and might well induce a drop in prices and a new industrial depression. The price rise caused by this temporary, speculative influx of foreign currencies will hamper a more vigorous upswing of export activities, which is the crucial factor in creating a long-range equilibrium between foreign and domestic prices. Any policy that would eliminate such speculative investments would make the *Krone*'s increase in value contingent on export growth, and this increase in value would be of a much more permanent nature. Whatever speculation in the *Krone*'s upswing then occurred would hardly impinge on the success of such a policy.

The measures proposed above are far from novel. The well-known American economist Irving Fisher already proposed such a regulation of the domestic price

level in all countries by the foreign currency policy described above ten years ago in his book on the purchasing power of money.[54] A number of other theoretical economists and economic experts have endorsed Fisher's proposal with great vigour. The idea is so familiar even to a wider audience in Anglo-Saxon countries that Austria's introducing such a policy would undoubtedly meet with full understanding and support there. The National Monetary Association in the United States has even taken the lead in a broadly based movement to put such a policy into law. It is therefore not a matter of prestige to keep the dollar exchange rate fixed, for fear that confidence in Austrian stabilization might be undermined. If the *Nationalbank* were to publicize explicitly its intention to focus on maintaining the stability of the price level and to announce that it would occasionally make small alterations in the dollar exchange rate with this objective in mind, the execution of measures of this kind would only increase confidence in Austrian economic stability. The *Nationalbank* must of course make it absolutely clear that its only goal is the stabilization of prices, not the raising of the *Krone*'s exchange rate as such. England's negative experiences with the latter course by means of a 'deflationary' policy calls such an objective into question and is likely to arouse mistrust as to the soundness of the economy.

The policy pursued by the *Nationalbank* up to this point can be defended on many grounds. In the beginning, it was fully justified in accumulating an adequate gold reserve and in trying to help trade and industry surmount the 'stabilization crisis' by a slow price rise. The more rapid price increase in recent months, as well as the declining importance of the initial objectives in the light of the more than adequate current reserves for the circulating bank notes and the improved industrial situation, make it imperative now to proceed to a stabilization of the price level. The possible threat of a sudden withdrawal of speculative investments should be an additional reason for abandoning efforts to accumulate the largest possible gold reserves, which could prove to be a false blessing, in favour of a price stabilization policy.

[54][Irving Fisher, assisted by Harry Gunnison Brown, *The Purchasing Power of Money. Its Determination and Relation to Credit, Interest, and Crises,* op. cit.—Ed.]

TWO

MONETARY POLICY IN THE UNITED STATES AFTER THE RECOVERY FROM THE CRISIS OF 1920[1]

Even after the recession of 1920 had put a stop to the periods of wartime and postwar inflation and the recession itself had run its course, the Federal Reserve Banks were still in no position to resume their customary practices for the extension of credit or to devote their attention to improving the machinery for regulating the routine questions of monetary policy. No sooner had the Federal Reserve Banks been freed from fiscal constraints and regained freedom of autonomous action than they found themselves faced with tasks that were almost unprecedented for central banks. The circumstances from which most of the problems facing the Federal Reserve System's policymakers have stemmed are admittedly so singular in nature that their recurrence is most unlikely. Nevertheless, highly interesting insights into monetary questions of the broadest significance can be gained from examining them. In all likelihood, moreover, the theoretical and practical principles of credit policy that have evolved in the United States in the last few years will dominate all discussions of monetary policy in the near future. Hence there is good reason to discuss them at some length, quite aside from the fact that the outcome of American monetary policy is of considerable importance, given that many European currencies are dependent on it at present and probably for some time to come.[2]

[1][Published as "Die Währungspolitik der Vereinigten Staaten seit der Überwindung der Krise von 1920" in *Zeitschrift für Volkswirt schaft und Sozialpolitik,* N. F., vol. 5, 1925. Section 6 of this essay appeared in an earlier translation in F. A. Hayek, *Money, Capital & Fluctuations: Early Essays,* ed. Roy McCloughry (Chicago: University of Chicago Press, and London: Routledge & Kegan Paul, 1984), pp. 5–32. The present translation of the complete article is by Dr. Grete Heinz. Hayek noted that the original article "constitutes a preliminary study for the final section of a more substantial work on the development of the United States monetary and credit system since the definitive establishment of the gold standard there in 1900, leaving aside, however, whatever organizational changes were put in place during this period".—Ed.]

[2]It must be remembered in this connection that the value of gold, at least at the time of this writing [December 1924], is determined almost exclusively by the purchasing power of the dollar. For the large number of countries without a freely convertible gold currency and

Before delving into the details of monetary and credit policy in the United States in the period under review, we must devote the first three sections of this article to the most important factors from which the problems in question arose, namely, gold movements, the course of the business cycle, and general credit conditions.

1. History and Causes of Gold Imports

The United States emerged from the war and subsequent economic disruptions not only as the greatest creditor nation but also as the only country of importance to have retained the gold standard intact. This was the main reason why immense amounts of gold flowed into the United States during the past four years, and it was this accretion in gold stocks that was the most distinctive feature of its monetary situation during this same period. Its total monetary gold reserves before the war had amounted to about 1.9 billion dollars, that is, nearly one-fourth (23 per cent) of the entire world's gold stocks and had risen there between the outbreak of the European war and America's entry in the war to 2.9 billion dollars and to over 3 billion dollars in 1917 and 1918. Substantial gold exports in 1919 and 1920 reduced gold stocks by nearly one-half billion dollars, but when this outflow ceased, gold stocks kept swelling as a result of new imports between September 1920 and November 1924. During these fifty-one months, gold imports exceeded exports by 1,670 million dollars. At that point, American monetary gold stocks reached nearly 4.6 billion, almost half the known world reserves, which the *Economist*[3] estimated at approximately $9,650,325,056. The first export surplus—of over 22 million dollars—did not recur until December 1924. Gold import and export surpluses for each of the years between 1915 and 1924 are given in Table I (with export surpluses denoted by a negative sign).

The graph in Figure 1 indicates fluctuations in gold imports during the past four years and their impact upon the composition of the total circulating media in the United States.

The impact of these gold imports has been further exacerbated since April 1924 by the reflux of American bank notes, which in August 1924 swelled to over 9 million dollars, after currency stabilization took place in countries where they had been hoarded during the inflationary period.

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operating on the gold exchange standard, foreign exchange policy is geared to maintaining the parity of their currency with the dollar, so that their currencies are forced to share the fluctuations in the value of the dollar. A further important point is that the financial community in the West tends to view continental European monetary problems from the perspective of specific American and English interests.

[3]December 27, 1924, p. 1069.

Table I
Gold Surpluses, 1915–1924

1915	$ 420,528,672
1916	$ 530,197,307
1917	$ 180,570,490
1918	$ 20,972,930
1919	$−291,651,202
1920	$ 94,977,065
1921	$ 667,356,921
1922	$ 238,294,891
1923	$ 294,072,395 (rounded off)
1924	$ 258,072,605 (provisional estimate)
Growth 1915 to 1924	$2,413,392,074*

Sources: 1915–1922: Annual Report of the Director of the Mint; for subsequent years, Federal Reserve Board publications and Monthly Letters of the National City Bank of New York

*The discrepancy between this figure and the figure given earlier in the text as to the total increase in the United States' monetary gold stock in this period is due to the excess of American gold production over its industrial use of gold.

The fact that we know the major countries from which the gold influx has originated since 1920 (England, France, Canada, Germany, Denmark, Sweden, and more recently Holland) does not shed any particular light on the causes for the gold flow. In this respect the ratio between gold imports and gold production during the same period proves to be more revealing, in that the latter lagged far behind the expansion of American gold stocks, since between 1921 and 1923 gold production did not exceed one billion dollars. The remaining gold influx since the beginning of the war stemmed from European monetary gold holdings, as had already been the case prior to 1917 and approximates the entire circulating gold stocks in use in 1913. A statistic in the *Federal Reserve Bulletin* for April 1924 indicates that up to the end of 1922 there had been almost no decline in the gold stock held by European central banks (from 3119 million to 3034 million dollars), because the nearly complete elimination of Russian, German, and Austrian gold reserves was counterbalanced by the enormous growth in the reserves of all the other countries. What had happened was that the 1834 million dollars in gold that had been in circulation in Europe in 1913 were almost completely drained off (mainly in the direction of the United States).

Even though the causes for these gold movements are fairly obvious, the model that was appropriate when a number of gold currencies continued to coexist—and to which many people still refer—is simply no longer applicable. Whatever gold has remained in Europe is now concentrated

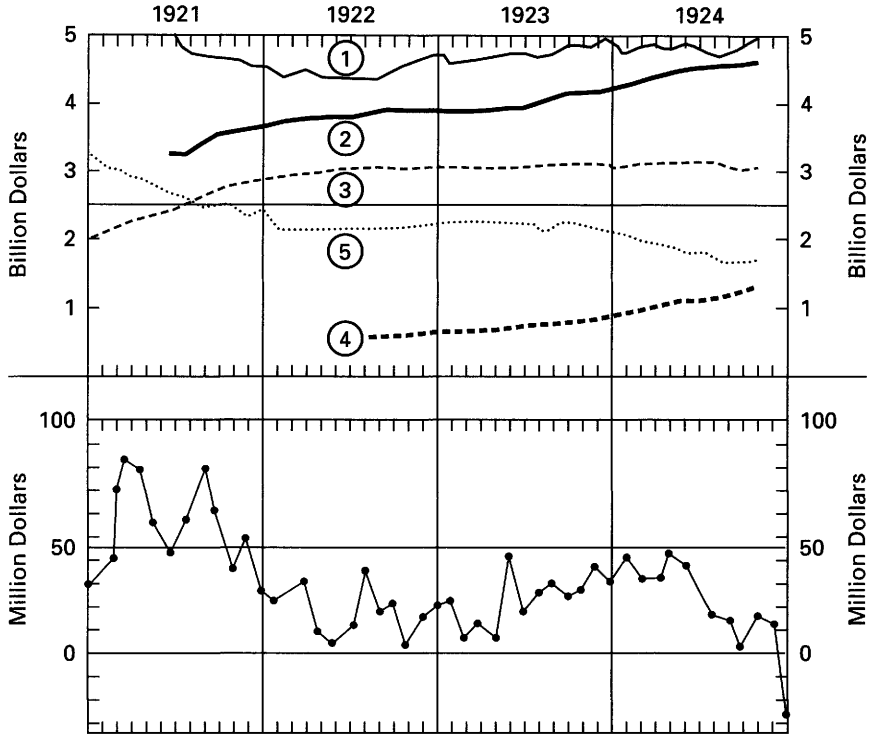

Figure 1 Gold Inflows into the United States 1921–1924 and Their Influence on the Quantity of Money in Circulation and Bank Reserves

Upper Segment:*
1. Total quantity of money in circulation
2. Total stock of monetary gold in the United States
3. Gold reserves of the Federal Reserve Banks
4. Gold in circulation (incl. gold certificates in circulation)
5. Federal Reserve notes in circulation

Lower Segment:
Monthly surplus of gold imports or exports of the United States

*All data relating to the 1st of each month.

Sources: Annual Reports of the Federal Reserve Board; Annual Reports of the Secretary of the Treasury, 1921–1924; Federal Reserve Bulletin 1921–1924.

in a few central banks, which are not compelled to redeem their obligations in gold and tend to base their decisions more on political than on purely economic grounds. Hence the precise nature of gold movements cannot be accounted for exclusively by economic factors. Obviously the rule still applies that wherever gold movement is not restricted, it will flow to the place where it can be used most advantageously, that is, where the highest price is offered. From this it does not follow, however, that the large gold movements that have taken place demonstrated a lasting difference in price level in different countries (expressed in gold units) and that therefore the country that is the recipient of the gold influx necessarily has a higher purchasing power of gold than the country from which the gold is shipped, compared to the equilibrium state (say, the prewar period).[4] It must not be forgotten that for most of the period under consideration the United States was the only major country in which gold, for all practical purposes (that is, without prohibitive loss), could be employed to expand the stock of gold. Hence, gold was shipped there not only to cover payments; it was sent there as well because there was no other way to transform gold into a usable means of exchange. Once that transformation had been performed, it could be freely utilized anywhere in the world, for instance to acquire various national currencies on more advantageous terms than gold itself. A direct conversion of gold into the various currencies was either prohibited by currency regulations, which excluded the purchase of these currencies by the central banks at any other price than legal parity, or rendered unattractive by the instability of these currencies.

Part of the gold flow to the United States basically served other countries, notably European countries, to establish credit there in this manner. This credit, which also consisted of exported notes, was then used as a stable means of exchange in their own territory or in inter-state transactions. A larger component of the gold flow, to be sure, consisted of payments to the United States, which had to be made in gold, after all, because most other countries did not have gold currencies. For a variety of reasons all operating simultaneously, Europe had unusually large payments to the United States falling due in these years. First of all there was the extensive European demand for goods after the war, which could initially be financed by American loans, but had to be repaid after 1921, when bankers became alarmed about the political uncertainty and currency devaluations in Europe. But capital movements, more than anything else, were the source of large payments. One major item was the

[4]As the "purchasing power parity theory", which has recently gained such great popularity, might lead one to believe.

repayment of the English war debt, which began in 1923. Another important factor was the flight of capital, which was triggered by the depreciation of continental European currencies and the fear of a capital levy in England. Added to all this, however, was the fact that in the years 1921 to 1923 Europeans were attracted to American investments, while Americans were averse to investing in Europe, thus increasing Europe's unfavourable balance of payments. Had gold currencies still existed in Europe, these payments would have resulted in a contraction of the money supply and would eventually have had to increase the export of commodities, which would have formed the equivalent in real terms of those payments. But persistent inflation or, at the very least, the failure of the gold outflow to induce a contraction in the money circulation prevented a decline in prices large enough to create a commensurate increase in European exports. The first response to the surplus in America's favourable balance of payments was generally a rise in the dollar's exchange rate, which anticipated any shift in the relative purchasing power of the various currencies, as would have been anticipated if gold currencies had existed on both sides. This appreciation of the dollar gradually led most European central banks to relinquish part of their carefully guarded gold hoards in order to buttress the foreign exchange value of their currencies and send the gold on its way to America.[5]

Several factors contributed to the slackening and eventual cessation of the gold influx to the United States in 1924: the large loans abroad extended during that year, the strong competition exerted by India, which managed to absorb a record quantity of gold that year because of the rupee's high exchange rate and from New York alone received about 15 million dollars,[6] and the elimination of some of the previously mentioned causes of the gold influx, such as political instability in Europe. Yet it is improbable that the present reversal of the gold movements will persist for long and that the United States will continue to be able to extend loans to finance the enormous surplus in its trade balance. Only after most of the other countries have been back on the gold standard for extended periods of time can the influx of gold to America be expected to cease.

2. *Unfolding of the Business Cycle*

Before looking more closely at the impact of gold imports on credit conditions in the United States, we will have to examine briefly the complete

[5]See Appendix A.
[6]*The Times,* January 1, 1925.

revolution of the trade cycle that occurred in the period under review, encompassing the trough of one phase and the trough of the next phase. The aftereffects of the recession of 1920 lingered for an extensive period, and the volume of output continued to decline until mid-1921, as indicated by various production indexes. Prices, as usual, continued to decline over an even longer period, and the wholesale commodity index did not begin to rise steadily until early 1922. Between April 1921 and March 1922, the curves representing the changes in the major business indicators remained so stable that they almost seemed to contradict the basic principle of business cycle theories, namely, that economic life can never be in a 'normal state', but that one cycle follows the other and any given state can be understood only as a phase in this cyclical movement. It is likely, however, that this impression is created by the statistical method of presentation, that is, the use of average values, whose individual components happened to bottom out at different points. This presentation gave a misleading picture of stability, while in fact a reversal of the direction of motion took place during that time and was merely obscured by its irregular pace. The upswing, which began in early 1922, then persisted rather steadily and reached its peak in March 1923, whereupon during the next sixteen months an intensifying period of depression asserted itself. The transition between boom and depression was not marked by any crisis-like phenomena and diverged in this and in several other respects from the usual course of this phase of the business cycle. One of the most highly regarded American business forecasters, Charles Oscar Hardy, rightly characterizes this aspect of the upswing as follows: "Its termination failed to observe the generally accepted rules of conduct of decent and orderly business cycles".[7]

The period of prosperity between 1922 and 1923 was not terminated—as is usually the case—by the banks' outstripping of their lending capacity and a commensurate rise in interest rates. This distinctive feature probably also explains most of its other deviations from the normal course of the business cycle. In this case, the downturn occurred when banks had very ample cash reserves at their disposal and interest rates had experienced only a modest rise and were on the whole at a rather low level. Consequently, the main elements involved in cyclical fluctuations did not follow the usual order in the timing of their downswing. Contrary to the

[7]Charles Oscar Hardy, in Warren Milton Person, William Trufant Foster, and Albert John Hettingser, Jr., eds, *The Problem of Business Forecasting. Papers Presented at the Eighty-fifth Annual Meeting of the American Statistical Association* (Washington, D.C., December 27–29, 1923). Publications of the Pollak Foundation for Economic Research, no. 6 (Boston: Houghton Mifflin, 1924), p. 297.

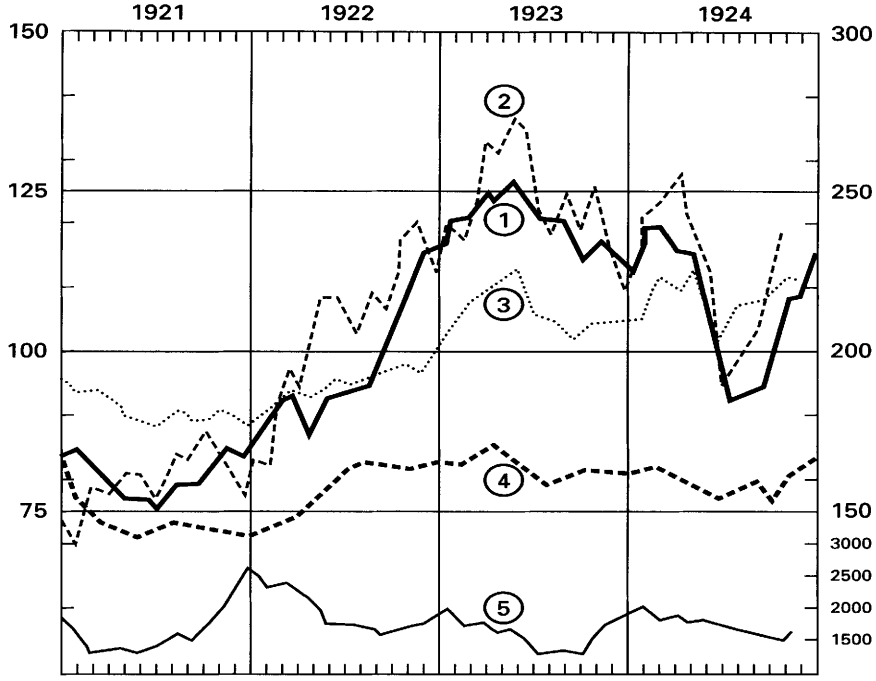

Figure 2 Production, Prices, Settlements, and Bankruptcies, 1921–1924

1. Federal Reserve Board index of output in 22 basic industries. 1919 = 100, and seasonal fluctuations have been eliminated.
2. Federal Reserve Board index of output of finished goods (regular seasonal fluctuations not eliminated). 1919 = 100.
3. Monthly amount of debits to accounts of individual banks in clearing in 140 cities of the United States, excluding New York (where the extent of clearing is primarily determined by the turnover on the Stock Exchange). Regular seasonal fluctuations eliminated. 1919 = 100.
4. Index of wholesale prices published by the Federal Reserve Board. 1913 = 100, 1919 = 211
5. Monthly number of bankruptcies in the United States.

Sources: Annual Reports of the Federal Reserve Board, 1921–1923; Federal Reserve Bulletin, 1924, and Monthly Review of Credit and Business Conditions, published by the Federal Reserve Bank of New York, 1924.

usual sequence of events, the stockmarket decline did not manifest itself several months before the decline in industrial production, the tight money market did not outlast the general decline, and interest rates started to fall close upon the heels of the decline in economic activity (see Figures 2 and 3). Similarly, fluctuations in the individual branches of

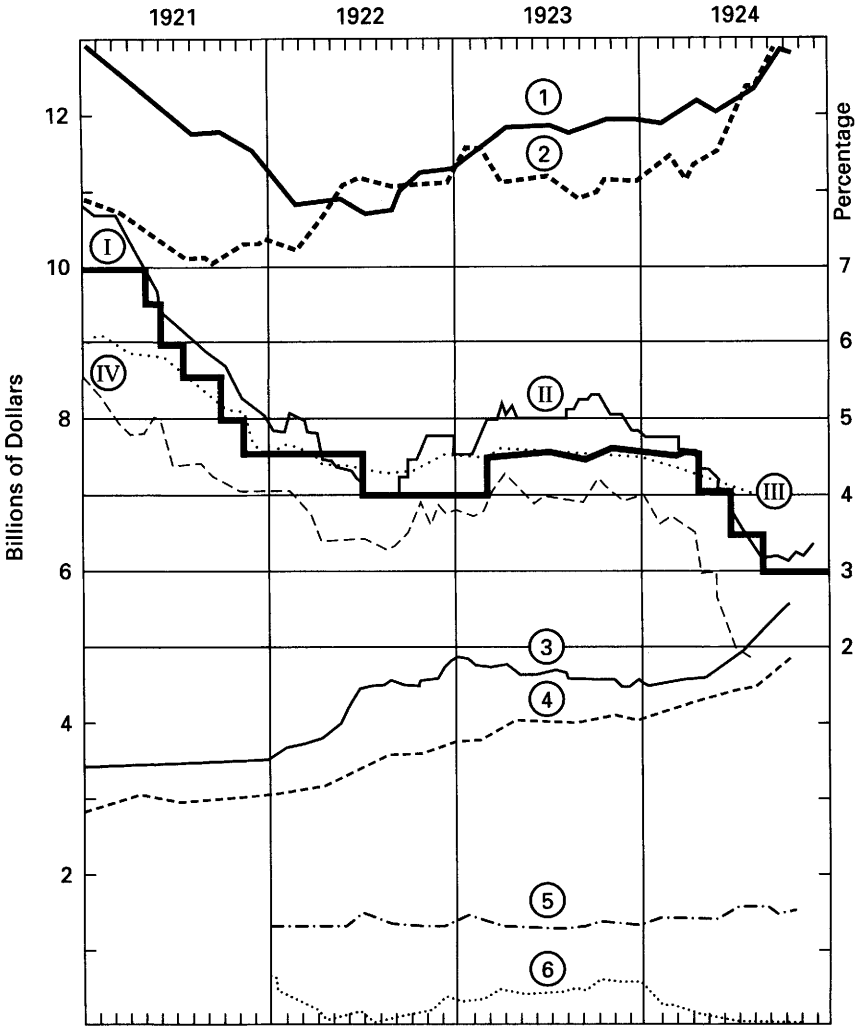

Figure 3 Interest Rates in New York, and Earning Investments, Deposits, and Reserves of 800 Member Banks in More Important Locations, 1921–1924

1. Loans and discounted bills.
2. Sight deposits.
3. Bonds and shares.
4. Deposits with more than 3 days notice.
5. Reserve deposits with Federal Reserve Banks.
6. Rediscounts with Federal Reserve Banks.

I. Discount rate, Federal Reserve Bank, New York.
II. New York market rate for "commercial paper".
III. Yield on "Liberty Bonds".
IV. Yield on short-term Treasury Bills.

Sources: Annual Reports of the Federal Reserve Board, 1921–1923; Federal Reserve Bulletin, 1924, and Monthly Review of Credit and Business Conditions published by the Federal Reserve Bank of New York, 1924.

production did not adhere to the usual pattern. The downturn did not appear first of all in the output of raw materials such as pig iron, building materials, etc., and only at a later stage in the production of finished products and the retail trade. On the contrary, all curves peaked almost simultaneously in March 1923.

Psychological factors were adduced as the main explanation for this abnormal sequence of events. The bad experiences of the 1920 recession were still so fresh in the minds of businessmen that the rapid upturn in 1922 aroused their fear of a new crash and made them moderate their expansion plans even without the pressure of credit restrictions.

The fact that several of the Federal Reserve Banks had slightly raised their rediscount rates in early 1923 was held to be of only moral significance as a warning to exercise caution. Optimistic expectations, without which an upswing cannot continue, were also shattered by the French occupation of the Ruhr. The consequent deterioration of political prospects in Europe was expected to delay indefinitely the growth of exports there and to hamper the near-term improvement in the unfavourable outlook of the agricultural sector.

These explanations, while undoubtedly relevant, are far from adequate. They fail to elucidate, in particular, what caused the further intensification of the recession once the decline had gotten under way, or what caused its special severity at the beginning of 1924, at the very time when the psychological factors were no longer operative and the availability of large liquid assets should have held out hopes for a rapid improvement. Since our only purpose in retracing the course of economic activities is to gain greater insight into the banking policy of that period, there is no need to delve any further into the causes of the recession. Suffice it to say that the entire economic cycle from 1921 to 1924 was not primarily a function of the banks' credit policy, although such an explanation is generally believed to hold for all business cycles. Rather, it should be viewed as one of those cyclical fluctuations in economic activity that are bound to recur in our kind of economy, irrespective of the amount of credit injected by the banks. If production increases for any reason whatsoever, this triggers a temporary rise in inventories, factory expansion, etc., based purely on the immediate growth of production; the increased activity vanishes once the demand for the finished product itself ceases to expand. Just as the increased activity of the industries stimulated by the expanded production initially reinforced the demand for finished products, the decline that they now experience—after meeting the needs of the expansion—in turn reduces the demand for finished products and thereby contributes to a general ebbing of economic activity.

This is how fortuitous changes in a particular branch of production may engulf the whole economy in a series of rhythmic motions, even in

the absence of overly cheap bank credits or, in Wicksell's terminology, of a monetary interest rate below the natural interest rate, which would cause overinvestment.[8] This overinvestment and the inevitable partial losses in the face of higher interest rates are generally considered as the most important cause of the initial stimulation of the economy and the subsequent recession. The type of business cycle that we have just described, in which the credit situation is largely irrelevant, has occurred most commonly in the wake of a very severe recession. Typically, a short upswing is followed by a downturn, long before the money market shows any significant tightening. The most reasonable explanation for the severity and persistence of the slump that follows the downturn is that it constitutes an aftereffect of the previous violent convulsion of the economy. Individual industries are thrown into a state of imbalance, which cannot be sufficiently rectified during the first upswing and tends to be fully eliminated only during the second period of stagnation. This is precisely the pattern that manifested itself in the United States after the severe recessions of 1893 and 1907, which were followed by a short business cycle. Various people have already emphasized the similarities between the shape of the individual curves in the most recent cyclical fluctuation with that observed in 1894–96 and 1908–10. The trajectory of the curve for bankruptcies in Figure 2 confirms the fact that in the recently concluded recession, the aftereffects of the 1920 recession played a significant role. Still to be discussed, however, is the extent to which the credit policy of the banks, in particular the Federal Reserve Banks, exerted a certain amount of influence.

The abundance of liquid assets, which had long been expected to spur the economy, finally began to have the anticipated effect in late summer of 1924. The stimulus first made itself felt in the securities market where activity intensified in the fall and winter and culminated in a sharp upsurge in speculation, in which new records were set for stock prices and transaction volume. Though recovery was slower in industry and trade, the upswing was clearly visible there as well by the end of the year.

3. Immediate Impact of Gold Influx on General Credit Conditions and Position of the Banks

Ever since the 1917 amendment to the Federal Reserve Act required member banks to deposit their full legal reserves with the Federal Reserve Banks, almost all additional gold reaching the country has made its

[8][Hayek adopted Mises's formulation of the Wicksellian natural rate of interest: "The rate of interest that would be determined by supply and demand if actual capital goods were lent without the mediation of money. . . ." Ludwig von Mises, *The Theory of Money and Credit,* trans. H. E. Batson (Indianapolis, Ind.: Liberty *Classics,* 1981), p. 393.—Ed.]

way to the Federal Reserve Banks, either to be exchanged at once against notes or—more commonly—to be credited to the bank depositing the gold there. In the latter case, the member banks will either use the deposit to raise their prescribed reserves and thus be in a position to extend more credit, or else utilize their gold to repay their existing obligations to the Federal Reserve Banks. Which course of action they pursue will depend on whether their customers are currently requesting more loans or whether they find it more advantageous to reduce their rediscounts or other obligations at the Federal Reserve Banks. During the period of depression following the 1920 downturn, the member banks took the opportunity to reduce sharply their rediscount obligations, which had swelled enormously during the preceding boom, by making cash deposits at the Federal Reserve Banks. Their obligations therefore decreased to a much larger extent than would have occurred solely on the basis of the reduced requests for credit from their own customers and the correspondingly lowered reserve requirements. With the level of economic activity beginning to rise again in the summer of 1922, larger reserves became necessary once more, deposits of member banks as a whole rose by $3.3 billion at the end of 1923, and the value of Federal Reserve notes in circulation by $0.5 billion. At that time, the banks were able to obtain the additional reserve deposits by making payments in gold, that is, without calling for any extension of credit on the part of the Federal Reserve Banks. Hence there was almost no change in the Federal Reserve Banks' earning assets (compare Figure 4) during this upturn. The temporary expansion of rediscounts for the member banks in 1923, as shown by curve 6 in the same figure, was almost completely balanced out by the reduction in funds placed in the open market (to be discussed below). It was this latter reduction, in fact, that deprived the member banks of cash and forced them to increase their rediscounts.

With the downturn of economic activity in 1923, there was no further need to use additional gold in this manner, and the member banks continued to pay off their obligations to the Federal Reserve Banks. By early summer of 1924, most banks had paid in the obligatory reserves almost exclusively in gold or other legally acceptable money. At the end of the first six months of that year, rediscounts constituted less than 3 per cent of the assets of the Federal Reserve Bank of New York, and this was almost equally true of the other Federal Reserve districts. For the great majority of the banks, this signalled the beginning of a third phase with respect to the impact of the gold imports. There was no longer any backlog of obligations to be repaid to the Federal Reserve Banks, so that the new gold perforce had to be utilized to increase reserve deposits of the member banks. Consequently the potential for extending new investment

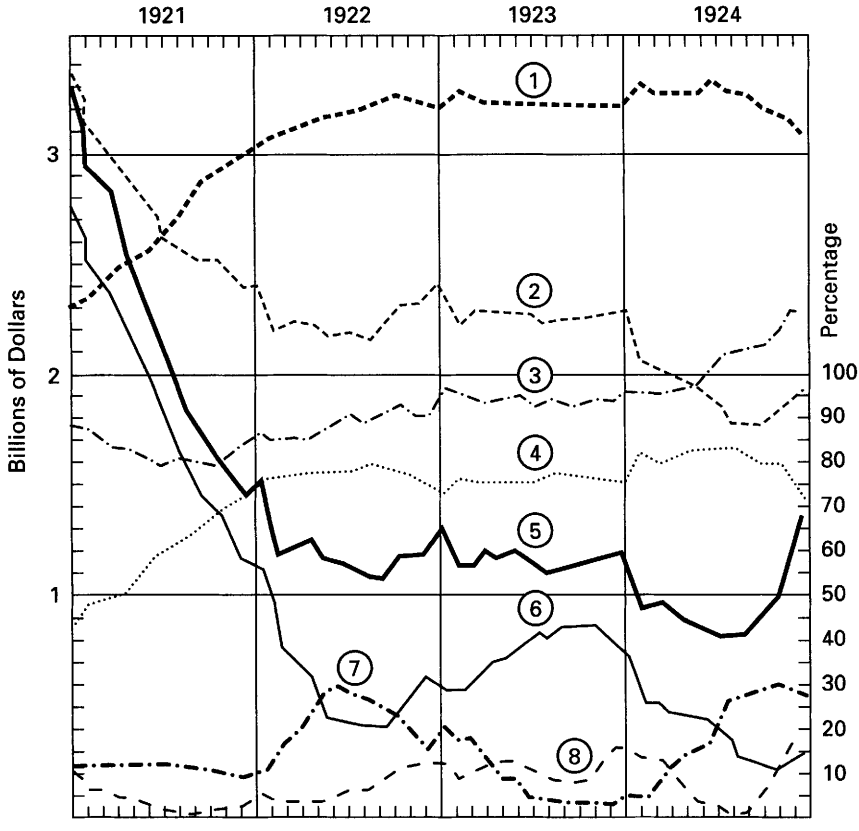

Figure 4 Assets and Liabilities of the Twelve Federal Reserve Banks as Shown in the Last Return for Each Month, 1921–1924

1. Cash cover.
2. Federal Reserve Notes in Circulation.
3. Deposits of member banks of the Federal Reserve System.
4. Ratio of cover to all liabilities (percentage).
5. All earning investments.
6. Bills rediscounted for member banks.
7. Open market purchases of Treasury Bills and government bonds.
8. Open market purchases of acceptances.

Sources: Annual Reports of the Federal Reserve Board, 1921–1923; Federal Reserve Bulletin, 1924.

credit had to be exploited to avoid the money's remaining idle, even though the general economic situation did not give rise to a commensurate increase in the demand for credit. Both trade and industry were in the grip of such a severe depression that short-term loans had few takers, even at extremely low interest rates. Most of the banks' surplus money therefore found its way into the investment market, thereby stimulating an upswing in the stock market in the summer of 1924, as already mentioned above. This upswing evolved into a pronounced stock market boom in the following winter.

The extent to which the banks pursued this method of utilizing their funds emerges from the fact that the national banks held only 3 per cent more than the legally required reserves to cover their deposits in October, although their purely commercial loans had increased less than usual in the preceding twelve months and their cash resources had swelled enormously. The investment market had been, directly or indirectly, almost the sole beneficiary of the increased money available. As a consequence, in the fall most banks had placed almost half of their earning assets in long-term investments, according to various estimates. In view of the customary sharp separation of investment business and the banking business proper in Anglo-Saxon countries, this was an unusual, not to say disquieting, situation, but one that had its favourable aspects as well. By tying down their resources in part, the individual banks become more dependent on the central banking system as soon as commerce and industry exert a greater demand for short-term credit. At that point the central banking system should regain some control over the inflationary impact of the expanded gold resources.

The movement in the interest rates mirrors the same evolution as the monthly bank returns. For now we will limit ourselves to conditions on the New York market, whose relations with the rest of the country will be discussed briefly at a later point. As Figure 3 indicates, both the open-market discount rates for commercial paper and the yield of short-term Treasury bills fell between the time that the tight money market following the 1920 recession gradually subsided until late summer of 1922. The discount rate of the Federal Reserve Bank of New York paralleled this movement: With the exception of a single, brief, and insignificant exception in July 1922, its discount rate was always lower than the open-market rate for commercial paper, but higher than the yield of the Treasury bills and almost always higher than the private rate for bank acceptances (not shown in the graph). With the revival of business activity, which had begun to manifest itself a year earlier and just then had speeded up its pace of recovery, the money market became tighter again and interest rates started an upward movement that continued until the reversal in the level

of economic activity in March 1923. Up to that point, the movement in interest rates had been commensurate with the intensity of the demand for credit, as is usually the case, so that the interest rate curves and those for bank loans run more or less parallel. Beyond that point, however, the two curves reveal an abnormal relationship, which can only be explained as due to the effect of the gold imports. Although the banks continued to extend more credit, the interest rates kept declining from the fourth quarter of 1923 to the summer of 1924, when they reached an almost unprecedented low level. This movement was less marked with respect to the interest yields of long-term bonds (for instance, the "Liberty Bonds" shown in the graph), which are generally less subject to fluctuations, of course.

Figures 3 and 4 can elucidate faster and more effectively the impact of gold imports on credit conditions than a lengthy explanation, but a few explanatory remarks may be needed for certain curves. The Arabic numbers in Figure 3 denote data on the earning assets, deposits, and reserves of about 800 member banks of the Federal Reserve System in various larger population centres, for which the Federal Reserve Board issues a combined monthly return. These data encompass about 60 per cent of all bank transactions in the United States and can therefore be considered reasonably representative for the whole country. The curves highlight the relatively greater increase in long-term investments in the last year compared to loans and discounts. It must be pointed out, in this connection, that the latter also include advances on securities, so that the rise in this curve in the last year is also primarily a reflection of long-term bank investments in the same market, although in a different guise.[9] We have already pointed out the contrasting movement of loans and interest rates revealed in Figure 3. Of equal interest in this figure is the simultaneous expansion in the legally required reserve deposits with the Federal Reserve Banks and the fact that the member banks have repaid almost their total indebtedness to the Federal Reserve Banks. Figure 4, which is based on data for all the banks in the Federal Reserve system and uses the combined returns of the twelve Federal Reserve Banks tracing the fluctuations in the most important assets and liabilities in these returns, offers even more convincing evidence concerning this situation. Despite a steady, pronounced increase in the member banks' deposits (curve 3), the total credits (earning assets, under curve 5) extended by the Federal Reserve Banks between 1922 and mid-1924 declined, first slowly and

[9]While purely commercial loans rose only from 8 billion to 8.2 billion dollars between early November 1923 and early November 1924, advances on securities rose by about 600 million dollars in the same period.

then at an accelerated pace, and case reserves (curve 1) kept on rising, while note circulation sharply contracted in the same time span, for reasons yet to be examined. Shifts in the composition of 'earning assets' encompassed under the headings for curves 6 through 8 and the marked expansion of all earning assets at the end of 1924 will be more fully discussed at a later stage.

4. Basic Policy Considerations

At this point we must examine the policy of the Federal Reserve System during the period under review and analyze its rationale. The Federal Reserve Board's Tenth Annual Report for 1923[10] is unusually helpful in this respect. This report outdoes even the customary openness of American federal government agencies, compared to that of their European counterparts, in allowing the public to gain a detailed understanding of its views and motivations. Since this report embraces the period of time in which the Federal Reserve Board was first obliged to take a clear stand on those problems that arose from the new position of the United States, the report helps us, furthermore, to determine to what extent the individual measures arose from a principled stand on the problems in question, which would also be decisive for future policies, and to what extent no such principles were involved. In this, as in later sections of this article, we shall therefore repeatedly refer to this report.

In discussing the policy of the Federal Reserve Banks, it is useful to adopt the distinction between 'cyclical' and 'secular' economic phenomena, which is thoroughly accepted in American statistical literature. Accordingly, it is best to treat separately, as far as possible, business-cycle-related changes in the volume of credit in proportion to the cash basis on the one hand, and independent changes in the cash basis and the impact thereof on the other. In view of the fact that independent changes in the cash basis had a far greater influence on the period in question than the fluctuations in credit, we will concentrate first on the Federal Reserve System's stand on gold imports, its gold policy, and only later turn to its specific business cycle policy. This distinction is, of course, by its very nature somewhat arbitrary and cannot be rigorously carried through. Within each of these two sections we will first discuss the relevant theoretical problems and then look at the actual policy implemented by the Federal Reserve Banks.

The year 1920 was the last time when the Federal Reserve Banks were motivated to raise the discount rate and thereby set off a general down-

[10] *Tenth Annual Report of the Federal Reserve Board Covering Operations for the Year 1923* (Washington, D.C.: Government Printing Office, 1924).

turn in the economy for the sake of maintaining a prudent coverage ratio for their obligations. The ensuing period of depression did not as yet confront them with a large number of new problems. The unusually high 7 per cent interest rate remained in effect for more than eleven months, that is, most of the period of decline. By this time the open-market discount rate for commercial paper had sunk nearly to the same level, the rediscount rate moved with the market rate and remained below that level until the beginning of 1924, with the exception of the brief interlude of early summer 1922 mentioned earlier. By the nature of things, there was little need during this depression period to dampen the impact of gold imports. Bank reserves, which are always inclined to be ample at the beginning of such a period, were even more abundant because of gold imports than they would have been otherwise, and the Federal Reserve Banks' bill portfolio contracted so sharply that the banks made substantial purchases of Treasury bills in the open market in the first six months of 1922 in order to earn sufficient dividends.[11] During this period, gold imports thus served to some extent as a mere reinforcement of the normal tendency, which consists of expanding gold imports as a credit basis when prices fall, in the hope of bringing the drop in prices to a halt. In this constellation the normal course of action was simply reinforced, but when the converse situation arose, gold imports—triggered by independent factors—stymied the normal mechanism whereby, at this stage of the business cycle, gold exports keep rising prices in check. As a result, changes in the coverage ratio at the central banks lost all relevance as a guideline for the discount policy. The proper policy to pursue became problematic only when the revival of business activity gave rise to increased demands for credit. It was clear from the very start that under existing international conditions and with the enormous gold reserves of the Federal Reserve Banks in mind, the raising of discount rates should not be postponed until reserves were nearly exhausted, lest a dangerous inflation be encouraged and a severe downturn subsequently precipitated in its wake.

As long as several gold currencies existed in tandem and international gold movements remained largely operative, a built-in safeguard against additional credit expansion manifested itself when price rises began to have an unfavourable effect on the balance of trade: The resulting gold exports automatically induced credit restrictions. Moreover, when inter-

[11]The Federal Reserve Banks' policy during this period can be said to reflect the abnormal gold movements only to the extent that they did not lower discount rates as fast or as much as the rapid growth in reserves would otherwise have permitted. [The open-market trading of Treasury bills by individual reserve banks so disturbed the Treasury that this discretionary trading was given only to the Federal Reserve Board, and trading was henceforth carried out only by the Federal Reserve Bank of New York.—Ed.]

est rates fell too sharply in one country because of an oversupply of money, compensatory shifts in liquid capital were triggered and also gave rise to gold exports. Even at that time, such shifts occurred too slowly to prevent money rates of interest from remaining temporarily below the natural interest rate, thus stimulating overinvestments. The belated rise in the money rate of interest then led to partial losses and inevitably triggered an adverse reaction. Nevertheless, gold movements introduced needed correctives before credit expansion assumed extreme proportions and thereby averted even more severe economic recessions. The compensatory influences of international interdependence thus counteracted economic fluctuations in modern economies largely based on bank credit.

Under current conditions, the automatic safeguards against excessive credit expansion no longer prevailed in the United States. With its confinement to a single large country, the gold currency lost the stabilizing effect that it had produced in the prewar period, as demonstrated both by the sharp rise in the general price level between the outbreak of war and 1920, in which the value of the dollar was cut in half, and by the ensuing drop in prices. In the years that followed, it became clear that the United States could not maintain even the degree of price stability attained by countries with an unconvertible paper currency. According to McKenna,[12] prices in England deviated by 2.37 per cent, 2.87 per cent, and 2.58 per cent from the annual averages in 1922, 1923, and 1924, while the respective deviations for these years were 6.34 per cent, 2.99 per cent, and 2.91 per cent in the United States. In short, price fluctuations were significantly higher there than in England. Fluctuations in the value of money operated within such wide margins in the United States without activating the corrective mechanism of gold movements that the mechanism was for all practical purposes inoperative. It would first of all have taken an extremely large price rise to trigger any outflow of gold at all. Even then, bank-held cash reserves would take an extremely long time to sink to a sufficiently low level to call for a restriction of credit and higher interest rates according to traditional banking principles. By postponing intervention to such a late stage, a catastrophic crash would inevitably follow the collapse of the boom, which had originally been fuelled by the unduly low interest rates. It was obvious that such a course of events had to be forestalled by a thorough reappraisal of the banks' credit policy in relation to gold movements.

The first step in this direction was the recognition that the coverage

[12]Rt. Hon. Reginald McKenna, "Company Meeting. Midland Bank Limited", *The Times*, January 28, 1925, p. 21. [McKenna was Chairman of the Midland Bank.—Ed.]

ratio of the central banks had lost its usefulness as the most critical and almost the sole guideline for their discount policy, although it had indisputably played that role ever since the founding of central banks.[13] The main objective of all monetary policy, that is, stability in the value of money, had been achieved under prewar conditions by a discount policy based on maintaining an adequate coverage ratio. This objective had been achieved indirectly as a sort of by-product, and the responsible authorities often hardly realized this connection. In their eyes, their main task was to preserve the national stocks of gold, although this goal made sense only because of its by-product. It is therefore a matter of no surprise that they were baffled when this connection was loosened by changing circumstances and they were forced to act directly to maintain a stable value of money without being able to rely on the simple guidance provided by changes in the coverage ratio. But even from a purely theoretical point of view, this task was by no means unproblematic. A lively discussion therefore arose in the United States in 1921 about a question that had been first discussed in 1915 and 1916 when gold imports became substantial. The question was how to decide on an appropriate discount rate now that the coverage ratio had lost its relevance as a guideline. From 1922 onward, in fact, people even began to consider how the discount policy could be applied to counteract the effects of gold movements.[14]

[13]Official statements notwithstanding, statistical investigations on the relationship between cash coverage and the discount rate clearly demonstrate that a satisfactory coverage ratio was in fact the sole determinant of the discount rate, to the nearly total exclusion of almost all other considerations as far as central banks were concerned. R. H. Inglis Palgrave, for example, concludes that "a study of this analysis shows the truth of the usual conclusion, that the rate of discount charged by the Bank of England is regulated more by the proportion of reserve to liability than by any other consideration (R. H. Inglis Palgrave, *Bank Rate and the Money Market in England, France, Germany, Holland, and Belgium 1844–1900* (London: J. Murray, and New York: E. P. Dutton, 1903), pp. 218ff). More recently, B. H. Beckhart has shown in his *The Discount Policy of the Federal Reserve System* ((New York: Holt, 1924), p. 48f) that central banks in England, France, and Germany moved their discount rates almost exactly inversely to the movements in the coverage ratio.

[14]Compare *Tenth Annual Report of the Federal Reserve Board, 1923,* op. cit., p. 29–31: "In thus recognizing the importance generally attached by the business public to changes in the reserve ratio as an index of the banking position, the board is not oblivious of, nor indifferent to, the fact that central bank practices associated with an effective international gold standard are now inoperative and that this seriously affects the serviceability of reserve ratios as working guides in credit and currency administration." And the report continues:

"*The gold standard* as a regulatory influence *cannot be effective for one country alone,* no matter how impregnable its gold position. . . . Under present conditions, with gold embargoes in force in most foreign countries and the United States practically the only free gold market of the world, *the movement of gold to this country does not reflect the relative position of the money markets nor does the movement give rise to corrective influences,* working through exchanges, money rates, and price levels, which tend to reverse the flow. The significance which move-

The altered distribution of gold worldwide, on the other hand, made the United States largely independent of monetary changes beyond its borders and at least offered the opportunity to influence the value of gold by policies that were not subject to external constraints. So large has the amount of gold accumulated in the United States become that further inflow or outflow of gold from the rest of the world has become relatively insignificant in its effect. On the other hand, this same circumstance implies that gold outflow or inflow can exert sufficient pressure on other countries to provoke large enough changes in the price level in these countries to restore the balance between them and the United States, without inducing any noticeable changes in the United States as such. It is therefore not unthinkable that the United States could attain a far-reaching price level stabilization without taking account of the policies of other countries and yet not have to sacrifice their gold currency.

The altered gold distribution implies a complete change in the meaning of the old-fashioned version of the gold standard not only from the American point of view but also from that of the other countries and must lead to a reappraisal of its positive and negative features. Previously the value of money was determined by the independent policy of a substantial number of central banks, which itself depended on their need to maintain their gold reserves, so that the value of money was not subject to any arbitrary manipulation. Today, on the contrary, measures taken by a committee of nine men in Washington can exert a strong influence on the value of money and therefore expose it to many of the dangers facing an arbitrarily regulated paper currency without having the compensating advantages of that type of currency or acquiring these advantages at immense costs, as remains to be shown. Things would not be greatly changed even if England, as expected, returns to the gold standard in short order. In fact, this state of affairs would even be reinforced under these circumstances if, as is likely, the central banks in both countries were to reach an agreement about their policies, because then that part of the world gold reserves managed from the same perspective would be considerably expanded.[15] We have now reached a state of affairs—though not in the predicted manner—whose inherent danger to our monetary

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ments in the reserve ratios formerly possessed rested upon the fact that they were the visible indicators of the operations of the nicely adjusted mechanism of international finance. With this mechanism now inoperative, the ratios have lost much of their value as administrative guides. *It has therefore been necessary* for banking administration even in those countries that have been most successful in maintaining a connection with the gold standard *to develop or devise other working bases*. This has been as true in the United States where the gold standard has been consistently maintained as in other countries where that standard is for the time being inoperative". (Emphasis added.)

[15]As has happened meanwhile, according to press reports.

system has long been recognized by far-sighted economists: the elimination of competition for gold.[16] Should these circumstances persist for some time, new scientific methods would have to be devised to replace the automatic regulation that used to prevail. This is our only hope for assuring the stability of the value of money, if it is not to be exposed to the sway of political factors.

Besides the above-cited arguments for sterilizing the gold influx as far as possible, a further consideration may have carried even greater weight in shaping the policy actually adopted than any other argument, despite its having only partial validity. It was the belief that whatever gold had flowed to the United States as a result of the abnormal circumstances prevailing in Europe would remain there only until normal circumstances had been restored in Europe and currencies had stabilized there. At that point the European countries would again be in a position to attract their due share of the world's gold and thereby reestablish its 'natural' distribution. In this view, the United States played the role of temporary 'trustees of the world's gold', which they could at any time be asked to give back, and that they should not, for that reason, permanently incorporate into their credit mechanism.[17] This characterization, however, is by no means valid for the entire accretion to the gold supply of the United States in the last few years. This mistaken notion rests in part on overlooking the main distinctions between the current organization of the circulating media and a system in which gold constitutes the sole means of exchange.

[16]See, for example, Ludwig von Mises, *Theorie des Geldes und der Umlaufsmittel* (Munich: Duncker & Humblot, 1912; 2nd edition, 1924). [English translation by H. E. Batson, *The Theory of Money and Credit* (London: Jonathan Cape, 1934; new edition, enlarged, New Haven, Conn.: Yale University Press, 1953; reprinted, Indianapolis, Ind.: Liberty*Classics*, 1981).—Ed.]

[17]For example, see *Tenth Annual Report of the Federal Reserve Board, 1923,* op. cit., p. 22: "The history of the distribution of gold in the past demonstrates that monetary gold under normal conditions distributes itself at a fairly steady rate among the gold-using countries in proportion to their ability to command it. *It is to be expected when conditions are on a more normal basis that a situation similar to this will reestablish itself through the redistribution of gold.* Great and impressive as has been the industrial growth of the United States in the past ten years, it cannot be contended that it will require a two-fold amount of gold to insure the integrity and impregnability of the gold standard. It is to be expected and desired that some portion of the gold which the tides of disorganized trade have brought us in the past ten years will eventually return to the countries whence it has come". (Emphasis added.)

And p. 20: "It is the part of prudence for the United States and for the Federal Reserve Banks in particular, . . . to pursue a course which will enable them to part with such portion of this gold as Europe will need to reclaim for currency restoration with a minimum of inconvenience and disturbance to our internal financial and economic situation. In view of the important effects of gold imports upon the American credit situation and upon the international monetary situation, the probable extent and direction of future gold movements is a matter of great concern".

In the latter case, there is a fixed relationship between a country's gold stock and the transactions for which it must be used, and this relationship will always reassert itself if no disruptions intervene. The situation differs when gold serves only for international payments, while domestically gold is only the basis for the organization of the circulating media. If equilibrium determined by 'purchasing power parities' between the various currencies were finally reestablished before a new distribution of gold had taken place (perhaps because European countries have meanwhile largely adopted the gold exchange standard and America has been able to block permanently the full impact of gold imports), there is no intrinsic reason why the current numerical maldistribution of gold should not persist. Countries that rely not only on gold but also on 'circulating media' (notes or bank accounts without coverage) for their means of exchange do not all require precisely the same amount of gold, irrespective of their monetary policy. Various factors can give rise to extensive differences in a country's relative need and absorption capacity for gold, such as the statutory or customary rules about the central banks' coverage ratio, what proportion of this gold can be replaced by foreign exchange, and how much influence the coverage ratio has on the discount policy.

If gold parities were reestablished and maintained for the European currencies, there would still be no guarantee that gold would flow back to these European countries. To be relieved of their gold burden, the United States would also have to persuade these countries to accept specific principles of banking organization and monetary policy, such as the reintroduction of gold into circulation. There is little ground to believe that such efforts would be successful and that the central banks of the smaller European countries would be willing to acquire costly gold reserves in place of their profitable foreign exchange portfolio, though they might recognize the need to reach some agreements on this score between the central banks under gentle pressure to that effect by the United States. The expectation that the stabilization of European currencies would soon lead to a speedy reflux of substantial portions of the gold that had been attracted to the United States must therefore be viewed as illusory. This conclusion is not altered by the fact that once stabilization is completed, an expansion in money demand is likely to follow. As is clear from the example of the Austrian Nationalbank, this expansion can take place without increasing real gold reserves, by simply relying on expansion of foreign exchange reserves.

As we have seen, the very measures that were taken to sterilize the increase in gold supplies and to prevent prices from rising contributed to continued gold imports. Similarly, the very measures being introduced in anticipation of the expected reflux of gold are likely to thwart any sub-

stantial reflux of gold. As long as surplus gold is prevented from stimulating a rise in the price level, the major incentive for a subsequent reflux of gold has been eliminated.

Extensive capital investments, particularly loans to be extended to the various governments, raised strong hopes that they would lead to a reflux of gold and were encouraged for this very reason. But in the long run even this expectation is likely to be largely disappointed. Such loans are likely either to contribute to inflationary tendencies in Europe and thereby give rise to new gold exports to America after the restoration of gold currencies, or else they will be spent on the spot and will therefore fail to generate any gold exports whatsoever. Only to the extent that the proceeds of these loans are used as coverage for notes that are already in circulation is there some hope that the gold shipped to Europe for that purpose will remain there for good. Hence there is little likelihood that this method will encourage large quantities of gold to migrate permanently to Europe or other parts of the world.

Obviously, none of these considerations apply to that not inconsiderable part of the growth in the United States' gold stocks which, as previously explained, came there not to purchase American securities but to obtain gold credits, with which to make payments in transactions outside America. This influx of gold owed nothing to the United States' greater capacity to absorb gold, but even so it acted to increase bank reserves there and to create the misleading impression that gold stocks have been permanently enlarged to a greater extent than is actually the case. It is hardly possible to estimate even approximately how large a proportion of the increase in the supply of gold is attributable to this cause. Whatever its actual magnitude, there is no question that this fraction of the credit basis will be withdrawn whenever European currencies have been so reliably stabilized that the dollar will no longer need to be used in international trade.[18] To that extent, the sterilization of the increased gold stocks is a justifiable policy of the Federal Reserve Board.

5. Measures Adopted

After this digression about the changed current and prospective role of gold and international gold movements, let us now come back to those

[18][Compare Bagehot's account of the predicament of the Bank of England following the resolution of the Franco-Prussian War of 1870: "A large part of the 'indemnity' was paid by France to Germany in bills on England, and the German government, as those bills became due, acquired an unprecedented command over the market." Walter Bagehot, *Lombard Street* (London: H. S. King, 1873; New York: Charles Scribner's Sons, 1883), p. 312 and pp. 309–313.—Ed.]

measures of the Federal Reserve System on which these changes have a bearing. The most important conclusion to be drawn from the above considerations is the reduced importance of gold movements for current American credit policy. We have already explained for what reason the coverage ratio for the banks' obligations has ceased to be an efficacious guide to discount policy, but an examination of the various alternate indicators proposed or actually tested for this purpose will be taken up later in conjunction with our discussion of the Federal Reserve Banks' business cycle policy. Suffice it to say for now that the directors of the Federal Reserve System are making a point of neglecting the coverage ratio in their policy and are guided solely by the goal of maximizing overall economic stability at this juncture.

Such a policy flies in the face of unrelenting pressure to provide additional and cheaper credit, a pressure that is reinforced by the abundance of available reserves. The directors therefore resorted primarily to two measures whose purpose it was to conceal the true size of existing gold reserves and to prevent a further increase in the reported coverage ratio.

The first step taken by the Federal Reserve Banks in 1922 was increasingly to meet the member banks' demand for cash not with Federal Reserve notes but with gold, or rather, with gold certificates issued by the Treasury in exchange for gold. The outcome of this policy has been, as indicated by Figure 1, that from 1922 on the entire expansion of the gold supply in the United States has been channelled into circulating money, while the gold reserves of the Federal Reserve Banks have remained virtually unchanged. The total amount of money in circulation thus increased gradually—despite a consistent and significant reduction in the circulation of Federal Reserve notes. The Federal Reserve notes at that time were fully covered by gold and were thus for all practical purposes indistinguishable from gold certificates. Nevertheless, this policy served to remove the gold used to cover the gold certificates from the Federal Reserve Banks' reports and therefore did not constitute any visible stimulus to credit expansion. Had Federal Reserve notes with full gold coverage been issued instead of gold certificates, the result would have been a further increase in the coverage ratio (since both notes and deposits are combined in the reported coverage ratio of obligations outstanding) and the Federal Reserve Banks would have found it even more difficult to resist credit demands.

A change was introduced into the Federal Reserve Banks' weekly reports at the beginning of 1924 with the same purely psychological effect in mind. It involved the partial adoption of a proposal that had already been put forward in 1921 by a member of the Federal Reserve Board,

A. C. Miller.[19] Miller's proposal included several steps that would bring the Federal Reserve System more closely in line with the Bank of England's practice of relying only on the coverage ratio for deposits as a significant index of credit conditions. Miller suggested, specifically, that a separate reserve be created for the notes issued, that a separate statement be made about note and deposit coverage, and that whatever gold remained after setting aside an appropriate amount for the coverage of deposits be placed in the reserve held for notes issued. The legally prescribed division of functions between the Federal Reserve Banks and the Federal Reserve Board as to the handling of deposits and the issuing of notes (with Federal Reserve agents acting as the Board's representa tives at the individual Federal Reserve Banks in handling the note coverage, insofar as it is not held in the redemption fund in Washington) already represents a certain conscious alignment with the English system. This separation of the note coverage was made more obvious in Federal Reserve reports issued since January 2, 1924, in that the term "gold held exclusively against Federal Reserve notes" is applied to both of the funds intended for note coverage. The fact that since that time, gold has been deposited with the Federal Reserve agent in exchange for Federal Reserve notes, even when these notes are not needed for transactions with member banks, further reinforces this separation. In contrast to the Bank of England's practice, however, there is no complete division between the 'Issue Department' and the 'Banking Department', so that the Federal Reserve notes kept in reserve are not separately reported again as coverage for the deposits. Consequently this part of the deposit coverage is completely omitted in the report and the impression is created that the notes have over 100 per cent gold coverage, while the coverage for deposits is relatively moderate and fairly stable, with coverage ratio depending only on fluctuations in the amount of deposits. To be consistent, each cash withdrawal should lead to a reduction in the coverage ratio of the deposits, as is the case at the Bank of England, but this effect is stymied by the existence of an (unreported) reserve of Federal Reserve notes. As long as the specific gold coverage exceeds the quantity of Federal Reserve notes in circulation, demands for cash can always be satisfied in any case from this reserve. The net impact of this new strategem has been to make deposits independent of gold movements and subject only to changes in their total amount. It might be said that fluctuations in deposits have become an index of the overall economic situation. Furthermore, a loop-

[19]Adolph Caspar Miller, "Federal Reserve Policy", *American Economic Review,* vol. 11, June 1921, pp. 177–206.

Table II
Combined Report of Federal Reserve Banks for Oct. 1, 1924

Assets	*In Million Dollars*	
Gold serving as cover for Federal Reserve notes	2062	
Other gold	983	
Other monetary reserves eligible as cover	86	
Overall cover*		3131
Means of payment not eligible as cover		40
Bills rediscounted	267	
Open-market purchases of acceptances	138	
Treasury bills and Federal bonds	576	
Other earning assets	2	
All earning assets		983
Other assets		708
		4862

Liabilities	*In Million Dollars*	
Federal Reserve notes		1745
Reserve deposits of member banks	2128	
Government and other deposits	86	
All deposits		2214
Longer-term liabilities		558
Capital paid in		112
Reserves		221
Other liabilities		12
		4862

*Ratio of overall cover to combined note and deposit liabilities: 79.1%.

hole was left in the measure in that no separate report was issued for the coverage of notes, and deposits and the statement continued to present data only for the combined coverage ratio. The specific deposit coverage can be deduced only by comparing their amount directly with the amount of reserves held against them. On the other hand, the total coverage ratio is solely a function of the disbursement of gold certificates in exchange for Federal Reserve notes, as described above. The new tabulation of individual items is illustrated in abbreviated form in Table II by the combined report of all twelve Federal Reserve Banks for October 1, 1924.

It is immediately apparent that neither of the two new measures just described significantly limited the Federal Reserve Banks' potential for credit expansion. The disbursement of gold certificates instead of Federal Reserve notes can at best be said to have had a slight effect, but one need

only recall the ease with which gold certificates in circulation during the war were replaced by notes, in order to be certain that the gold certificates now in circulation could just as easily be reincorporated in their reserves and thereby become the basis for an additional expansion of credit. In any case, the impact of this measure is largely, and of the second measure exclusively, psychological. By camouflaging the actual expansion of the Federal Reserve Banks' cash basis, they indirectly act to let the Federal Reserve Banks keep the discount rate higher than public opinion would tolerate otherwise. Their effectiveness depends on the effectiveness of the official discount rate, which is itself a function of the extent to which the member banks rely on credit from the Federal Reserve Banks in order to acquire the needed reserve deposits. Yet the Federal Reserve Banks have no way to control the willingness of the member banks to use the reserve deposits they have paid in—which is almost always done by a cash payment—as a basis for extending many times that amount in credit. What the Federal Reserve Banks can do, for their part, is to avoid turning the cash that they receive into new credits on account for the member banks, which the latter could then use as reserves and thereby multiply the inflationary effects of the gold influx. The Federal Reserve Banks could also do their best to compensate for the effects of the gold influx by reducing the loans already outstanding.

There is no lack of evidence in the figures cited earlier and illustrated in the accompanying graphs (Figures 3 and 4) that the Federal Reserve Banks succeeded in keeping their discount rates during this period consistently high enough to prevent increases in rediscounts over and above the normal cyclical fluctuations and even to induce a substantial decline in rediscounts during this whole span of time. How could the relatively low interest rates in effect during these years have deterred a greater demand for credit by way of rediscounts from the Federal Reserve Banks? Part of the explanation certainly lies in the presence of gold imports and the injection of funds by the Federal Reserve Banks into the market by other means (to be discussed below), but the strongest restraint stemmed from the general economic depression then prevailing. There can be no doubt in any case that the Federal Reserve Banks could have lowered discount rates much further, given their gold holdings, and that lower discount rates would have provoked more rediscounts. To that extent it is true that the policy in effect mitigated the impact of gold accretion. Even in this respect, however, the steps taken by the banks had at best a moral impact, since the banks reinjected through open-market purchases the very sums that they had withdrawn from the market by letting their discounts drop to a very low level. There was only one way in which their abstention from credit extension via rediscounting could have had a sig-

nificant impact: If they had similarly abstained from investing the funds that had been withdrawn and, if necessary, discontinued dividend payments and even covered the Federal Reserve System's operating costs from the ample reserves accumulated in previous years. Instead of pursuing this course, they attempted to maintain their total earning assets constant, when in the first half of 1922 and again since the end of 1923, rediscount demands rapidly declined, by purchasing large amounts of Treasury bills and acceptances (see Figure 4). They thereby induced a further decline in rediscounts, since banks needing higher reserves or more cash naturally preferred to sell acceptances and Treasury bills to the Federal Reserve Banks at the lower private rate than to rediscount ordinary commercial paper, thereby cancelling out almost entirely the impact of the official discount rate. The management of the Federal Reserve system apparently set a lower limit of 1,200 million dollars, below which it would not allow total earning assets to fall, in order to be able to cover operating costs and distribution of normal dividends. Open-market purchases were therefore undertaken even when they were inopportune from a monetary policy perspective.

All that the Federal Reserve Banks undertook, in reality, to deal with the extraordinary gold influx, was to refrain from expanding credit, as their increased gold stocks would have authorized them to do, thereby leaving their total earning assets and the credits associated with them at the level attained prior to the gold influx. They therefore prevented the expanded gold supply from exerting a multiplier effect, which would have resulted from using the new gold as coverage for extending additional credit up to the legally permissible limit. But the only way that they could have compensated for the gold-based credit expansion of the member banks would have been to reduce their own total earning assets by an equal amount. When one recognizes, however, that it would have wiped out their entire earning assets, had they wanted to absorb only the amount of gold imported between 1922 and 1924, it becomes clear that such a policy would have deprived them of any future influence on credit conditions. They would have served exclusively as a highly costly mechanism for exercising custody over the country's gold stocks, an arrangement that the member banks would hardly have been willing to countenance, and one which would certainly not have withstood for long demands for cheaper money on the part of the farming population and other population groups.

This may be the right place to clear up explicitly a common misunderstanding about the Federal Reserve System's current gold policy, a misunderstanding that has been reinforced by the widely read and in other

respects very brilliant new book by J. M. Keynes.[20] Keynes refers to "the experience of the Federal Reserve policy in 1922–23 of burying this gold in Washington, withdrawing it from the exercise of its full effect on prices, and thereby, in effect, demonetising this metal",[21] and credits the policy of the Federal Reserve System with the result that the United States now have a pro forma gold currency, which is in fact already a managed currency, whose value is arbitrarily set by the Federal Reserve Board. From our earlier discussion it is clear that Keynes is overstating the case and indulging in some wishful thinking in his observations, while actual conditions in the United States are still quite remote from his ideal. We will see in the near future to how small an extent the Federal Reserve Banks have actually succeeded in insulating the value of the dollar from gold movements, once the shocks of the last great recession have finally been fully surmounted and the ground for a new economic upswing has been laid by an improved agricultural situation and a more optimistic political outlook. The expansion of the gold basis has not been counterbalanced by any commensurate reduction of other parts of the credit basis. By refraining from converting the increased gold supply into the basis of a credit expansion, the Federal Reserve Banks are merely underutilizing the heightened expansion potential offered by the existing central banking system, but they have not rendered the increase in the gold stock less effective than it would have been before the introduction of the Federal Reserve System. Had the Federal Reserve Banks been guided exclusively by private economic considerations, the increase in their gold stocks would undoubtedly have led to altogether different results, but their unwillingness to pursue such a course can hardly be viewed as a radical departure from the well-established responsiblities of central banks. It is not particularly objectionable if Keynes wishes to apply the poetic term of "burying gold" to the Federal Reserve Banks' failure to make use of their gold stocks, but it would be a serious mistake to believe that the actions of the Federal Reserve Banks have in fact succeeded in stemming the effects of the gold influx. They could have accomplished this only by withdrawing credit that they had extended exactly matching the amount of the gold increment—a step that they did not take, as we have already emphasized.

Keynes's view has found little support in America; B. M. Anderson re-

[20]John Maynard Keynes, *A Tract on Monetary Reform* [1923], reprinted as vol. 4 (1971) of *The Collected Writings of John Maynard Keynes,* Austin Robinson and Donald Moggridge, eds, 30 vols (London: Macmillan for the Royal Economic Society, 1971–89).

[21]*Tract,* op. cit., pp. 152–153.

fers to it as "pure mythology",[22] and the term is not altogether unjustified. Along with many other economists, he is convinced that the Federal Reserve System's policy erred in the opposite direction. He blames the Federal Reserve System not only for its failure to counteract the inflation effects of gold imports, but even accuses it of having amplified these effects by its ill-timed open-market purchases. This view seems currently to be shared by the American banking community (which admittedly has always been inclined to show a certain hostility to this aspect of the Federal Reserve Banks' activities from a competititve standpoint), as witnessed by several resolutions of the last annual meeting of the American Bankers Association. An article published in the *Commercial and Financial Chronicle*[23] in conjunction with these resolutions and sharply critical of the Federal Reserve System's policy raised quite a stir. The Federal Reserve Banks' large-scale open-market purchases of Treasury bills and acceptances in the last months of 1924 (see Figure 4, curves 7 and 8) may in retrospect have justified these criticisms to some extent, but when they were first voiced in the summer of this year, they were almost groundless. We already explained earlier why it would hardly have been possible for the Federal Reserve Banks to reduce their total earning assets substantially, as was demanded of them. There is another reason why it seems opportune to maintain larger assets of this kind during a general recession. Under current conditions, the sale of these assets is the only method capable of absorbing money rapidly enough to dampen speculative excesses once an economic upswing gains momentum. We will have more to say about the appropriateness of subsequent large open-market purchases, which already overlapped with the first phases of the upswing.

6. Theoretical Foundations for Regulating Business Cycles by Means of Banking Policy

Earlier in this article we examined the general attitude of the Federal Reserve Banks with respect to the problems raised by the gold influx. Before proceeding to examine the various phases of the Federal Reserve Banks' policies during this time span, we must, however, dwell more fully on the second of the two new objectives to which we alluded earlier, and the one that loomed particularly large in the period under consideration: exercising a systematic control over credit in order to moderate economic fluctuations and avert recessions. In the preceding section, we frequently referred to the relationship between credit policy and economic fluctua-

[22] B. M. Anderson, Jr., "Cheap Money, Gold, and the Federal Reserve Policy", *The Chase Economic Bulletin*, vol. 4, no. 3, August 4, 1924, pp. 3–26.

[23] *Commercial and Financial Chronicle*, vol. 119, no. 3100, November 22, 1924.

tions to explain how the banks' efforts to deflect the detrimental effects of gold imports forced them to deviate sharply from established banking practices in these respects. In the pages that follow we will concentrate on the banks' endeavours to establish a preventive policy with respect to cyclical and recession phenomena in place of their previous almost entirely repressive policy for mitigating on-going recessions.

A new scientific perspective on cyclical economic movements was at the root of this new tendency. Perceptive observations about the alternation of periods of prosperity and stagnation had already been made nearly a hundred years ago by proponents of the 'currency school',[24] but it was only in the last decade that economists, especially in English-speaking countries, shifted their focus from isolated recession phenomena to these fluctuations. In conjunction with this new approach, merely surmounting recessions, which were after all just an inescapable phase of this wavelike movement, became less important than finding ways to control the entire cycle in all its phases. In the United States above all, an extraordinary amount of attention has been devoted in recent years to investigating cyclical phenomena, not least because it implies the possibility of reliably predicting the development of future economic activity and thus the hope of making economics serviceable for direct practical purposes. Since the 1920 recession, there has been almost an overabundance of research there on the topic, which has attracted an unprecedented degree of interest even on the part of the lay public for a subject of an economic nature. Recent scientific insights have thus quite rapidly become public knowledge and even official institutions have not been able to ignore them completely.

Thanks to this intensified concern, our knowledge about the ebb and flow of the economy and its causes has in effect progressed so significantly that in the not-too-distant future we may well be able to prevent a large part of the damage inflicted by the business cycle. The new insights have not yet reached the point where they can be summarized in the form of

[24]One of the most eminent representatives of this school, Lord Overstone, had already in 1837 pointed out with the utmost rigour the basic tenets of the modern theory of 'business cycles'. In his *Reflections suggested by a Perusal of Mr. J. Horsley Palmer's Pamphlet on the Causes and Consequences of the Pressure on the Money Market,* he says: "The state of trade revolves apparently in an established cycle. First we find it in a state of quiescence; next, improvement, growing confidence, prosperity, excitement, overtrading, convulsion, pressure, stagnation, distress, ending again in quiescence". Quoted in Alfred Marshall, *Money, Credit and Commerce* (London: Macmillan, 1923), p. 246. [Hayek's detailed account of the debate between the Currency and Banking Schools is found in chapter 12 of *The Trend of Economic Thinking,* W. W. Bartley III, and Stephen Kresge, eds, being vol. 3 of *The Collected Works of F. A. Hayek* (Chicago: University of Chicago Press, and London: Routledge, 1991), pp. 216–244.—Ed.]

a recognized unified theory, as is the case with the various recession theories in existence. One of the obstacles to the formulation of such a theory is the methodology favoured by most American researchers; they do not take a specific basic theoretical concept of the economic process as their starting point, but limit themselves to constructing as detailed a picture as possible of the typical course of a business cycle by exhaustive statistical investigations of the behaviour of the individual factors at each phase of the cycle. From this picture of the relative behaviour of individual branches of production they hope eventually to deduce theories about their interconnections.[25] The outcome is a sort of symptomatology of the course of the cycle, which establishes the characteristic features of each phase of the cycle on the basis of far-reaching similarities between the different business cycles. This enables them not only to offer a proper diagnosis for the prevailing economic situations, but also, as we just mentioned, to prognosticate to some extent about fluctuations in economic activity in the near term. Even if this approach ultimately offers a comprehensive description of all essential features, which is the hallmark of all theories, in its initial stages (to which it remains largely confined), it is incapable of providing the sort of comprehensive insight that can be gained from any theory that is deduced from general economic principles. It is therefore of little use in revealing the causes of economic fluctuations as such, rather than the interconnections between specific elements. Even those researchers who rely on the new methodology therefore tend, consciously or unconsciously, to revert to the explanations drawn from 'abstract' theory when they set out to attack the root cause of economic fluctuations.

The major findings of this inductive research have in any case significantly reinforced certain largely theoretical views about the causes of cyclical movements in the economy. These statistical investigations into the relative behaviour of the individual factors of the business cycle—aptly christened 'cyclical chartography' for their predominantly graphic

[25]This approach represents an extension of a general trend in American economic research in recent times. Under the influence of objective (behaviourist) psychology, which has gained prominence in the last few years, economics has increasingly turned away from purely theoretical research focused on understanding economic behaviour and now seeks to construct a picture of the typical course of all economic phenomena, with generous statistical backing. This school of thought, which is usually designated as the 'institutional school' because of its special attention to concrete manifestations of economic life, has been particularly successful in the field of business cycle research, in which Wesley Clair Mitchell is the leading American scholar and is generally recognized as the pioneer of this new trend. See his *Business Cycles* (Berkeley: University of California Press, 1913). [See Hayek's note on Mitchell in *The Fortunes of Liberalism* (1992), ed. Peter G. Klein, being vol. 4 of *The Collected Works of F. A. Hayek,* op. cit., pp. 40–41.—Ed.]

method of presentation—have highlighted the significance of two recurring events, which are also the focal point of the most important group of business cycle theories: During the upswing, it is the rise in prices that is the strongest driving force, and it is the excessive expansion of the capital goods industries and, more generally, the relatively greater expansion of higher-order goods[26] and the correspondingly slower rise in demand for consumer goods that precipitates the regularly recurring recessions. For lack of space, we cannot dwell here on the other linkages and interrelationships upon which these investigations have shed new light. All we can do here is to delineate the most conspicuous features of what is considered a typical business cycle. It is only because so much attention is now focused on these features that explanatory factors drawn from the sphere of the monetary and credit system have recently regained a decisive role within the theory of cyclical phenomena.

In addition to specific and general price statistics, which are always utilized, American researchers have an abundance of other data, such as comprehensive figures on the quantity of production, inventories, and turnover, as well as on the employment level in specific industries and production branches. There are as well the particularly copious banking statistics, all of them available in monthly series and some of them even on a weekly basis. The first step is to isolate and factor out certain built-in tendencies in these data that are independent of the business cycle, such as regular seasonal fluctuations or long-range developments related to population growth and technical progress, which continue for decades at an even pace. The next step is to compare the relative behaviour of each of these adjusted factors in the individual phases of the cycle, and the final step is to draw conclusions about the connections involved. There emerges a well-defined, regularly recurring sequence of cyclical movements with respect to production, prices, commerce, and credit, with the same pattern reproduced in the individual branches of the economy. Each of these factors is said to have its own particular cycle, but explanations of their causal connections must await further advances in the theory of cyclical phenomena.

The following are the most important empirically determined regularities in the fluctuations of the individual curves which, in combination, constitute the business cycle: The recession period ends when all available inventories in all branches have reached a minimum, and the upswing

[26][Higher order, in this context, designates goods furthest from final consumption, that is to say, raw materials and capital goods. The concept derives from Menger. See Hayek's introduction to the collected works of Carl Menger, reprinted as chapter 2 of *The Fortunes of Liberalism,* op. cit.—Ed.]

first asserts itself in the increased output of industries producing raw materials and capital equipment, although prices may continue their decline for some time. The further removed any products are from end products, the sooner and the more sharply their output and, somewhat later, their prices will increase. Conversely, raw material and capital goods industries will be the first to suffer from a slowdown and will display the widest swings in their curves. Intermediate and semi-manufactured products of various kinds will be the next to show the impact, and consumer goods and services related to immediate consumption will be the last to be affected by the fluctuations. Wholesale and retail sales and prices repeat this pattern in their relationship. Generally speaking, prices will continue to rise longer than output in a given line of production, but in that particular line, price fluctuations will correspond to fluctuations in output. As applied to the financial aspects, stock market prices are usually the first and interest rates the last to be caught up in the upward spiral; bank credit grows very rapidly in the later part of the upswing, tends to outlast the peak of prosperity, and often nearly exhausts the banks' lending capacity. In the downturn and decline, the individual factors maintain approximately the same sequence as in the upswing, with those in the vanguard displaying the greatest decline.

The reason that the individual branches of the economy follow the sequence described above is the well-known fact that each change in demand for finished products has a cumulative effect on the next-higher production level, where changes are a multiple of the original change. We will not discuss in detail here the intermediate steps involved in these changes, but recent American literature on business cycles boasts many excellent studies on this topic.[27] Suffice it to emphasize that they all depend on the proposition that during an upswing higher-order production goods are geared not only to an increased demand but to an increasing demand, and must therefore accommodate an expansion of inventories, of the production apparatus, etc. By their very nature they are geared to a temporary demand, which is bound to come to an end whenever the demand for finished products ceases to increase. Furthermore, during the later phase of the upswing, in particular, expectations that prices will continue to rise stimulates accelerated purchases anticipating demand, which leads to a particularly marked increase in production branches that are remote from the consumer, compared to the actual increase in consumer demand. This excess growth in higher-order production hinges on the requirements of a rapidly increasing output of fin-

[27]See particularly the classical presentation by Wesley Clair Mitchell in *Business Cycles*, op. cit.

ished products and now becomes the main reason why overall productive activity can no longer be sustained at the higher level once the increase in demand happens to come to a halt. Any standstill or even a mere slowdown in the pace of increase of the upswing inevitably reduces activity in higher-order production and induces a corresponding decline in demand for finished products, which culminates in a general decline. The pattern that manifests itself in the decline is a mirror image of the one observed in the upswing: Each partial reduction has a multiplier effect and eventually culminates in a general recession. A major role in bringing the upswing to a halt and in triggering the inevitable decline is played by two factors: the banks' eventual retrenchment of credit and the disparities in the position of the various branches of industry, which cannot fail to arise in conjunction with rapid price rises affecting different sectors at different rates.

The overexpansion of raw material and capital goods industries, which recurs regularly, must be regarded as the chief culprit of the periodic economic recessions. This overexpansion in turn is contingent on the highly vaunted elasticity of our modern credit system, which is in fact its main cause. The fact that banks are in a position to extend credit exceeding the concomitant growth in savings is what sets in motion the cumulative impact of a given increase in demand for finished products on the output of higher-order commodities and thereby triggers the accumulation of excess inventories, the overexpansion of capital equipment, and, above all, the disproportionate rise in raw material and capital goods prices, whose ultimate result is a dwindling of profits. They can supply purchasing power to the entrepreneur without a corresponding sacrifice in purchasing power on anyone else's part, and their willingness to extend credit is enhanced when favourable economic conditions seem to lower their risks. Since an increased demand manifests itself on a market where supply has remained constant, prices must rise, disproportionately so for higher-order commodities. This occurs because banks can supply money capital in excess of the real available capital and can therefore offer money capital *more cheaply* than would correspond to the relationship between the increased demand for and supply of real capital. One consequence is that economically unjustified capital investments[28] may still

[28]Inappropriately low interest rates offer the greatest advantage to those sectors of the economy whose products are farthest removed from the consumption stage. This is so because for them savings in interest payments for the eventual end product will accumulate over a correspondingly longer stretch of time and because the next purchaser at each stage can pay a higher price, in view of the overall savings in interest on the way to the consumer. What is decisive here is not so much the effect of lower interest payments on production costs for that sector—the savings obtained might be equally large in all branches of production—but rather the cumulative impact of increases in demand on the part of all partici-

seem to be profitable and will therefore eventually turn into a loss.[29] Over-investment and a general price rise are the most important features of the upswing and at the same time the causes of the inevitably ensuing recession. Both these phenomena are largely the result of a temporary excess in lending (or, to use Wicksell's terminology, a temporary drop of the money interest rate below the natural interest rate), which results in a short-lived period of inflation. The concomitant spur to the economy in turn provokes disproportionalities between the various economic sectors, which can be eliminated only by a recession. This recurring inflation acts

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pants in the subsequent stages of production in the broadest sense (including commerce) generated by the greater profit potential the lower interest rate offers all of them. There is an additional consideration. The value of fixed capital depends not on the price attained at a particular point in time, but on yield anticipated over a longer period of time. The value of fixed capital is thus much more influenced by the interest rate in effect when the yield is capitalized than is true of working capital (materials, labour), which is fully consumed in a given productive cycle and obtains a single price, which must be discounted. A relatively low interest rate therefore raises the price of fixed capital and the profitability of its production far more than is true of working capital. Since a larger proportion of fixed capital is required in the output of producer goods than in the output of consumer goods and especially in commerce, the final stage of production in a broader sense, there is an added reason why a lower interest rate triggers the greatest expansion of those economic sectors that are farthest removed from the consumption stage.

In order to prevent a disproportionate expansion of higher-order producer goods, the interest rate must always be set at a high enough level to confine the output of producer goods to a volume matching the capital required for continuing production in the later stages that can be raised at equally favourable interest rates. It is the interest paid for capital that serves as a necessary restraint against a disproportionate expansion of a capital-intensive mode of production—a point on which almost all modern (catallactic) theories agree. When the interest rate happens to be temporarily too low, it is inevitable that excess capital will accumulate. The result will be a build-up of capital at the base of the pyramidical structure of the economy, but one for which the requisite savings are not available. While demand first rises in the raw materials, etc., sector because of the improved profitability of the branches of the economy refining their products, this demand is certain to decline again when the savings that were used up in expanding producer goods of a higher order are not available for a corresponding expansion of lower-order production (i.e., under equally profitable conditions, that is, without a higher interest rate).

[Hayek later wrote of this footnote: "In the draft of my account of American monetary policy after 1920 I had made use of what I thought was a theory of Ludwig von Mises that was familiar to us in the Vienna circle. But another member of our group with whom I was in daily contact, Gottfried Haberler, persuaded me after reading my first draft that no sufficient exposition of the theory I had used was to be found in Mises's published work, and that if I was to expect to be understood, I must give a fuller account of the theory underlying my report of the events described. Thus arose the long footnote . . . containing the first statement of my version of Mises's theory". F. A. Hayek, *Money, Capital and Fluctuations,* ed. Roy McCloughry (London: Routledge & Kegan Paul, 1984), pp. 2–3.—Ed.]

[29]See in this context Ludwig von Mises, *Theorie des Geldes und der Umlaufsmittel,* 2nd edition, op. cit., pp. 373ff.

in effect like a narcotic, producing at first a short spell of euphoria and later giving way to a more prolonged hangover.

Wherever a gold currency exists, banks can certainly not continue indefinitely to create more credit than the actual amount of accumulated capital. The inhibiting mechanism is so cumbersome and dilatory, however, that it will not be activated until after the credit inflation has inflicted serious damage. Under a gold currency or any currency system of this type, banks will be forced to stop extending additional credit or even to contract credit, in order to protect their liquidity, when price increases reach too large a dimension. When credit expansion and the concomitant rise in the price level is confined to a single country, gold outflow to other countries will gradually compel banks to impose credit restrictions. When prices rise internationally or at least in all the countries with the same currency basis, the braking mechanism will take even longer to activate: Only when higher prices increase the banks' cash needs and they can no longer meet the customary or legally prescribed cash coverage for their liabilities. We know from experience that this braking mechanism is incapable of preserving the economy from the recurrence of violent price fluctuations within the span of a few years, the hallmark of economic cycles. For counterinfluences to assert themselves, price rises must be very marked or prolonged. In the interim, all those forces will be unleashed which, once price rises come to a halt, will inevitably set off a sharp reaction. And once the decline is under way, there is again too great a time lag before banks are encouraged by the influx of gold from abroad or the reflux of cash from circulation to lift their credit restrictions, which had been imposed because of the unfavourable business climate. Until this reversal takes place, the banks' restrictive policy actually contributes to the decline in prices and thereby exacerbates the recession.

In the context of a highly developed system of bank credit, the built-in mechanisms of gold currencies are insufficient to deflect a dangerous inflation spurred by bank credit. It would seem that, because of the alien element of bank credit, special artificial provisions must be introduced to attain even that degree of economic stability guaranteed automatically by the exclusive use of gold as the circulating medium in an economy that largely relies on bank credit. An understanding of the interactions that we have just described readily suggests that automatic but slow-acting economic forces can no longer suffice to eliminate disproportions between the different economic sectors caused by the excessive creation of credit—a process that invariably involves crisis-like convulsion in the entire economy—and that systematic regulations must intervene as soon as excessive credit expansion becomes apparent and threatens to culminate in a dangerous development. It would therefore seem that the proper

approach is a timely restriction of credit in the rising phase of the cycle, even before such an intervention is required in terms of the banks' liquidity or the maintenance of gold currencies. This method would thus seem to be an ideal method for stabilizing the economy and preventing recessions. 'Credit control' has thus become the slogan and panacea of all those who seek to combat recessions. Almost the entire discussion about the prevention of recessions revolves around the possibilities and forms of credit control, and all other conceivable measures are accorded scant attention. Admittedly many American economists have set their hopes too high in this respect and may be overdoing a good thing. The importance of this whole complex of problems, which has hardly ever received its due on the European continent,[30] should nevertheless be fully recognized. This may also serve as our excuse for devoting somewhat more space to this subject than would be strictly necessary within the framework of this essay.

We have briefly discussed in the preceding pages the logical sequence of ideas interconnecting bank credit and recessions, of which these proposals are the direct outgrowth. It must be stated explicitly that these ideas largely represent the theoretical views of European scholars, notably Wicksell, von Mises, and Cassel, rather than conclusions based on American research. But, as already pointed out earlier, the critical role attributed to banking policy as a means of moderating economic fluctuations stemmed only secondarily from the widening dissemination of recession theories that blamed recession primarily on excessive bank credit and the ensuing overcapitalization. The major impetus came from statistical findings, which clearly demonstrated that price movements were the driving force of economic fluctuations. Thanks to these findings, coupled with often rather simplistic versions of the quantity theory of money, banking policy became the center of attention.[31] These circumstances may explain in part why there is no consensus about the measures to be taken to prevent severe economic fluctuations and what their effect might be. The situation would be different if the proposals were derived from

[30]The only German authors who occasionally dealt with this problem were, to the best of our knowledge, Knut Wicksell, Arthur Spiethoff, Friedrich G. von Schulze-Gävernitz, Ludwig von Mises, Joseph Schumpeter, and Albert Hahn.

[31]The situation is different in England. There, interest in theory has remained livelier, thanks to the influence of Alfred Marshall, and Ralph George Hawtrey in particular has made essential contributions to our understanding of the connections between credit and business cycle phenomena. In this and other respects, too, there is a clear parallelism between political economy in America and England, on the one hand, and Germany and Austria on the other. In America and Germany the historical-statistical approach prevails, while in England and Austria, theoretical research predominates.

consistent theoretical views. As it is, there is considerable divergence between the proposals, which are more in the nature of rules of thumb that were discovered and developed empirically.

The main aim of the great banking reform of 1913–14 had been to create an authority that would help prevent financial panics, which had frequently wracked the United States, by extending credit in times of recession ("panic financing"). Even then it was envisaged that an authority of this kind might be an instrument for moderating cyclical fluctuations by a systematic credit policy. The particular severity of such fluctuations in the United States was, rightly or wrongly, attributed to its decentralized banking system.[32] High hopes were roused as to the accomplishments of a central banking system. A bill introduced in the House of Representatives specified that the maintenance of a stable price level should be explicitly included in the Federal Reserve Act as the guiding principle for the banks' discount policy.[33] Even though this ambitious provision failed to survive committee deliberations, there can be no doubt that engaging in open market operations in particular was justified largely in terms of the Federal Reserve Banks' applying them to control economic fluctuations.[34]

But at the same time, the reform of 1913–14 deserves to be reevaluated from a different aspect, which has hardly ever been brought out in the entire discussion on this matter. While it is true that the banking reform facilitated the development of a systematic credit policy by a central authority, it also created the very situation that made such a credit control indispensable as a counterweight to the increased inflationary potential

[32]See, for example, B. H. Beckhart, *The Discount Policy of the Federal Reserve System,* p. 100f: "The diffused character of the National Banking System, the lack of any but local cooperation amongst the members, and the scattered nature of the reserves *prevented any pretense at credit control. Cyclic fluctuations were consequently greatly sharpened and intensified.* On the upward swing of the cycle, always a time when business men overcapitalize future earnings, credit was freely extended. No check was placed on the expansion. The boom periods regularly terminated in severe crises, which as regularly degenerated into panics, followed by prolonged and severe depressions. *The asperities of cyclic fluctuations were much more severe in America than in England, France, or Germany, where some degree of control* was exercised by the central banks over credit extensions". (Emphasis added.) Similarly, Harold G. Mounton, *The Financial Organization of Society* (Chicago: University of Chicago Press, 1921), pp. 522ff; Victor Morawetz, *The Banking and Currency Problem in the United States* (New York: North American Review Publications, 1909), pp. 4–50; and Hugo Bilgram and E. Levy, *The Cause of Business Depressions* (Philadelphia: Lippincott, 1914), pp. 762ff.

[33]Section 11d of the first printing, respectively Section 15 of the draft: [the rate of discount] "shall be made with a view to accommodating the commerce of the country and promoting a stable price level". See Henry Parker Willis, *The Federal Reserve System: Legislation, Organization, and Operation* (New York: Ronald Press, 1923), pp. 1585 and 1605.

[34]See Willis, op. cit., pp. 332 and 1626.

arising from the existence of such an institution.[35] By ensuring greater elasticity in the credit system as a whole and in note circulation in particular, the reform had also cancelled out certain factors which, according to the latest views, had the beneficial effect of applying a brake to the credit expansion that occurs during the upswing. With their removal, the danger of excessive credit expansion was bound to increase, and with it, the need to take special preventive measures. One of the most highly criticized features of the old system was that, especially in periods of upswing, the money supply was automatically curtailed because the issue of new national bank notes became less profitable when interest rates were high. At the same time, larger receipts from tariffs and indirect taxes, which constituted the main sources of government revenues, accumulated in the treasuries, thus withdrawing large sums of money from circulation. The creation of 'elastic' Federal Reserve notes and the abolition of the 'Independent Treasury System', which meant that these government funds could no longer be withheld from circulation, eliminated this automatic restraint on credit expansion. Admittedly this restraint was not always exercised at the most appropriate time or in the most appropriate way; it usually came too late, and that made it more difficult to satisfy the increased demand for money in times of recession. These side effects of the old system tended therefore to appear as unwelcome disturbances. Yet it is paradoxical to observe that the very same authors who stigmatize this tendency to produce a scarcity of money during the boom as one of the serious flaws of the old system often, in the very same work, recommend a planned scarcity of money as the best policy for preventing economic recessions. It therefore seems questionable whether attacks against the old system on this score were fully justified. Nor would it be misleading to categorize this part of the reform, along with several others, as measures with an unintended inflationary tendency. It seems that ideas of this kind, originating with the influential 'Banking School', have repeatedly seduced American monetary experts to take misguided steps in that direction.

Americans have had little to learn with respect to a systematic countercyclical policy from the great European central banks, which have in many ways served them as models in formulating the bank reform. Of course there was Walter Bagehot, whose repeated attacks on the Bank of England are given their most lasting expression in his classic work, *Lom-*

[35]Only William F. Gephart, *Inflation in Relation to the Bank Reserves and Business Cycles* (St. Louis, Mo.: First National Bank, 1923), p. 13, seems to have stated this with the necessary degree of clarity.

bard Street.[36] It was Bagehot who gained acceptance for the doctrine that during recessions central banks should not be guided by private economic principles, in which the maintenance of liquidity has the highest priority, but that they should be mindful of broader economic considerations and intervene to mitigate hardship by a generous expansion of credit, even if at a high interest rate. So far almost no attempts have been made to go beyond an ameliorative policy towards on-going recessions and to lay the foundations for a purposeful, preventive counter-cyclical approach.[37] As was pointed out earlier,[38] central banks focused their credit policy exclusively on confining changes in the value of money within certain limits set by the gold currency and acted to restrict credit only when their reserves or the maintenance of the gold parity of the national currency seemed to be at risk. They felt under no obligation to counteract a general rise in the price level, as long as the gold currency was not threatened thereby, even if the price rise inevitably led to an economic recession with all its evil consequences.

"As long as credit is regulated with reference to reserve proportions, the trade cycle is bound to recur". This remark by the English monetary theorist, Ralph George Hawtrey,[39] which quickly gained wide circulation, summarized the opinion of more recent writers on the effectiveness of the guidelines hitherto observed by central banking policy and simultaneously suggests along what lines reform should be sought: shifting the guidelines for discount policy from the coverage ratio to different criteria.[40] The major part of the discussion on this subject now revolves

[36][Walter Bagehot (1826–1877), English editor, literary critic, banker, and economist, was editor of *The Economist,* which was founded by his father-in-law, James Wilson. *Lombard Street,* op. cit., was published in 1873.—Ed.]

[37]The older English theorists of the Currency School, who, as we already pointed out, understood the nature of cyclic fluctuations better than most of the economists who came after them, also hoped that cyclic swings could be prevented by their proposals for the regulation of note issues. However, they disregarded the effects of deposit money and paid no attention to the fact that limitations against the expansion of bank credit could always be circumvented by expanding clearing house business, so that Peel's Banking Act and the central bank statutes modelled on this Act failed to achieve this purpose. If the basic idea underlying the Peel's Act were consistently implemented and a 100 per cent gold coverage were required for bank deposits as well as for bank notes, the problem of preventing depressions would be resolved in a drastic manner.

[38]See this chapter, section 4.

[39]R. G. Hawtrey, *Monetary Reconstruction* (London: Longmans, Green, 1923), p. 144.

[40]Obviously, the issue here is not to replace a credit policy based on a strict maintenance of adequate liquidity with a laxer credit policy. Far from it; what is proposed is to take the maintenance of liquidity fully into account and at the same time apply additional far more stringent rules. Even where credit extensions would still be permissible in terms of the

around the concrete problem as to what other data should be substituted for the coverage ratio to guide discount policy.

As we pointed out earlier in this article, there was an additional reason for the abandonment of the traditional principles for the discount policy: the isolated position of the United States as the only country with a gold currency. It is likely that this circumstance contributed far more to the widespread interest in this problem in recent years than any theoretical considerations. A third factor intervened, however, to make the question of the most efficacious criteria for the central banks' credit policy in America especially topical. Traditional views about the guiding principles for discount policy have been derived almost exclusively from the experiences of the Bank of England and are therefore contingent on the specific conditions under which it operates. These principles were largely inapplicable or inadequate even for the continental European central banks, which found that they needed supplementary approaches but failed to develop any discount policy theory of their own. It became quickly apparent in the United States, however, that a number of the most critical presuppositions for effectively guiding the discount policy were either totally lacking or largely absent there. Most significantly, there was no counterpart for the mechanism that played such a prominent role in discount policy theory as a regulator of excessive credit: the 'internal drain', that is, the withdrawal of cash from the central institution, when domestic demand for circulatory media increased in response to any kind of excessive credit expansion. In the United States only proportional coverage was required by law; checks, moreover, were used extensively instead of cash, a practice without counterpart in continental Europe. The Federal Reserve Banks thus lost almost no gold to circulation in the early stages of a credit expansion, and the coverage ratio did not constitute as sensitive an indicator of credit conditions as in England.[41] The only reason why an increased demand for domestic currency has a somewhat greater—though still insufficient—impact on the coverage ratio than the

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banks' liquidity and would even be deemed desirable from the point of view of earnings, they would not be allowed on general economic grounds. More generous credit extensions would be required after the downturn, but these would not be at the expense of greater liquidity, since the banks would find themselves in a more liquid state after the downturn than is currently the case, because they would have undertaken a timely restriction of credit during the upswing.

[41]As is emphasized particularly by O. M. W. Sprague, "Bank Management and the Business Cycle", *Harvard Business Review*, vol. 1, no. 1, October 1922, pp. 19–34, p. 26: "Bank of England practice however loses significance and is positively misleading when it is applied to a banking system which loses no gold for purposes of domestic circulation as credit expands".

increased demand for deposits is that commercial banks in need of additional Federal Reserve notes must acquire deposits with the Federal Reserve Banks for the full amount by rediscounting, while they must acquire reserves for only a fraction of their increased deposits from the Federal Reserve Banks. Since it seems that in the course of an upswing, notes tend to increase faster than money deposits, the dependence on the Federal Reserve Banks increases in the later part of the upswing, when the growing need for cash outstrips the expansion of bank credit, thereby creating a certain parallelism to the internal drain affecting the Bank of England.[42] At the same time the so-called 'external drain' is less effective than in London, in view of the much smaller role of foreign credits on the American money market, so that its impact on discount policy is much slighter there.

The most radical departure from the traditional goals and guidelines for the discount policy is the view that the policy's exclusive or primary objective should be the stabilization of the general price level. Accordingly, for each per cent rise in the price index, the discount rate should be raised correspondingly and lowered to the same extent in response to a drop in the price index.[43] This very policy was to be mandated in a passage of the draft version of the Federal Reserve Act, as mentioned

[42]See, for example, *Tenth Annual Report of the Federal Reserve Board, 1923,* op. cit., for its interesting observations on this score, especially p. 25: "This is the usual sequence—an increase of deposits followed by an increase of the currency. Ordinarily the first effect of an increase in business activity on the banking position is a growth in loans and deposits. . . . There comes a time when the increase of business activity and the fuller employment of labour and increased payrolls call for an increase of actual pocket money to support the increased wage disbursements and the increased volume of purchases at retail. At this stage the rough parallelism between growth of loans and deposits of the banks gives way to a divergent movement between these items. Loans may continue to increase while deposits will remain stationary or show a decline. . . . What in the first instance was the creation of bank credit in the convenient form of a checking account has now become a demand for cash. . . . The ratio of loans to deposits rises with an increased demand for currency".

Again, p. 27: "Under the Federal Reserve System, as before, fluctuations in the ratio of loans to deposits are occasioned by the changes in the country's demand for currency. This increased demand, however, under present conditions, leads to increased borrowing at the reserve banks. In the absence of gold imports in sufficient volume to meet the currency demand, it will be reflected in larger rediscounting at the Federal Reserve Banks for the purpose of obtaining currency. . . . [I]t is then that the resources of the reserve bank are brought more fully into play and its loans mount rapidly. So long as the member bank's customers required only book money, the amount of member bank credit which a dollar of reserve bank credit would sustain was on the average in the ratio of about 10 to 1. But, as the demand for currency increases, this ratio declines and eventually reaches a point where a dollar of reserve bank credit must be obtained for each dollar of currency taken from the banks by its customer".

[43]Such as Fisher, Beckhart, Foster and Catchings, and many others.

earlier, but the passage was deleted from the final version. The authorities charged with implementing credit policy have energetically rejected this demand, buttressing their stand with the decisive rejection of this proposal by Congress.[44] Most theorists have been equally adamant in their rejection of the price stabilization approach. The main objection raised by Irving Fisher in the United States, John Maynard Keynes in England, and, most vigorously, by B. M. Anderson, Jr., is the time lag that exists between the average price level movements and the movements of the other factors involved in the business cycle, particularly the volume of output. Moreover, the general price level continues to drop even after the level of economic activity has resumed an upward course, a stage at which rising prices benefit the economy by stimulating further expansion of production.[45] Any credit policy guided exclusively by price movements would therefore send the wrong signals. It would unduly spur productive activity by credit expansion at a time when production was already in the upswing, yet hamper its growth long before it reaches its maximum by imposing credit restrictions. It is generally agreed that price rises become dangerous and should be resisted only when they no longer encourage an increase in productive activity because of the full utilization of the productive apparatus. The fact that the phases of the business cycle manifest themselves much more clearly in the relative movement of the prices of different types of commodities than in the fluctuations of the general price level strikes us as a much more serious objection, since under these circumstances the general price index could not possibly be a suitable and, above all, a timely indicator of economic trends. Many people contend, furthermore, that fluctuations in the general price level may also involve non-monetary elements and neither could nor should therefore always be rectified by monetary policies. An additional point of controversy is the extent to which index numbers as such accurately portray movements in the value of money, but all these controversial questions cannot be discussed here in full.

The method discussed above may well be too simplistic to solve the problem at hand. Other more sophisticated procedures have been outlined which would serve to forestall excessive business fluctuations, or to prevent them altogether, by the use of discount policy. We have already noted the abundance of statistical observations collected in the United States with respect to cyclical phenomena. Condensed as different kinds

[44]See *Tenth Annual Report of the Federal Reserve Board, 1923,* op. cit., p. 31: "No credit system could undertake the function of regulating credit by reference to price without failing in the endeavour". See also A. C. Miller, op. cit., as well as the comments of various Federal Reserve System officials quoted by Beckhart, op. cit., p. 524f.

[45]See W. C. Mitchell, op. cit., p. 457.

of 'economic activity barometers', they offer a far more accurate assessment of conditions at any given time than price statistics alone, and should therefore allow the conduct of a more appropriate business-cycle policy. From the welter of statistical observations, a manageable, unambiguous, and simple method must be derived for determining automatically what are the most effective credit policy measures at any given time. Since there is general agreement in the United States that the most important task of any credit policy geared to prevent recessions is to restrict credit just when its further expansion would lead to a disproportionality between the creation of capital goods and the demand for consumer goods, the most urgent goal is to find the right indicator for determining at which precise moment credit restrictions should be put into effect.

This subject has indeed been frequently touched upon by various authors and discussed in different articles,[46] but has not so far received any systematic treatment. A major general work on this subject by O. M. W. Sprague has been eagerly awaited, but its publication, which had been announced already for 1923, has not yet materialized.[47] Sprague was the first to direct public attention to this problem with great vigour, and his exploratory proposal on this subject gave the original impetus to the whole discussion. Mitchell, like Adams, has taken up Sprague's exploratory proposal in his published works, explaining Sprague's suggestion in these terms:[48]

> Professor Sprague proposes to use index numbers of physical production such as have been made recently by Day, King, Snyder, and Stewart

[46]See, for example, J. R. Bellerby, "Some International Aspects of Monetary Policy", *American Economic Review,* vol. 15, no. 1, March 1925, pp. 60–66; J. R. Commons, "The Stabilization of Prices and Business", *American Economic Review,* vol. 15, no. 1, March 1925, pp. 43–52; William F. Gephart, *Inflation in Relation to the Bank Reserves and the Business Cycles,* op. cit. See also William Trufant Foster and Waddill Catchings, "Business Conditions and Currency Control", *Harvard Business Review,* April 1924; *Money,* Pollak Foundation Publication No. 2 (Boston and New York: Houghton Mifflin, 1923); and Thomas Sewell Adams's article, "Financial Devices for Controlling or Mitigating the Severity of Business Cycles" in *Business Cycles and Unemployment,* Report of the Committee of the President's Conference on Unemployment (New York: McGraw-Hill, 1923).

[47]O. M. W. Sprague, *Bank Credit and Business Cycles,* announced as Publications of the Pollak Foundation for Economic Research no. 5. [This was never published. But see O. M. W. Sprague, "The Discount Policy of the Federal Reserve Bank", *American Economic Review,* vol. 11, no. 1, March 1921, pp. 16–29; "Bank Management and the Business Cycle", op. cit.; and Charles J. Bullock, O. M. W. Sprague, and W. B. Donham, "Federal Reserve Bank Policy—the Need of a Definite Statement", *Harvard Business Review,* vol. 1, no. 2, January 1923, pp. 132–138.—Ed.]

[48]W. C. Mitchell, "The Crisis of 1920 and the Problem of Controlling Business Cycles", *American Economic Review* (supplement), vol. 11, 1921, p. 24; also in L. Edie, ed., *The Stabilization of Business* (New York: Macmillan, 1923), p. 42f.

> as a basis for discount policy. These series show that the increase in the volume of business after a depression is for some time produced mainly by a rapid increase in the output of serviceable goods. During that phase of the cycle, expansion is economically desirable. But whenever the existing industrial equipment is booked to capacity and the industrial army is fully employed, then future growth in the supply of serviceable goods slows down to the rate at which new equipment and new hands can be provided and improved technical methods devised. After that point has been reached in the cycle, a further rise of prices serves not to increase the current supply of serviceable goods, but to create confusion in the markets, stimulate disserviceable speculation, and to produce the credit entanglements which cause so much anxiety during the crises and prolong the period of liquidation. *Our aim accordingly should be to check the rise of prices when the index number of physical output indicates that the limit of existing capacity is being approached.* At that point it would be desirable to raise discount rates—even though the reserve ratios might still be high.

We have italicized the main point in this passage: imposing credit restriction to bring price increases to a halt, as soon as they can no longer elicit a commensurate increase in production. Production statistics rank highest as the best indicator of when credit expansion can no longer induce higher production, but the employment level (or rate of unemployment) is also considered a very good indicator, inasmuch as recent American studies, notably those by W. A. Berridge[49]—in keeping with the findings of German researchers (Jastrow[50])—demonstrate that employment statistics provide the most reliable picture of the economic situation as a whole. In J. R. Bellerby's opinion,[51] the general employment index should in fact be the indicator of choice for credit policy, and as soon as employment has reached the level considered normal for any particular

[49]W. A. Berridge, *Cycles of Unemployment in the United States,* Publications of the Pollak Foundation for Economic Research, No. 4 (Boston and New York: Houghton Mifflin, 1923).

[50][Ignaz Jastrow (1856–1937) was a German economist, historian, social reformer, lawyer, and one of the founders of the Berlin Handelshochschule.—Ed.]

[51]J. R. Bellerby, *Control of Credit* (London: P. S. King & Son, 1923), p. 90: "In the meantime, the employment index, rough as it may be, if taken in conjunction with the movement of the price level itself, would form an admirable criterion for the guidance of discount policy. A tendency on the part of the employment index to turn down towards the horizontal (after a comparatively high level of employment, varying according to the country, had been reached), coupled with an upward turn of the price index number, would be the strongest possible evidence that the time had come to regulate credit strictly in accordance with the needs of industry as expressed in the volume of goods coming to the market. In other words, after this point had been reached, the movement of the price level would be the principal guide, the object of credit policy being to prevent the rate of movement from attaining any degree of rapidity".

country, all further price increases should be prevented. A similar proposal is offered by F. W. Pethick-Lawrence,[52] which treats inventories for finished products as the key indicator for the business cycle and therefore suggests that discount rates should be raised when inventories begin to go up and lowered when inventories decline. Bellerby rightly observes in this connection that these indices could be quite valuable if they were not limited to average values for the whole economy but were broken down for retail, wholesale, and manufacturing branches.[53]

The discussion has so far progressed little beyond the acceptance of the basic principles underlying all these proposals. Until the method can be further elaborated and refined, it is too unreliable to be tested in practice. It will still take years of practical experience to determine which of the proposed methods is actually workable. For now, even the improved proposals suffer from the same weakness as the proposal for simply stabilizing prices. The phase of the business cycle is primarily reflected in the relation between the fluctuations of the level of production, employment, or inventories in the different industrial sectors, rather than in the average movement of these factors or their reciprocal relation or their relation to price fluctuations. But the most significant relations (those between the different sectors) have not been sufficiently explored, nor is the pattern of their recurrence sufficiently regular, to serve as clear criteria for determining the right credit policy. A serious obstacle from the statistical point of view is the fact that the theoretical categories that must be applied in explaining economic fluctuations do not always coincide with the customary demarcations between the different economic sectors, nor even with the way in which various activities are reported in the individual enterprises. Consequently even the most accurate production statistics cannot provide reliable information about the way balance shifts between the production of higher-order and lower-order goods, nor can they prove that this relationship corresponds to the capital accumulation that is actually taking place.

[52]Sir Frederick William Pethick-Lawrence, *Unemployment* (Oxford: Oxford University Press, 1922), p. 53: "What would really help to regulate trade would be to begin to contract credit as soon as stocks of finished articles unmarketed showed signs of increasing (instead of waiting, as now, until they have become considerable), and to begin to expand it as soon as they show signs of diminishing. In this way, both the extreme height of the boom and the extreme depths of the slump would be avoided". [Pethick-Lawrence (1871–1961), English social worker and politician. After a brilliant performance as a student at Trinity College, Cambridge, he entered Parliament as a Liberal-Unionist in 1905 and with his wife Emmeline Pethick was active in women's suffrage activities. In 1923 he became a Labour MP, defeating Winston Churchill. In 1925 he opposed the return to the gold standard and later played an important role in India's transition to nationhood.—Ed.]

[53]J. R. Bellerby, *Control of Credit,* op. cit., p. 75.

Other problems remain to be resolved besides the collection of statistics on the most important relevant data. By their reliance on a largely statistical and atheoretical approach, American investigators are denied access to the underlying problems and fail to come to grips with the basic obstacles that face their undertaking.

A separate paper would be required for a thorough critique of the various proposals from the point of view of recession theory. Suffice it to emphasize here that, from a theoretical viewpoint, it is highly doubtful that recessions can be completely prevented, at least as long as our present credit system is retained in its basic features. Mere changes in the banks' credit policy could do little to affect the underlying causes. The naive optimism on the subject shared even by many of the most eminent American scholars[54] can best be explained by their frequently derogatory attitude towards theory, which deprives them of insights into the inescapable interactions of economic phenomena revealed only by theory. But even to the extent that theory offers the possibility of eliminating the causes of recession by a thoroughgoing overhaul of the current organization of economic life, the question remains whether the price of attaining this degree of stability would not be too high. For it is by no means unlikely that any 'additional' credit—that is, credit exceeding the current accumulation of savings—must sooner or later lead to a backlash against the more rapid economic progress to which it gave rise, for the simple reason that a continuing development of the society's productive apparatus at the same pace would have absorbed a larger part of its income than it was either willing or able to withhold from consumption. The losses incurred because of economically unjustified capital expenditures are the price that must be paid for an unsuccessful attempt to impose a more rapid progress than can be exacted from people by a voluntary sacrifice of current consumption.

There is no doubt that capitalist economies could not have developed as they did without the 'forced savings' resulting from the extension of 'additional' bank credit. Economic fluctuations may therefore have to be accepted as the unavoidable concomitant of the accelerated development experienced by the more advanced societies over the last 150 years. The complete elimination of fluctuations would require a very sharp reduc-

[54]See, for example, W. C. Mitchell, "The Crisis of 1920 and the Problem of Controlling Business Cycles", op. cit., p. 31: "For since the money economy is a complex human institution, it is subject to amendment. What we have to do is to find out just how the rules of our own making thwart our wishes and to change them in detail or change them drastically as the case may require." [On this statement, see this volume, chapter 1, note 3.—Ed.]

tion in the pace of development, that is, to whatever tempo voluntary savings would allow. The reduction in the rate of development would perforce be far greater than it would seem at first glance, inasmuch as current accumulation of private wealth largely derives from entrepreneurial profits, which would suffer a serious decline as a result of this slower growth, and thus the amount of actual private savings would be curtailed. If such a slowdown is not acceptable, while both rapid progress and recessions spring from the same causes, the best one can do is to weigh the pros and cons carefully and restrict development to the point where the harm inflicted by recessions does not outweigh the benefits of a more rapid possible progress.

Once these dilemmas are realized, however, all the new proposals lose the revolutionary character that is claimed for them by most of their advocates; all that they afford is a clearer formulation of an old problem and new perspectives on its resolution. It becomes obvious, at the same time, that the practical questions arising in this context cannot be solved in any unequivocal fashion by science alone. To some extent they are also philosophical questions and their solution is, in the broadest sense, a matter of judgement, as to which opinions can sharply diverge. But in this light one comes to realize the dangers that would be conjured up if the traditional well-defined rules of credit policy were summarily dismissed in favour of overly bold experimentation, long before new rules had acquired the same authority, thus inviting abuses. It is assuredly a great step forward that new approaches to central banking policy are being developed alongside the imperfect old ones. By taking these new approaches into account, it should become possible to arrive at a more appropriate policy in situations where the old criteria were unworkable, inadequate, or tardy in application, and the new criteria are more apt. Central banking policy has far too long been neglected by scholarship and fully deserves some added attention. It should be feasible to confine economic fluctuations within narrower limits than has been the case up to now through a suitable credit policy. At the same time, these prospects would be gravely vitiated if too much were expected of central banking policy at this stage, and if premature and rash experimentation were to result from these excessive expectations. This could well lead to immeasurable direct damage and might well also bring political intervention into play. In the end, not only would central banks be deprived of the considerable potential that they already possess for beneficial regulation, but the entire monetary and credit system would be politicized, and a continuing source of turmoil rather than a stabilizing influence would be introduced into the economy.

As a general comment on the various concrete proposals for an active[55] cyclical policy by the banks, it need only be added that the complete suppression of cyclical fluctuations anticipated by some authors is unattainable, if for no other reason than that excessive credit expansion is not their sole cause. Another reason is that interest rates would have to be raised to prevent a reversal in economic trends at a time when the need for a higher rate would not yet be perceived. The interest rate would presumably have to be maintained at a significantly higher level during the entire period of recession, or at least from the time that output ceases to decline, than is now customary. Since the influence of central banks is particularly weak just at the beginning of an upswing, it seems quite dubious that such a policy would have any practical bearing. This applies particularly to cyclical policies guided by price movements in general or those of specific commodity groups. A downturn can never be forestalled by them in a timely fashion, since the harm has already been done and capital largely tied down by the time credit expansion begins to manifest itself in rising prices.

It seems to us, however, that another element involved in economic fluctuations has not received the attention it deserves, although it can be ascertained statistically. We are referring to the total volume of bank credit currently in use, a factor that should be relevant for any bank policy attempting to stabilize economic activity. If changes in currently utilized credit are viewed as the main cause of the uneven development of supply and demand and hence of economic fluctuations, it is plausible that a policy to maintain the volume of bank credit approximately constant would contribute most to the prevention of economic fluctuations. We merely offer this suggestion here, without discussing any of the practical or theoretical problems connected with it.[56]

With this we bring to a close our discussion about the new views on the proper aims of credit policies. We turn finally to the instruments of credit policy and the changes in perspective about their utilization that have taken place in recent years. The first question that arises in this context is: Which institutions should play a policy-making role, that is, which can

[55]Active, in the sense of a policy aiming to modify the course of economic activity, in contrast to a passive policy, whose only objective is to adjust to the on-going development of economic activity.

[56]See in this context R. G. Hawtrey, op. cit., p. 123f: "Traders and Bankers often deprecate changes in the discount rate as being unsettling to business. *But what is unsettling is the alternation between expanding and contracting credit.* If credit, and therefore the flow of purchasing power, are kept approximately steady, the short period changes in the rate of discount cause no trouble except in the highly specialized calculations of the discount market itself". (Emphasis added.)

be expected to do so most successfully? It has long been believed that only central banks should and could be expected to conduct a credit policy guided by general economic considerations. In recent years there has been increasing support for the view that central banks are insufficiently equipped for this task and that the measures required for credit control can be implemented thoroughly and promptly only with the voluntary and independent collaboration of at least all the large commercial banks.[57] It is hoped that these banks can be motivated, in line with their private economic interests, to pursue a policy similar to the central banks with respect to economic fluctuations, at least to the extent that during an upswing they observe greater caution in evaluating the assets of credit seekers than during a period of stagnation, since the latter will not entail the same unpleasant surprises as a short-lived boom. It is not altogether utopian to expect such broad economic considerations to be taken into account by individual commercial banks, as demonstrated by the fact that many large American commercial banks have in recent years set up their own economic bureaus, whose main task it is to keep a close watch on business fluctuations and whose findings are fully taken into account by the management of these banks. The expectation of an imminent downturn, as soon as data begin to indicate that economic activity is nearing its peak, will undoubtedly motivate banks to exert greater restraint in the later part of the upswing. The braking effect exerted by the commercial banks should reinforce the goal pursued by the central banks through their discount policy at this same point in time.

The large central banks were, of course, expected above all to exert the necessary credit control by means of their discount policy. There has been considerable discussion as to whether and to what extent changes in the discount rate can, on their own, exert the requisite influence on the total volume of bank credit and what supplementary measures might prove useful. The sceptics, who deny that raising or lowering the discount rate can substantially influence total outstanding bank credit, base this view on the belief that interest costs are such a minor element for industry in general that any change in the interest burden would not affect the volume of production. For industry, the major incentive to increase production is the outlook for profits, which tend to go hand in hand with rising prices. They argue, moreover, that credit extended by the central banks is only an insignificantly small fraction of all outstanding bank credit.

[57]See especially O. M. W. Sprague, "Bank Management and the Business Cycle", op. cit., pp. 20ff; W. F. Gephart, "Inflation in Relation to the Bank Reserves and the Business Cycles", op. cit., p. 7; and Edwin W. Kemmerer as cited in T. Adams, "Financial Devices for Controlling or Mitigating the Severity of Business Cycles", op. cit., p. 269.

Their opponents, notably Hawtrey, rightly contend that interest rates affect the decisions of wholesalers, who largely operate with outside capital, and wholesalers have a major influence on the volume of production. Similarly, interest rates play a large role in stock-market calculations. These two intermediaries (wholesalers and the stock market) thus serve to link changes in the interest rate and changes in output. Furthermore, loans extended by the central banks are the only element in the whole credit structure that is susceptible to rapid change and therefore generally represents the marginal supply of credit, which determines the price of bank credit as a whole.

On the other hand, it is becoming more widely accepted that the impact of raising discount rates on bank credit outstanding is too slow on its own to bring the desired influence to bear on movements in economic activity. The main reason is that once orders are placed, they must be executed even in the face of higher interest rates. Thus discount rate increases need to be reinforced by the sale of securities on the part of central banks, the so-called 'open-market' operations, whereby the volume of credit extended by them would be immediately reduced. Many authors have in fact recently come to consider these open-market operations as the most important instrument of discount policy (in the broadest sense) and tend to recommend its use not only in an incidental and supporting role but in many situations even as a real substitute for changes in the discount rate.

The Federal Reserve Banks were limited by law to dealing only with member banks in almost all their operations, the one exception being that they were legally authorized to buy and sell bank acceptances, Treasury notes, and certain other securities and to enter into these transactions even with non-members of the Federal Reserve System, in part to allow them to invest their resources profitably in periods when rediscounting is at a low level and in part to stimulate the use of certain kinds of commercial papers (drafts, bank acceptances) by creating a regular market for them. But the main reason was to equip the Federal Reserve Banks with an effective instrument for their discount policy. These open-market operations were modelled along the same lines as those of the Bank of England and the German Reichsbank, which made their discount rate more effective by selling or borrowing on government securities (consols) and high-quality bills purchased for this purpose at the private rate; the resultant withdrawal of funds forced the banks to use their rediscounting facilities.[58] In the converse situation, the central bank can ease the money market by the purchase of these securities, if it considers

[58]See B. H. Beckhart, op. cit., pp. 61ff.

the interest rate set by the commercial bank to be excessive. Since purchases made to ease the money market usually coincide with a higher prevailing interest rate than sales that are intended to absorb excess cash, discountable or fixed-interest bills and securities may well yield a quite respectable profit.

The central bank has an essentially passive role in its handling of the discount policy as such, since it has to wait and see how much rediscounting it is asked to do. Only at that point can it act to set a rediscount rate. Interventions on the open market, on the other hand, allow it to influence the credit supply directly and in addition affect the volume of demand it must satisfy by rediscounting at the rate that has been officially set. It thus gains the initiative and is able to influence the policy of commercial banks much more directly than is often the case through changes in its official discount rate.

Several other basic questions relating to discount policy in the broadest sense have been raised by the Federal Reserve System's ongoing practices, but only the most important issues will be mentioned here. Among the topics currently discussed in the United States are the choice of securities to be included (their original and date of maturation), and the relationship between the central bank's discount rate and the open-market rate. Objections have been raised to the Federal Reserve System's policy in the last few years of almost invariably maintaining its discount rate below the open-market rate for the same category of securities, rather than keeping it on principle above the open-market rate.[59] It is argued that any rediscount rate enabling credit from the Federal Reserve Banks to be put to profitable use must necessarily have an inflationary effect. We refer to B. H. Beckhart's excellent work, which has already been repeatedly cited in this essay, for all other aspects of the Federal Reserve System.

7. *The Federal Reserve System's Business Cycle Policy*

A central banking system obviously faces a difficult mission in a country and at a time when new views about the basic principles of central banking policy are being formulated and are the object of general controversy, though no new proposals have as yet solidified or achieved general recognition. And this was precisely the situation facing the Federal Reserve System between 1922 and 1924, when for the first time questions of cyclical policy were not overshadowed by more pressing issues. The directorate could no longer rely on the traditional indicators for central banking

[59]See especially Alonzo B. Hepburn and B. M. Anderson, Jr., "The Gold and Rediscount Policy of the Federal Reserve Bank", *The Chase Economic Bulletin,* vol. 1, no. 5, July 20, 1921, p. 4f.

credit policy which induced it to impose a deflationary policy in 1920 and 1921, with the most serious political consequences for the system. With the typical deep-rooted distrust of the practitioner towards any drastic innovations proposed by theorists, the directorate moved with extreme caution and could hardly be said to have developed a consistent policy. And yet its actions during these years reflect the unmistakable influence of the new ideas examined in the previous section, although they hardly measured up to the new demands and often adhered not only to well-established monetary principles but often even to completely obsolete views. On the whole, the period in question can rightly be considered a time of on-going experimentation which may be as important for the prospects of the principles of credit policy as the inflationary period that came in the wake of the Napoleonic Wars, which gave rise to the famous 'Bullion Report' of 1810, has been for banking policy ideas of the last 100 years.

The upswing in economic activity first manifested itself in mid-1921 by an expanded output and, in early 1922, led to a prolonged disturbance in the price level (see Figure 2), but it failed to affect the credit situation until the second half of that year. At the end of June and in early July, the Federal Reserve Banks in New York, Boston, and San Francisco were still cutting their discount rates from 4–1/2 per cent to 4 per cent. Even a year after output began to increase, credit extended by the banks and the volume of their discounts at the Federal Reserve Banks continued its downward course. The decline in credit outlasted the upturn in prices by about half a year, the same length of time that credit had continued to increase after the reversal in prices in 1920.[60] On July 26, 1922, rediscounts reached a low point of 380 million dollars, a decline of 86 per cent compared to their peak in November 1920.[61] Several of the Federal Reserve Banks responded to this situation by purchasing substantial quantities of short-term Treasury bills in the first six months of 1922 to bolster their earnings.

In July 1922, however, the open-market rate in New York briefly dipped below the Federal Reserve Banks' rediscount rate, which therefore lost its effectiveness. Shortly thereafter, credits extended by member banks began to rise, and the Federal Reserve Banks in turn sold the recently purchased Treasury bills to absorb cash, using this method to limit monetary liquidity and to regain their influence on the money market. These purchases and sales, which were carried out without coordination

[60]See *Tenth Annual Report of the Federal Reserve Board, 1923,* op. cit., p. 2, as well as Figures 3 and 4, this article.

[61]*Ibid.*

between the different Federal Reserve Banks and often involved transactions outside their districts—unless they happened to be located themselves in one of the financial centers—proved to be unsatisfactory in terms of their effect on the credit situation. For this reason a joint committee of the twelve banks was appointed in April 1923, with whose help the open-market operations evolved into the Federal Reserve System's most potent credit-policy weapons in the months that followed. The occasion to act arose at once, since the upswing accelerated in the final months of 1922 and particularly in 1923.

The policy followed by the System during these months is of particular significance, therefore, since it was during this period that departures from the traditional principles of credit policy began to manifest themselves and the basic features of a new Federal Reserve policy emerged. The rapid onset of the upswing, which brought to mind fresh memories of the 1920 recession, aroused much concern at that time that if the upswing were allowed to continue, it would culminate in a new catastrophe. Yet there would have been no ground for intervention in terms of the Federal Reserve Banks' reserve holdings. Since the time at which their total earning assets had sunk to their lowest point, they had been barely going up, as gold imports had enabled the member banks to enlarge their reserves to the required level without resorting to rediscounts. The steady rise in the gold reserves of the Federal Reserve Banks had raised the coverage ratio to 75 per cent. According to traditional standards, the figures indicated on their regular statements would have pointed to an expansion rather than to a restriction of their credit. On the basis of estimates by Foster and Catchings,[62] the legally prescribed coverage ratio would have permitted the Federal Reserve Banks to expand credit to a point at which the price level would have risen to twice the actual level. The Federal Reserve Board took the position, however, that a further expansion of credit should be forestalled and intervened with measures that not only dampened the upswing with surprising speed, but gradually reversed existing tendencies. As indicated, the sale of securities on the open market served as the Board's almost exclusive weapon, since this procedure was considered more effective for various reasons than changes in the discount rate.[63] It is true that the three banks which, as

[62]Foster and Catchings, "Business Conditions and Currency Control", op. cit., p. 273: "Within the reserve requirements of the Federal Reserve System, the price level could have been carried twice as high as the highest point of 1923" and, p. 277: "in the early months of 1923, they would have been just as true to the letter and to the spirit of the law if, instead of putting their rates up, they had put them down".

[63]See *Tenth Annual Report of the Federal Reserve Board, 1923,* op. cit., p. 3: "[T]he experience of several of the reserve banks is demonstrating that changes in discount rates need not be

mentioned above, had lowered their discount level to below 4–1/2 per cent, the level maintained by all the other Federal Reserve Banks, raised it again to 4–1/2 per cent, but it is unlikely that this small rise in the discount rate, which, moreover, applied only to a small fraction of the Federal Reserve Banks, could have had a decisive influence. But almost all (ten out of twelve) of the Federal Reserve Banks kept up the sales of Treasury bills initiated by several of the banks in the previous year throughout the first half of 1923. This step enabled them to keep constant the total volume of credit extended by them (that is, the volume of their earning assets), despite increasing demands for discounts. Or, expressed in the basically equivalent terminology of the Federal Reserve Board, it enabled them to force the member banks to rely more heavily on rediscounts (because of the withdrawal of cash entailed by the open-market sale of Treasury bills) and thereby increased the effectiveness of the prevailing discount rate. The importance of this procedure was further emphasized in April 1923 by the Federal Reserve Board's establishing the following rule with respect to the open market operations of the Federal Reserve Banks, which was published as a 'resolution' in the May 1923 issue of the Federal Reserve Bulletin. The greatest significance was generally attributed to this new rule, despite its innocuous formulation. The resolution states that "the time, manner, character, and volume of the open market investment purchased by Federal Reserve Banks be governed with primary regards to the accommodation of commerce and business and to the effect of such purchases and sales on the general credit situation".[64] This text merely repeats in part the passage in the

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in all circumstances the main reliance or in any situation the exclusive reliance in making the credit policy of the reserve banks effective" [the passage cited by Hayek continues: "By maintaining constant, close, and direct contact with the loan policies and operations of its member banks, through examination or otherwise, a reserve bank can do much by other means than changes in discount rates to establish an effective supervision and control of the credit released by it to its member banks".—Ed.]; p. 11: "[T]he results of the year (1923) have demonstrated that open market operations, when wisely timed and well conceived, are, in a larger measure than has hitherto been generally appreciated, capable of giving effective support to the discount policy of Federal Reserve Banks without an accompanying change of rates", and p. 13; "[T]he difference between discount operations and open market operations is that the initiative in rediscounting lies with the member banks, while in the purchase and sale of securities the initiative may be taken by the member bank", as well as J. R. Commons, "The Stabilization of Prices and Business", *American Economic Review*, vol. 15, no. 1, March 1925, p. 50: "[T]he open market operations are a more efficient and smooth working device than the discount rate, simply because they make it possible for the reserve system to take the initiative and not to wait on the member banks in order to furnish or withhold the supply of funds to the market".

[64]On the meaning of this decision, see J. R. Commons, "The Stabilization of Prices and Business", op. cit., who may, however, in his desire to put things into a favourable light,

Federal Reserve Act establishing guidelines for determining the discount rate,[65] but its cautiously formulated reference to the general credit situation was widely understood to mean that the greatest possible stabilization of cyclical fluctuations had been officially established as the goal of the Federal Reserve Banks' credit policy. The actual policy implemented by the Federal Reserve Banks supports this interpretation to some extent, although the Federal Reserve Board's Annual Report for 1923 happens to be very reticent on this score.[66] Political consider ations probably motivated the Federal Reserve Board to deny that it intended to slow down the upswing in the spring of 1923,[67] but it is generally believed that the

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have attributed guidelines to the Federal Reserve Board that were far removed from their intentions. See p. 43: "I take it, now, that the phrase 'general credit situation' adopted by the Federal Reserve Board in April 1923, as a 'primary' purpose of the reserve banks in governing their open-market investments, is equivalent to the deleted phrase of the original bill promoting a stable price level in governing their discount rates. And the substitute is perhaps superior to the original. . . ."

[65] *Tenth Annual Report of the Federal Reserve Board, 1923,* op. cit., p. 16: "As the Federal Reserve Act provides that discount rates shall be fixed with a view of accommodating commerce and business, the adoption of this principle by the Board has established the open-market policy on the same basis as the discount policy".

[66] In its Annual Report for 1924 (*Eleventh Annual Report of the Federal Reserve Board, 1925* (Washington, D.C.: Government Printing Office, 1924), the Federal Reserve Board itself also appears to make greater concessions in this regard. Thus, on p. 12 of the Report: "During the period when reductions in discount rates decreased the cost of reserve bank credit to member banks, security purchases, by facilitating the repayment of borrowings by member banks, were an influence in reducing the amount of their indebtedness to the reserve banks. This general credit was the adjustment made by the reserve banks to the trend in business and credit. At the time when the open-market purchases were made, there was a recession in industrial activity, the attitude of the business community was hesitant, and there was no evidence of the growth of speculation. Open-market purchases during this period served to build up a portfolio of securities and to increase the proportion of outstanding reserve bank credit under the direct control of the Federal Reserve Banks. By these purchases the reserve banks placed themselves in a position, through the subsequent sale of securities in case it should become desirable, to cause member banks to discount and to bring a larger part of the outstanding reserve bank credit under the influence of the discount rate. [Thus during 1924 both the discount and open-market policies pursued by the Federal Reserve Banks, taken as a whole, were approved by the Federal Reserve Board with regard to the broader aspects of the credit situation and 'with a view of accommodating commerce and business', the basis provided in the Federal Reserve Act for discount policies and adopted by the Board as the principle for the conduct of open-market operations.]"

[67] See *Tenth Annual Report of the Federal Reserve Board, 1923,* op. cit., p. 5: "The rise of prices during the early months of 1923 led to expression of concern that the country might once more be entering upon a period of credit expansion and gave rise in certain quarters to a demand for further discount rate advances. The judgement of the Board, however, was that the increasing volume of credit was justifying itself in the continued increase in the volume of production and consumption; the fact that there was little indication of speculative activity was regarded as sufficient evidence that credit was not being put to uneconomic uses".

sale of securities brought the upswing to a—possibly too abrupt—halt.[68] A recession slowly set in as the year progressed, and credit demand began to decline sharply in late 1923 and especially in early 1924. Thereupon the banks increasingly resumed their purchase of Treasury bills. It is true that they thereby infused additional funds into a market already flooded with liquid assets by gold imports that came in the wake of the economic downturn. At the same time, however, these purchases put them in a position to regain their influence on the market, should this prove desirable, by the resale of these security holdings. Had gold imports not distorted the credit situation, the effect of these measures shortly after the downturn began would have been to ease the credit situation, at the very time when such an intervention would have given some support to the business community caught up in the growing recession. Commercial banks are inclined at that stage to restrict their loans because they are short of liquid assets and by their actions contribute to intensifying the recession. This would seem to be the rationale underlying the Federal Reserve System's policy, if the measures adopted in the past two years are indicative of their future interventions. At the particular time that the security purchases took place (in 1924), however, they coincided with a period of abnormally high monetary liquidity and rapidly weakening interest rates, with daily money rates and bank acceptances hovering around 2 per cent in the late summer of that year. The net effect of the Federal Reserve System's intervention was therefore meaningless in this instance from the point of view of easing the credit situation. What it accomplished was to

[68]Commons, "The Stabilization of Prices and Business", op. cit., p. 47: "Almost immediately, in all parts of the country, the open-market operations of the reserve banks and the warning of a rate increase by only three banks had a general effect. The balances of member banks at the reserve banks began to be reduced, and it was discovered, now that substantially all the gold of the member banks had been impounded by the reserve banks, that it was the sale of investments by the reserve banks that offset the influence of gold imports. These sales and liquidation of loans had almost an equal effect on the ability of member banks to extend loans to businessmen that a similar export of gold would have had, and the slowing up of the commercial loans occurred in substantially all parts of the country", and p. 48: "[Now, however, at the opening of 1925, no one can say that this admirable feat of 1923 can be repeated under the conditions of continually increasing gold imports which are relieving member banks from direct and immediate dependence upon the reserve banks. And] I think the Federal Reserve Board and the reserve banks must have been astonished at the ease with which the stabilization of the credit situation was effected. If anything, they overdid it, and the business activity of the ensuing period has not been as lively, nor the prices of products as steadily maintained, as one could have wished who hoped for a stabilization of the price level". The fact that the Federal Reserve Board actually follows a systematic course of action in this respect has been demonstrated in early 1925 by its applying the same tactics—isolated and slight increases in discount rates, but substantial security sales—to bring an incipient, increasingly lively upswing successfully to a halt.

increase even further the liquidity of certain banks (from which the Federal Reserve Banks bought most of their Treasury bills and acceptances in the open market). These banks, which had already previously been unable to find suitable short-term investments for their cash assets, now converted their even larger cash holdings into long-term investments on a large scale. We already pointed out in Part I, Section 2, in which we described the economic fluctuations of that period, that the end of the upswing in 1923 was attributable to several other factors besides the banks' policies and that the entire course of the business cycle was not significantly influenced by the credit situation. One might say that the Federal Reserve Banks succeeded in preventing the gold influx from causing more than a temporary business upturn only because the underlying economic conditions were not too favourable for a brisker upward movement. This is probably a more accurate characterization of events than saying that the Federal Reserve Banks were able to moderate a regular cyclical fluctuation despite large simultaneous gold imports. It therefore seems highly unlikely to us that under more favourable economic conditions than prevailed so shortly after the great 1920 recession and in the face of continuing gold influx, the Federal Reserve Banks would have been able to stem such an upswing by an effective control of credit. This they could have accomplished only by relinquishing any reinvestments of the proceeds obtained from the sale of their securities, a course that they would naturally be very reluctant to follow.[69] Whether inflationary effects of gold imports can be prevented thus essentially depends on the ability of the Federal Reserve System's directorate to subordinate profitability to monetary policy considerations. As it was, the dwindling of the Federal Reserve Banks' earning assets forced most of the Federal Reserve Banks in 1924 to draw on the previous years' reserves in order to pay the legally required dividends, and two of the banks were unable even to cover current costs from their earnings. Under these circumstances, it is not likely that they would readily give up the last of their earning assets.

Account must be taken, too, of the political difficulties that impede any cyclical policy whose aim it is to put a premature end to an upswing. Vehement objections had already been raised, in retrospect, against the measures taken by the Federal Reserve Banks in the early stages of the boom in 1923. It was asserted that they had quite unjustifiably stopped a sound recovery in its track and thereby set off the ensuing recession. If,

[69]It must be kept in mind, however, that gold *exports,* which first manifested themselves in December 1924, continued during the first third of 1925 and assumed almost the same dimensions as gold imports had a year earlier, so that between January and April there was about a $146 million gold export surplus.

on a second occasion, the bank's intervention were to be followed by a prompt downturn in business activity and an extended recession, it is to be feared that violent opposition would arise in the business community and would prevent the Federal Reserve System from repeating this operation. It might even quite possibly happen that resistance against any kind of arbitrary control and support for cheap money would gain the upper hand altogether, thereby seriously endangering the current organization of the Federal Reserve System, which has already been increasingly politicized in the last few years. I am afraid that the business community might continue to prefer savouring the blessings of a boom right up to its natural conclusion, and in return accept the costs of the ensuing severe recession and its consequences rather than accept a control that was arbitrary in their view but that would be stringent enough to reduce the damage inflicted by a recession. In 1923, when the bad experiences of 1920 were still fresh in the public's memory, people were willing to accept the need for such a control. That does not guarantee, however, that the rational arguments of the Federal Reserve Board will be equally persuasive once these experiences have largely faded from memory and a new wave of untrammeled optimism holds sway. The extent to which the Federal Reserve Board will be free to act along these lines will depend on how effectively the public has been educated to understand the rationale of the Board's credit policy. For this reason, the criteria guiding the authorities' credit policy must be comprehensible to the whole community as well as objectively correct. Comprehensible criteria will also enhance the effectiveness of the measures taken by allowing business leaders to foresee impending changes in policy. The promptness with which any changes in the Bank of England's discount rate took effect was in no small part attributable to the fact that the City had learned to keep a watchful eye on the symptoms used as its lodestar by the Bank and was thus able to anticipate the measures taken by the Bank. Under no other conditions can stringent measures depending solely on the judgment of a few men be imposed without causing the most serious economic disturbances. For these very reasons it was emphatically demanded in America in various quarters in 1922 and 1923 that the Federal Reserve Board make public the guiding principles by which its credit policy was conducted.[70]

In response to this demand, the Federal Reserve Board published its annual report for 1923, to which we have already referred repeatedly. In this report the principles underlying its policy are fully elucidated and specifically discussed in a separate section devoted to "guides to credit

[70]See in particular the article by Bullock, Sprague, and Donham, "Federal Reserve Bank Policy—The Need of a Definite Statement", op. cit.

policy".[71] The theoretical underpinnings given there for the Board's efforts to stabilize economic fluctuations, laudable though the efforts themselves may be, are precisely what raises doubts about its future ability to accomplish what must be considered attainable goals.

We have already emphasized and demonstrated by quotations from the report that the Federal Reserve Board fully recognized the peculiar features of the American monetary situation in the last few years and its special problems. We have also outlined its views, in the light of this report, about the specific means at its disposal to accomplish its objectives. What still remains to be presented here with respect to the material covered in the report is the Federal Reserve Board's general attitude towards the guidelines and objectives of credit policy under the prevailing conditions. As we know, the main issue—and the point that the Board was specifically asked to elucidate—is how to ascertain and establish new criteria for the discount rate, in view of the fact that the coverage ratio has turned out to be unworkable or at least inadequate.

The Federal Reserve Banks' discount rates showed no unusual features during the declining phase of the cycle. The rates went along passively with the decline in the market rates, and, in addition, the drop in the volume of securities presented to the banks for rediscounting, as mentioned earlier, was so substantial that the discount rates lost almost all their importance.[72] In the last third of 1924, the Federal Reserve Banks' discount rates were as low as they had ever been since the establishment of the Federal Reserve System: 3 per cent in New York, 3–1/2 per cent in Boston, Philadelphia, Cleveland, and San Francisco, and 4 per cent in the remaining 'Federal Reserve Cities', without a corresponding increase in the volume of rediscounts. In view of the fact that the member banks have paid in the prescribed reserves almost entirely in cash, so that these banks are hardly affected by possible changes in the discount rates, it may well be that, in the near future, changes in the discount rate are condemned to ineffectiveness, unless they are supported by appropriate open-market operations on the part of the Federal Reserve Banks. It may

[71] It should be noted here that the Federal Reserve Board and the Federal Reserve Banks, in contrast to their sister institutions in Europe and especially the Bank of England, are remarkably communicative and make a point of issuing regular publications containing their current policies and views on the economic situation, notably the Federal Reserve Board's *Monthly Bulletin*. The support for their measures generated by the contact that is thereby maintained with the public should not be underestimated. Despite occasional sharp criticism expressed in the following pages with respect to official views presented in these publications, the author cannot deny his admiration for the deep insight and high level of general economic knowledge evident in all the publications.

[72] See this chapter, section 3 and Figure 3.

seem absurd that the resale of securities which had originally, by their purchase, pumped this cash into the market at a time of excess liquidity, should be a more effective way of withdrawing cash from the economy than the maintenance of a higher discount rate without purchases of securities. Under the prevailing circumstances, however, it is quite possible that this method may be more effective in preventing an undesirable credit expansion, though it may also have had quite unwelcome side effects through its impact on long-term investments. As always, when monetary liquidity is high and the demand for short-term credit limited, there is a relatively greater expansion of long-term investment by banks as compared to loans for working capital. Thus, a large portion of the funds that were injected into the market by the Federal Reserve Banks' security purchases were invested in a way that precluded their being rapidly converted to cash. As soon as the Federal Reserve Banks began to withdraw the cash that they had injected into the market by reselling their securities, this withdrawal reduced liquid funds much more sharply than the previous purchases had expanded them. The resulting tightening of the market for short-term credit dampened economic activity far more effectively than keeping the discount rate at a high level. Admittedly, this success has been attained at the cost of overstimulating the security market. It was reflected in the violent boom on the New York Stock Exchange in the final months of 1924 and in early 1925 and must inevitably lead to a relatively greater expansion in the production of fixed capital—an outcome that is hardly compatible with a policy designed to stabilize economic fluctuations.

Not enough time has elapsed since the Federal Reserve System's new policy was put into effect to be certain how great an impact should be attributed to the specific credit policy measures and what share of the success is due to them. Nevertheless, when one looks at economic developments in the United States over the course of the last four years, one is struck by the degree of economic stability that was actually achieved. The steep rise in prices that was generally anticipated as a result of the large gold imports has not as yet materialized; a start in that direction was nipped in the bud in 1923, and the recession that came in its wake, and for a while threatened to become serious, was once more transformed in 1924, faster than expected, into general prosperity.[73] The fluctuations

[73]The development of this upswing into a pronounced boom—the prelude to a crash—was nipped in the bud in early 1925 by the same kinds of measures that were put into effect in 1923. It would seem that the policy of the Federal Reserve System was contributing both to the mitigation of the cyclical swings and to their abbreviation. The effect of impeding upswings at an early stage might thus be that periods of relative prosperity and depression would henceforth succeed each other more rapidly than has hitherto been the case. It must

demonstrated in the output curves were much less marked in the curves for commercial activity, and consumer demand remained quite stable. All this was achieved without greatly affecting the volume of credit extended by the Federal Reserve Banks, despite the steady rise in the nation's gold stock, while the Federal Reserve Banks' intervention was largely limited to shifts in the proportion of their earning assets derived from discounts and those derived from securities purchased in the open market.

Certain American economists are quite enthusiastic about this success, which they ascribe chiefly to the new policy of the Federal Reserve System. They even assume that an earlier adoption of the new principles would have enabled the System to forestall the severe 1920 recession[74] or at least to alleviate it substantially. They believe, to some extent, that during any upswing the preventive measures of banking policy should be implemented at an earlier stage than in 1923 in order to achieve even greater stability. It would be foolhardy to accept these optimistic interpretations too readily and feel confident that the Federal Reserve System will continue to be able to prevent all major economic fluctuations. Caution is advisable in assessing the new policy, not only because it has been applied in practice for so short a period, but also [omission in original Hayek text —Ed.] the discussion of this problem with an energetic rejection of the proposals so often advocated in recent years, namely to use

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be kept in mind in this respect, however, that even before the war there were signs that cyclical swings were becoming shorter and flatter, even without a systematic anti-cyclical policy on the part of the banks.

[74] J. R. Commons, "The Stabilization of Prices and Business", op. cit., p. 46: "Had the Board adopted, in April 1919, the resolution which it adopted in April 1923, and had it and the reserve banks applied the resolution to the rediscount rates as well as the open-market operations, then the extreme fluctuation and collapse of the world credit in 1919–20 would not have occurred, or would have been far less extreme". Also, p. 48: "Here it was revealed to the astonishment of many that the enormous gold reserves and gold imports of the country, while all other countries were on a paper-money basis, nevertheless need not have the effect of raising gold prices in this country. As a matter of fact, it might almost truly be said that, since that date of April 1923, we have not been actually on a gold basis, but have empounded our gold beyond the use of the banking system, and have stabilized prices at something much lower than gold level. And this was done with just a slight and delicate touch on the two great levers in the hands of the reserve board and the banks, the lever of the rediscount rates and the lever of the open-market operations". Foster and Catchings, op. cit., p. 277, are more cautious: "[T]he discount rate and open-market policies of the Reserve Banks had their part in preventing the sharp upward movement of 1923 from going forward to a boom and collapse". They, however, emphasize the opinion noted in more detail above: that better results could have been achieved if the extension of credit had been restricted in an even earlier phase of the cycle. "Apparently, the effect would have been better still had the policy been carried out sooner. The action of the banks seems to lag several months behind the signals for such action", op. cit., p. 276.

fluctuations in the price level as the major criterion in this context, a position supported by some cogent arguments.[75] Not content with rejecting the choice of the prime index as a suitable indicator for its discount policy, the Board refuses to accept the view of a number of economists that any set of statistically ascertainable data can conceivably take the place of changes in the coverage ratio to prescribe appropriate action in an equally simple and almost automatic fashion.[76]

The Federal Reserve Board is currently, on the whole, drawing much closer to the more recent views that we have discussed and has made a point of emphasizing the desirability to check too rapid an upswing in a timely fashion.[77] But in our opinion it indulges in completely misguided notions with respect to the signposts to be observed in order to attain the desired goal. It argues that the provisions of the Federal Reserve Act already contain the basic principles to follow in order to avoid an excessive credit expansion. It claims that the Act accomplishes this goal by its definition of the criteria for setting the discount rate and by restriction of its discountable bills to those used for industrial, commercial, or agricultural

[75] *Tenth Annual Report of the Federal Reserve Board, 1923,* op. cit., as well as p. 32 of the report: "Credit administration must be cognizant of what is under way or in process in the movement of business before it is registered in the price index. The price index records an accomplished fact. Good credit administration in times of active business expansion should not encourage or assist the excessive accumulation of forward commitments in business and banking which only later on will definitely reflect the rate at which they have taken place in resulting changes of credit volume and changes of price levels; and in times of business reaction should discourage enforced liquidation of past commitments which also will only later on reflect the rate at which it has been taking place in altered credit volume and price levels. [The problem of efficient credit administration is, therefore, largely a question of timeliness of action.]"

[76] *Tenth Annual Report of the Federal Reserve Board, 1923,* op. cit., p. 72: "No statistical mechanism alone, however carefully contrived, can furnish an adequate guide to credit administration. [Credit is an intensely human institution and as such reflects the moods and impulses of the community—its hopes, its fears, its expectations. . . . They are elusive and cannot be fitted into any mechanical formula, but the fact that they are refractory to methods of the statistical laboratory makes them neither nonexistent nor nonimportant.]", and p. 38: "No test so simple, so definite, so easily understood, and so practicable has been found, nor is likely to be found, as the old reserve ratio".

[77] *Tenth Annual Report of the Federal Reserve Board, 1923,* op. cit., p. 10: "It seems clear that if business is undergoing a rapid expansion and is in danger of developing an unhealthy or speculative boom, it should not be assisted by too easy credit conditions. In such circumstances the creation of additional credit by rediscounting at Federal Reserve Banks should be discouraged by increasing the cost of that credit—that is, by raising the discount rate. It seems equally obvious that if industry and trade are in process of recovery after a period of reaction, they should be given the support and encouragement of cheaper credit by the prompt establishment at the Federal Reserve Banks of rates that will invite the use of Federal Reserve Credit to facilitate business recovery".

purposes.[78] Underlying this notion is the widespread fallacy that 'legitimate' credit in the form of bills drawn on commodities can never be excessive or harmful, a view that has been formulated in line with J. L. Laughlin's[79] distinction between 'normal' and 'abnormal' credit, and as such won great influence in the United States.[80] The Federal Reserve Board in this context refers to 'productive' credit in contrast to credit used for non-productive or speculative purposes and states emphatically that credit will be kept within appropriate limits in its opinion as long as it is restricted to cases where it serves productive purposes.[81] All that was

[78]Federal Reserve Act [approved December 23, 1913, with amendments approved June 21, 1917] Section 13: "[A]ny Federal Reserve Bank may discount notes, drafts, and bills of exchange arising out of actual commercial transactions; that is, notes, drafts and bills of exchange issued or drawn for agricultural, industrial, or commercial purposes or the proceeds of which have been used, or are to be used, for such purposes, [the Federal Reserve Board to have the right to determine or define the character of the paper thus eligible for discount, within the meaning of this Act]".

[79][James Laurence Laughlin (1880–1933), American economist and professor, was founder of the Department of Political Economy at the University of Chicago, campaigned against free-silver agitation and in favour of the Federal Reserve System, and was the author of *Money, Credit, and Prices* (New York: Scribner's, 1919).—Ed.]

[80]Both the main author of the Federal Reserve Act, Henry Parker Willis, and the sole economist among the members of the Federal Reserve Board, Adolph Cooper Miller, studied directly under Laughlin.

[81]*Tenth Annual Report of the Federal Reserve Board, 1923*, op. cit., p. 33ff.: "The Federal Reserve System is a *system of productive credit.* It is not a system for either investment or speculative purposes. Credit in the service of agriculture, industry, and trade may be described comprehensively as credit for productive uses. The exclusion of the use of Federal Reserve Credit for speculative and investment purposes and its limitation to agricultural, industrial, and commercial purposes thus clearly indicates the nature of the tests which are appropriate as guides in the extensions of Federal Reserve Bank Credit. [The problem in good administration under the Federal Reserve System is not only that of limiting the field of uses of Federal Reserve Credit to productive purposes, but also of limiting the volume of credit within the field of its appropriate uses to such amounts as may be economically justified—that is, justified by a commensurable increase in the Nation's aggregate productivity.] The Board is fully aware of the fact that the problem of credit extension involves the question of amount or volume as well as the question of kind or character. . . .

". . . *It is the belief of the Board that there will be little danger that the credit created and contributed by the Federal Reserve Banks will be in excessive volume if restricted to productive uses.* . . . It is the nonproductive use of credit that breeds unwarranted increases in the volume of credit; it also gives rise to unnecessary maladjustment between the volume of production and the volume of consumption, and is followed by price and other economic disturbances. Administratively, therefore, the solution of the economic problem of keeping the volume of credit issuing from the Federal Reserve Banks from becoming excessive or deficient is found in maintaining it in due relation to the volume of credit needs as these needs are derived from the operating requirements of agriculture, industry, and trade, and the prevention of the uses of Federal Reserve Credit for purposes not warranted by the terms or spirit of the Federal Reserve Act". (Emphasis added.)

needed was to prevent the speculative use of credit to guard against the degeneration of any period of prosperity into an actual boom period.

If these views, which occupy the most prominent place in the Federal Reserve Board's discussion on the problem of stabilizing business cycles, were in fact the main determinants of its policy, only slight progress would have been made in relation to the traditional views of banking practitioners. The effort to prevent speculation on moral grounds and the inclination to put the entire blame for recession on speculation have almost as ancient a history as do recessions themselves. In our view, scientific progress in understanding the mechanisms linking credit and recession has made its major contribution by making clear the need to stop credit expansion at a certain stage—whether or not it is accompanied by a burst of speculative activity. This insight, rather than moral judgements about the rights or wrongs of speculation, have improved the prospects for effectively dealing with recessions. The point is to prevent excessive expansion of certain sectors of the economy by timely credit restrictions, whether the expansion was triggered only by speculative activity or facilitated by 'legitimate' credit. But the stated views of the Federal Reserve Board give no guidance with respect to the timing of credit restrictions in given cases, nor do they even provide a basis for setting the proper discount rate, since the volume of legitimate credit needs is itself dependent on that rate. As long as movements in the coverage ratio could indicate the proper timing for raising discount rates or imposing other credit restrictions, the guidelines invoked by the Federal Reserve Board might have been useful supplementary criteria for its policy. In the absence of this indicator, these guidelines are clearly insufficient, all the more so when they are expected to accomplish the highly ambitious objectives which, in the light of the current state of knowledge, a credit policy is now expected to take into account if it proposes to moderate cyclical fluctuations.

Fortunately, however, a second line of argument makes its appearance in the Federal Reserve Board's analysis alongside the erroneous view that was just criticized. This second approach bodes well for the future success of its policies. In discussing the specific phases of the policy pursued in the last few years, the Federal Reserve Board already refers to a general principle repeatedly adduced by economic theorists, and states that further credit expansion must be halted as soon as all available productive capacity is fully utilized and productive activity can therefore no longer be increased by the extension of credit.[82]

[82] *Tenth Annual Report of the Federal Reserve Board, 1923*, op. cit., p. 5: "[T]he economic use of credit is to facilitate the production and orderly marketing of goods and not to finance

With reference to the principle of avoiding the extension of 'unproductive' credit for whose observance the individual Federal Reserve Banks are considered responsible,[83] the Board then discusses the principles that guide its own actions in its role as the supervisory authority for these banks. In its supervisory capacity, it has no influence over particular loans, but must provide guidance for the overall policy of the banks under its jurisdiction. In this capacity the Board must, above all, take the general economic situation into account and therefore be guided by a different perspective than in evaluating individual loans. For this purpose, it cannot be influenced by specific aspects but must rely on information about the state of the economy as a whole, which, in the nature of things, must be in the form of statistics. Here the Board can benefit from the great strides that have been made in statistical research in the United States, but it can also point to the large statistical apparatus that it has set up for its own purposes and from which it receives increasingly abundant information about fluctuations in the individual components of the business cycle. In this context it not only mentions the material at its disposal for reaching its decisions, but gives some brief and rather vague indications about the way it interprets this material and what it considers the most important signposts for imposing a more restrictive or a more open-handed credit policy. It rightly emphasizes the importance of the statistical data on the volume of inventories, employment, and output in the individual industries. A comparison of these data allows an approximate assessment of whether the individual sectors are developing harmoniously or whether disproportions are emerging between them, and particularly whether production at specific stages threatens to outstrip the demand of the sectors refining its products and the demand for finished products, and thus lead to stagnating sales. Since this passage of the report may well be its most important section and certainly offers the most

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the speculative holding of excessive stocks of materials and merchandise. So far as available indications go, the increased demand for credit during recent months appears to have arisen from the larger financial requirements of current production and trade and not from speculation in inventories. *When production reaches the limits imposed by the available supplies of labor, plant capacity, and transportation facilities, in fact, whenever the productive energies and resources of the country are employed at full capacity, output can not be enlarged by an increased use of credit and by further increase in prices*". (Emphasis added.)

[83] *Tenth Annual Report of the Federal Reserve Board, 1923*, op. cit., p. 35: "In brief, the technical administrative problem presented to each reserve bank is that of finding the ways and means best suited to the circumstances in which it operates of informing itself of when and to what extent the extension of credit for speculative uses is the real occasion of member bank rediscounting".

characteristic formulation of its stance of this problem, we will give the full text in the footnote.[84]

In this passage the Federal Reserve Board aligns itself most closely with the above-mentioned proposal by F. W. Pethick-Lawrence[85], whose proposal seems to be in effect the most workable of all those we have discussed, if a few modifications are applied. A good deal might be expected of it in the way of results, once the needed information is readily available in really plentiful and reliable form and the competent authorities are equipped with a sound economic background and the requisite detailed knowledge about the behaviour of the individual factors in cyclical movements. Suppose that capital goods industries, manufacturers of semi-finished products, and wholesalers are generally expanding their output and inventories, while no corresponding expansion occurs in the output of finished products, and wholesalers are generally expanding their output of finished products, retail trade, and consumption; suppose that at the same time, savings do not grow vigorously enough to justify such an increase in the economy's capital equipment. This constellation would

[84] *Tenth Annual Report of the Federal Reserve Board, 1923,* op. cit., p. 36f: "The volume of production in physical units indicates the extent of industrial activity and measures the output of goods which will subsequently come into the market. Monthly data are available for basic industries, and while fluctuations in the volume of production in these industries are wider than those in the total for all industries, the data are sufficiently representative to indicate at any given time the direction and trend of industrial activity. Changes in the volume of employment at industrial establishments, figures for which are available for a larger number of industries, not only reflect the degree of current productive activity and thus supplement the figures on production, but because of their bearing on the earnings of workers, also indicate changes in the purchasing power of a large body of consumers. It is the buying power of consumers which primarily determines the demand for goods and the rate at which current production can be maintained. The movements of goods into the hands of final purchasers is measured by the volume of retail buying, which for many lines of trade throughout the country is reported monthly. The rate at which goods are moving through the intermediate channels of distribution is reflected in the volume of wholesale trade and of the shipments of merchandise. *A smooth distribution of goods requires that stocks of raw materials and merchandise shall be held at different points in the marketing process, and the extent to which the marketing is orderly—that is, without undue accumulation or exhaustion of stocks—is shown in the changes in the volume of stocks held by producers and distributors.* While information concerning stocks is not yet as complete or as current as information on production and trade, it is now available for many commodities and is steadily becoming more satisfactory". (Emphasis added.)

[85] Pethick-Lawrence, *Unemployment,* op. cit., p. 53: "What would really help to regulate trade would be to begin to contract credit as soon as stocks of finished articles unmarketed showed signs of increasing (instead of waiting, as now, until they have become considerable), and to begin to expand it as soon as they show signs of diminishing. In this way, both the extreme height of the boom and the extreme depths of the slump would be avoided".

then be the surest possible indication that excessive bank credit is redistributing the available productive resources between current and future production of commodities in a way that threatens the stability of production, and it would make a restriction of credit seem advisable. Conversely, if employment in the basic industries (raw material production, construction, machine manufacturing, etc.) is below average, inventories are shrinking, demand for bank credit is declining, and the price of capital goods is falling below the general price level, this combination of circumstances, unless it comes right on the heels of a sharp downturn, is a sure indication that the easing of credit conditions is appropriate.

We have long been searching for guidelines to determine the proper volume of circulating media. Self-regulating currencies secured by their convertibility into a precious metal often bring their compensatory mechanisms into play too slowly to prevent severe economic fluctuations and create additional disturbances in the economy because of frequent variations (due to extra-monetary factors) in the value of their underlying metallic standard. The utilization of suitable statistical data on the current economic situation may prove to be the first step in solving this old problem and in creating a more stable exchange medium. This is at present the problem whose solution holds the greatest promise and also offers the greatest interest in the field of monetary theory. In their quest for new guidelines to its practical solution, the United States have gained a significant headstart over Europe, because the wealth of statistical information gathered for this purpose in the United States will, for a variety of reasons, be slow in becoming available there. The Federal Reserve Board is well aware of its pioneering role in this area[86]—its many specific inadequacies notwithstanding. Its policy in the next few years deserves to be watched with close attention, and related studies by American theorists should continue to be the object of lively interest.

[86] *Tenth Annual Report of the Federal Reserve Board, 1923,* op. cit., pp. 38–39. "In the United States more than in any other country, business men in recent years have shown a disposition to use current statistical data measuring the rate and movement of basic factors in the economic situation and to adjust the policies of their individual business enterprises to the underlying economic forces. The Federal Reserve System in developing its policies is also in a position to use as guides these indicators of changes in the state of industry and trade, and with the increasing public appreciation of the value and meaning of these guides will to a larger degree have the cooperation of an informed public opinion in the carrying out of its policies. *It is the belief of the Board that out of the experience of the United States and other countries* that are now endeavouring to adapt their banking systems to the changing conditions and needs of industry during this period of unprecedented disturbance, *there may result a larger conception of the function of these banking systems and the development of a new and more competent basis of credit administration*". (Emphasis added.)

8. Proposed Currency Reforms

The banking policy measures adopted by the Federal Reserve System to neutralize the effects of the gold influx discussed earlier and to stabilize economic fluctuations should have demonstrated amply in this particular instance that no credit policy is able to counteract effectively a long-term trend towards the devaluation of gold, and this was exactly the outcome to be expected from general considerations. It may be hoped that cyclical fluctuations in the value of money which regularly follow in the wake of the business cycle can be moderated in this fashion. The example of the United States also shows that throughout a period of years large increases in gold holdings can be neutralized, but by the end of 1924 the point has almost been reached where no additional credit instruments can be withdrawn from circulation to keep compensating for the increase in gold holdings.[87] Given the maintenance of a gold currency with unrestricted gold coinage, inflation must result from continuing large gold imports, as all economists recognize. It is also recognized that the world situation might allow large gold imports to persist, and possible changes in the existing gold standard system to remedy this situation are the subject of lively discussions. On the one hand, in the eyes of most economists, the complete abandonment of the gold standard is not under serious consideration; on the other hand, the problems raised by a pure paper currency whose value is determined by arbitrary changes in its volume ('managed currency') have much in common with the difficulties discussed above, connected with a credit policy geared towards economic stabilization. We will therefore concentrate here on those proposals attempting to preserve the gold standard, albeit in greatly modified form, while seeking to prevent the gold influx from devaluating the currency unit.

Irving Fisher's earlier proposal for a 'compensated dollar', whose detailed analysis is beyond the scope of this article, has received the widest attention and fullest discussion.[88] C. Snyder's article (mentioned earlier in our study) and a similar plan by Foster and Catchings have also been the subject of lively interest.[89] The 'National Monetary Association' founded a few years ago under Fisher's initiative is making a systematic survey of all these proposals and plans to formulate proposals of its own

[87]See this chapter, section 5.

[88]The author hopes to discuss this proposal elsewhere in greater detail in the near future. See also the author's review of Fisher's *Stabilizing the Dollar* in the collective book review published as chapter 1, this volume. B. M. Anderson, Jr.'s book, *The Fallacy of the 'Stabilized Dollar'* (New York: The Chase Manhattan Bank of the City of New York, 1920), should be added to the works listed in Fisher's book as dealing with Fisher's proposals.

[89]Foster and Catchings, *Money*, op. cit., p. 360f.

with the help of the most qualified American experts. As of this writing, their long-awaited report has not yet been published, reportedly because no consensus could be reached within the scientific committee responsible for its preparation. At one of the Association's meetings in New York in June 1923, however, an excellent presentation of the ideas in question was given by a member of the Association, Hudson B. Hastings[90]. In addition, the Association later sent a revised summary of the proposals to a large number of American economists. Neither of these versions has been published, but some reference will be made to them in what follows.[91]

The proposals for counteracting undesirable effects of gold on the value of the gold-based monetary unit are all attuned to the situation currently facing the United States and therefore concentrate on neutralizing further additions to existing gold reserves rather than on reversing the impact of an eventual rise in the value of gold. Leaving aside a few insignificant variations, these are the main types of proposals offered:

First of all, there is the old proposal for a general nationalization of gold production, whereby gold output would be set at a level that would cause no fluctuations in the value of gold, whether that meant restricting production or extending it beyond a profitable level. Since the implementation of this plan is predicated on an international agreement at least between the major gold producers, and the United States cannot act unilaterally, the plan has little bearing on the current American situation. Its future effectiveness, on the other hand, may be considerable, since it is relatively easy to implement, once such an agreement is in place. It would involve no changes in the organization of the currency system in the individual countries, and cooperation between the United States and England would probably be sufficient for its adoption.[92]

A second kind of proposal centres on the restriction of gold coinage, which would not affect the convertibility of the currency into gold but would still impede gold inflation. One possible approach is to bar coinage completely (as happened in Sweden during the war), another is to collect a variable coinage fee, as originally proposed by I. Fisher. Both proposals are intended only to neutralize a threatened devaluation of gold and do not deal effectively with an appreciation of gold. For the latter case, however, they could be supplemented by subsidizing gold mining under an

[90][See review of Hastings in chapter 1, this volume.—Ed.]

[91]The Stable Money Association, founded in 1925, has apparently taken on the tasks of this association, under the presidency of Henry Parker Willis, whom we have already mentioned as the main author of the Federal Reserve Act.

[92]See particularly Robert Alfred Lehfeldt, *Restoration of the World's Currencies* (London: P. S. King, 1923), translated into German by B. L. Frank as *Die Wiederherstellung der Währungen* (Stuttgart: 1924).

international agreement[93] or, as the first proposal noted, by an internationally regulated expansion of the use of 'non-cash payment instruments', lowering of the legal or traditional coverage ratio of central banks, etc.

An improved version of Irving Fisher's proposal, which works both to prevent gold devaluation and appreciation, belongs in this group as well. Briefly, gold coins in circulation would be completely replaced by gold certificates, to be delivered in exchange for variable amounts of gold and exchangeable for a slightly smaller amount of gold bullion. These amounts of gold would be set at regular intervals (perhaps on a monthly basis) by reference to an officially calculated general price index number, with changes in the 'gold content' proportional to changes in the index number. The plan proposes to cancel out secular fluctuations in the value of gold and is to be complemented by a discount policy geared to prevent cyclical fluctuations in the price level.

The majority of the proposals, however, would not tamper with the existing gold parity and the convertibility of all paper money into gold. What they propose, on the contrary, is either to withdraw all or most of the monetary gold stock from circulation and replace it by a more or less arbitrarily alterable amount of paper money. As to the legal bank reserves, several options have been proposed. The paper money could be used in part as a bank reserve or not at all,[94] or, on the contrary, to the exclusion of gold.[95] The volume of paper money in circulation and in the bank reserves (where it replaced gold) would be manipulated chiefly by government purchases and sales of securities (Treasury bills), or, possibly, by an equivalent budgetary surplus or deficit, though this would hardly be a practical solution. Alterations in the volume of paper money would be guided by fluctuations in the general price index, as was true for the

[93]The dangers implicit in subsidizing gold production are best illustrated by the demand made in all seriousness by American gold producers for a subsidy on gold production, even under the given circumstances. They justified this demand by stating that many gold mines had become unprofitable because of the rise in the price level and the corresponding decline in the value of gold, and that these mines would have to close down without government support. The proposal was introduced in the House of Representatives as the McFadden Bill and approved by a subcommittee, but had to be withdrawn in the face of overwhelming general opposition and the fall in prices that had occurred meanwhile. (See B. H. Beckhart, op. cit., p. 273ff, and the expert opinion of a subcommittee of the American Bankers Association reprinted in Alonzo B. Hepburn, *A History of the Currency in the United States with New Chapters on the Monetary and Financial Developments in the United States from 1914 to 1922 and a Preface by Mrs. Hepburn on the Author's Relation to the Federal Reserve,* revised edition (New York: Macmillan, 1924)).

[94]Carl Snyder, op. cit., p. 283.

[95]H. B. Hastings, in the previously mentioned memorandum of the National Money Association.

previously mentioned set of proposals. Regulation of the quantity of paper money to be used for bank reserves would permit direct control over circulating money and would also allow the banks to exert a far greater influence on the volume of bank credit (and hence of deposit money) than is currently the case.

Both Fisher's proposal and the plans enumerated in the last group of proposals, which have the best chance of being realizable in America alone, present problems even if they are implemented just in one country. These problems raise considerable doubt about their prospect of being seriously considered for implementation in the United States. Even aside from the special complications stemming from the implementation of Fisher's proposal in just one country, all these proposals have one drawback in common if they are adopted unilaterally:[96] They would compel the country in question to continue buying up the gold output of the entire world, over and above the amount needed to maintain a stable gold value, and to keep it indefinitely out of use. Only thus could it prevent the debasement of its currency. As long as only this one country refused to allow the enlargement of its gold stock to debase its currency, all newly produced gold would eventually find its way there. It is highly unlikely that the United States would be willing in the long run to assume a financial burden of this magnitude.[97]

Should the gold influx to the United States continue or resume at the same rate as between 1921 and 1924, there remains only one workable method to prevent a sharp general price rise: the most radical method, suspension of unrestricted coinage of gold. It seemed for a while that things were irresistibly heading in that direction. It is not likely, however, that this measure would have been adopted in the near future, even if the gold influx had continued unabated after 1924. The cessation of gold imports at the end of this year has certainly ruled out completely the adoption of such a drastic measure in the foreseeable future.

9. Retrospect and Prospect: The Position of the New York Money Market in the Economic Life of the United States and Its International Significance

The preceding sections of this study have dealt with the most important developments in monetary policy over the last few years. We must now

[96]With respect to Fisher's proposal, this applies only under the assumption that the United States continues to be the only major country with a fully convertible gold currency, while all other countries remain on the gold exchange standard, an assumption that is no longer valid because of England's subsequent return to the gold standard.

[97][The United States placed itself in just that position in 1934. See Frank D. Graham and Charles R. Whittlesley, *Golden Avalanche* (Princeton: Princeton University Press, 1939).—Ed.]

attempt, in conclusion, to apply the insights into the operations of the current monetary and credit system in the United States to an assessment of its new financial system. It was already noted that the Federal Reserve System did not begin its operations until several months after the outbreak of the war in Europe. Thus the period under review here constituted the first opportunity for the System to operate under near-normal conditions. For this reason, the experiences accumulated in the course of these four years have particular significance and must serve as the main basis for evaluating the accomplishments of the 1914 reform and the prospects of the new system. In view of our cursory description of the new organization, we will confine ourselves here to brief comments from a general monetary perspective. We will then turn our attention to several general effects of the reorganization of the banking system, which did not fit in with our discussion of the different aspects of credit policy. We will also examine the connection between developments on the New York money market (which up to now has been almost our sole reference point) and developments elsewhere in the United States. We will finally analyze those changes in credit procedure that impinge on the ways and means of monetary policy—and which, in fact, were introduced by the reform of 1914 with that purpose in mind. In this connection we will briefly indicate the influence of recent changes in the American monetary and credit system on the international position of the New York money market.

We have already discussed at length the two most striking aspects of monetary policy for this period and will say only a few more words on that score. The first concerns the effect of gold imports on prices. As we have seen, contrary to general expectations, a pronounced rise in prices failed to materialize, but this success, which is widely attributed to the policy of the Federal Reserve Banks, should not simply be credited to their actions. It is far from certain, moreover, whether the increase in gold stocks will not at a later point contribute to a general rise in prices. But it is in truth beyond the power of central banks permanently to neutralize the inflationary effects of increased gold holdings, and so success or failure in this respect is not a meaningful criterion for assessing the Federal Reserve System's achievements. The second aspect, which we have also discussed at length, has greater bearing on our assessment. Prior to the establishment of a central banking system, it would have been inconceivable to implement the kind of active business cycle policy envisaged and attempted in the United States. We have up to this point focused on the effectiveness of the Federal Reserve System's interventions under the current organization of the American central banking system and given the means at its disposal, assuming these to be immutable. But to determine how well the organization has been designed, we will have

to investigate how adequately it is equipped for this task, compared to other conceivable or pre-existing organizations of the same sort. It is well known that the Federal Reserve System owed its origin to the wish to adapt the European system of note-issuing central banks to American conditions, and that this adaptation required extensive modifications of the European model. We must now raise the question to what extent the compromise resulting from the struggle to introduce a central banking system in the United States has in fact created an effective instrument for the 'control over the money market' that all proponents of central banking systems, indeed almost all economic theorists or practitioners today, and particularly the younger among them, regard as essential. And specifically, can a system established on predominantly political grounds and composed of twelve autonomous District Banks serve as a satisfactory substitute for a unitary central institute along European lines?

Before taking up these questions, however, one would have to settle a preliminary issue: Did the adoption of the central banking system really offer the best possible remedy for the known weaknesses of the credit organization in the United States, as was asserted at the time, or did its adoption actually conjure up new dangers to economic stability? But to deal with these questions would take us too far afield and would require an extensive treatment of basic doctrinal issues with respect to the importance and tasks of central banks in general, an area that has received far too little attention.[98] We can therefore address these questions only very briefly here, although they are in fact critical in evaluating the 1913–14 reform. It cannot be taken for granted that a central banking system is better suited to prevent disturbances in the economy stemming from excessive variations in the volume of available bank credit than a system of independent and self-reliant commercial banks run on purely private enterprise (liquidity, profitability) lines. Nor can it be assumed that the influence of the central bank will fully compensate for the added incentive its very existence gives to commercial banks to extend a large volume of credit, with the knowledge that they can always rely on the central bank for help. In the absence of any central bank, the strongest restraint on individual banks against extending excessive credit in the rising phase of economic activity is the need to maintain sufficient liquidity to face the demands of a period of tight money from their own resources. The main weakness of the old system in the United States was that favourable eco-

[98]The main reason for the perfunctory research devoted to the most critical problems in this field is the one-sided emphasis on the note-issuing monopoly of central banks, an aspect that has been rendered completely obsolete as a result of the developments of the last decades. See Johann Plenge, *Von der Diskontpolitik zur Herrschaft über den Geldmarket* (Berlin: J. Springer, 1913) and T. E. G. Gregory, "What Can Central Banks Really Do?", *American Economic Review,* vol. 15, no. 1, March 1925, p. 53f.

nomic prospects could trigger unrestricted creation of bank credit, which could proceed at a feverish pace until this limit was reached and credit expansion was forced to a sudden halt only then. There was no way in which individual banks could, by their own restraint, forestall the unavoidable negative consequences for the whole economy. Had banking legislation had the primary goal to prevent cyclical fluctuations, its main efforts should have been directed towards limiting credit expansion, perhaps along the lines proposed—in an extreme, yet ineffective way—by the theorists of the 'currency school', who sought to accomplish this purpose by imposing limitations upon the issuing of uncovered notes. Such was not the primary objective either in the United States or elsewhere. On the contrary, central banks owe their origin to the need to create a safety valve that eases the situation once the money market is overstrained, thereby moderating the fluctuations in the money market when money becomes tight. This intervention fails to have an equally moderating effect on the oversupply of credit, which is responsible for harmful overinvestments. It must therefore inevitably tend to generate a steady increase in the volume of credit being utilized and thereby render the recurrence of recessions even more unavoidable. Largely because of the public conception of their function, central banks are intrinsically inclined to direct their activities primarily towards easing the money market, while their hands are practically tied when it comes to preventing economically unjustified credit extension, even if they should favour such an action. If central banks are to have a truly stabilizing influence, their capacity to tighten up too liquid a money situation must be at least on a par with their capacity to moderate an existing money shortage, and it must be brought into play with equal frequency. Yet while it is child's play for a central institute to create new credits, and in the process easily double the volume of the credit created by all the other banks, an institute rarely finds itself in a position to absorb excess credit completely and prevent its utilization.

This applies especially to a central banking mechanism superimposed on an existing banking system. This superimposed central banking system will perforce be even more inclined to create new credits than a central bank that has grown up alongside the other banks. The American bank reform of 1913–14 followed the path of least resistance by relaxing the existing rigid restraints of the credit system, rather than choosing the alternate path, which would have reinforced its capacity to reduce normal credit utilization and at the same time increased its leeway to provide extraordinary credit expansion in times of recession. The 1913–14 reform thus created new possibilities for inflation, which were further increased by successive amendments to the Act. These possibilities were

fully exploited during and immediately after the war, and were in fact the most important causes of the severe 1920 recession. In view of the unusual conditions prevailing in the years preceding the recession, it would be unreasonable to blame the Federal Reserve System for this credit expansion, which would probably have occurred in any case, even in its absence. The only difference would have been that all the banks would then have been forced to suspend cash payments. The experiences of these years demonstrate, nevertheless, how large an expansion of credit took place under the new system without exceeding the legal limits and without activating in time automatic countermeasures forcing the banks to restrict credit. There can be no doubt that the introduction of the central banking system increased the leeway in the fluctuations of the volume of bank credit in use, but we cannot pursue any further here the importance of this effect of the reform.

We cannot settle the problem as to the intrinsic justification of central banking systems in trying to evaluate the concrete shape assumed by the American central banking system and to assess the extent to which the Federal Reserve System has been able to achieve the goals that were set for it. The only way we can answer the narrower question is by determining the effectiveness of the System's discount policy. Although implementation of an effective discount policy in the United States has raised a variety of problems, we will concentrate here on those that are inherent to the country's special circumstances.

Significant modifications had to be introduced into the European central banking system to adapt it to American needs. At the same time, attempts were made to bring about certain changes in the existing infrastructure of the new central banking system, that is, the organization of commercial credit, changes that were viewed as more or less indispensable preconditions for the successful operation of central banks. The most conspicuous deviation from the European type of central bank is the 'regional system', in which twelve autonomous district central banks were established in the place of a single central bank. Politics probably were the preponderant reason for decentralization, but the major theoretical argument advanced in favour of this type of decentralized organization was the existence of highly diverse interest rates in different localities, which had prevailed in the United States since times immemorial, and the impossibility of imposing a single bank rate throughout the whole country. We have discussed elsewhere at some length in what way this decentralization was carried through.[99] What concerns us here is the ex-

[99]See the author's preliminary presentation in the series of articles published in *Der Österreichische Volkswirt,* vol. 17, nos. 29–33, 1925.

tent to which it influenced the Federal Reserve System's credit policy. It should be observed at the outset that, at least in the last few years, the independence of the individual banks has in practice had almost no bearing on the discount policy. Moreover, the mechanism set up to facilitate harmonization of action by the twelve District Banks has been so effective that in this respect there is little difference between the Federal Reserve System and other centrally organized note-issuing banks. The central supervisory authority, the Federal Reserve Board, has had enough influence to make its intentions heeded everywhere and to ensure that national credit policy as a rule prevails over local interests. For all practical purposes, the Federal Reserve System operates in this respect like a central bank with twelve branches, so that the formal autonomy of the Reserve Banks can safely be ignored. We agree with the view that decentralization is at present no greater than required for administrative reasons. Hence it is plausible that the System currently in effect does not differ significantly from the way it would have evolved had it consisted of a central agency with branch offices from the very start.[100] Aside from the leading position held by the Federal Reserve Board, which is itself not directly involved in any banking business, there is another factor that lessens the federalist character of the System with respect to its credit policy, and that is the dominant role of the Federal Reserve Bank of New York. Not only does it by itself account for one quarter of the total capital and of all earning assets, but it is also especially qualified to take the lead in all operations because of its direct contact with the country's main money market. Were it not for political considerations, it would have been perfectly reasonable to merge this largest bank in the System with the official directorate in Washington, thereby formally ratifying the de facto approximation to a branch system pointed out above. The theoretical arguments for the autonomy of the individual Reserve Banks to which we referred earlier proved to have little validity. There was no way that the desired accommodation of rediscount rates to local interest rates could have been achieved; understandably, variations between market interest rates in the various local centers where the Federal Reserve Banks are located and interest rates in remote areas of the same District were far greater than between the different Federal Reserve Districts. It proved unnecessary, in fact, to maintain different rediscount rates in each of the Districts in most cases. These rates not only tended to move almost in parallel in the individual Districts, but even repeatedly stayed at the same absolute level in all twelve Districts for longer periods of time, notably

[100]See Harold Lyle Reed, *The Development of Federal Reserve Policy* (Boston and New York: Houghton Mifflin, 1922), p. 18.

between March 1923 and May 1924. This convergence of the local interest rates was probably itself largely a reflection of the greater fluidity of credit within the United States brought about by the Federal Reserve System.

Uniformity in the Federal Reserve System's credit policy was thus assured by the above-mentioned developments. The effectiveness of the credit policy was also contingent, however, on certain changes in the traditional ways of carrying out credit transactions. What was required, above all, was the establishment of the kind of credit market in which the central bank's discount policy could successfully assert itself. It is well known that in the United States, prior to the 1914 reform, it was the market for short-term loans on securities, the call money market, that served as the central reservoir for credit, not the discount market, which predominated in Europe. It was the call money market in which changes in supply and demand initially worked themselves out and which the various segments of the credit market used for intercommunication.[101] To give the proper scope to the central bank as a rediscounting institution along European lines, the bulk of credit transactions had to shift from the call money market to the discount market. This shift was in turn reinforced by the operations of the central bank. Since drafts were not in use in the United States, a discount market existed only to a very limited extent and included only commercial paper, promissory notes of the highest-rated firms. These were traded by bill brokers and, incidentally, constituted the sole reasonably fluid component of commercial credit before 1914. By offering an opportunity to rediscount this type of paper, the reform opened up a new market for them and contributed to their expansion. It is the market for commercial paper that has become the most important channel through which changes in discount rates of the Federal Reserve Banks have their impact. But parallel efforts to create a market for domestic commercial and bank acceptances along English lines have so far met with almost no success, despite high expectations. Neither drafts in general nor bank acceptances in particular could be successfully transplanted to the United States. A limited market for them was created by the Federal Reserve Banks' open-market purchases, but most commercial banks remain averse to investing currently idle funds in these securities and still generally prefer to lend them out as call money.

[101] See Paul Moritz Warburg, *The Discount System in Europe,* Washington, 1910 (Publications of the National Monetary Commission), series: Senate documents (United States Congress (61st, 2nd session) Senate); 402 (Washington, D.C.: Government Printing Office, 1910), p. 23: "The European financial system is constructed upon discounts as its foundation; the American system is constructed upon bonds and stocks as its foundation".

Consequently the discount market has not yet reached the point where it is a true reflection of general economic conditions, as is the case elsewhere, and the Federal Reserve Banks' credit policy, whose direct impact is limited to this market, does not reverberate as strongly as it does in other countries.

It is true that efforts to introduce drafts as a feature of domestic transactions have not met with success. The wide acceptance of drafts in foreign trade, on the other hand, had consequences that are of more general interest. The creation of a permanent market for American bank acceptances facilitated their penetration into international transactions and contributed enormously to the insertion of the American money market into the world money market, a turn of events that added greatly to the effectiveness of the discount policy. Previously there existed very little movement of funds between the United States on the one hand and the other great financial powers on the other, while between the latter countries movement was considerable and facilitated primarily by the use of bank acceptances. It was only in times of recession that large compensatory movements of funds occurred, taking shape eruptively as exports of securities. At present a market for overseas acceptances has developed in New York, with the encouragement of the Federal Reserve Bank. This new market has led to close contact between New York and the other financial centres, especially London, and has created opportunities for a rapid restoration of balance between them.[102]

Let us now take a retrospective look at the developments in American banking within the areas covered here—in the last decade, and particularly during the most recent period, which has been the focal point of this article. It is startling to see how much relative postures towards basic questions in this field have changed. Barely twelve years ago, the United States adopted the European system of central banking and until very recently looked to Europe for guidance. And now, in no time at all, they have taken the lead in developing new banking policies, and it is their actions now that offer guidance to European banking policy. We would do well here in Europe to pay close heed to American developments, or else the countries of continental Europe will be completely at sea in confronting American arguments at pending international conferences and would give the United States and England a free hand in settling the fate of the world's monetary system. Earlier we referred to America's stake in channelling European monetary and credit policy in a certain direction, and there are already indications that it is planning to use its influ-

[102]See Elisha M. Friedmann, *International Finance and Its Reorganization* (New York: E. P. Dutton, 1922) for the relative prospects of London and New York.

ence to produce the desired changes in policy. The Report of the Financial Committee of the Genoa Conference of 1922 included a proposal to call a meeting of all central banks,[103] a suggestion that has remained in the public eye, as witnessed by discussion along these lines in the English House of Commons.[104] The same idea resurfaced in the American Senate's Commission of Gold and Silver Inquiry Report,[105] and President Coolidge, for his part, announced the convocation of such a conference in his noted address of last spring. The Senate report cited above resurrected the old plan for a unified coinage system, an issue considered very timely by a number of highly prominent economists,[106] as a likely topic for the upcoming conference, an indication that Americans have high expectations for the conference's achievements. If this particular issue were to figure among the topics to be discussed at the conference, it would serve mainly to divert attention from questions that are currently of greater significance. But the fact that the topic was mentioned at all shows that more than mere recommendations are expected to emerge from any such future conference.

Appendix A: United States Balance of Payments, 1922–1923

The following summary figures compiled by Midland Bank (London) from data published by the United States Department of Commerce in its *Monthly Review* (May–June 1924) present the United States balance of payments for the years 1922 and 1923. These figures show the importance assumed by gold movements within the framework of America's total economic exchanges with other countries and are therefore of general interest. However, it would be a mistake to attribute an undue significance to them in explaining the course of events as a whole.

Note the unusually large excess of commodity exports over imports, which rose to over a billion dollars in 1924. It is also significant that even if payments for war debts are omitted, foreign investment in the United States for 1923 almost

[103]Resolution 12 of the *Report of the Financial Commission* reads: "With a view to the development of the practice of continuous co-operation among central banks and banks regulating credit policy in the several countries . . . this Conference recommends that the Bank of England be requested to call a meeting of such banks as soon as possible to consider the proposals adopted by the Conference, and to make recommendations to their respective Governments for the adoption of an International Monetary Convention". (Lausanne: League of Nations, Report to the Council by the Finance Section of the Provisional Economic and Financial Committee on its session held in Geneva June 6–9, 1922.)

[104]See *The Times,* February 25, 1925.

[105]John Parke Young, *Foreign Currency and Exchange Investigation,* serial 9, vol. 1 (Washington, D.C.: Government Printing Office, 1925).

[106]See also R. A. Lehfeldt, op. cit., who offers specific proposals on this score.

equalled US investments abroad in 1923 and exceeded US investments by 75 million, if repayments are included, while in 1922 capital exports still registered a surplus of 683 million dollars. In 1924, foreign government bonds were sold in the United States for a total of $944,000,000, of which over $520,000,000 came from European governments. (See "Monthly Letter on Economic Conditions, Governmental Finance, and United States Securities", published by the National City Bank of New York, January 1925.)

Estimated Value of Visible and Invisible US Imports and Exports for 1922 and 1923 (in millions of dollars)

Debits (imports)	*1922*	*1923*	*Credits (exports)*	*1922*	*1923*
Capital items			*Capital items*		
Newly issued US loans abroad*	637	377	Loan repayment from other states	78	23
Securities issued abroad but sold to the United States	326	33**	Bonds resold in other states	189	125
US securities owned abroad, resold to the United States	34		US securities sold abroad	61	214
			US bonds sold abroad	—	32
			Repayment of debt to the US government	31	92
Total	997	410		359	485
Current invisible items			*Current invisible items*		
Government expenses abroad	29	19	Money collected by the Treasury from abroad	13	—
Interest on foreign investment	125	150	Export freight charges	71	65
Import freight charges	64	73	Expenses of foreign travellers in United States	60	100
Transfers abroad of immigrants, charities	400	360			
Expenses of Americans abroad	360	500			
Total	978	1102		620	732
Current visible items			*Current visible items*		
Commodities+	3113	3819	Commodities	3867	4359
Gold	275	323	Gold	37	29
Silver	71	71	Silver	63	72
			US notes	—	50
Total	3459	4216	Total	3976	4359
			Unclassified	488	152
Overall Total	5434	5728	Overall Total	5434	5728

*Excluding refunding loans

**Excluding capital repayments

+Department of Commerce specifically includes "smuggled liquor"

THREE

THE FATE OF THE GOLD STANDARD[1]

There has been much talk about the breakdown of the gold standard, particularly in Britain where, to the astonishment of every foreign observer, the abandonment of the gold standard was very widely welcomed as a release from an irksome constraint. However, it can scarcely be doubted that the renewed monetary problems of almost the whole world have nothing to do with the tendencies inherent in the gold standard, but on the contrary stem from the persistent and continuous attempts from many sides over a number of years to prevent the gold standard from functioning whenever it began to reveal tendencies which were not desired by the country in question. Hence it was by no means the economically strong countries such as America and France whose measures rendered the gold standard inoperative, as is frequently assumed, but the countries in a relatively weak position, at the head of which was Britain, who eventually paid for their transgression of the 'rules of the game' by the breakdown of their gold standard.

That the otherwise conservative managements of the central banks deviated in a relatively lighthearted manner from the traditional rules of monetary policy can be attributed to the influence of new ideas on monetary policy, propagated by the academic fraternity, which obtained wide circulation during the postwar years. In order to understand what actually happened, therefore, a brief consideration of the origin and significance of these new ideas is necessary.

The Rise of the Concept of Stabilization

What must be remembered first of all is that, as a result of the general paper money inflation in Europe and the associated drift of gold to America after the end of the [First World] War, gold was devalued to such

[1][This article, "Das Schicksal der Goldwährung" (1932), first appeared in English translation in F. A. Hayek, *Money, Capital, and Fluctuations: Early Essays,* Roy McCloughry, ed., (Chicago: University of Chicago Press, and London: Routledge & Kegan Paul, 1984), pp. 118–135.—Ed.]

an extent that precisely at the time when the return to the gold standard was the most pressing need in most European countries, in America the fact that even gold did not constitute a completely satisfactory basis for a currency in all circumstances was felt more strongly than ever before. Little attention was paid to the fact that even this fall in the value of gold had only occurred because of the abandonment of the gold standard in Europe, and would never have reached the stage that it did had not the few countries which had maintained gold payments used the cessation of competition for gold so as also to inflate, though at a lower rate than those which had departed from gold.

The second important factor which determined the development of ideas on monetary policy was that the above-mentioned facts were partly contributory to the extraordinary influence exercised by two particular representatives of the mechanistic Quantity Theory of Money and of the concept of a systematic stabilization of the price level, Irving Fisher and Gustav Cassel. The fluctuations in the value of money mentioned above necessarily aroused wide interest in Fisher's proposal for stabilizing the value of gold, which he had been advocating for a long time; and the lively propaganda which was being circulated, particularly by the Stable Money Association which he had founded, had succeeded in making the concept of price stabilization as the objective of monetary policy into a virtually unassailable dogma. Cassel, who deserved the greatest credit for the stabilization of European currencies, contributed a further, extraordinarily effective argument in favour of the policy of stabilization, the influence of which upon actual developments it is impossible to overestimate.

This was his prediction that gold production was not adequate for the annual increase of 3 per cent in the world stock of monetary gold which, on his calculations, would be required to maintain stability in the price level.

Fear of the imminent shortage of gold, and the desire to arrive at a systematic policy for stabilizing the value of money, gave rise to two further ideas which dominated the period, and were expressed particularly in the resolutions of the conference on international economic relations in Genoa in 1922; a preference for the *gold exchange standard* as the object of stabilization in individual countries, and the recommendation of "*Cooperation between Central Banks*". Both desires were to become extremely significant for the development of monetary policy over the next few years. Perhaps it is therefore appropriate at this point to also name the man who acquired special influence as the propagator of the ideas expressed by the Genoa Conference—even if he were not, as one might suspect, its instigator: R. G. Hawtrey of the British Treasury. Together with the two

men already mentioned, and the most influential member of the group to whom we shall shortly refer, Hawtrey seems to be one of the stabilization theorists referred to above, to whose influence the willingness of the managements of the central banks to depart more than ever before from the policy rules traditionally followed by such banks can be attributed.

Two further points of antecedent history must be recalled before we can attempt to understand developments during the last six years. At the end of 1923, J. M. Keynes's *Tract on Monetary Reform* appeared.[2] Keynes, who had risen very rapidly to international fame by his writings on the Peace Treaty, not only associated himself in this pamphlet with the group who argued for stabilization of the value of money, but also in my opinion set in circulation an erroneous interpretation of contemporary events which gained general acceptance in Britain, and formed one of the bases of the monetary policy which ultimately led to the suspension of convertibility. Keynes maintained that the American Federal Reserve Banks were pursuing a systematic policy of 'sterilizing' incoming gold, i.e., preventing the monetary circulation in America from increasing in accordance with the increase in the supply of gold and thereby putting the adjustment mechanism of the gold standard out of operation. Although this assertion was immediately and categorically opposed by the American experts (particularly by B. M. Anderson), and, as we shall see, the Federal Reserve System certainly did not err in the direction of a policy which was too restrictive in the period which has since elapsed, the assertion that America had continuously contravened the recognized rules of the gold standard was not exposed to any criticism in Britain. The conclusion drawn from this was that Britain had become powerless with respect to the gold withdrawals, since America appeared to be a bottomless pit in which the gold of the whole world could be swallowed up without affecting the level of prices there.

The last point which must be briefly mentioned concerns the Federal Reserve Board. In its Annual Report for 1923,[3] which quickly became famous, it rejected the policy of a complete stabilization of the price level. Nevertheless, it joined the stabilization theorists in as much as it expressed its conviction that the intensity of crises and depression could be substantially lessened, not only if every boom were checked at the appropriate time by raising the discount rate, a proposition which could hardly be disputed, but also that every recession in general business activity

[2]John Maynard Keynes, *A Tract on Monetary Reform* [1923], reprinted as vol. 4 (1971) of *The Collected Writings of John Maynard Keynes,* Austin Robinson and Donald Moggridge, eds, 30 vols (London: Macmillan for the Royal Economic Society, 1971–89).

[3][Hayek's extensive review of this report appears as chapter 2, this volume.—Ed.]

could be immediately counteracted by a sharp cut in the discount rate. This belief is of great significance for an understanding of its subsequent policy. For as we shall see, the Federal Reserve Board has not merely strictly adhered to this programme, but in addition, it may be noted, the demands of the extreme representatives of the concept of stabilization were continually urged upon it during the Congressional enquiries ('stabilization hearings') which took place throughout the whole of the subsequent period.

The Beginning of Britain's Difficulties

The actual problems in whose solution these ideas were to play something of a fateful role began with Britain's return to the gold standard in 1925. Whether it was wise to return to the prewar parity with the aid of a difficult process of deflation is extremely questionable. The events which have since occurred make it seem likely that Britain would have done better to have remembered Ricardo's advice. More than a hundred years previously, he wrote that he would never recommend a government to ease back to par a currency whose value had declined by 30 per cent. By doing so Britain must have got itself into a very difficult position, since there is always a certain length of time before domestic prices adapt to the new level of foreign exchange rates. Furthermore, as a result of stabilization at the conclusion of the process of deflation, prices in Britain were above the international level at the same time when domestic prices in the various continental countries were below the world level as they gradually stabilized at the end of the process of inflation and would remain so for many years to come. If the gold standard were to be permanently adhered to by Britain, the deflation would therefore have had to continue until the British domestic price level had also reached an equilibrium with the rest of the world. The British, however, wanted less than anything to do this, and the new ideas of stabilizing prices and the economy as the aim of monetary policy were welcomed as justifying deviation from the orthodox rules of monetary policy. The situation in which the British economy found itself doubtless exhibited all the symptoms which, according to the doctrines of the stabilization theorists, made a policy of credit expansion appear advisable. Given the existence of falling prices, increasing unemployment and the persistently unfavourable position of the most important industries, even the years before 1929 looked like depression years in Britain.

For those managing monetary policy, this amounted to a serious dilemma. It was in fact solved, in the years which elapsed until the final breakdown of the gold standard, by the Bank of England's restricting itself to the minimum of measures unavoidable for the maintenance of

a momentary, highly unstable currency equilibrium, and utilizing every opportunity to avoid the tightening of credit dictated by the international situation. In diametric opposition to the basic concept of the gold standard, the gold which was draining away was constantly being compensated for by bank loans, so that the overall circulation was kept stable at a time when it would have had to diminish if a genuine gold standard had existed.[4] It is only natural that in this situation the Bank of England became the most enthusiastic protagonist of 'cooperation between central banks' which was to have released it completely from these unpleasant necessities. The discussion as to the relative significance of national determination of monetary policy came increasingly to the fore in Britain during these years and reached a peak with the publication of the report of the Macmillan Committee, which also represented a great success for the nationalist trend in monetary policy led by Keynes.

The Dangers of the Policy of Stabilization

However, the theoretical foundations of all of this are very weak. Without mentioning its other shortcomings, the theory of stabilization of prices had been developed for a closed economy and could not readily be applied to a country which is a member of an international system. Yet Britain in particular was the country least able to look upon her domestic situation as something fundamentally different from her international relations. Her problems could be said to arise in the first place from the deterioration in her international situation, which in turn was the result of a level of prices and wages which was relatively too high even after the deflation. In the period since 1925 Britain's international position deteriorated still further, with the futile policy of stabilization followed by the Bank of England making no small contribution to this. There can hardly be any doubt that during this period, at least in the United States, the rate of progress in production technology and the associated reduction in costs was substantially faster than in Britain. The existence of a common currency system, and especially the presence of the gold standard in both countries, led to the result that even if an equilibrium between the domestic value of currency in Britain and in the United States

[4]This was publicly admitted by the Bank's representatives before the Macmillan Committee, seemingly without anyone's being aware that this constituted a flagrant offence against the much-discussed rules of the gold standard. The Deputy Governor of the Bank of England, Sir Ernest Harvey, declared (*Minutes of Evidence taken before the Committee on Finance and Industry* (London, 1931), vol. 1, Q. 353): "You will find if you look at a succession of Bank Returns that the amount of gold we have lost has been almost entirely replaced by an increase in the Bank's securities". [The Macmillan Committee on Finance and Industry, chaired by Lord Macmillan, met from November 29 through May 31.—Ed.]

had initially existed, there must be an enduring tendency for gold to move to America, thereby inevitably creating constant pressure on the British level of prices. These processes are a necessary element in the mechanism by which the distribution of the world's gold is adjusted to the changes in the conditions of production.

It hardly needs mentioning that the payment of war debts constituted a further highly significant factor which necessitated a relative fall in prices and therefore a contraction of credit in Europe as compared with America, even if in Britain's case its significance was essentially smaller since Britain was merely the place through which these payments passed. The attempt, in the face of all these circumstances, to nevertheless avoid the inevitable fall in the national level of prices, would not have been relatively successful for so long if it had not met with sympathetic cooperation and efforts along the same lines in the United States because of the supremacy there of the concept of stabilization. The already mentioned fall in costs which occurred in America should have led, if it had not been compensated for by an enormous expansion of credit, to a corresponding fall in prices. On the one hand, this fall in prices would not have harmed production in any way, since it would merely have resulted from the fall in costs, and on the other hand, it would have forced the ultimately unavoidable reduction in costs in Europe by absorbing Europe's gold. That such a fall in prices corresponding to the reduction in costs can take place without any detriment to production was clearly demonstrated by developments in the United States between 1925 and 1927, when there was a boom despite continuously falling prices. At that time, i.e., until 1927, it seemed an obvious conclusion to draw from the fall in prices in particular, that the United States would succeed in avoiding an inflationary expansion of credit, and thereby the following crisis as well, and thus in perpetuating the favourable economic conditions. It became evident, however, that even before 1927 prices were being prevented from falling to the full extent of the reduction in costs by a systematic expansion of credit, so that in 1927 the threat of a reaction emerged. And the first signs of this reaction gave rise to an enormous acceleration of this expansion of credit for which the policy being followed by Europe and particularly Britain gave America the opportunity, and which led directly to the crisis of 1929.

America and Cooperation between Central Banks

That the United States did not, as is frequently maintained, sterilize incoming gold until 1927, but made it the basis for a quite lavish expansion of credit, is a fact which emerges from all the statistics but particularly from the development of the deposits in the member banks of the Federal

Reserve System between 1925 and 1927, which rose from approximately 18 to over 20 thousand million dollars.[5] The unmistakable signs of a reversal in the boom which made itself felt in 1927 are, nevertheless, the best indication that the United States expanded credit during these years more than was good for it. This expansion would probably have been less if the sustained 'cheap money policy' followed by the Bank of England had not freed the Federal Reserve system from any worries that excessive gold withdrawals would occur. From 1927 onwards, however, the significance of this factor can hardly be in doubt. The fact that the Federal Reserve Banks were rekindling a boom which had passed over into a decline by further huge injections of credit, and could then maintain it for another two years at a previously unheard of level, was possible only because the European Central Banks were willing to follow the path of credit expansion. However, the moment they began this policy, movements in the opposite direction began, but despite this the draining away of gold came to a standstill after a few months. Yet the Federal Reserve Banks were not forced to abandon their policy of expansion. The conscious co-operation between central banks certainly played a great role at this critical moment. It has even been maintained that, at the conference of the central banks which was held in August 1927 in Washington, it was agreed that in future no central bank would be permitted to withdraw gold from another without its consent,[6] though this hardly seems credible to me.

Yet whatever form this agreement may in fact have taken, there can be no doubt that it was because of such tacit or explicit cooperation during the period 1927 to 1929 that an expansion of credit was made possible which would not have been possible under the automatic gold standard of the prewar years.

Given this cooperation, the accusation that the United States had caused Britain's problems by hoarding gold is absurd; all it means is that America should have stimulated inflation even more and thereby caused an even greater crisis. It is asking rather a lot of America that it should singlehandedly, and at the cost of severe jolts to its productive apparatus, have brought about international equilibrium exclusively by credit expansion on its part, while no attempt was made to implement a corre-

[5][There is some confusion of time periods here. The "sterilization" of gold to which Keynes referred occurred prior to 1923.—Ed.]

[6]Thus, P. Einzig, *Behind the Scenes of International Finance* (London: Macmillan, 1931), p. 36. However, once one reads the statements of Governor Norman before the Macmillan Committee, in which he not only refers to the efforts by the Bank of England to get the central banks to cooperate as one of the two most important activities during this period, but also identifies their task as the "elimination of the struggle for gold", Einzig's assertion already becomes less improbable. Cf. *Minutes of Evidence,* op. cit., vol. 1, Q. 3490.

sponding tightening of credit on the part of the other countries. The fact that this claim could be made at all can only be attributed to the dominance of the concept of stabilization, which was based on the idea that an expansion of credit which serves merely to keep the level of prices stable could not have any detrimental effects, even if it was simply a question of the domestic price level within that member of an international system whose productivity was rising most rapidly. It could equally well have been asserted that no detrimental effects could flow from an expansion of credit which was just barely adequate to stabilize the price of that commodity whose cost of production was declining most rapidly. The fact that this point has fatal implications for the concept of stabilization and that the present crisis is attributable above all to persistent inflation until 1929, an inflation which moreover was not even sufficient to keep the level of prices completely stable, is generally recognized in America today. The best proof of this is afforded by the recent report by a committee of the Federal Reserve System, which recommends a substantial tightening up of the existing regulations on reserves for the system's member banks to prevent a return to such inflation.

The accusation that France systematically hoarded gold seems at first sight to be more likely to be correct. France did pursue an extremely cautious foreign policy after the franc stabilized at a level which considerably underdevalued it with respect to its domestic purchasing power, and prevented an expansion of credit proportional to the amount of gold coming in. Nevertheless, France did not prevent her monetary circulation from increasing by the very same amount as that of the gold inflow—and this alone is necessary for the gold standard to function. The only thing which must be said about France's monetary policy in this context is therefore that France had learnt from the experiences of the other European countries. After they had at first permitted a very rapid adjustment of their price level to that of world prices and the associated expansion of credit once their currencies had stabilized, they were all stricken by a more or less severe 'stabilization crisis'. France's policy, however, actually enabled it to avoid any such crisis. Here, too, it was the attempt to ward off the danger of inflation stimulated by Britain's monetary policy in particular which determined France's monetary policy.

Britain's 'Gold Shortage'

For the period before 1929, it can scarcely be seriously maintained that the economic development of the world was hindered in any sense by a shortage of gold. On the contrary, we have during this period experienced an expansion of credit to an extent such as hardly existed pre-

viously in countries on the gold standard. It is therefore also highly improbable that since that time the world's gold reserves, which were adequate for an expansion of credit of this extent, should suddenly have become inadequate, and that a shortage of gold should be the cause of the present decline in prices. In fact, there was only a single country in which there was a continuous gold shortage at that time, i.e., Britain. Britain's gold shortage could be attributed basically to the same cause which can lead to a shortage of money for any private person, in that she was continually spending more than she earned. If Britain had not been the country from which the rest of the world had been accustomed to draw its views on monetary policy for over a century, it would hardly have come about that the existence of a gold shortage in Britain would readily have been accepted throughout the whole world as sufficient proof of the need for a policy to combat the gold shortage. Britain's dominant influence in the field of monetary policy, which had been a blessing for the rest of the world so long as Britain was in a strong position, must become detrimental to the world as soon as Britain's international position became unfavourable. For the gold standard and, indeed, any international standard, merely constitutes the means by which changes in the relative economic position of a country work out their effects on its share of world income. Consequently, whilst every country which is in a favourable position continually advocates sound principles of monetary policy, opinion will always turn against the gold standard in a country whose international relations are deteriorating. Yet this is merely the means by which tendencies work themselves out, tendencies which cannot in any case be eliminated.

It was not a big step from the desire to be released from the unpleasant necessity of adapting the general standard of living to the lower level of national income by reductions in wages and prices, to a theoretical justification of a monetary policy which rendered inoperative the tendencies of the gold standard in that direction. A special treatise would be required to provide a more detailed exposition and criticism of the errors which are already widespread today with respect to the functioning of the international gold standard and the mechanism of international capital movements, errors which are at the basis of the policy followed by the Bank of England. The most important error is the distinction drawn between temporary movements of gold, which cannot be attributed to deep-rooted causes but merely to momentary circumstances and hence should not be allowed to bring about any changes in the domestic volume of credit, and 'genuine' movements of capital, which should provide the only occasion for effecting changes in the rate of interest. What is left unexplained in this is why movements of gold should under any circum-

stances represent movements of capital which are not genuine. Nor is it explained why a country which is unable to cover its current obligations from current output and is therefore required to pay partly in cash, i.e., to offset the deficit on current account by capital payments, should nevertheless still be in a position after doing so to make just as much capital available to domestic industry for investment purposes as previously. These theories are neither new nor do their advocates take the trouble to show that the refutation of them provided by the classical economists more than a hundred years ago, a refutation which was finally held to be definitive, is unfounded. Yet this did not prevent them from being joyfully seized upon by those conducting policy (*Praktikern*) and put into practice. Indeed, it can be said that monetary policy was conducted on the basis of gold theories even before they had been clearly formulated. Keynes's *Treatise on Money,*[7] which represents a grandiose attempt to justify this policy, and the report of the Macmillan Committee which is formulated entirely in the spirit of Keynes and predominantly influenced by him, are much less revolutionary in this respect than they may appear if they are compared with the traditional rules of monetary policy. What they essentially did was merely to elevate to the status of principle the violations of the traditional rules of the gold standard which the Bank of England has been continuously perpetrating during the last six years.

Of course, the Bank of England was not alone in its efforts during this period to deprive the movements of gold of their effect. Britain is merely the most important country in which such attempts were made and the only one in which this policy was not only consistently pursued but in which the attempt was also made to justify it theoretically. In order to explain why these attempts became so general after the war, one factor must be mentioned here which had seduced central banks into undertaking such attempts: the general disappearance of gold from circulation and the concentration of the entire gold supply in the central banks, in a word the general introduction of the system of the gold bullion standard. So long as gold was in circulation, and gold for export therefore did not have to be withdrawn directly from the central banks, a reduction in the circulation of money occurred directly as a result of these gold exports, and the central bank, which might not be directly affected at all by this, thus had no grounds for or temptation towards compensating for this by expanding the volume of credit. The shortage of money in circulation led

[7]J. M. Keynes, *A Treatise on Money,* 2 vols [1930], reprinted as vols 5 and 6 (1971) of *The Collected Writings of John Maynard Keynes,* op. cit. [For Hayek's review of *A Treatise on Money,* see *Contra Keynes and Cambridge,* ed. Bruce Caldwell, being vol. 9 of *The Collected Works of F. A. Hayek* (Chicago: University of Chicago Press, and London: Routledge, 1995).

much more directly to an increase in market interest rates and thereby in the long run to an increase in the official bank rate as well. If, on the other hand, the gold for export is withdrawn exclusively from the central bank, it faces an extremely strong temptation not to let a reduction in the credit base take place but to compensate directly for the gold drain by expanding the volume of credit extended.

In practice, this procedure was usually summarized in two well-known rules which in themselves are entirely correct, but which were interpreted in a way which ran completely counter to the meaning which their classical authors had given them. The two propositions were, firstly, that the purpose of movements of gold is the adjustment of the international trade balance, and secondly, that gold reserves are there to be used if needed. But the first proposition must not be taken to mean that the movements of gold represent the final settlement of international imbalances, but merely that they are one element in the mechanism which leads ultimately to an effective payment in goods. Nor does the second proposition imply that gold reserves are held to avoid the necessity to limit the domestic monetary circulation if gold leaves the country. Both propositions are valid for the case of a gold bullion standard and the case of a mixed monetary circulation in exactly the same way in which movements of gold would work themselves out in the case in which gold alone was in circulation. It was not in vain that the great monetary theorists of the classical period from Ricardo onwards always insisted that a non-metallic circulation of money ought always to be so controlled that the total volume of all money in circulation changes in just the same way as would happen if gold alone were in circulation.[8] The only effect of any attempt to compensate for movements of gold by changes in the volume of credit in the opposite direction can be to render the mechanism of international capital movements inoperative and also ultimately to smash the gold standard, the instrument which should serve to make them possible.

Stabilization Policy and the Crisis

It is quite obvious that the assertion that the artificial prevention of the fall in prices, induced by the reduction in costs, had a detrimental effect, relates to the period up to 1929 and is not meant to depict the fall in prices which has occurred since then as innocuous. On the contrary, this fall in prices is precisely one of the most severe and harmful consequences of the stabilization policy followed during the previous period. Instead of

[8][Hayek wrote a thorough account of Ricardo's views on the 'bullion controversy', which is published in *The Trend of Economic Thinking*, W. W. Bartley III and Stephen Kresge, eds, being vol. 3 of *The Collected Works of F. A. Hayek*, op. cit., chapter 11.

prices being allowed to fall slowly, to the full extent that would have been possible without inflicting damage on production, such volumes of additional credit were pumped into circulation that the level of prices was roughly stabilized even in those countries in which faster technical progress gave rise to a tendency for the level of prices to fall in relation to the rest of the world. Whether such inflation merely serves to keep prices stable, or whether it leads to an increase in prices, makes little difference. Experience has now confirmed what theory was already aware of; that such inflation can also lead to production being misdirected to such an extent that, in the end, a breakdown in the form of a crisis becomes inevitable. This, however, also proves the impossibility of achieving in practice an absolute stabilization of the level of prices in a dynamic economy. The maintenance of stability, at a time when the natural tendency was downwards, finally led to a collapse of prices which doubtless led to their falling far below that level which would have been reached if they had fallen slowly throughout the whole period—in precisely the same way as, under otherwise stationary conditions, the reaction led to an inflation which was expressed in an increase in prices can lead to a fall in them to far below their original level.

Although there can be no doubt that the fall in prices since 1929 has been extremely harmful, this nevertheless does not mean that the attempts made since then to combat it by a systematic expansion of credit have not done more harm than good. In any case, it is a fact that the present crisis is marked by the first attempt on a large scale to revive the economy immediately after the sudden reversal of the upswing, by a systematic policy of lowering the interest rate accompanied by all other possible measures for preventing the normal process of liquidation, and that as a result the depression has assumed more devastating forms and lasted longer than ever before. The measures of monetary policy themselves, particularly in the form in which they were pursued by the Federal Reserve Banks most clearly, were in complete accordance with the prescriptions of the stabilization theorists. They were supplemented in America by all kinds of non-monetary policy measures, dictated almost without exception by the desire to 'maintain purchasing power', and, although such measures were originally based on the underconsumption theories of crises, obtained weighty support from the stabilization theorists. From President Hoover's appeal to employers in the autumn of 1929 to avoid dismissing workers up to the recent founding of the Reconstruction Finance Corporation, which is supposed to help firms which have fallen into difficulties to avoid collapse, one measure for preventing or delaying the normal process of liquidation followed another in the United States.

Even if it is hardly possible to offer proof for this assertion, given the space at my disposal here, what must still be said is that it is quite probable that we would have been over the worst long ago, and that the fall in prices would never have assumed such disastrous proportions, if the process of liquidation had been allowed to take its course after the crisis of 1929. Only a rather superficial explanation of the crisis, like that advanced by most stabilization theorists, could have led to the assumption that it was possible to avoid a thorough reorganization of the whole production apparatus. Only if it was believed that the cause of the crisis lay in a process of monetary deflation alone, and if no attention at all was paid to the direction which production had taken in the previous boom, could it be believed that the crisis could be overcome by what is in fact a fight against the symptoms. But if, as can scarcely be doubted, the immediate cause of the crisis lies precisely in this real misdirection of production, and the process of deflation represents only a secondary phenomenon caused by this, an element in the process by which production is necessarily forced to readjust, then the measures which the stabilization theorists advocate for preventing the process of liquidation can only have the effect of significantly prolonging the depression and the fall in prices.

No other reason at all exists to make the gold standard responsible in any way for the present fall in prices. On the contrary, all the factors outlined which do really appear to have played a causal role represent an attempt to put out of commission the normal mechanism of the capitalist economy in general and the gold standard in particular. It is, however, at this point necessary to briefly examine one argument, probably the weakest of its type moreover, which has hitherto not been explicitly mentioned but to which an implicit answer has certainly already been given, namely the allegedly harmful effects flowing from the existing unequal distribution of gold throughout the world. Anyone who has followed the arguments up to this point will have little difficulty in realizing that what is at issue here is in fact a result of the circumstances that have already been discussed, an effect of the failure of a number of countries to adhere to the rules of the gold standard, and not an independent cause. The pressure which today emanates from this unequal distribution only represents the inevitable intensification of those tendencies which these countries have for so long resisted.

The Breakdown of the Gold Standard in Britain

The world crisis and the process of deflation to which it gave rise did not make the Bank of England's situation any easier, and probably lessened still further its determination to intensify the domestic difficulties by

maintaining interest rates at a high level. After 1929, it vied with the Federal Reserve Banks in lowering the interest rate, which fell from 6.5 per cent to 3 per cent within a few months. The situation only took a significant turn for the worse, however, when the Bank of England, after maintaining the rate at 3 per cent for twelve months, reduced it further to 2.5 per cent in May 1931 and maintained it at that level until well into July. This, at a time when the collapse of the Austrian Credit-Anstalt had already sent up the first storm signals, and although huge withdrawals of gold were already beginning. From this time on, hardly any serious attempts were made to save the pound, and the Bank of England appeared to have reconciled itself to the fact that convertibility would have to be given up sooner or later. Only this can explain why neither the Bank's own gold reserves, nor the loans which were gradually being raised in France and America, were utilized to restrict the domestic circulation by selling these gold assets. What is more, to free the Bank from effecting the reduction in circulation that would otherwise have been necessary, the legal limit for the fiduciary note issue was raised at the end of July, and during July the volume of notes actually in circulation was increased to an extent greater than could be justified by seasonal considerations. It is obvious that, in these circumstances, the credits available for intervention purposes must eventually have been exhausted without having any effect. This apparent lack of determination to do something to protect the pound would in itself probably have led to considerable withdrawals of credit. But when, in September, the well-known additional shocks to confidence increased withdrawals still further, the lack of any struggle as the end came could not have been expected even on the basis of the policy pursued by the Bank of England in the previous years. That it suspended cash payments when the official discount rate stood at no higher than 4.5 per cent is surely the most surprising event in monetary policy of the previous era, and the one which stands in greatest contradiction to the traditional rules of monetary policy.

This abandonment of the gold standard undoubtedly implies a final break with the unique tradition of more than two hundred years, on the basis of which Britain has repeatedly returned to the gold standard at the cost of great sacrifices, even after periods of temporary shock to its currency unit. This time the sacrifices which had been made since 1921 were in vain, because the responsible authorities were unwilling or unable to exact what probably would have been the smaller sacrifices necessary to ensure the long-term position of the pound. The greatest responsibility for this, however, must be borne by those who initially opposed the return to the gold standard. For although their position was justifiable at that time, they did not abandon it even when the gold standard had been

restored at its former parity, and fought with the utmost vigour against all the measures necessary if that standard were to be finally consolidated. It is beyond all doubt that they found an increasingly more receptive hearing within the management of the Bank. If one wanted to describe the abandonment of the gold standard in Britain as 'the economic consequences of Mr. Keynes', and there are many reasons to do so, I believe that even today J. M. Keynes would still regard such a statement not as criticism but as praise.

The Prospects for the Gold Standard

However urgent a speedy, general restoration of a free, unmanipulated gold standard must therefore seem from these points of view, the prospects of Britain's returning in the near future to the gold standard, and of course this would be the prerequisite for a general restoration of the gold standard, are unfortunately very small. The same representatives of a nationalistic monetary policy who, while the gold standard existed, were successful in preventing the international influences to which it gave expression from becoming effective in Britain and leading to the restoration of equilibrium, are now resisting to the utmost Britain's reassumption of the 'fetter' which she has successfully thrown off. Everyone talks about conditions under which Britain alone would be able to return to the gold standard, and these conditions usually amount to no more than the fact that Britain can do so only if the other countries offered her a guarantee that in future she will be able to maintain the gold standard permanently even if she continues to break its rules. In the meantime, the British cannot see that every international currency, every system of stable foreign exchange rates (and in the long run Britain can do without this less than any other country), would impose upon Britain the same unpleasant necessity for a domestic credit contraction from time to time for reasons which have their origin abroad. The hope is simultaneously voiced, perhaps with greater justification, that in the not-too-distant future America and consequently the rest of the world would stimulate inflation so that the value of gold would be reduced to such an extent that Britain could honourably return to the gold standard without sacrifice, and perhaps even at the former parity. In the meantime, plans are being devised for an 'Empire currency'—but in all probability nothing at all will come of this for a long time yet.

Even a de facto stabilization of the pound's rate of exchange can be expected in the near future only if this can be implemented easily and without a contraction of the domestic circulation. In other words, the implication is that in all probability the Bank of England's policy will aim

at stability of the domestic level of prices, and will show little or no consideration for changes in the pound's rate of exchange. The difficulties confronting such a policy in a country in which almost all foodstuffs are imported, and hence fluctuate in price as exchange rates vary, are not small. To maintain a stable level of prices when prices of imported articles have increased therefore implies that the prices of domestic products must be decreased, which would undoubtedly give rise to complaints about the Bank's restrictive policy and therefore create the danger of inflationary pressure being exerted upon it. This danger becomes even greater if occasionally, as is still possible, the pound should be depressed on the exchanges as a result of large-scale withdrawals of short-term foreign assets. A reduction in the exchange rate of the pound is the only way in which such capital payments to abroad can actually be made, so long as the Bank adheres to the policy of keeping the level of prices stable.

However, even if the prospects of Britain's speedy return to the gold standard are small, nationalism in monetary policy has, nevertheless, probably reached or even passed its peak as an intellectual movement, as has already been indicated. The surrender of the gold standard has brought little change to the industrial situation, in contrast to the high hopes that were entertained for it, and this has had a sobering effect in many ways. It is more important, however, that the publication of the Macmillan Committee's report and of Keynes's *Treatise,* in which the attempt was made for the first time to provide a theoretical underpinning for that policy, provides leads for the refutation of those theories, in addition to the criticism which is beginning to make itself felt. It is to be hoped that in this context the two works do not represent the beginning of a new era, as many believed, but are simply the final flourishes of an extremely fateful era of monetary policy that has now passed.

The history of the gold standard over the last decade bears great similarity to the most recent history of capitalism. Every effort has been made to obviate its functioning at any point at which there was dissatisfaction with the tendencies which were being revealed by it. As a result, it could finally be assumed, with some semblance of authority, to have become completely ineffective. The leading role in this process was initially played by motives relating purely to social policy, but the recent period has seen the appearance of increasingly overt nationalistic aspects, which have already become almost more dangerous in the area of monetary policy even than in that of trade policy. Dare we hope that they will therefore be even more quickly pursued ad absurdum?

FOUR

THE GOLD PROBLEM[1]

I

No sensible person would deny that there are certain intrinsic drawbacks to the use of gold as the determinant of currency in circulation and that from an ideal standpoint there are better ways of regulating the volume of money than tying it to gold production, with all its vicissitudes. Under actual world conditions, however, gold may well be the most reliable and acceptable monetary standard, a conclusion that the experiences of the last years and decades support despite superficial impressions to the contrary. The spectre of an imminent gold shortage was constantly raised until a few years ago, when it was replaced by the opposite threat of an oversupply of gold. No wonder gold is viewed as fickle and unstable by the layman. Closer inspection of these fluctuations in the gold supply reveals, however, that the monetary policy of various governments has destabilized the world's money supply much more seriously than the contingencies of gold production. The so-called gold shortage of the 1920s, like the oversupply of gold in recent years, must be blamed far more on erratic monetary policies than on 'erratic fluctuations' in the production of gold.

Assuming that the annual prewar gold production was optimal from the monetary standpoint (it was probably slightly above the optimum), it should have been obvious from the very start that trends in monetary policy between 1914 and 1920 would inevitably induce a 'gold shortage'. A sharp rise in the prices of all commodities, and hence a drop in the value of money and gold, was predictable from the overwhelming substitution of paper money for gold in most countries and the vast expansion in circulating paper money even in those countries that retained a gold currency. There were thus two reasons why a shortfall in gold output was

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bound to accompany a worldwide expansion of the money supply at the customary prewar rate. An annual rise in gold production at the old rate, first of all, would have resulted perforce in a much smaller percentage increase in relation to the greatly expanded total volume of money. And secondly, the reduction in the value of gold in terms of all other commodities lowered the profitability of gold production and encouraged an absolute decline in the annual gold output.

To the extent that there was a genuine threat of a gold shortage, all this threat implied was that the annual gold supply was insufficient to support the high general price level created by wartime inflation, a level attributable to monetary excesses and not to the factors regulating gold production. It should be noted, incidentally, that the experts dominating discussions about probable future gold production in the 1920s completely misjudged and vastly underestimated future gold output—quite aside from the impact of ongoing devaluations—and thus did their share in raising unnecessary concern about this matter.[2]

By the same token, the abrupt oversupply of gold in the last few years is an even more obvious consequence of the artificial appreciation in the value of gold by means of successive devaluations in the major currencies. These measures, by and large, represented the converse of wartime monetary policy and therefore had the converse effect on the standing of gold: On the one hand, the relative significance of a given amount of gold produced increased with the increased value of gold, and on the other, a very substantial rise in the quality of gold available was stimulated by the higher price of gold. Things were somewhat more complicated and muddled because gold changed in value not only in terms of commodities but also in terms of the currency units of almost all countries. In the discussion that follows, we will largely concentrate on the different ways in which the position of gold has been affected by recent events and on the distinctive features of the current situation. We will conclude with a few brief remarks about the monetary problems created by this situation.

II

The rise in the price of gold has had three major effects in terms of the most important currencies: (1) An immediate and commensurate increase in the relative size (compared to the current amount of money in circulation) of (a) the annual output of gold, and (b) the world's stock of monetary gold. This effect will persist as long as the price of gold is main-

[2]Compare the interesting study on this point by C. O. Hardy, *Is There Enough Gold?* (Washington, D.C.: The Brookings Institute, 1936).

tained at its new level and the volume of money worldwide stays within its present range. (2) With rising gold prices, very substantial gold hoards from the Orient, and India in particular, emerged from hiding and were thus incorporated in the world's monetary gold reserves. This process manifested itself over the past five or six years at a very slow pace and may well be largely subsiding. Hoarding activities in these countries could conceivably resume and reabsorb part of the gold that had previously been released. Temporarily at least, this process has contributed very substantially to a build-up of gold stocks available for general monetary purposes. (3) The rise in gold prices is expected, finally, to lead to a substantial increase in the annual gold production. This effect is slow-acting and probably is not yet fully evident; in some of the gold-producing countries at least an additional and long-lasting stimulus to the gold production may have been set in motion. The sharp rise in gold production in the last years is partially attributable to the temporary stimulus of the rise in gold value, but an independent factor has been the exploitation of new gold deposits in Russia. The rate of increase in the physical production of gold annually has probably not yet peaked and the increase is likely to persist for the foreseeable future.

We have cited the different effects of the rise in the price of gold in their chronological order, but their order of importance is the inverse. We shall proceed to discuss the individual factors in their order of importance and start out with the changes in the annual gold production. Table I reproduces the data for the annual world gold production and itemizes output separately for the four major gold producers. Figures are given for 1931 through 1936, as well as for 1915, the record year prior to 1932.

What strikes one immediately in looking at these numbers is the fact that the rise in world production since 1931 is primarily due to the in-

Table I
Gold Production (in millions of ounces of fine gold)*

	World	*South Africa*	*Russia*	*United States*	*Canada*
1915	22.6	9.1	1.5	2.4	0.9
1931	22.4	10.9	1.7	2.4	2.7
1932	24.3	11.6	2.0	2.5	3.0
1933	25.5	11.0	2.7	2.9	2.9
1934	27.6	10.5	4.3	2.9	3.0
1935	31.0	10.8	5.8	3.6	3.3
1936	35.3	11.3	7.4	4.3	3.7

*According to the Bank for International Settlement, *Seventh Annual Report* (Basle, 1937), p. 37.

crease in Russian gold production, while production has remained very stable for the last five years in the largest producer country, South Africa. This fact is especially significant because the Russian figures are not necessarily correct, not so much due to their unreliability as to the absence of published data on gold production for the last years. The figures appearing in the above table, though widely used, are based on indirect calculations. They undoubtedly include significant sources of errors, and Russian production may well be currently much lower. There also exist substantially higher estimates, however, and even if the figures in the table exceed current production at the moment, the production level they indicate will soon be reached, given the available gold deposits and the investments made in their exploitation.

The modest increase in South African gold production stems from the fact that the large mining companies were encouraged by the rise in the gold price to mine lower-yield gold deposits in order to extend the productive life of the mines. It is to be expected, however, that by the time the newly exploited mines begin to yield some ore, gold production will go up considerably. Increased production in the United States, Canada, and a few other countries, on the other hand, is due in part to the fact that during the depression some individuals have resumed placer mining of gold, a procedure that had become unprofitable, so that it is to some extent a temporary phenomenon. Under the present circumstances it is impossible to make any reasonably reliable prediction about the development of world production, but for some time to come an increase is to be expected, and it would hardly be surprising if annual production exceeded 40 million ounces in a few years.

III

As mentioned earlier, newly produced gold was by no means the only source of the enlarged monetary gold stocks worldwide. The final report of the League of Nations sets world monetary gold stock for 1930 at 585 million ounces. In addition to the contribution of the annual gold production (minus industrial consumption), we must include the contributions made by the inflow of gold hoards from the Orient, which became part of the monetary gold stock worldwide. Taking this figure as a starting point, Table II provides estimates of the world monetary gold stock for the years between 1930 and the present.[3]

[3]These figures were calculated from data in the Bank for International Settlement's annual reports; in some cases, estimates had to be made. All tables in this chapter are based on the same data. [See Appendix A, this chapter, for discussion of the reliability of these figures.—Ed.]

Table II
World Monetary Gold Stocks (in millions of ounces of fine gold)

	Amount at year's end	*Increment*
1931	609	24
1932	642	33
1933	672	30
1934	707	35
1935	742	35
1936	792	50

Table III

	Monetary World Gold Stocks (year's end) $ millions	*Gold Production $ millions*
1931	12,573	463
1932	13,159	502
1933	21,570	826
1934	24,482	964
1935	25,688	1082
1936	27,318	1231

The reader must have noticed that the annual increment in the monetary gold stocks worldwide recorded in the second column of this table substantially exceeds the annual production of gold in Table I, particularly for the last few years. This difference is largely attributable to the inflow of gold hoards from the Orient.

IV

We have concentrated so far on the change in the physical quantity of gold, but from the point of view of monetary policy, changes in its value are more critical. The changes in value that have taken place depend of course on the currency in which this value is expressed. Assessment of its value in terms of dollars seems to be the most appropriate method. For this reason, Table III above expresses monetary world gold stocks and annual gold production in terms of the corresponding dollar value of gold (that is, $20.67 per ounce of fine gold prior to 1932 and $35 per ounce of fine gold since 1934).

The physical quantity of gold produced annually rose from about 22.6 million ounces in 1931 to 35.3 million ounces in 1936, that is, by about 55 per cent, but its value in dollars rose from 463 to 1231 million dollars, or 166 per cent between the same years, because the gold price in dollars rose 69.3 per cent during this time. And similarly, the physical quantity of the total monetary world gold stock rose from 609 to 792 million

ounces or 36 per cent during that time, while its value in dollars rose from 12,573 to 27,318 million dollars or 117 per cent.

V

It is largely arbitrary, to be sure, to express the value of the monetary gold stock or the annual gold production worldwide in terms of dollars (or any other national currency for that matter). The conversion becomes meaningful only because it enables one to compare both magnitudes with various other constituents of the total money in circulation. It is not so easy to decide which kind of comparison is most appropriate here, and the choice is contingent on the specific objective that is being pursued. Under present circumstances, the most commonly used comparison between the annual increment in the gold stock and the total gold stock is also the least significant, because its own value has undergone such marked changes as a result of depreciations. Even a comparison with the total money supply (which would have to include deposits available for check transactions) is not very informative, since gold has only a very indirect connection with deposits in commercial banks, and this connection is different in various countries. Under the current organization of the currency and banking system, gold is mainly utilized as 'coverage' for circulating government or bank notes and short-term central bank deposits, which in turn constitute the major part of the commercial banks' reserves for their short- term deposits, which themselves function as money. It therefore seems most reasonable to compare the figures for gold cited above with the sum-total of the notes in circulation and the short-term deposits of central banks worldwide. This calculation requires a prior conversion of the figures for the individual countries into a common unit, for which the dollar again seems to be the most appropriate. To the best of my knowledge, Alexander Loveday was the first to carry out such a calculation for the Gold Delegation of the League of Nations for 1913, 1925, 1927, and 1928.[4] A similar computation was recently performed at the Economic Research Division of the London School of Economics, whose results are reproduced here. There were fifty-two countries, for which the requisite data could be assembled, to wit, the sum of short-term central bank deposits and the entire circulating paper and

[4][See Appendix B, this chapter.—Ed.] League of Nations, Economic and Financial Committees. *Interim Report of the Gold Delegation of the Financial Committee* (Geneva, 1930), p. 94. These figures are complemented to some extent up to 1931 in the Final Report of the Gold Delegation (Geneva, 1932), p. 35. Some of the results of Loveday's research are reproduced here.

Table IV
Total Value for Circulating Paper Money and Bank Notes and Sight Deposits of Central Banks in 52 Countries
(in million dollars, at year's end)*

	1931	*1932*	*1933*	*1934*	*1935*	*1936*
52 countries	23,524	23,668	34,521	34,927	38,524	37,146
Russia's share	1,413	1,731	5,224	3,043	4,319	2,182
Excluding Russia	22,111	21,937	29,297	31,884	34,205	34,964
Germany	1,406	1,074	1,746	2,116	2,298	2,561
England	1,660	1,693	2,823	2,674	2,789	3,285
France	4,464	4,193	6,021	6,629	6,119	4,905
United States	6,943	7,368	7,971	9,490	11,891	13,135
Argentina	729	784	405	386	619	607
Belgium	545	532	873	885	859	917
India	455	433	684	684	772	786
Italy	836	781	1,193	1,217	1,150	750
Japan	704	376	591	567	624	643
Netherlands	485	509	718	723	583	602
Switzerland	501	509	664	669	574	654
Spain	508	473	737	760	833	470

*My sincere thanks go to the head of the Economic Research Division of the LSE and staff members for assistance in this calculation.

bank notes,[5] converted to dollars at the corresponding exchange rate. The figures calculated for year's end 1931 to 1936 are shown in Table IV. Aside from the problematic nature of the Russian figures (and for this reason both the total sum and the sum excluding Russia are given separately for all the data), the main source of errors in this calculation is the choice of exchange rates for countries whose currencies are not freely convertible into foreign currencies. Where no uniform exchange rates exist for national currencies even on the foreign market (as is true in particular of Germany), there was no way to avoid calculating the conversion ratio from the official exchange rate. As a result of these unavoidable errors, the resulting figures tend to exceed their real magnitude, a fact that must be taken into account in subsequent comparisons, in which ratios turn out to be unrealistically low.

In examining the figures for each of the countries in this table, one must keep in mind that they reflect the combined effect of the change in

[5]For some of the smaller countries, circulating coins are included in the figures for notes and paper money in circulation, but the amounts involved are too small to affect the result significantly.

the nominal amount of money in circulation in the particular country and the change in value of the country's currency in terms of the dollar. It is this second factor that often exerts the greater influence. The comparison between 1932 and 1933 highlights the impact of the depreciation of the dollar which occurred during that year. Similarly, the comparison between 1935 and 1936 emphasizes the effect of currency depreciations in all the countries belonging to the 'gold block'. Only the figures for the United States reveal an uninterrupted rise over this period, since all the figures are expressed in its own currency unit.

The overall figures reveal an almost equally large and continuous increase since 1932. It is of some interest to observe that money in circulation worldwide (calculated in dollars) rose so very markedly throughout the whole period of depreciation. If the numbers had been expressed in old gold dollars instead of current dollars, to be sure, the surprising result emerges that the gold value of the overall world figures remains remarkably constant. For this purpose it is best to use the figures from line 3 of Table IV, that is, the figure excluding Russia, for which we can with the help of Loveday's figures extend the data back for a few additional years to compile Table V.

In this table we are trying to obtain quantitative estimates of the ratio between the monetary gold stocks plus the annual gold production and the sum of the 'central bank money supply' (as the figures in Tables IV

Table V
Total Value of Circulating Paper Money and Banknotes and Sight Deposits of Central Banks in 51 Countries (Excluding Russia) in Current Dollars and in Old Gold Dollars

	In dollars, by current value			*In old gold dollars*	
	"Loveday"	*"Hayek"*	%		%
1928	22,768*		106		
1929	22,601		105		
1930	22,445		104		
1931	21,546**	22,111**	100	22,111	100
1932		21,937	99	21,937	99
1933		29,297	133	18,661	84
1934		31,884	145	18,834	85
1935		34,205	155	20,204	91
1936		34,964	159	20,653	93

*[24,571 per Appendix B.—Ed.]

**The discrepancy may be due to the fact that Loveday's figures apparently left out several of the smaller countries, and perhaps in his figures several sources of error were avoided which, as mentioned above, seemed to be inflating our estimate.

Table VI
Monetary World Gold Stocks and Annual Gold Production Excluding Russia—year's end
(in millions of dollars, current value)

	Gold stocks	*Annual gold production*
1931	12,227	428
1932	12,824	462
1933	20,883	739
1934	23,685	817
1935	24,586	912
1936	25,959	977

*The desired percentages expressing the ratio between the gold stocks and the world's money supply are obtained from the first line of Table III and the first line of Table IV for the whole world, including Russia. The figures for the whole world, excluding Russia, are calculated from Table VI and line three of Table IV.

and V might be designated). There are two ways of expressing this ratio, either in terms of the current dollar value or in terms of the old gold dollar value (Column 4, Table V). Both methods must of course yield the same ratio and both were used as a way to check the calculation. We will base subsequent figures on the first method only. For this purpose all we need are the figures for all countries including Russia in Table III as percentages of the corresponding figures on the first line in Table IV. The calculation of these numbers excluding Russia presents a problem, because there is no information available on the size of Russia's gold reserve. A tentative estimate can be derived on the fairly plausible assumption that any newly mined gold in Russia since 1931 (about which we can, again, rely only on estimates) represents in its entirety a net increase in the gold reserve maintained in Russia at that time. Table VI reproduces the world figures, excluding Russia, from Table III.

Table VII shows the ratio between the gold stocks and the world's money supply. Figures from the first line of Table III and the first line of Table IV are used to obtain percentages for the whole world, including Russia. Figures for the whole world, excluding Russia, are calculated from Table VI and line 3 of Table IV.

VI

The figures in Table VII deserve a fuller examination. They highlight the fact that at the end of 1936 all money in circulation that requires gold coverage under existing institutions was, on a worldwide average, covered 74 per cent by gold. Gold production during 1936 would have

Table VII
Monetary Gold Stocks and Annual Gold Production as Percentages of World "Central Bank Money Supply"

	Golds stocks		*Gold production*	
	including Russia	*excluding Russia*	*including Russia*	*excluding Russia*
1931	53.5	55.4	1.97	1.94
1932	55.6	58.5	2.12	2.12
1933	62.4	71.3	2.39	2.52
1934	70.1	74.3	2.76	2.55
1935	66.6	71.8	2.81	2.66
1936	73.5	74.3	3.31	2.79

raised this coverage by between 2.8 and 3.3 per cent.[6] Starting out from the assumption that these gold stocks were more or less evenly distributed internationally, current gold production would have been sufficiently large to cover 100 per cent of the anticipated long-term increase in the money supply. Supposing that the annual increment in circulating central bank money matched the increment in available gold precisely, the uncovered amount would stay constant, but the coverage would gradually increase as to percentage.

Should the production of gold continue to rise—a likely eventuality—a gradual reduction in the uncovered amount of the circulating central bank money would be the only way to avoid an unwelcome and rapid increase in the money supply. The roughly 76 per cent of the money supply at the end of 1936, or about 9.5 billion dollars, thus represents the maximum additional gold production that could be absorbed. This maximum implies that all current short-term obligations of the central banks as well as increments in the money supply would be 100 per cent covered by gold. Even if gold production were to reach the highest likely level, that is, about 50 million ounces or 1750 million new dollars (and this merely assumes, incidentally, that the increment in gold available for monetary purposes would permanently remain at the level that it already

[6]It is tempting to compare these figures with the corresponding prewar figures. For 1913, the number given by Loveday for the first group is 83.9 per cent, and the corresponding percentage of the annual gold production for that year is 4.54 per cent. This comparison, which makes the current figures appear as much lower than the prewar figures, is misleading, however. In 1913, various countries did not yet have any central banks, and gold had to be held in much larger amounts for covering the obligations of commercial banks. The comparison between the world's gold stocks and the quantity of 'central bank money' did not become meaningful until the near-universal adoption of a central banking system.

attained in 1936, if both new production and dishoarding in the Orient are included), it would take only sixteen to eighteen years until, through the cumulative effect of an annual 3 per cent increment in the total money supply, this same amount would just suffice to match the annual increment in the money supply. And the excess gold that would have to be absorbed in the meantime would still amount to hardly more than half the uncovered money supply that exists at present. It is true that an 89 per cent coverage of all paper money and short-term obligations, even assuming an even distribution of gold, would place a heavy burden on the central banks, which are expected to earn a profit, but that is a separate question.

VII

It is of course highly academic to discuss all these questions under the assumption that gold is evenly distributed internationally. Our only purpose is to demonstrate that there exists no absolute gold surplus from an international viewpoint. Even with an approximately uniform distribution, there would be no cause for alarm. On the contrary, a more abundant gold supply would provide a welcome opportunity to introduce important reforms that could compensate for the serious flaws introduced at an earlier time in the construction of our monetary system. The fact of the matter, however, is that it is the unequal distribution of gold that is the major problem. A few figures suffice to clarify this situation.

In Table VIII we compare gold stocks and central bank money in the two countries towards which the gold flow has been primarily directed in the last six years, the United States and England. The situation confront-

Table VIII
Monetary Gold Stocks as a Percentage of Central Bank Money in England and the United States

	(1) *Central bank money in million dollars*	*(2)* *Monetary gold stocks, end 1936*	*(3)* *(2) as % of (1)*	*(4)* *Increment of (2) in 1936*	*(5)* *(4) as % of (1)*
United States	13,135	11,250	84.8	1,125	8.5
England	3,285	4,425*	134.8	990[10]	31.5
Sum	16,420	15,675	95.4	2,215	13.5

*A large margin of error underlies our estimates for the data on England's gold stock. This is unavoidable, as a large fraction of the gold is held in the Exchange Equalization Account and in private hoards. The estimates tend to be too low rather than too high. We have disregarded private hoards in the United States, which are presumably very small.

ing us is in truth quite different than it would be if gold were evenly distributed worldwide.

These are the two countries that by the end of 1936 served as the shelter for almost 60 per cent of the world's monetary gold stocks. As far as the United States is concerned, the total coverage ratio is rapidly approaching the 100 per cent level—if gold inflow continued at the same rate for two more years, that level would be reached. In England, the estimated monetary gold stocks already exceeded by a third the central bank money in circulation, and this excess third was added almost entirely in 1936. The percentage covered in the rest of the world, on the other hand, is about 56 per cent, when these two countries are excluded. The feeling that there is an irresistible overflow of gold, which looms so large in current discussions, is quite obviously engendered almost entirely by the special situation of these two countries. Both countries in fact felt obliged to relieve their central banks of the task of preventing an expansion of the money supply commensurate with the gold inflow, and they have expended substantial government funds (by way of short-term loans) to 'sterilize' this gold.

VIII

Before examining the methods that have been applied to deal with this problem, a few words must be said as to the causes of the gold concentration in these countries, which is of course a consequence of the sharp devaluation of their currencies. This devaluation, by giving them a head-start in this respect over other countries, now seems to guarantee the greatest relative stability of their currencies for the near future. America, moreover, happens to be the only country for the moment with a fixed purchase price for gold, while the gold value of the English currency is indirectly guaranteed to some extent (by means of the provisional exchange rate stabilization of the 'Tripartite Agreement'). Here it must be recalled, however, that all the current difficulties could have been avoided if England and America had lowered the gold price before the fall of 1936, instead of forcing the 'gold block' to devaluate by keeping the exchange rate of their currencies at an artificially low level. It would have been easier, of course, and would have led to fewer disturbances if the disparity produced at that time between the value of the dollar and the pound on the one hand and with the French franc in particular on the other had been achieved by appreciating the former two currencies rather than by depreciating the franc. An enormous amount of economic damage and social turbulence would thereby have been averted. We will not examine here whether prestige considerations or other factors caused suggestions of this sort to be brushed aside. But there is some irony in

the fact that no sooner had the gold block countries been compelled to follow the path of the Anglo-Saxon countries in lowering the gold value of their currencies, there then arose the problem of a general appreciation of the currencies' gold value. The fact of the matter remains, nevertheless—even after the second franc devaluation—that the best solution would be not a general lowering of the gold price, but merely a partial lowering of its price in those countries where it had been excessively raised in the first place.

IX

This is not the place to discuss the detailed methods used by the various Exchange Equalization Accounts in order to 'sterilize' excess quantities of gold.[7] It is perfectly obvious that gold can be purchased and withdrawn from circulation either directly or indirectly through expenditure of public funds (and it is purely a matter of degree whether gold is purchased directly from tax revenues or whether taxes are used to pay interest on government bonds issued for that purpose); the technical procedures for implementing this policy are of little interest here. There is another method that has also come into use in the United States as a means of counteracting the oversupply of gold. It is worth examining this method more closely because it represents a partial application of a principle that could have a much wider application for the purpose at hand, and for which the current oversupply of gold offers a good opportunity. The Federal Reserve Board effectively exerted its legal power to raise the minimum cash reserves of commercial banks (which had always been regulated by law in America). Three successive increases since August 1936 have doubled these reserves, so that the prescribed reserves vary between 14 per cent and 26 per cent of pay-on-demand deposits for the various categories of these banks. In this instance, the only purpose was to tie down the excess reserves already held by the banks and thereby prevent their serving as the basis for a further expansion of the deposit circulation. In principle, however, the same regulation could be applied to force banks to keep larger reserves. We will not address here the difficult question whether it makes sense to have legally required minimum reserves for commercial banks. Be that as it may, it could well be appropriate to shift most of the burden of keeping adequate reserves from the central banks to the commercial banks. This could be done without prescribing specific reserves simply by notifying the banks that they could no longer rely on the central banks to the same extent as before to provide them

[7]Compare Noel Frederick Hall, *The Exchange Equalization Account* (London: Macmillan, 1935), for a good description of the English situation.

with cash to repay their deposits. Under those circumstances, they would have to take care of any foreseeable needs out of their own cash reserves. I have explained elsewhere[8] the general advantages of such a reform—which admittedly touches the very root of the entire central bank or national reserve system as it now stands—and will therefore not address it any further here.

What is of interest in this context is the relation of such a reform to the current gold problem. Should it prove to be advantageous for commercial banks to be obliged to rely entirely on their own reserves and for that purpose to keep their own gold—and this is a point that will not be discussed further here—the result would be that gold would acquire a new function. The gold stocks would then have to be commensurate not only with the amount of central bank money in circulation but with the sum-total of all circulating currency worldwide, including commercial checking accounts. I have no new estimates for the amount of all circulating currency worldwide at my disposal, but one can get some idea of the magnitudes involved from Loveday's calculations for 1928.[9] In that year the sum of the circulating currency and of the checking accounts of commercial banks worldwide was 61,537 million dollars.[10] If we assume that this amount increased to the same extent as the central bank money between 1928 and 1936, the sum of these two entities would be about 97,500 million (new) dollars at the end of 1936. Compared to this amount, there is nothing excessive about a monetary gold reserve of somewhat less than 26,000 million dollars or not much over 26 per cent. When the reserve is no longer expected to cover only the issuing of new notes by the central banks but must also serve as an effective reserve for the world's bank notes and checking accounts, it is not unreasonable to set a coverage ratio of about 25 per cent.

X

One option for countering a genuine overabundance of gold would thus be to shift the burden of keeping a gold reserve from the central banks to the commercial banks. In contrast to the most obvious and most widely discussed measure, namely, a lowering of the price of gold, this option

[8]In the author's *Monetary Nationalism and International Stability,* to be published this year [1937] in the series of publications by the Graduate Institute of International Studies at Geneva. [London and New York: Longmans Green, 1937. Reprinted in *Good Money, Part II,* ed. Stephen Kresge, being vol. 6 of the Collected Works of F. A. Hayek (Chicago: University of Chicago Press, and London: Routledge, 1999).—Ed.]

[9]*Interim Report of the Gold Delegation of the Financial Committee,* op. cit., p. 106.

[10]*Ibid.*

would have the advantage that it would finally offer the chance to introduce an important and advantageous reform. But the very advantage that it would involve a fundamental alteration in the structure of our banking and currency system also constitutes its drawback. It is certainly conceivable that eventually, after lengthy discussions, such a reform might become a serious possibility. It is nevertheless beyond doubt that such a measure is completely impractical as a short-term remedy for an acute oversupply of gold. For this purpose a lowering of the gold price has the undeniable advantage that it can be implemented with a stroke of the pen and that it not only reduces the magnitude of the annual increment in gold reserves (in two ways), but that it also directly diminishes the size of the available reserve. But fortunately all this is not a matter of great urgency, and the chance that at one time this abundance of gold could provide the foundation for such a reform is an additional reason to avoid rash steps.

There remains a third option, however, which has a good deal in its favour at least theoretically and is likely to play an important role in the future discussions of this problem. We refer to Lionel Robbins's recent ingenious proposal that excess gold be used to finance the government's anti-cyclical and anti-recession policy.[11] The traditional methods for financing such measures unfortunately have the built-in tendency to counteract their effectiveness. There is nothing wrong with the basic concept to set aside reserves to be used for unemployment compensation and public works in times of recession during the preceding period of prosperity. The trouble arises when these reserves are invested in the usual fashion and then must be withdrawn from the market as needed during the slump. The forced accumulation of additional capital in boom times further stimulates the overheated investment activities, while the liquidation of this fund during the slump, when it is needed, deprives the economy of funds at the very time that they should be supporting investment activity. A rational investment policy would require such funds, if they are raised by tax revenues, to be truly hoarded, so as to be available as a 'war chest' for deployment in times of recession. The relative reduction of the money supply during periods of economic expansion and its relative increase when the economy is in a decline would counteract the inverse changes in the velocity of money that regularly manifest themselves in these two phases.

[11] Lionel Robbins, "How to Mitigate the Next Slump", *Monthly Review of Lloyds Bank Ltd.*, May 1937. It has come to my attention that similar proposals have been offered independently by Bruno Suviranta in Finland [*The Theory of the Balance of Trade in England: A Study in Mercantilism* (Helsinki: Suomal, Kirjall, Seuvankirjap, 1923).—Ed.]

There are no theoretical objections against this proposal. Even though there are many concerns about organizing public works ad hoc during a depression, everything speaks in favour of having public agencies perform during a depression whatever investment activities need to be carried out in any case and can possibly be postponed until then. It is the timing of these expenses that presents a problem, since funds are often extremely hard to raise in the midst of a severe depression and the accumulation of reserves in good times generally faces the objections mentioned above. There is little question that in times of general unemployment the state must intervene to mitigate genuine hardship either by disbursing unemployment compensation or, as in earlier times, by legislation to help the poor.

The difficulties and concerns involved are largely of a political nature. Who is to decide, and on what basis, whether the economy is unusually prosperous and reserves should therefore be accumulated or whether employment, etc., is below the long-term average and the disbursement of this reserve is therefore justified? There will always be sections of the country or population groups that consider themselves sufficiently hard-pressed to be entitled to support. Can a rational counter-cyclical policy under these circumstances be devised if it is entrusted to political bodies? These are problems, however, that are far beyond the scope of this article and that we must content ourselves with mentioning here without further discussion.

Appendix A: Comparison of Data Used in Tables

The figures used in all the tables in this article are based on data from the annual reports of the Bank for International Settlement. We have learned recently of a different set of computations in the annual report for 1936 of the Union Corporation Ltd. Those results are presented here for purposes of comparison. They are probably more accurate than the figures used in the text and in subsequent calculations. In view of the rather small differences between the two sets of data (and particularly the likely range of errors), there seemed no need to recalculate our tables.

	Amount at year's end	*Year's increment*
1931	596.0	26.8
1932	631.2	35.2
1933	664.2	33.0
1934	700.1	35.9
1935	736.1	36.0
1936	773.7	37.6

*Appendix B: World Monetary Gold Stocks Compared to Note Circulation and Bank Deposits**

	(1) *Note circulation*	*(2)* *Sight deposits of note-issuing banks*	*(3)* *(1) + (2)*	*(4)* *World monetary gold stocks*	*(5)* *(4) as % of (3)*
1913	8,982	1,226	10,208	8,560	83.9
1925	16,749	5,287	22,036	10,057	45.6
1927	17,608	6,060	23,668	10,407	44.0
1928	18,181	6,390	24,571	10,747	43.7
1929	17,078	5,523	22,601	11,125	49.2
1930	16,776	5,669	22,445	11,507	51.3
1931	16,456	5,190	21,546	about 12,000	55.7

*The figures from the Final Report after 1928 exclude Russia; the percentage figures in Column 5 were computed by [Hayek] for this article. [The figures for 1913, 1925, 1927, and 1928 are attributed to Alexander Loveday (1888–1962).—Ed.]

FIVE

INTERTEMPORAL PRICE EQUILIBRIUM AND MOVEMENTS IN THE VALUE OF MONEY[1]

The Consequences of Economic Theory's Characteristic Abstraction from Time

All economic activity takes place over time. Every individual economic process occupies a certain interval of time, and all economic interactions perforce take place within longer or shorter time spans. Economic theory, in its investigations, nevertheless at least initially maintains the fiction that it can abstract from time and posits an economic system in which all individual processes take place simultaneously, so that prices for all commodities of a given type are formed under the same conditions. This fiction serves as a methodologically useful starting point, but it limits the results obtained from this stage of the investigations, in that they only partially explain what happens in the real world. In truth, economic activity is so predominantly geared to a reasonable satisfaction of needs at particular points in time that common usage is inclined to designate this aspect of human behaviour as "economic behaviour".

[1][First published as "Das intertemporale gleichgewichtssystem der Preise und die Bewegungen des 'Geldwertes'", in *Weltwirtschaftliches Archiv,* July 1928, no. 1, pp. 33–76. The present translation was first published in F. A. Hayek, *Money, Capital & Fluctuations: Early Essays,* ed. Roy McCloughry (London: Routledge & Kegan Hall with the London School of Economics and Political Science, 1984). This translation has been amended by Dr. Grete Heinz.—Ed.] This article is intended as a section of a larger work in progress on the goals of monetary policy. It focuses on the theoretical presuppositions underlying the widely supported demand for an artificially stabilized price level through monetary policy measures. I was compelled in this connection to treat several extremely complex and purely theoretical problems, which have hardly received any attention in the literature. Since this initial treatment was bound to be inadequate, I felt that it would be preferable to publish separately this effort to establish a few hitherto neglected interconnections. Let me stress that I am much more interested in offering a new approach to the problems than in attempting a concrete solution to them or in presenting specific arguments that are certain to be still deficient. Needless to say, an adequate solution of the practical questions of currency policy must not be expected from the results of such an isolated study, no matter how great the theoretical relevance of the particular problem. To the extent that this article attempts to apply its results to concrete phenomena, it hopes merely to contribute to a better understanding, not to an adequate explanation of these phenomena.

In the same way, however, prices have a particularly important function in triggering and regulating the timing of individual economic processes in an exchange economy. Yet this very function has been largely neglected by economics. It is simply assumed that results obtained from this first stage of theoretical investigations can be extended to the treatment of all concrete problems and no effort is made to complement them by a fundamental investigation of the effect of the time element on the structure of the price system.

Yet as soon as we replace these oversimplified and counterfactual assumptions by more realistic ones, it becomes evident that the customary abstraction from time does such violence to reality that serious doubts arise about the utility of the ensuing results. As soon as we abandon the elementary but fictitious presentation of simultaneously formed prices and turn to the actual monetary economy, where prices are necessarily set at successive points in time, a problem arises whose solution we seek in vain in the existing corpus of economic theory. For here we must explain not only the need for specific differentials between simultaneous prices and the function of these differentials, but also the necessity and importance of the relative price level at successive points in time.

The Absence of a Theoretical Basis for Assessing Different Prices of the Same Goods at Different Points in Time

From the outset there can be no doubt that, even in a stationary economy, in which the same processes are repeated in the same order, the same goods will not necessarily realize the same prices at every point in time. Rather, under certain conditions, their prices will be different at different points in time, and such price changes *must* recur if the economy is to regularly reproduce itself. The reason is that regular self-reproduction of the economy is not at all synonymous with continuity in the flow of the individual processes within it. In fact, under given external conditions, this will never be so. In that mode of analysis which abstracts from time, this difficulty is overcome by supposing—a necessity imposed upon it by its assumption that the economic periods succeeding one another are in all respects the same—that the length of the period is such as to include within itself even those production processes recurring over the very longest periods of time. The first implication of doing so is to lengthen the economic period, to which the elementary theory applies, to such an extent that it embraces even the longest-term of the price fluctuations arising from the discontinuity between the individual economic processes. As a result, such price fluctuations are eliminated from the picture, so that all acts of exchange are conceptually transferred to a single point in time

within the economic period. These periods must be of at least a year's duration, given the seasonally determined variations in individual economic processes, and can be assumed to be even longer because of the existence of production processes of such great duration which are performed but once. The outcome is that the simplification permissible only as a first step in the analysis has led in turn to a failure to consider the necessity for the existence of different prices at successive points in time.[2] Now, it does not matter whether we are dealing with acts of exchange undertaken on a number of occasions at different points in time within such long periods, or with those undertaken on a single occasion in a stationary economy. In either case, it is undoubtedly the rule, and not at all merely an assumption, that the conditions by which they are affected will differ from time to time, and hence that the prices realized in them will also differ. Not merely external circumstances such as changes in the time of day and the season of the year, and the particular technical characteristics of many production processes, but also the natural variations in human needs, ensure that even a self-replacing economy cannot present the same picture at every moment in time. On the contrary, the same processes can be repeated within it only periodically. Consequently, as a rule, the transfer through time of goods which are currently available will not be possible at will or without incurring a certain expenditure. It also follows that, in such an economy, the factors which are operating upon the prices of the same sort of goods at different points in time—and hence also these prices themselves—will be different.

In precisely the same way as, in static theory, the difference in the price of a particular good at different locations due to transport costs and the like must be regarded as the precondition for the existence of an equilibrium, the disparity between the prices of the same goods at different points in time in a self-reproducing economy is a necessary precondition for that self-reproduction to take place.[3] Yet more consideration has been given to the case of the interspatial price system than to the determinants and the functions of the *intertemporal price system.* It can even be said that

[2]At least one extremely idealized case of an economy functioning in time could be adequately explained only if it were also possible to assume that infinitely short, consecutive economic periods were completely the same. But since this is basically excluded by the essentially discontinuous flow of most economic processes, it cannot be applied at all in relation to the propositions derived from the assumption discussed above.

[3]Cf. in this connection especially Ludwig von Mises, *Theorie Des Geldes und der Umlaufsmittel* (Munich and Leipzig: Duncker & Humblot, 1912), pp. 151ff. Second edition, 1924, translated by H. E. Batson as *The Theory of Money and Credit* (London: Cape, 1934; new edition, enlarged (New Haven, Conn.: Yale University Press, 1953; reprinted, Indianapolis, Ind.: Liberty*Classics,* 1981, pp. 195ff.).

existing theory usually concerns itself merely with the utilization of goods given at one place and at one point in time, and, with very few exceptions, completely ignores those features of space and time which do not fit within its framework.

Virtually the sole exception to this is provided by the well-known works of E. von Böhm-Bawerk. But though they are replete with hints of this kind, they have little to offer in the way of positive conclusions for the problems to be dealt with here. The most significant step beyond Böhm-Bawerk is taken by F. A. Fetter, in his exposition of the influence exerted upon the valuation of given goods by the temporal conditionality of their enjoyment. His concept of *time value* [*Zeitwert*] at least touches upon what are the most significant problems in the present context. Nevertheless, in my view, Fetter too does not confront the problem which is decisive in this connection, which is the significance of the temporal pattern of prices of a good for the undisturbed functioning of an economy.[4] At most, some brief attention has occasionally been paid to the significance of the difference in the prices prevailing at various points in time, and the consequences of disturbances in normal price differentials, in connection with the theory of interest (Knut Wicksell, Irving Fisher, Ludwig von Mises). But so far as I am aware, the full implications of the problem have never been analyzed.

Economic analysis can solve a problem of this sort in only one manner, that is, by asking under what constraints price formation generally oper-

[4]Unfortunately, to my knowledge, Fetter has dealt with the problem of *time value* only in the two editions of his textbook, in a way imposed upon him by the exigencies of that form, but has never given a more detailed exposition of it. In general, Fetter's earlier expression *time value* also appears to get closer to the nub of the question than the phrase *time preference* which for other reasons he substituted for it. The most valuable comments are nevertheless to be found precisely in the second book referred to below, in which he restricts in this way the more general expression he originally used, but deals with time more searchingly as one of the aspects to be considered in decisions as to economic allocations. See Frank A. Fetter, *The Principles of Economics* (New York: Century, 1904), and later editions; *Economic Principles,* being vol. 1 of *Economics by Frank A. Fetter* (New York: Century, 1915), pp. 20, 29, and especially pp. 101ff and pp. 235–277. Reference should also be made to the most recent and very interesting essay by Fetter which became known to me only after I had completed this article, "Interest Theory and Price Movements", *The American Economic Review,* vol. 17, 1927, no. 1, Supplement, pp. 62ff [Reprinted in *Capital, Interest, and Rent. Essays in the Theory of Distribution,* Murray N. Rothbard, ed. (Kansas City, Mo.: Sheed, Andrews & McMeel, 1977).—Ed.]. Hints at similar considerations, whose only purpose was to prepare the ground for his well-known theory of the underestimation of future needs, can also already be found in Eugen von Böhm-Bawerk, *Positive Theorie des Kapitals,* vol. 2 of 3rd edition (Innsbruck: Verlag der Wagner'schen Universitätsbuchhandlung, 1889), e.g., pp. 439 and 587ff. [English edition, *Capital and Interest,* 3 vols, trans. G. D. Huncke and H. F. Sennholz (South Holland, Ill.: Libertarian Press, 1959), vol. 2, pp. 265 and 347ff, respectively—Ed.].

ates in order to be compatible with the maintenance of existing economic structures, or *mutatis mutandi,* what must be the impact of any price differential that deviates therefrom. As in any other problem of price formation, we must establish what determines the exchange relations between two goods. The only difference is that in this case we are dealing with goods at successive points in time, whether or not the goods can technically be assumed to be identical.

Acceptance of the necessity for an intertemporal price system is not merely incompatible with, it is diametrically opposed to the prevailing notion that constant prices over time are a precondition for an undisturbed economy. In particular, the analysis to be presented below will show that, given a general expansion of production, the maintenance of equilibrium requires a corresponding reduction in prices, and in this case any failure of prices to fall must give rise to temporary disruptions of the equality between supply and demand. Before this point can be considered in greater detail, however, we will proceed to analyze more precisely the necessity of and the conditions for a temporal equilibrium position, and to establish the criteria for its existence or its absence. It is especially necessary to do so because the view has already been advanced above that it is possible to apply the concept of equilibrium, and the static mode of analysis adopted in doing so, only to an economy which is presumed to be without time.[5] Moreover, it is at least uncommon to treat price changes—or, more correctly, the differences between the prices of technically equivalent goods existing at different points in time—within the framework of an equilibrium system.

Constructing a Theoretical Basis by Treating the Problem as One of Equilibrium

Yet the concept of equilibrium is just as indispensable a tool for the analysis of temporal differences in prices as it is for any other investigation in economic theory. Strictly speaking, its field of application is identical with that of economic theory, since only with its assistance is it possible to give a summary depiction of the very great number of different tendencies of movement which are operative in every economic system at every point in time. It basically conveys nothing more than the assumption that interrelationships between economic phenomena obey a regularity of their own, shown by the fact that the overall economy strives, under any given constellation of the circumstances influencing it (the 'economic data'), to achieve a quite particular articulation of its component parts. Any at-

[5]Cf. Rudolf Streller, *Statik und Dynamik in der theoretischen Nationalökonomie* (Leipzig: R. Streller, 1926).

tempt to explain economic processes must set out from the proposition that, given the particular constellation of such circumstances that exist, there is only one particular mode of behaviour by an economic subject that corresponds to his interests, and he will continue to change his decisions until he has achieved the most advantageous uses of the resources available to him.

In addition, if there is any change in the external conditions, for the whole of the period within which it falls there is naturally only one way of allocating the goods available to him which offers him the highest satisfaction. If the individual could foresee the change in question, he would make the appropriate decisions at the very outset of the period. If he could not have foreseen it, he will become aware only subsequently that he could have achieved a better result through carrying out a different allocation of his resources, and so he has in comparison suffered a loss. Only in the former case will the outcome of the allocation of resources among individual uses be successful in the sense that it corresponds to the expectations which gave rise to them, and hence there is no occasion to change the decisions that have already been made. Suppose that, at the time a person decides upon a particular distribution of his given resources among various uses, he also has knowledge of all the conditions under which his individual actions will be taken. If this is so, there will be only one quite particular configuration of these decisions which will correspond to an equilibrium position. Hence, if the differences that exist in these conditions at every point in time within a forthcoming period are known, this time period may be as long as can be conceived of, and the differences between the conditions existing at every moment of time within it can be as great as one wishes. But the relations between the particular decisions of the economic subjects, and thus between all the economic processes conducted within the overall time period, must always be basically the same as those which can be derived for an equilibrium system in which time has been assumed away.

Hence, to conclude that an economy can persist in a static condition, it is not at all necessary to assume that, at every point of time within the economic period under consideration, wants and production possibilities remain the same. All that needs to be assumed for such a static equilibrium to occur is that the wants and the means of production existing at every point in time are known to the individual economic subjects at the time at which they frame their economic plan for the period as a whole.[6]

[6]In addition, it must be obvious that, if a reciprocal dependence between economic activity at different points in time is to exist, the possibility of employing the same good either at one point or at another for the satisfaction of needs and wants must always exist.

That this will never be so in reality is obvious, but a large number of the changes in data are known beforehand and, in assessing the effects of such changes, the use of the ideal case of a state of equilibrium enables us to investigate the basic relationships which are dominant in such circumstances.

Even from a static viewpoint, an economic system extended through time must bear in mind the temporal conditionality of the various data. Or, to put it in terms which are more easily understood but also more exposed to misunderstandings, it must take account of those changes in the data through time which are predictable and will exist in any economic system which possesses a time dimension, as for instance, the changes connected with the alternation of the seasons. The purpose of analyzing an economic system of this type is to ascertain the price differentials between technically equivalent goods at various moments in the time period under consideration. Such differences in price must emerge because of the difficulties in transferring goods from one point in time to another, in just the same way as such goods will not carry the same price if they are located at different places. In line with the basic concepts of modern price theory, it will nevertheless be necessary to preface an investigation of this type with a short discussion of the subjective valuation of given goods at different points in time, if an explanation of exchange relationships is to be provided.

Temporally Determined Variations in the Value of the Same Good

We will take the valuation method of an isolated individual as our starting point. We must then examine how it will affect the way in which he provides himself with a certain commodity and the value he places on it at different periods. Let us take the case of a commodity whose availability will vary at different points in time because of the given technical production factors (notably seasonal influences on agriculture) and where an extra expenditure is implicit in shifting procurement from a time when the commodity is readily available to a time when it is more difficult to procure. Here it can be stated with certainty that a higher valuation will be placed on a commodity that can be procured with greater difficulty or, what amounts to the same thing in economic terms, which is scarcer than on the technically identical commodity at a more favorable time of the year. Obviously, the economic subject might seek to achieve the same satisfaction of a particular want at a given point in time, though a greater expenditure would be involved in his doing so. But then his behaviour would be inappropriate, for the same outlay devoted to satisfying another need, with a good whose conditions of supply at this moment were not

particularly unfavourable, must yield a more satisfactory outcome.[7] Every attempt, even under such conditions, to make the good in question available at both points in time in such quantity that its marginal utility and therefore its (subjective) value was the same on each occasion, can have only one outcome. Relative to the supply of other goods at the two points in time, the satisfaction of this need will imply either that too great an outlay must be made on it at one of the points, or too small an outlay at the other, or both. The shifts to which this must give rise are evident, and will come to a stop only if one condition is fulfilled: If, in relation to the other goods, the good in question is valued more highly at the second point in time than at the first, and therefore it has a higher value at the second point in time, or all other goods have a lower value, than at the first point (or—as must actually be the case—both are true). It therefore follows that, in these circumstances, equilibrium presumes variation in the valuation of the individual goods at different moments in the period of time to which it relates.

Intertemporal Exchange

We have derived the differential in the subjective valuation of a commodity at different points in time. To proceed from there to what determines temporal differentials in prices, we must assume that technically identical commodities are available for exchange between individuals at different points in time. At this point in our over-all inquiry, we must proceed from the assumption that this involves a direct exchange, that is, in the absence of any medium of exchange. Here as elsewhere, of course, exchanges between individuals presuppose that the persons participating in the trade have a relatively different valuation of the commodities at hand.[8]

[7]Cf. my article 'Zur Problemstellung der Zinstheorie', *Archiv für Sozialwissenschaft und Sozialpolitik*, vol. 58, 1927, pp. 517ff, for one result of the comparison of the utilities which can be attained at two separate points in time, which only apparently contradicts what is written above. [Translated as "Some Problems in Interest Theory", published in F. A. Hayek, *Money, Capital, and Fluctuations: Early Essays*, op. cit., pp. 55–70.—Ed.]

[8]But it is not necessary, as is often assumed, for the values attributed by those participating in exchange to any arbitrarily chosen unit of the good to be exchanged at both of the two points in time in question to be precisely inversely related, therefore, for example, A values some quantity of the good x more highly today than in a year's time, while B values this same quantity of the good available to him today less than the same quantity in prospect for him a year later. Rather, the precondition for an exchange to be possible is merely that the one market participant values any quantity of one good (i.e., in our case, any quantity of the good at any one point in time) more highly than any quantity of the other good (i.e., of the same good at the other point in time), while for the other market participant the valuation of this arbitrarily chosen quantity of the good is the opposite, or—what amounts to the same thing—that there is a divergence between the marginal utility of the two goods

Such a situation can arise because differential valuations with respect to time are of a subjective nature, so that different persons may well have opposite valuations. Thus some persons will be prepared to exchange goods available at a given point in time for goods of the same type available at another point in time, and in general they will find that there are others who are willing to undertake this exchange with them. The question now becomes: Can this exchange be expected to take place, usually or always, in such a way that equal quantities of the goods available at a given point in time are exchanged for the same quantities of the same good available at another point in time?[9] Or are there conditions under which such a ratio, even if it is established, cannot last, since, while it persists, supply and demand will not be equal, and hence there will be further shifts in supply and demand which continue until another exchange ratio has been established on the market? By simple analogy with any other problem of prices, it is clearly the second question which is to be answered in the affirmative.[10]

Since variations in the relative estimates of the goods to be exchanged that are made by the persons concerned can occur to precisely the same extent as in any other process of price formation, it is certain that the exchange ratio between the good x at moment 1 (in what follows: x_1, where x at present represents a unit of *quantity*) and good x at moment 2 (in what follows: x_2) can just as well assume the form $x_1{:}2x_2$, or $2x_1{:}x_2$, or any other form at all, as that of $x_1{:}x_2$. Equally certain is the fact that the consequences which flow from the existence of a ratio of exchange between the quantities of a good available at different points in time, which is not in conformity with the market position, must be the same as in another context, those following from the setting of a price which is out of line with the market position. If, for example, an exchange ratio $x_1{:}x_2$ is arbitrarily established on the market, while for an intertemporal exchange of this kind the ratio $2x_1{:}x_2$ would be required for an equilibrium between supply and demand, there would then be an excess supply of x_1 and thus an excess demand for x_2 at the ruling price. Suppose that, for

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to the two persons. The outcome of the exchange conducted to its economic limits is then that, for all arbitrarily chosen units of the two goods (or of the one good at two points in time) the divergence between the respective marginal utilities is the same for both individuals, or—as this can probably be expressed most simply—*the marginal differences are equalized.*

[9]For the relation between this problem and that of interest, see the Appendix to this article.

[10]Only during the correction of this work did I receive the article by G. P. Watkins, "Parity in the exchange of future money and future commodities", *Quarterly Journal of Economics,* vol. 42, 1927–28, pp. 366ff, in which a similar answer is given to the same question raised in another context.

any reason, an immediate change in the market price could not take place, then, so long as this price prevailed, production for the second point in time would be less advantageous than if the 'correct' price ruled, since in this case x_2 could be obtained more cheaply by exchange for x_1 than by taking steps oneself to produce the good at moment 2. This must lead in turn to a further shift in the relative supply of this good through time: an expansion of output at moment 1 at the expense of output at moment 2, and thereby, on the one hand, to an intensification of the disproportion between supply and demand on the intertemporal exchange market and hence also to an intensification of the pressure on the existing price of x_1. On the other hand, however, the 'incorrect' price will lead individuals to produce goods for moment 1 to an extent which is in contradiction to a rational distribution of supply throughout the whole time period. Even if the 'incorrect' price should be artificially maintained, a number of persons whose decision to produce a greater quantity of x_1 was wholly due to the possibility of exchanging $x_1$for x_2 at the ratio x_1:x_2 will find themselves disappointed in their expectation of improving the supply of x_2 they have at moment 2 by such an exchange, since at this incorrect price the supply of x_1 exceeds that of x_2. They must therefore become aware that they would have done better to expand the outlay they have made directly upon the production of x_2.

Differences in the Supply of Some Goods between Two Points in Time Affect the Intertemporal Exchange Ratios between All Goods

This ought to be sufficient to show that, in a state of pure barter, the exchange between goods of the same kind available at different points in time will not as a rule take place at the ratio 1:1, but according to the circumstances can take place at any other ratio, and that what happens in this case follows precisely the same rules as does the formation of the prices of two different goods. Strictly speaking, goods which are technically equivalent but available only at different points in time ought to be considered different goods in an economic sense, just as can be said of goods which are technically the same but located at different places.[11] Once this is recognized, it ceases to be puzzling; it becomes, in fact, self-evident that even in a static system, goods that differ only in the time at which they are available should realize different prices. We have now established that certain exchange relations must prevail for the intertemporal barter to take place. Before we proceed to derive the necessary existence of a certain price differential between technically identical goods at

[11]Cf. Mises, op. cit., pp. 151ff [in Liberty*Classics* reprint, op. cit., pp. 195ff.—Ed.].

different points in time, however, we want to carry our investigation into the effect of intertemporal barter one step further. We wish to show to what extent the factors influencing the ratio of exchange between goods of the same type at two points in time also exert an influence upon the ratio of exchange between all the other goods available at these two moments.

To say that, in the exchange of the quantities of a particular good which are available at different moments, a ratio of exchange which deviates from 1:1 must result, however, leaves unconsidered a substantial part of the consequences which arise from differences in the difficulty of acquiring a good at different points in time, linked with the impossibility of transferring it from one point in time to another. The analysis must now be extended to deal with the exchange ratio which will exist between the stock available of all the other goods at the two points. The first effect of a disparity in the possibility of acquiring a good at two separate instants of time must be that the exchange ratio of this good to the other goods will not be the same at each of the two instants. Suppose, for example, that at the first point in time the good x can be exchanged for the good y in the ratio $2x_1{:}3y_1$, but that at the second instant, at which x can be obtained only with greater difficulty, a ratio of (say) $2x_2{:}4y_2$ will at first prevail. Nevertheless, the extent to which the price of x in terms of y at the second instant exceeds that in the first instant will not in general be fully proportional to the greater difficulty of acquiring x at that second point. The reason is that proportionally more labour and other productive forces must now be employed in the production of x and less in that of y. On the one hand, therefore, the rise in the value of x will be less, but on the other hand the value of y will rise in comparison with its value at the first point in time, and the greater outlay necessary to obtain x_2 will not be fully reflected in the ratio of exchange between x_2 and y_2. The result is, however, that the value of y_2 will rise above that of y_1, both in its direct uses and as means for the acquisition of x_2, and hence engender efforts to exchange y_1 for y_2.

Consequently, if we once again assume that, as will generally be the case, the transfer of y from the first to the second point in time is not possible without making a certain outlay, then the exchange ratio between y_1 and y_2 cannot be $y_1{:}y_2$. On the contrary, it must shift in favour of y_2 in such a way that the shift which takes place is not due to the behaviour of any of the factors influencing the production of or the demand for y. To restore the state of equilibrium which has been disturbed by changes concerning one good, changes must also occur in the intertemporal exchange ratios between the other goods which must move in such a way that those quantitites of the other goods for which the good in

question can be exchanged at a future point in time cannot also be obtained in intertemporal exchange more cheaply than the good itself. The disparity in the exchange ratios between different goods at separate points in time therefore makes an agio advantageous, and hence creates the necessity for another exchange ratio, even for goods for which there is no reason to suppose that factors peculiar to them are operative which would cause the intertemporal exchange ratio to diverge from 1:1.

In summary, it may therefore be concluded that what follows from the difference in conditions that must always exist at different points in time at least so far as it involves the supply of a number of goods, together with what is only a limited possibility of transferring goods from one point in time to another, must be the formation of definite exchange ratios for intertemporal exchange between goods of all kinds available at separate points in time, in the same way as exchange ratios are formed between goods which are simultaneously available. Moreover, neither of these two groups of exchange relationships is explicable in isolation from the other; both can be understood only as component parts of a unitary system, which must incorporate intertemporal exchange ratios. The exchange ratios for goods which are simultaneously available thereby constitute at most a subordinate system of limited independence, in the same way as this can be asserted of prices ruling at one point in space as compared to the price system which prevails for the country as a whole, or of the latter in relation to international prices.[12]

As is often the case in the discussion of economic problems, the main difficulty in grasping the temporal exchange relations described above is that the technical characteristics of the identity of goods which dominate our thinking make it very difficult for us to avoid regarding goods which are the same in technical terms as also being the same in economic terms. That this must be so for goods available at separate moments of time is also a result of the fact that technically identical commodities with differing temporal quality cannot be utilized with equal facility to achieve a given aim, indeed in some circumstances only a part of them can be thus employed. From the viewpoint of the economic mode of analysis, the status of those goods which are technically identical but are not simultane-

[12]In general, the above considerations are completely analogous to those with which it can be shown that in all cases in which a commodity exchange between two countries takes place, a definite relationship, a state of equilibrium, must exist not merely between the existing prices of the goods exchanged between the two countries but also between the prices of all the other commodities in them. This is not manifested in the same relationship having to exist between the prices of all commodities in the two countries but in the fact that any change in the price of any one commodity in one of the countries can basically occasion a change in the price of any other commodity in the other country.

ously available, and hence also the conditions to which their value and price are subject, cannot differ from that of any of those other goods which, while certainly largely of the same origin, are ultimately produced in basically different production processes (in the widest sense of the phrase) which thus renders them directly utilizable only for different ends. Like the goods which are technically identical but located at different points in space, which have repeatedly been instanced in the preceding discussion for the purpose of comparison, such goods can best be described as goods which are closely related in their production. A particularly close relationship thus exists between their value and their price, but their value and price do not always have to be the same.

Intertemporal Exchange Ratios and Successive Money Prices

Up to this point in the analysis, the basic assumption has been that, in the economic system under consideration, all acts of exchange were undertaken without the use of a medium of exchange. While this assumption was maintained, prices in the narrower sense could not enter into the analysis, only prices in the sense of exchange ratios between any goods at all. It was therefore impossible to discuss intertemporal quantitative relations in terms of the differential in the money prices realized at different points in time, but only under the restriction of direct exchange between two goods available at different points in time. It has already been shown that there must exist a definite ratio at which two goods available at separate instants are exchanged. But is the existence of such a ratio necessary if the exchange does not take place directly but is split up into two steps: the acquisition of the means of exchange by surrendering one good at the first point in time, and the acquisition of another good by surrendering the means of exchange at a later point? This is the main question which has already been posed at the outset of our analysis. More specifically, we are interested in whether the intertemporal differential in money prices generally has a definite and necessary function and—in the affirmative case—what will be the effect of any deviation from the 'natural level' of the price differential caused by external interventions.

In essence, this question has already been answered in the affirmative by the arguments presented in the preceding section. As soon as it is recognized that the possibility of transferring given goods from one point in time to another links together all exchange relations at and between each of the two points in time into a system in which they all tend towards a state of equilibrium, it clearly follows that the relative magnitudes of the quantities of goods obtainable for a given quantity of means of exchange at different points in time must be characterized by the same regularity

of behaviour. There is only one distinction between this case and that described more extensively in the preceding section, which is that while the outcome in both cases is the same, in the former it is achieved not by the roundabout method of interpreting an exchange between two other goods, but by the fact that because the medium of exchange generally permits the individual to store it for the future in a way which is costless (or even yields a positive return) and more effective than that provided by most other goods, it is itself stored and at the second point in time expended to acquire the good desired.

These arguments should be sufficient in themselves to show that, in an economic system which is extended through time and is in equilibrium, the relative level of the money price of any good must vary in accordance with the conditions prevailing at every instant of time. The only thing which remains to be done is to demonstrate, with the aid of concrete examples, what must be the consequence for the regular self-reproduction of the economy of any disturbance of this system of prices by influences which are wholly unrelated to the basic impulses of the economy.

Nevertheless, it is probably necessary to explain in somewhat greater detail the relationships involved in this context. For it may not be immediately obvious that, for example, the existence of the same money prices at two different points in time is equivalent in every respect with that of an intertemporal exchange ratio of 1:1, nor, likewise, that all other ratios existing between two prices at separate points in time are compatible with the same intertemporal exchange relation. In particular, it might be objected that the different subjective value of money at separate points in time, even if the prices of the goods are the same, in itself creates the required equilibrium in all individual economies. Hence it might be argued that if the overall supply of goods is greater at the later point in time while prices remain unchanged, equilibrium will be maintained by the fact that, while the same price is being paid, it is paid precisely in money of lower marginal utility. Yet the equality of money prices at different points in time has exactly the same meaning as the intertemporal exchange ratio 1:1. The issue raised by variation in the marginal utility of money is therefore not in any sense a new one in that it would have already been necessary to deal with it in any explanation of exchange relations conducted in terms of a state of barter. In that state, too, as has already been shown, the magnitude of the marginal utility of most goods must certainly differ as between the various points in time. In addition, this must be the case even when equilibrium has been achieved. It is precisely the efforts to eliminate, to the greatest extent possible, disparities in availability which motivates the intertemporal acts of exchange, and leads to the emergence of definite exchange relations in which the

differences in availability necessarily continuing to exist will be expressed. In the same way, too, the difference in the marginal utility of money merely expresses the differences in availability which must exist as between the two points in time, without thereby being able to replace the necessary gradation of the prices which prevail at successive points in time. The following sections of this article, in which assumptions of a rather more concrete character are employed, will show the consequences of attempts to stabilize prices by monetary policy in such circumstances.

The Equilibrium Price System in Circumstances of Periodically Recurring Changes in the Conditions of Production

Such changes in data as are predictable, which can as such be taken account of in the economic plan, and whose effects can therefore be handled with equilibrium analysis, can be divided essentially into three groups: those which recur with precise periodicity; those which are of uniform tendency in both direction and extent; and finally, those whose unique occurrence can be confidently expected for a definite point in time, as the result of developments which are currently observable or of known human decisions. The effects of such changes in data can most clearly be seen in the first of these three groups. It is in the analysis of the effects of the changes in external conditions which naturally recur in relatively short periods of time that it is most obvious that only by conceptually reducing them to an equilibrium system can they be understood. But this also shows how unjustified and inappropriate are all attempts to restrict the applicability of the equilibrium concept exclusively to systems which extend through periods of time within which all external conditions remain constant. Rather, to enable the use of equilibrium analysis, it is only necessary to assume, as we have done, that no deviation from the expected course of events takes place during the period.

Among the cases in the first group, the price gradations through time with which we are most familiar, and whose necessity is immediately evident to us, are once again linked with the most short-term of such periodic changes, the change in the time of the day. It is scarcely possible to deny that the explanation of the different prices realized by a good or service at different times of the day still falls within the sphere of static theory, yet simultaneously it can equally scarcely be doubted that, from an economic viewpoint, the same services which are produced on one occasion during the day and on another occasion at night must be regarded as different goods. One of the best-known examples of this sort is that fares on the tramways are frequently higher at night than during the day, but the same phenomenon can be observed for the most variegated

of goods, for example the prices of theatre tickets at the day and the evening box offices, and the lower night-time prices for electricity which are customarily frequent. To show the basic concordance between this differentiation of prices of technically equivalent goods at various hours of the day with the gradation of the prices of goods which are different in nature but are being sold simultaneously, and the existence of a linkage between them which can be explained only by employing the concept of equilibrium, it is sufficient to subject the example of tramway tickets to closer analysis.

It is clear that, in given conditions, the maintenance of a night service on a tramway is profitable only at relatively higher fares, and that in such a case (assuming, obviously, free price formation) both the provision of the night service at prices which were not appropriately higher, and its suspension, would signify a loss for the entrepreneur. But the only conclusion to be drawn from this example is that, while a night service cannot be conducted at correspondingly increased prices, the entrepreneur could profit by changing the conditions under which he supplies the service. Hence it is only if the night service can be appropriately priced that the necessary changes are not called forth by the market but an equilibrium exists. And the resulting gradation of prices is explicable only within the context of equilibrium, in which the decisions made by every economic subject are such that he achieves the ends he seeks.

Basically the same can be said of those gradations of prices which emerge in the course of the change of the seasons. For them, too, it is easy to show that the difference between the prices of technically equivalent goods at different seasons fulfills a definite function, and, whenever a condition of equilibrium does not exist, it is advantageous for the individual participant in the market to continuously change their decisions, and thus call forth changes in the gradation of prices in the direction of equilibrium. The well-known fact that the prices of agricultural products like corn are different immediately before and after the harvest can be adduced as an example of this. What is perhaps for many purposes a better example is provided by the analogous difference in the price of eggs during and outside the main laying season, because in this case the output of eggs could be increased in every season by undertaking the appropriate expenditure.

The goods instanced above are therefore without exception goods whose supply is subject to greater difficulty at certain times of the year, whether because of climatic or other reasons, greater costs are involved in so organizing their production that they become ready to be consumed at these points, or because they cannot be made available at these times at all, but can only be transferred from an earlier point in time by incur-

ring certain expenditures. It is well known that these difficulties are also in fact expressed in corresponding differences in the prices of the goods concerned as between different seasons of the year. In this context as well, all that has to be shown is that a quite definite gradation of these prices is a necessary precondition for a continuance of the regular repetition of the economic processes currently taking place to just the same extent as it is with simultaneously existing prices. This is best shown by analyzing the consequences which must follow from the establishment of two prices at two points in time between which no such equilibrium relationship exists.

Assume that, at the first of the two points in time to be considered, the good in question can be produced at significantly lesser cost than at the second, but simultaneously that the money price obtainable for it is the same at each of the two points. Given the argument presented above, this assumption clearly implies either that too high a valuation has been placed on the good at the first point, or too low a valuation at the second. As a result, expenditures to ensure a future supply of the good are less attractive, and conversely larger sums will be spent upon getting hold of it in the present. For at the existing prices, it is most advantageous to satisfy the demand for the good at the second point in time by selling it at the first point and using the proceeds to purchase it at the second. But this must mean that, at least for a number of individuals, the expectations which have induced them to make certain dispositions with respect to this good will not be fulfilled. In particular, some of them will not be able to obtain the good at the given prices at the second point in time. By assumption, at that point it is more difficult to produce, and hence in most cases will be supplied to the market in lesser quantities, even at an equilibrium price. In the present case, however, its scarcity at the second point in time, and hence the disproportion between supply and demand then, is still further intensified by the fact that an equally high price existing at the first point in time does not make it appear profitable to incur those expenditures involved in making the good available at the second point, though the purchasers would still be prepared to defray them at that point. Because of the stability of prices, which has been foreseen, the situation at the second point will therefore be such that not even a subsequent rise in the price to the level corresponding to equilibrium would be sufficient to bring supply and demand into equality with each other. Preventing the necessary configuration of prices existing at different points in time thus leads to a still further intensification of the tendencies towards a change in prices, tendencies which must sooner or later be realized if a complete disorganization of the market is not to result.

The analysis of the converse case yields similar results. Assume that a natural product realizes the same price in two separate seasons, but that

in the later season it can be produced in greater quantity at the same cost because of more favourable weather conditions. It will then obviously be advantageous to expand the output of the good for the more distant point in time at the cost of that for the point nearer in time. At the latter instant, the goods are obtained more cheaply by purchase than by producing it for oneself; a greater quantity of it is obtained at the point further away in time in return for one's own production than one has expended in the intervening period upon providing it for oneself. Output for the first point in time will therefore be sharply cut back, and that for the second point unduly expanded. A situation must then result in which, in comparison with the supply that would otherwise be available, on the one hand a deficiency of this good must emerge at the first point in time and on the other hand a surplus at the point more remote in time. Once again, some of those demanding the good at the first point in time will be unable to purchase it at the price they expected to prevail and likewise some will not be able to sell it at the second point in time at the price they expected. Supply and demand will not be equal to each other at either point in time because at each point the same price corresponds to the marginal costs of quite different quantities of output and to the marginal offer made by a number of purchasers, the latter of which is inversely related to the former.

Under certain circumstances, the conclusions arrived at previously with respect to the prices of individual goods at different points in time will also hold for the totality of goods in an economy and so also for the so-called 'general price level'. To show this as clearly as possible, let us take an extremely idealized example. Assume that an isolated people feeds itself predominantly with a fruit which can be brought to maturity at any time of the year, though only at very different cost, but at the same time cannot be preserved for more than a few days. Then the price not merely of this fruit but also of most other commodities will differ at different times of the year. The implied assumption is that the work necessary to obtain the fruit is undertaken a relatively short time before it ripens. When production conditions are unfavourable, a part of the tools and capital otherwise employed in other directions will therefore be transferred to the cultivation of this fruit. Consequently, at this time there will be a deterioration in the supply of all those other goods which can only be stored at a certain cost, and this deterioration will not be compensated for by a rise in the supply of foodstuffs to the level it attains in more favourable seasons. The quantity of most goods possessed by the people will therefore differ very greatly as between one time of the year and another. Indeed, at one time they will be relatively well provided with most goods, at another time relatively badly.

Suppose that in these conditions the various goods could be obtained at any time for the same money price. Then everyone would gladly save a part of his money income in the good time, in order thereby to improve the supply of goods he can obtain in the bad time. But it is perfectly clear that if all individuals seek to act in this way, prices in the bad period must be driven up, and they will continue to rise during it until the money unit will not be able to purchase a greater utility for anyone than it could at the good time of the year. As against this, however, and at least with respect to goods which are transferable from earlier points in time, it would not pay to assume the higher costs connected with doing so, and hence not even the degree of equalization of availability that is economically possible would be achieved. Naturally, in this connection we completely abstract from the existence of credit for the time being, since otherwise the result of saving would be neither a decline in the sums of money expended during the period when saving was occurring nor a rise in expenditures during the period for which the savings had been made. On the contrary, no change in the overall sum of money expended in the economy need occur in this case because of the investment of the money saved by the individual savers. Nevertheless, to bring credit into the picture would only make the analysis unnecessarily complicated without forcing any essential change in its conclusions.

These conclusions can be stated thus: A difference between the levels of all or at least most prices prevailing at different points in time may also be necessary, hence under certain conditions *movements of the so-called 'general price level' fulfill a definite function.* It is hardly necessary to devote much space to that naive conception of the Quantity Theory which provides the only basis for denying the necessity of changes of the price level stemming from the goods side. At this point, the significance of such conceivable seasonal fluctuation of the 'price level' for the theory of the value of money need only be briefly mentioned. The absurdity of always wanting to attribute changes in the general price level to some kind of avoidable changes in the 'value of money', due mainly to the imperfection of our monetary system and to be avoided wherever possible, is clearly shown by the possibility of such regularly recurring movements of prices as, for example, a continuous general price rise in the winter months. This merely expresses the greater difficulties to which supply is subject at that time, and hence differences in the value of the majority of goods at different points in time. Leave aside the fact, which will be dealt with elsewhere, that it is impossible to establish a general 'value of money'. It would also be quite nonsensical to speak of a difference in the value of money, because the difference in the value of goods is expressed in terms of the difference in money prices. If use is made of the inexact concept

of a general value of money, consistency would also require denial of the fact that, within an equilibrium system extended through time, temporal differences in the value of money may exist, in the same way that Mises disputes the possibility of spatial differences in the value of money.[13]

The Equilibrium Price System in Persistent and also in Once- and-for-All Changes in the Conditions of Production

Up to this point in the analysis, the description of the linkages between prices at different points in time can hardly have been subject to contradiction, even if, as far as I am aware, they have hitherto never been set forth explicitly. But what could be more surprising at first sight is the further assertion that basically the same relationships exist in cases in which the shifts in the data are not of a periodic nature but consist in a known, uniform movement in one direction. In what follows, an attempt is made to prove that, in the case of such a movement as well, only one quite particular relative level of prices at successive points in time ensures the maintenance of equilibrium, and that any other pattern of prices leads to shifts in the structure of production which ultimately must call forth a disparity between supply and demand and thereby induce further price changes which as a rule involve losses. This conclusion constitutes the essential point of the present analysis and provides the most important basis for the thesis as to the relations between movements in the 'value of money' and the natural gradation of prices with which the following section will be concerned.

First of all, assume once more that the prediction can be made with certainty that, over a longer time period, the cost of production of *one* good will continuously decline. Suppose that, because of the construction of a drainage system decided upon for health reasons, a certain area of soil particularly appropriate for the output of a particular natural product, but hitherto under swamp, becomes available each year for cultivation. If the price of this natural product did not continuously fall in such a case, it would not be worthwhile to increase output, even before the expected expansion of the production area had been achieved, through more intensive utilization of the area already available at the cost of its later productivity, as would undoubtedly correspond to a state of equilibrium and also be in the general interest. The owners of the fields already under cultivation would then so direct their current production, in the expectation of receiving the same price at a later time, that they could produce the same quantity at the same cost for the entire future as well.

[13]Cf. Mises, op. cit., pp. 151ff [in Liberty*Classics* reprint, op. cit., pp. 195ff.—Ed.].

But as soon as they have to compete with the product of the better soil which has been newly opened up for cultivation, it is evident that they would have done better to have increased their production at the earlier time at the cost of that at the later. If the assumed constancy in the price obtainable for the good when the supply of it has been expanded is to hold, one of the following conditions must be fulfilled: Either all other prices must have risen correspondingly, or at this price supply and demand will not be equal, but the former will exceed the latter. This immediately becomes evident if we consider that, by assumption, the good in question comes on to the market in greater quantity at the later point in time, and hence can only be disposed of by a fall in its price relative to that of all other goods. It follows that either the producer will not be able to dispose of a portion of the product he supplies at the later time, or he can only acquire a smaller quantity of other goods with the same money proceeds. Hence his position in either case will be worse than if he had increased his output at the earlier time instead of producing part of it at the later time. If he undergoes this experience more than once, and if the factor reducing costs can be assumed to continue operative, the producer will finally have to decide in his own interests to expand his current output by more intensive cultivation of the soil; but for so long as he has distributed his production uniformly through time, confident of the validity of his price expectations, he will thereby suffer losses.

As in every other case, a price structure which is not compatible with equilibrium will have two main consequences; on the one hand, a widening of the differences in supply that are minimized in equilibrium; and on the other hand, whenever equilibrium has not been achieved, the prices actually realized will not represent the greatest returns that could be obtained by the producer. The same conclusion can be shown to apply in every other instance of a predictable, regular alteration in the conditions of production of a good in one direction or the other. To avoid prolonging the discussion inappropriately, let us now pass directly to the case in which the changes do not take place in the conditions of production of one good alone. Assume that the predictable improvements in methods of production and the resulting reduction in costs take place uniformly throughout the whole economy. The type of economy involved is familiar in economic theory as a 'regularly progressing economy'. In this case, it is the investment of a relatively constant volume of current savings which leads to continuous rises in output in all branches of the economy. The same analysis can in principle also be applied to the opposite situation. The productivity of an economy may continuously decline because of the enduring operations of particular factors, for example, the exhaustion of the mines, climatic changes, or declining population and hence diminish-

ing division of labour. The question to be answered in this context is whether—in the same way as with a uniform expansion or contraction of the quantity of a good produced—changes in the overall quantity of output bring about certain changes in all prices and so also in the so-called 'price level'. Similarly, must any deviation of prices in successive instants away from this quasi-static gradation of prices give rise over time to the same outcome as can be established in the case of a single good?

The practical significance of this question becomes evident when it is realized that the answer given to it must also be valid in basic respects for the case which undoubtedly occurs frequently in reality, in which every producer can reckon upon being able to sell his product at unchanged prices, or at prices which have not declined by the full extent of the reduction in costs, even after the improvements in production have been made, because the organization or the regulation of the country's monetary system prevents any general fall in prices. This instance will be considered in greater detail in the following section. For the moment, however, the analysis will continue to be based on the assumption that has enabled us to make direct use of the equilibrium concept up to this point, namely that the expansion of output is not merely known to individual entrepreneurs, but can also be predicted in general terms as arising from factors which are generally known to be operative.

If, during such a general expansion in output, the expectation is held with certainty that the prices of products will not fall but will remain stable or even rise, hence that at the point more distant in time the same or even a higher price can be obtained for the product produced at lesser cost, the outcome must be that production for the later period, in which supply is already at a relatively adequate level, will be further expanded at the cost of that for the earlier period, in which supply is relatively less adequate. Even a person who has no intention of saving will, in this case, expect the greatest advantage to arise from his distributing his output in such a way, because by doing so he will raise his total income for the period as a whole. On the basis of the present market situation, he will believe that he can count on being compensated for the temporary constraint on his income, which operates until his increased output comes on to the market, by a greater rise in the earnings he will then derive from it.

It follows that there is no difference in this respect between the outcome of an increase in the output of *one* good and that of a general rise in output. The expectation that prices will not change calls forth an excessive rise in output for the future. This expansion will proceed on the assumption, on the part of the individual, that he will be able to maintain himself in the intervening period in his accustomed fashion and to pay for the goods he needs during this period with the future proceeds of his

increased output. In just the same way as in the cases previously discussed, however, the quantities of present goods which producers want to obtain at the given price will not be available, precisely because of the expansion of output for the future. Now, as between the two points in time, conditions of production have changed. But by assumption, the exchange ratios between current goods and future goods that currently prevail reflect the existence of the same money prices at those two points in time. Hence these exchange ratios will now reveal themselves as too favourable for future goods, hence the supply of current goods will remain below the demand for them.[14]

However, the exaggerated stimulus to the expansion of output for more distant points in time at the expense of that for nearer points will make it more difficult for the same levels of prices, which are already in themselves inappropriate, to persist during the whole period, and in time must exert an ever-intensifying pressure on prices. The discrepancy between supply and demand at the prices ruling will be expressed initially in too low a supply and later in too great a supply. Even during the first period, the upshot will be that those who do not succeed in covering their demand during that period at the low prices they expect to prevail will see themselves forced to offer higher prices. Consequently, because a fall in prices in the future is not expected, a temporary rise in current prices must take place, even before the increased output comes on to the market. But then the assumptions upon which the entrepreneurs have decided to expand their output for the later point in time reveal themselves to be incorrect. Not only will they have to discover that they would have realized better prices by shifting their production a point nearer in time, in addition they will have to pay a price higher than that which they expected for the goods necessary for the continuance of production at the later point, and for that reason, for at least some of them, part of the profit they expected will be converted into a loss. In other words, the situation in which they now find themselves means that they will not be able to sell their products at the later point in time at prices which cover costs.

These consequences, which are brought to a head by the expectation of stable prices as production grows, are therefore the same as those of an inflation, if not in degree, then certainly in nature. For prices to remain stable as output increases, the quantity of money must be expanded. But even if the money supply is increased just sufficiently to

[14] In order not to overburden the analysis, the reader is once again referred to the Appendix to this article for treatment of the connections between this phenomenon and that of the rate of interest which have been neglected here.

prevent a fall in prices, it must have basically the same effect on the structure of the production as any other expansion in the quantity of money not 'justified' by an increase in output. By preventing the temporal gradation of prices determined by the 'goods situation' from being established, it gives rise to shifts in production which prevent the necessary equalization of the supply of goods as between different points in time. Moreover, at a later stage, when some of these shifts have already been irrevocably completed, it obliges much greater changes in prices which must result in a loss of some portion of the expenditures made.

Basically the same conclusion holds in the case of a continuous decline in output with unchanged, or even falling, prices. Here the disturbance to supply and the hindrance to the equalization of supply as between different points in time operate in the opposite direction, but will probably have less serious consequences because of this. As a rule, goods which have incorrectly been produced in too great a quantity for present needs can subsequently be shifted into the future relatively easily, while a shift in the output of goods in the opposite direction will usually be impossible or, if it can be done, will involve substantial costs.

To some extent, the case in which the changes in the conditions of production consist in a change in the size of the population calls for particular attention, though it can only briefly be dealt with here. Since it cannot be possible in this case to shift the utilization of the variable productive factors, it follows that an 'incorrect' price structure cannot lead to their being employed at the incorrect point in time. Neither the new labour power nor the disposition of it is in existence at the earlier point in time. With arguments analogous to those presented above, it can be shown that, if output rises because of an increase in the number of workers, an equilibrium will emerge only with the establishment of a quite particular set of relative prices at the two points in time. Similarly, any deviation of prices from that set must give rise to the type of consequences already described above. But to go into the process in detail would take us too far afield at this point.

Similar types of propositions as to the significance of intertemporal price structures could also be stated for the instance in which a once-and-for-all change in the conditions of production is assumed to take place, for example in the case of the expiry of a patent. In this case, however, the concept of equilibrium hitherto deployed could no longer be validly used to depict actually existing tendencies. The results achieved in an analysis of this type would then have greatest significance merely in serving as a foil against which the particular features of the actual course of events could be more sharply highlighted.

The Influence of Automatic Changes in the Quantity of Money Under a 'Tied' Monetary System upon the 'Natural' Level of Prices

Any currency policy which seeks to arbitrarily influence the 'value of money' will prevent the establishment of that natural structure of prices through time corresponding to the intertemporal exchange relations originating from barter, and alone able to ensure undisturbed self-reproduction in a monetary economy as well. Furthermore, the same is true of the mechanism of any monetary system at all, either actually existing or merely conceivable. Above all, a tendency towards the stabilization of prices is operative not merely under a currency 'manipulated' with respect to that very aim, but also with any tied currency [*gebundene Währung*] or commodity money [*Sachgeld*]. The effect of such a tendency must be to counteract any tendency to that general change in prices emanating from the 'goods side' as already described and prevent the materialization of a movement in prices in accordance with the temporal equilibrium system. As is well known, a tied currency[15] is described as a monetary system in which the quantity of money is automatically regulated by the possibility of converting a fixed, given quantity of one good into a definite quantity of money and vice versa, whether through direct transformation or exchange. For the sake of simplicity, discussion will be confined to the gold standard as a typical manifestation of such a tied currency. Obviously, however, any conclusions arrived at with respect to it can equally well be applied to any other tied currency.

The essential characteristic of every tied currency and of the gold standard in particular is that every change in prices, so long as it is not merely a matter of two such changes accidentally compensating for each other, leads to changes in the quantity of money and hence to further changes in prices. Suppose that, in the case of the gold standard, we temporarily abstract from changes on the side of gold production and in the industrial demand for gold, and concentrate upon the effect of its operation in the case of a change in the prices of some randomly chosen goods (which are not produced by gold itself nor serve in its production), or a fairly general change in prices. It is then evident that the operation of the gold standard

[15]The lack of an established, more accurate term makes it necessary to use in this context what is really a juristic rather than an economic concept: *Währung* (literally: currency), though this conflicts with the use made of the term elsewhere in this work. The expression also immediately used directly above, "commodity money" (*Sachgeld*) (Mises) is too narrow, since it does not include the various types of credit money which also fall within the category of tied currency. Cf. Mises, op. cit., pp. 33ff. [Liberty*Classics* edition, op. cit., pp. 73ff. —Ed.]. To be completely accurate, one would perhaps have to speak of a money tied in value to a quantity of metal for which it can be exchanged (*stoffwertgebundenem Geld*).

will regularly be such as partly to prevent or even to reverse the change in prices arising from other causes. Since some of these effects are of the most minor order and without practical interest, let us confine the discussion to the case of a rather general price change, for instance to that of a fall in prices which originates from extensive improvements in the conditions of production. The increased purchasing power of gold following upon a greater output of commodities will have the familiar consequence of a rise in both the production of gold and also to a still greater extent in the transformation of gold into money, so that prices will be pushed up still further, or a farther fall in prices wholly or partially prevented. The result is that the difference in prices which necessarily arises from the relationship between the supply of and demand for goods at two separate points in time, and which serves to bring about equality in provision between them, is partly prevented from being established. The responsibility for this outcome is wholly unrelated to the original motivations to engage in economic activity, but stems solely from the particular economic form, the system of indirect exchanges. Yet, as obstacles are set in the way of the establishment of the natural price structure, not merely will the possible equalization of supply as between various points in time as depicted in the preceding sections be prevented from taking place, but in addition the equilibrium between supply and demand will be disrupted.

The tendency of a tied currency to stabilize the 'value of money', even if in a lesser degree than a free currency regulated towards this end, namely its tendency to prevent the establishment of that temporal set of exchange relations expressed in money which must of necessity have been established in a barter economy, must necessarily lead to disturbances of the economic process. *Given what has previously been said, it must be assumed, in sharpest contradiction to the prevailing view, that it is not any deficiency in the stability of the purchasing power of money that constitutes one of the most important sources of disturbances of the economy from the side of money. On the contrary, it is the tendency peculiar to all commodity currencies to stabilize the purchasing power of money even when the general state of supply is changing, a tendency alien to all the fundamental determinants of economic activity.* That is true to an even greater extent of every currency which is regulated with the aim of keeping the price level as stable as possible, since with such a currency changes in the general level of prices stemming from the goods side are wholly prevented. A tied currency, on the other hand, achieves a balance at mid-point, so to speak, between the tendency to a change in prices and their stabilization. Remaining with the example of a fall in prices originating from the goods side, the fall in prices will in this case certainly induce an expansion in the flow of gold into the monetary circu-

lation. But the new equilibrium will emerge before prices have been brought back to their previous level. On the one hand, an increase in the output of gold will bring with it higher costs of production, yet on the other hand, an outflow of gold from its industrial uses will also raise the price of gold in relation to the prices of other commodities.

It would be possible to conceive of a structure of money prices at successive points in time being established which corresponds to the intertemporal equilibrium system only if the monetary system was one in which any change in the quantity of money was excluded. In practice, as will be discussed later in this article, it is impracticable to regulate the monetary system in this way. But it is worthwhile considering for a moment the situation in which the quantity of money is kept constant, with respect to its significance for the price structure and its relation to the 'natural' price system. In this case, a cancelling-out of the price fluctuations emanating from the side of goods by changes in the quantity of money is not in question. Let us temporarily abstract from certain disturbances which have already been discussed in other connections and are to be dealt with again in connection with the underlying assumptions being made here. For, in a situation of indirect exchange, such disturbances always offer resistance to the achievement of full equilibrium. Now, if the quantity of money is invariable, obviously prices must fall as output rises and rise as output falls, and indeed both occur in such degree that the changes in costs which gave rise to a change in the volume of output are expressed in the change in prices. For example, suppose that production methods have been improved and hence costs reduced. Under otherwise equal conditions, the prices of products must fall precisely to the point at which the increased output now producible with the same quantity of resources can be sold at the same total revenue as the smaller quantity previously produced. If product prices do not fall, there is a stimulus to expand still further, at the cost of current supply, the greater future supply initially made possible by the improvement in production methods, because it promises a greater return than production for the present. If to simplify matters we temporarily also assume that the rise in output takes place in all sectors simultaneously and equally, and that after this general rise in output the relative volume of demand for the various products remains the same, this implies that the price movement permits just that expansion of output with which a state of equilibrium will be regained.

Circumstances become substantially more complicated if the change in the conditions of production and thereby in quantities produced takes place only in individual branches of industry, since shifts in the relative quantities of output and relative prices would then have to take place, but to pursue this would take us too far afield at this point. Yet a brief consideration of

the case which frequently does occur demonstrates that the picture gained under the assumption of a generally uniform and simultaneous rise in output, and the conclusions drawn from it, are not completely impractical. What we have in mind is that improvements in productive methods do not occur simultaneously everywhere but they do so successively within a short period of time. Yet the organization of the monetary system does not permit a decline in the general price level and hence all producers can reckon upon being able in the final analysis to sell their expanded output at the same unit prices again after prices have temporarily declined. Clearly, the consequences of this frequently held and well-founded expectation must in general be the same as those of a stability of prices which can be expected to persist with a similarly predictable general rise in production, namely an expansion of output for the period because of the more favourable conditions which is excessive in comparison to the equilibrium level. Analogous considerations lead to essentially the same conclusions for the converse case of a declining level of output.

Hence the disturbances which can arise because of the use of a medium of exchange in an economic system are in no way to be considered as the consequence solely of a change in the absolute level of money prices. On the contrary, in some circumstances they must be seen as originating in the absence of such a change. Neither the equality between the money prices of individual goods or of all goods or of the 'general price level' at two different points in time, nor the equality of the prices of two different goods at the same point in time, is essential to equilibrium, although it is obviously possible for these equalities to exist in concrete cases. A difference in the 'value of money' at different points of time within the intertemporal equilibrium system is therefore completely compatible with the existence of equilibrium. All that a disturbance of the equilibrium would do is to establish a structure in the value of money at the various points in time which would create an uneconomic configuration in the relative levels of individual prices at those different points, which fulfill a quite definite economic function. *In describing the damaging effects which can arise from money, however, it is not changes in the value of money which should be at issue, but disturbances of the intertemporal price system which are without any economic function.* The theoretical significance of this conclusion can be grasped only if it is realized that the prices established with the assistance of money do not correspond to the equilibrium prices of the hypothetical system which does not possess a medium of exchange, and therefore must yield the same outcome as any other price structure inconsistent with equilibrium. If this proposition is not brought into the analysis, any concrete change in the so-called value of money, or constancy in it, becomes wholly without interest.

It is not at all new to argue that, if disturbing influences from the side

of money are to be avoided, the 'value of money' must not remain unaltered as the situation in the market changes but should continuously be adjusted to the changed conditions. Particularly in the bimetallic controversy of the 1870s and 1880s, the thesis was advanced from many sides that, as productivity rose and hence costs of production fell, a corresponding decline in prices would be desirable.[16] In addition, among various authors the view is to be found that changes in the general level of supply ought to find expression in corresponding changes in the value of money. Yet there was no theoretical basis presented for this view, and in my opinion it can be provided only by considerations of the type discussed above. To my knowledge no one has hitherto analyzed the function fulfilled by the relative levels of prices at different points in time. In its absence, however, the sole criterion by which the significance of concrete structures of prices could be assessed was also lacking.

Only recently, and with respect to a particular problem, has Haberler[17] investigated the significance of general price movements for the undisturbed progress of the economy. In this context, he has convincingly shown that a fall in the price level due to continuous improvements occurring in all branches of production does not have the same troublesome consequences as a deflation. Theory has hitherto scarcely progressed beyond this distinction between the effects of changes in the price level originating on the one hand from the 'goods side' and on the other from the 'money side'. The view advanced here, that changes in the price level coming from the 'goods side' are not merely not detrimental but are even necessary if disturbances of equilibrium are to be avoided, may still appear to many to have something of the air of paradox. This is especially so because the view that is dominant today, according to which only an invariable price level will ensure an undisturbed course of production, and every general rise in prices must lead to an overexpansion, every general fall to an unjustified restriction of production, appears to be confirmed by general experience and the results of statistical investigations. Nevertheless the results of my analysis do not seem to me to be in any way in contradiction to the facts.

Parallel Changes in Prices and Production

With only few exceptions historically, the best known of which are immediately to be noted, rising output and rising prices and falling output and

[16]Cf. the remarks made by C. M. Walsh in his valuable book, *The Fundamental Problem in Monetary Science* (New York and London: Macmillan, 1903); on the representatives of the cost standard, *ibid.*, especially pp. 235ff.

[17]Gottfried Haberler, *Der Sinn der Indexzahlen, Eine Untersuchung über den Begriff des Preisniveau und die Methoden seiner Messung* (Tübingen: Mohr, 1927), pp. 112ff.

falling prices run parallel to each other. But this is completely compatible with the recognition that, under otherwise equal conditions, a rise of production can take place only with falling prices, and a decline in production only with rising prices, if equilibrium is not to be disturbed. The restrictive assumption "under otherwise equal conditions" implies that the changes have taken place in the conditions of production alone, and that simultaneously such changes in the level of demand as would counterbalance the effects of the former have not also fortuitously occurred. Under these conditions, however, the circumstance discussed above, namely that the existing monetary systems prevent the necessary price changes, at least in part, must always imply that any improvement in the conditions of production leads at first to an excessive expansion of output, and any deterioration of those conditions to an excessive restriction of it, in relation to the given demand.

But suppose that a secondary disproportionality between supply and demand has come about because of such an incorrect movement of prices. The direction of the relative movement of prices and quantities must then be precisely the opposite of that arising from a simple change in the conditions of production. This can be shown most clearly by the familiar diagrammatic presentation of the conditions for the establishment of equilibrium by means of the supply and demand curves. In this case, a change in the conditions of production, demand remaining constant, always causes a shift of the equilibrium point along the demand curve, which implies either falling prices and rising output or rising prices and falling output. But the equilibrium point must always shift along the supply curve if production and prices are adjusted to *one another* but do not conform with demand. In this situation in particular, production and prices must simultaneously fall or rise if 'incorrect' prices have called forth an incorrect volume of output. Production, which is temporarily guided by 'incorrect' prices, will therefore always have to traverse a path towards equilibrium along which prices and quantities of output develop in parallel. On the contrary, however, there is no contradiction in saying that production and prices must move in a numerically opposite sense if equilibrium is to be maintained as conditions of production change. The regular parallel movement of both phenomena therefore merely confirms that the economy does not in practice take the shortest route from equilibrium to equilibrium, hence in a type of moving equilibrium, but continually oscillates around it.[18] This is not simply a well-known fact but the circumstances under discussion here show it to be an actual necessity, even for the case in which no unforeseen changes occur.

[18]Cf. H. L. Moore, "A Moving Equilibrium of Demand and Supply", *Quarterly Journal of Economics,* vol. 39, 1924/5, pp. 357ff.

Under the existing monetary organization, which militates against changes in the general price level, the necessary price changes can enforce themselves only if an erroneous guidance of production has already come about. In particular, it must be assumed that the immanent tendency of the gold currency towards stabilization in fact also administers an excessive stimulus to the expansion of output as costs of production fall, and thus regularly makes a later fall in prices with a simultaneous contraction of output unavoidable. Since, conversely, every deterioration in the conditions of production in the given situation must have analogous consequences as well, it may even be regarded as theoretically probable that the actual movement of the economy will describe continuous fluctuations around equilibrium. But it is an equilibrium which can never be achieved, because of monetary influences which hinder the establishment of the natural price structure. Yet while the parallelism in the empirical movements of prices and production can be explained by these particular circumstances, it naturally provides no proof at all that a rise in prices must regularly lead to a rise in output, and a fall in prices to a fall in output. Rather, it is quite probable that, if the adjustment of prices were to proceed without any disturbance, the connection between prices and output would be completely the reverse, and price movements would then be an expression of the necessary differences in supply as between the different points in time and not of regularly recurring disturbances of equilibrium (i.e., shifts between supply and demand).[19]

It is not our task here to elaborate these reflections into a theory of economic crises, especially since our neglect of the phenomena of credit would mean that any such theory at which we arrived would be com-

[19]That a connection normally exists between rising prices and rising production on the one hand, and between falling prices and falling production on the other hand, is shown by experience, though it is by no means always necessarily so. But this furnishes a beautiful example of how dangerous it is to derive theoretical propositions from the results of statistical investigations or even to seek to base practical demands upon them. Even the highest correlation coefficient between movements in production and in prices cannot prove that rising production can take place only if prices are rising or that falling prices bring about falling production. Yet it is precisely from such considerations that efforts to stabilize the value of money derive their strongest support, though even the points emphasized in this article show how dubious they are. The false reasoning which led to their adoption was that, if a rise in prices led to a rise in output, and a fall in prices to fall in output, the price level must be maintained stable to eliminate all influences upon produciton originating from money. But naturally the aim of efforts at stabilization, to achieve certainty as to the future structure of prices, can least of all be achieved by seeking to prevent those price changes which are necessary for the maintenance of equilibrium in production, and such efforts thereby call forth disturbances of equilibrium which must ultimately lead to intensified price movements.

pletely lacking in reality. It is sufficient at this point to have established that certain disturbances of economic equilibrium are not merely linked to the introduction of credit, but, if probably to a lesser extent, are indissolubly linked with the use of a medium of exchange in itself. Hence attempts to stabilize the purchasing power of money are likely to be least successful of all in eliminating such disturbances. There can be no doubt that they show themselves more markedly in a credit economy and thus can be observed more easily there. From this viewpoint, it may also be justified, in depicting the significance of monetary phenomena for the course of an economy, to set out from the assumption that exchange is mediated by credit alone and not at all by cash. This is the procedure adopted by, for example, R. G. Hawtrey[20] and L. A. Hahn.[21] In any judgement of the efforts to eliminate whenever possible the influences which emanate from the side of money to disturb economic equilibrium, it is nevertheless of decisive significance to recognize that these disturbances are inseparably bound up with the operation of all conceivable monetary systems. Only if the quantity of the means of exchange could be fixed once and for all[22] would it be possible to eliminate merely the most important influences from the money side discussed above, influences which prevent the automatic adjustment of the economy to changes in external conditions.

Obviously this is out of the question, given the ever-present possibility of using a surrogate money in place of real money. The quantity of that surrogate could not be rigidly tied to that of the real money, and its creation would have precisely the same effect as that of any other expansion of the money supply. In addition, it cannot be argued that it would be desirable to fix the quantity of money in this way with the aim of preventing the operation of all active influences from the side of money. Probably it has been fortunate for mankind that the organization of the monetary system has forced it into taking a step forward for which it would not have been prepared to accept the sacrifice involved. Indeed, from what has been said above, this is true of the operation of all tied currencies in a progressive economy and not merely of the effect of credit in the relevant sense, though it is certainly the latter which is generally recognized today. It is not our task to discuss this issue further at this point. But it is certain that this step forward is inseparably connected

[20]Ralph George Hawtrey, *Currency and Credit* (London: Longmans, Green, 1919; 2nd edition, 1923). Also in German translation, *Währung und Kredit*, edited from the 2nd English edition by F. Oppenheimer, trans. by L. Oppenheimer (Jena: G. Fischer, 1926).

[21]L. Albert Hahn, *Volkswirtschaftliche Theorie des Bankkredits* (Tübingen: J.C.B. Mohr, 1920).

[22]For those advancing this demand, see Walsh, op. cit., p. 5.

with those disturbances towards whose elimination efforts are currently being devoted, and that therefore success in such efforts could be achieved only by setting up obstacles to progress. If the foregoing is correct, we must finally give up all thoughts of completely eliminating monetary influences by restricting money to the role of a passive mediator, so that the economy proceeds as if money were not employed in it. We will have to come to terms with the idea that money always exerts a determining influence on the development of the economy, that the principles derived for an economy without money can be applied to an economy with money only with substantial qualifications, and hence that it can never be the goal of monetary policy to ensure that money exerts as little influence as possible upon the path which the economy traverses. On the contrary, the aim must always be to ensure that the unavoidable influences exert their effect in as desirable a fashion as possible.

At this point we must turn away from any further investigation of the inherent tendencies of any monetary economy to recurrent disturbances of equilibrium, and in particular their significance for the explanation of the familiar 'economic fluctuations', *business cycles*. Nevertheless, some practical applications of the conclusions at which we have arrived may be briefly outlined. Above all, it is necessary to consider an exception already noted above to the empirical rule that rising prices imply rising levels of production and falling prices, falling levels of production. As is widely known, much surprise has been aroused by the fact that the extraordinary cyclical upswing which the United States economy has experienced in recent years has proceeded for the most part with falling prices, and especially that it has gone on evenly without bringing with it a crisis, at least for an unusually long time. On the basis of the view advanced above, the presumption would be that the upward movement of production has been able to continue for so long not despite but precisely *because of* the simultaneous fall in prices. For exceptional reasons that need not be discussed here, it has not been possible for those forces to assert themselves which generally prevent a fall in prices as costs of production fall, and hence the price structure and price expectations have not been such as to stimulate that excessive expansion of output for points more distant in time which otherwise regularly leads to sales difficulties. The secret of the duration of the boom in the United States is thus to be sought precisely in the fall in prices, and the boom can be expected to continue only so long as the fall in prices persists. Now, that prevention of a rise in prices during the cyclical upswing also demanded by ruling opinion would be insufficient by itself to prevent the emergence of a disproportionality in the development of the individual sectors of production, a disproportionality which would determine the later reaction. But a fall in prices correspond-

ing to the decline in costs as output rose would be at least as effective in preventing an over-expansion as the rise in interest rates which the dominant doctrine regards as being the only step necessary, and in addition it would do so in a way which was economically more appropriate.[23]

The same considerations also show the baselessness of the concern recently expressed in many quarters about the threatened scarcity of gold, in so far as all that is feared is that the current output of gold will not be sufficient to 'adjust' the quantity of money to the growth of the economy, not that the scarcity of gold could become so acute that the gold in circulation is withdrawn to satisfy industrial demand. But a mere cessation of the tendencies stabilizing the 'value of money', which under the gold standard have hitherto counteracted a fall in prices caused by a rise in the level of production, is all that would be desirable. Yet even a gold currency under which these stabilizing tendencies operate unchecked is unconditionally preferable to a monetary system in which the purchasing power of the monetary unit is maintained as a matter of policy. It has already been shown above that, in a tied currency as opposed to one which is artificially held stable, the necessary changes in prices are only in part prevented from taking place, and hence relatively lesser disturbances to equilibrium are to be expected. The reason is that, with a tied currency, larger quantities of money are obtainable only at greater cost, and money flowing out of the circulation can find a place in industry only at a falling price. Hence, in the new equilibrium which emerges after the level of prices has been changed by a change in the conditions of production, prices will be somewhere between their former level and that which must obtain if the quantity of money were invariable. In this case, therefore, only a partial compensation through passive changes in the value of money takes place.

However, the gold standard (and every other commodity money) has one further advantage. Any attempt to get complete fixity in the quantity of money must come to grief on the fact that it is only possible in part to regulate the quantity of the various surrogate monies. On the other hand, to compensate for changes in their quantity by a change in that of real money meets the problem that it is not possible to ascertain the quantity of them in circulation. Yet no other criterion exists by which the quantity of money could be regulated such that the establishment of prices is not disturbed. The gold standard, however, ensures that changes in the quantity of surrogate money are automatically compensated for within the same limits as permissible change in the general level of prices. If the expulsion of gold money from the circulation by surrogate money can

[23] In this connection, see the Appendix to this chapter.

never proceed to the point at which the total quantity of means of exchange remains unchanged, at least a partial correction ensues, while no criteria exist for a systematic correction in the case of a manipulated currency. The greatest disadvantage of the gold standard lies in the possibility of decisive alterations taking place in gold's conditions of production due to the discovery of new deposits or better extraction methods, yet it is precisely this drawback which can most easily be overcome. In general, however, the conclusion of our analysis is that the gold standard is still to be regarded as relatively the best, i.e., as the monetary system which creates *relatively* the fewest disturbances for the natural formation of prices.

On the Origin of the Theory that the Quantity of Money Must Be Accommodated to the 'Demand for Money'

There is no basis in economic theory for the view that the quantity of money must be adjusted to changes in the economy if economic equilibrium is to be maintained or—what signifies the same—if monetary disturbances to the economy are to be prevented. Yet it is still generally presented as a self-evident proposition. Even if the concept of the demand for money can only be subjected to an intensive critique at other places in this investigation, it still appears to be appropriate in this context to add a few remarks as to the origin of the concept and the misunderstandings connected with it. It seems to me that the most important reason for the dogmatic acceptance of this view is to be found in an uncritical transfer of a practice perceived as necessary for individual nations to the overall world economy, or to that assumed isolated economy which usually takes its place in theoretical discussions. I believe, however, that it can relatively easily be shown that it is quite impermissible to make this transfer, because the change in the quantity of money which fulfills a necessary function for one nation trading with others is not merely useless but even directly deleterious for the overall world economy.

The theory that the money supply is distributed among the individual nations in proportion to their demand is a familiar one, and can be traced back to North and Hume.[24] It shows that the overall supply of money in existence must automatically so distribute itself among the various nations that there must always be more money in an economy in which a greater volume of transactions is carried on, a greater volume of output is produced, than in an economy which is smaller in these respects. This theory as to the necessary relative supply of money in two countries at the same point in time now gives rise to the idea that in every individual

[24]Cf. James Waterhouse Angell, *The Theory of International Prices; History, Criticism and Restatement* (Cambridge, Mass.: Harvard University Press, 1926).

country as well the quantity of money must grow in proportion to the volume of transactions to be effected by it. There is, however, a crucial difference between the two cases. In the first case, the changes in the relative quantities of money in the individual countries are a necessary precondition for the restoration of equilibrium, namely for the change in the relative price levels in the two countries which has become necessary. But there is no change in the absolute quantity of money in the two countries now linked together into one economic system. A change in the total quantity of money would not imply at all that the equilibrium that has been upset within the economy is now restored, but merely that a temporary disturbance of equilibrium in the production of goods has been created for the purpose of bringing about a new equilibrium with the output of gold. The difference between the two phenomena has not been more clearly grasped because it has been usual, in the analysis of movements of money between different places, to content oneself with showing that under certain conditions changes in the relative quantities of money circulating in several countries must ensue. As a result, there has been a failure to realize that it is not by this change alone that the equilibrium between them is restored. So far as the individual in the monetary economy is concerned, the increase in his money income is only a necessary link in the chain of processes which enables him to obtain an increased share in output in return for an increase in his participation in production. The same is true for an economy in that an increase in its monetary income is merely a necessary precondition for it to increase its share in the output of the world taken as a whole. Obviously, however, the unique function thus fulfilled by a change in the quantity of money circulating within a group cannot be discharged by a change in the quantity of money in the world as a whole.

The distinction can best be shown with the aid of two examples. Assume, firstly, that there is a rise in the agricultural output of a country with lower costs of production, and that therefore it is the recipient of an inflow of gold. The reason for the inflow is familiar: Money always flows to the place at which its purchasing power is greatest, and hence the quantity of money in the country involved will continue to increase until the relationship between prices there and abroad is once again in equilibrium. This is the explanation usually advanced and yet it relates to only one part of the adjustment process. By virtue of its incompleteness, it gives the completely erroneous impression that, for example, the assumed country that has occasioned the gold movement by raising its productivity will end up with a useless increase in its stock of money in exchange for at least a part of its additional output. The conclusion therefore appears to follow that it has made a sacrifice, so to speak, in the interest of the maintenance of international price equilibrum. But this is

as little valid for the assumed country as it is for a person for whom an increase in his money income is the first step to an increase in his real income. A distinction between the case of the individual and that of the country certainly appears to lie in the fact that a rise in the money income of the individual is drawn from the other economic subjects, while a gold movement to one country need not in any way imply a rise in the money income drawn from abroad. But as will immediately be evident, this distinction is merely apparent.

In discussing the example we have set up, we have to begin from the proposition that, in one country, the prices of agricultural products decline because of improvements in production. Because of this, it will be more advantageous for foreign countries to buy such products in this country (to the extent that, taking transport costs, etc., into account, they can in general be exported), and the quantity it exports must rise, without any presumption that the value of its total exports must thereby fall. An import of gold will take place because of the fall in prices only if the overall value of the quantity now exported has risen in relation to that previously exported. If we assume that this is indeed the case, then the increase in demand from abroad, which will lead to a renewed rise in prices or at least to prevention of a further fall, will take the form of an import of gold, other things remaining the same. The reason is that, by assumption, the prices realized in this country for all those commodities the importation of which might be increased, would be lower than those prevailing abroad (since otherwise this country's imports of them would already have risen). Hence the import of gold represents the most advantageous mode of payment. How long will this import of gold continue? For as long as it itself, or the rise in the incomes of the sellers of agricultural goods which it represents, does not bring about such a rise in the prices of other goods that it will become advantageous to import those goods instead of gold. It would take us too far afield to pursue this process in all its details. A little reflection will show that ultimately our country's share in the value of total world output has increased to the same extent as the relative level of the money income of the inhabitants of our country has risen by comparison with that of other countries because of the gold inflow.[25] The change in this share will be due partly to the fact that the people of our country retain for their own use an absolutely

[25]It must be noted that these remarks convey nothing at all as to the extent of the movement of the prices of individual goods or of all goods, especially also of the agricultural goods whose costs initially fell. They do not do so because the change in national income was wholly due to simultaneous changes in prices and the quantities of goods consumed. All that can be said with certainty is that the overall price of the total product, which changed because of the initial rise in the quantity produced in one branch of production, has risen by just as much as total income.

greater part of their increased agricultural output and an absolutely and relatively greater share of their unchanged output of other exportable goods and simultaneously can import more of other goods. After the conclusion of the transition period within which the gold movements have taken place and exerted their influence upon prices, the share of our country in the value of world output will therefore have risen by precisely as much as the value of the total output of the commodity whose output was initially increased, and the precondition for this increase in the share of world output was precisely a corresponding rise in the sum of money incomes in the country.[26]

The flow of gold from one country to another, and the rise in the 'money supply' thereby brought about in the latter, therefore merely constitute necessary intermediate steps in the process by which a movement of goods is called forth, steps which in the monetary economy must precede a change in the market positions of the two countries. The fact that the money income of a group of people linked together in a particular place rises proportionately, and indeed not merely in terms of that part of it composed of sales to foreigners but also that originating in the reciprocal exchange within this group, must result in a relatively greater quantity of money permanently remaining within this group. This phenomenon can certainly be described as an increase in the demand for money, but to do so offers no explanation of it. Nevertheless, it is precisely this description which renders it easy to conclude that these so-called changes in the demand for money are independent causes of the gold movements, and further that an adjustment of the quantity of money to the changed demand for it under all circumstances is a prerequisite for the maintenance of equilibrium.

But it is obvious that the function discharged by changes in the quan-

[26]At this point, where my concern with this complex of problems is subordinate to a more particular inquiry, the question as to whether the rise in the sum of individual incomes bears a fixed numerical relationship to the newly added money can be left open. The question is also uninteresting, because, in consequence of the change in individual prices, no measuring-rod for the increase in real national income is available. Only the change in the share of the individual countries in the value of world product is basically capable of quantification, and this in turn could be derived from the relative change in the total money income of the individual countries. Yet the latter is immune from any measurement.

It may nevertheless be noted that the propositions advanced in the text show that the view of the mercantilists as to the significance of the relative supply of gold of the various countries as an indication of their wealth are not so basically erroneous as is customarily believed, even if the maxims of economic policy they derived from their imperfect insight into the interrelationships were naturally of no use at all in achieving the goals they desired. A view which is in many respects related to that presented in the text above is to be found in F. W. Taussig, *Principles of Economics*, 2nd edition (New York: Macmillan, 1915 and later), vol. 1, chapter 35, section 1, pp. 502ff.

tity of money available in the world (i.e., movements of gold into and out of its monetary use and the changes in gold output called forth by price movements) simply cannot be similar to that of movements of money from country to country, since the world's share in its own real income can hardly vary. In the preceding sections, it has also been shown that such changes in the quantity of money must give rise to disturbances in quite definite ways. These conclusions need only be added to here by looking at a somewhat different aspect of the same process, which stems from the arguments in the paragraphs above and clearly shows that changes in the total quantity of money can never contribute to the maintenance of equilibrium but on the contrary must always disrupt it.

For this purpose, suppose we vary somewhat the example chosen earlier. Assume now that the cheapening of agricultural output takes place not merely in one country but in the whole world, and the fall in price resulting from the increase in output gives rise to an expansion of gold output and associated with that an expansion in the quantity of money. Certainly, in this case as well, a number of persons whose products and services are first demanded because of new gold inflows will initially enjoy a rise in their money incomes, which for them signifies a rise in their real income as well. But this nominal rise in income will not in any sense imply an enduring change in their market position, since similar rises in nominal income will take place successively with all other persons, and hence in the final analysis the share of social output falling to each individual will not have undergone any essential change.[27] Nevertheless, the temporary rise in the profitability of the sectors of production first affected by the gold inflow will have led to their expansion, an expansion which must show itself to have been unjustified as soon as the gold inflow slackens because of the rise in prices which takes place as a result of it. In the moment in which this extra demand slackens off, a part of the extra output stimulated by it will no longer be able to be sold at prices which cover costs but only at a loss. Hence the branches of production concerned will ultimately have to be contracted back to their level at the beginning of the gold inflow.

The final effect of the gold movements will therefore be that the economy, in return for temporarily giving up a larger part of its overall output to the gold producers, will once again achieve an equilibrium between supply and demand only after it has incurred certain losses. Apart from the losses caused by this disruption of equilibrium, every individual must see an additional source of loss in the fact that at least a part of the rise in his money income does not represent for him a means to an increased

[27]Cf. Mises, op. cit., pp. 116ff [Liberty*Classics* reprint, pp. 160ff.—Ed.].

acquisition of goods but constitutes his ultimate payment. Hence the only recompense he obtains for that part of his output with which he has acquired it is that the stock of money he possesses has been uselessly enlarged. In contrast to the case of a movement of gold within the economy, therefore, changes in the total quantity of money in the economy do not provide a basis for the individual economic subjects to alter the extent to which they satisfy their needs. Rather, in this context the change in the quantity of money is the definitive and conclusive outcome; and so, when the money supply is expanded, the individual is forced to accept as final payment something which he had no desire to take as such.

Appendix: Necessary Changes in Prices and Interest

The view has been advanced above that, with the growth of output as a result of technical improvements and the like, prices must fall if an excessive expansion of production is not to ensue. But it could be objected that it is already the function of the interest rate to maintain equilibrium between production for the future and that for the present, so that any further regulation of that relationship by the movement of prices is unnecessary. At first sight this appears to be an obvious objection, but it overlooks one problem: that in so far as the interest rate is most widely held to be a static phenomenon, what is involved are two completely different functions, which must be performed by the interest rate on the one hand and movements of prices on the other. The interest rate must exist because, for reasons which are not of any further interest here,[28] it is impossible to utilize current means of production to expand the output of goods producible in the distant future to such an extent that their price falls to that of the means of production employed to produce them. The interest rate, so to speak, serves to maintain equilibrium by preventing inappropriate expansion of future production. Yet there must be changes in prices if, because of alterations in production possibilities, disparities have emerged between the price of the means of production and the goods produced by them, disparities which will not necessarily have to persist because of capital scarcity. If the interest rate remains stable, and even if it is subject to variation, shifts in the relative price levels of present and future goods may also be necessary if equilibrium is to be maintained.

For example, suppose that a new technical process is invented that enables a greater quantity of output to be produced than hitherto from the given quantity of means of production in a country's single capital-utilizing branch of production. There may well be a rise in the interest rate, but this by itself will never be able to prevent a temporary overexpansion of the output of the product concerned if the price of that product does not also simultaneously fall. In the most

[28]See also my article, "Zur Problemstellung der Zinstheorie" [in *Money, Capital, and Fluctuations: Early Essays*, op. cit., pp. 55–70.—Ed.]

favourable but by no means most likely case, the lowering of production costs may give rise to a lasting expansion of the demand for means of production and thus to a rise in interest rates. But this by itself would not outweigh the particular stimulus to production arising from the fact that a greater quantity of the product still saleable at the same price can temporarily be produced at the same cost. The rate of interest especially will not rise to a higher level, since a permanent difference must now open up between the price of the means of production and that of the outputs they can now produce. Even if the prices of the products do not fall, what was initially a very substantial difference between the two sets of prices must narrow in time to the level determined by the interest rate. But we have assumed precisely that the prices of the products do *not* fall. So the expansion of output proceeds until a point has been reached at which the intensified demand for means of production has driven their prices up to a corresponding level. It is immediately obvious that this expansion can take place only at the cost of a restriction of current consumption, which has been based wholly upon the higher level of money returns expected, but it will cease to operate as soon as this profit has been realized and paid out in purchasing articles of consumption. The price of current goods will then rise again, so that part of the expansion of output already undertaken will have become unprofitable and will therefore have to be retracted. What this implies in turn is merely that this temporary expansion was just as excessive as that which is called forth for instance by inflation.

Within the framework of this analysis, this exposition must suffice to show that the 'natural' movements of the interest rate in the case of a rise in physical productivity will not be enough to prevent an excessive expansion of output for the future, if a corresponding decline in produce prices does not take place simultaneously. The preceding remarks therefore cannot lay claim to constitute a complete treatment of the problem. All that was possible was to point out the direction in which is to be sought the solution of the questions arising in the analysis of the special problems discussed here. To provide adequate answers to them would be possible only within the framework of a complete theoretical system of economic theory. As a supplement to these remarks, it can only further be indicated that the essential difference between the independent character of interest on the one hand and the intertemporal gradations of prices on the other arises from the fact that, with respect to the direction in which they must move if equilibrium is to be maintained, they are not at all linked together in any particular way. According to circumstances, it is just as possible for the price of a given future good relative to that of a present good to rise as to fall at the same time as interest rates are rising. For example, as described above, an invention which raises physical productivity can necessitate a rise in the interest rate and a fall in prices; but equally well, enlargement of the stock of capital equipment at an unchanged level of technology can lead to both a fall in the interest rate and a fall in prices. It is well known that, with constant physical productivity (an invariable quantity of output producible by the given goods), a fall in interest must in fact lead to at least a relative decline in the price of the product as compared with that of the means of production. Hence it cannot occasion any further surprise that if physical productivity changes because of new discoveries and the like, quite definite shifts be-

tween the prices at successive points in time would become necessary to an ever greater extent, and indeed even with an unchanged interest rate, if equilibrium were to be restored.

Obviously this article has had to abstain from any discussion of the extent to which the two types of temporal differences in value—those expressed in interest and those expressed in the difference in the price of the same good at different points in time—can reciprocally influence or substitute for each other.[29] The fact that each of them fulfills a particular function means that it is basically improbable that a substitution of one for the other could be made without occasioning disturbances of equilibrium. As against that, it can certainly be assumed that each of them can discharge their function properly only if the other also corresponds to the equilibrium position.

[29]See also the well-known relevant works by Irving Fisher, especially *Appreciation and Interest,* Publications of the American Economic Association, vol. 11, no. 4 (New York: Macmillan for the American Economic Association, 1896), and *The Rate of Interest* (New York: Macmillan, 1906).

SIX

ON 'NEUTRAL' MONEY[1]

In the various discussions recently devoted to the concept of 'neutral money', there has been some ambiguity in the way in which this concept has been understood and applied. Hence it seems appropriate to again briefly outline the nature of the problem which I sought to pose for discussion under this phrase.[2]

Moreover, the way in which I understand the phrase still seems to me to accord not merely with what previous authors have understood by it but also with that for which it is more appropriately reserved. It is all the more unnecessary for me to devote much space to the matter since J. G. Koopmans,[3] in his excellent treatise, has developed the concept wholly in the sense in which I wish it to be understood. Even he, however, has failed to lay sufficient stress upon the distinction which I wish to emphasize in this context. As an example of what I consider to be an inappropriate usage of the concept, I would point above all to the essay by W. Egle,[4] though it has many valuable individual insights.

The concept of neutral money was designed to serve as an instrument for theoretical analysis, and should not in any way be set up as a norm for monetary policy, at least in the first instance. The aim was to isolate the influences which money actively exerts upon the economic process, and to establish the conditions under which it is conceivable that the eco-

[1][First published as "Über 'neutrales Geld'" in *Zeitschrift für Nationalökonomie,* vol. 4, 1933, pp. 659–661. This translation is from F. A. Hayek, *Money, Capital, and Fluctuations: Early Essays,* ed. Roy McCloughry (Chicago: University of Chicago Press, and London: Routledge & Kegan Hall, 1984).—Ed.]

[2]This must not be taken to imply that I claim to have invented the concept or the term 'neutral money'. Rather, see my *Preise und Produktion* (Vienna: J. Springer, 1931), p. 30n [in English translation, *Prices and Production,* ed. Lionel Robbins (New York: Macmillan, 1932), pp. 27–28.—Ed.], as well as J. G. Koopmans, "Zum Problem des 'neutralen' Geldes", in *Beiträge zur Geldtheorie,* ed. F. A. Hayek (Vienna: J. Springer, 1933), p. 228n.

[3]*Ibid.*

[4]Walter Egle, "Das neutrale Geld", *Untersuchungen zur theoretischen Nationalökonomie,* vol. 10 (Jena: G. Fischer, 1933).

nomic process in a monetary economy, and especially relative prices, are not influenced by any but 'real' determinants—where 'real' relates to the equilibrium theory developed under the assumption of barter. More precisely, what is involved is the clarification of the significance of the assumptions customarily employed in the theory of economic equilibrium: that, while money is indeed present to facilitate indirect exchange, it can be neglected as a factor influencing the relative levels of prices. That this is the normal procedure is shown both by the distinction usually drawn by the Lausanne school between money as mere '*numéraire*' as distinct from 'money' (*monnaie*) and the Menger-Mises assumption of the 'inner objective exchange value' of money.

Obviously, a clarification of this problem must possess great significance for questions of monetary policy. Nevertheless, from the very outset the possibility must be envisaged that the realization of this ideal may compete with other important aims of monetary policy, and consequently that the only practical solution attainable is a compromise. But that will be taken up again below.

The answer to the theoretical problem of neutral money sets out from the recognition that the basic identity of supply and demand, which in a state of barter must exist on every market, is disrupted by the interposition of money. It is therefore necessary to grasp the one-sided effects of money, as I have previously called these phenomena in unconscious imitation of Friedrich von Wieser,[5] phenomena which make their appearance when, as a result of the division of barter into two independent acts, the one or other of these acts takes place without its complement. In this sense, demand without a corresponding supply, or supply without a corresponding demand, become evident above ail when money is expended from 'hoards' (cash balances are diminished), money received is not immediately expended, newly created money comes on the market, or money is destroyed. The problem to which this gives rise therefore leads directly to the adoption of an assumption that the flow of money is constant, with the exceptions to which I have made only passing reference in *Prices and Production.* It was only J. G. Koopmans who subjected the concept to a systematic analysis, in his book referred to above.

If the tendencies towards equilibrium depicted in general economic

[5]Cf. *Geldtheorie und Konjunkturtheorie* (Vienna and Leipzig: Hölder-Pichler-Tempsky, 1929), p. 56 [*Monetary Theory and the Trade Cycle* [1933] (reprinted New York: Augustus Kelly, 1966 and 1975), p. 108.—Ed.]. Friedrich von Wieser has already remarked upon the particular effects of a 'one-sided supply of money' in "Der Geldwert und seine Veränderungen", *Zeitschrift für Volkswirtschaft, Sozialpolitik und Verwaltung,* vol. 13, p. 54 [1904], *Gesammelte Abhandlungen* (Tübingen: J. C. B. Mohr, 1929), p. 178.

theory are to remain operative in a monetary economy, all those conditions which it is the task of neutral money to indicate must be realized. Now, it is not merely entirely possible but even probable that this cannot be achieved in practice; moreover, even if it were possible, other considerations could make it appear to be undesirable. Suppose that, in addition to the assumption of the existence of a general medium of exchange, we introduce the further, realistic assumption that many long-term contracts are concluded in terms of this medium of exchange in the expectation that prices will be more or less stable. Also, assume that many or all of the existing prices exhibit a certain rigidity and are especially difficult to lower. The result is that there are very substantial 'frictional resistances' to the realization of a 'neutral' money supply, resistances which are of the utmost significance for the framing of a practical norm for monetary policy. In this situation, it is at least possible that monetary policy will have to seek for a compromise between two aims, each of which can be achieved only at the cost of the other: between the complete realization of the tendencies towards an equilibrium, and the avoidance of excessive frictional resistances. Yet we must then be clear that, in this situation, the elimination of the disturbances actively emanating from the side of money has ceased to be the sole aim of monetary policy, or even the only one of its aims which can be fully achieved. In addition, it can only give rise to confusion to refer to this practical aim with the same phrase as is employed for the theoretically conceivable situation in which one of the two competing goals is fully achieved.

Hence the relationship between the theoretical concept of neutrality of the money supply and the ideal of monetary policy is that the degree to which the latter approximates to the former provides one, probably the most important though not the sole, criterion for assessing the maxims of monetary policy. It is perfectly conceivable that monetary influences would always give rise to a 'falsification' of relative prices and a misdirection of production unless certain conditions were fulfilled, e.g., (1) the flow of money remained constant, *and* (2) all prices were perfectly flexible, *and* (3) in the conclusion of long-term contracts in terms of money, the future movement of prices was approximately correctly predicted. But the implication is, then, that if (2) and (3) are not given, the ideal cannot be attained by any kind of monetary policy at all.

Basically, the theoretical concept of neutral money, which relates to the influence of money upon the price relationships (simultaneous and intertemporal) determined by real factors, cannot bear any relation at all to the concept of some 'price level' (even if this concept is introduced merely implicitly in the form of a 'demand for money' related to a definitive price

level).[6] Nevertheless, the adoption of the stabilization of some particular price level as the criterion for that policy which represents a compromise between the competing aims is not thereby excluded. Rather, it seems to me that the stabilization of some average of the prices of the original factors of production would probably provide the most practicable norm for a conscious regulation of the quantity of money.[7]

For the reasons already given, however, I would regard it as a regrettable confusion of two different problems if this problem of monetary policy were to be dealt with within the context of that of neutral money.

[6]It appears to me that, if an investigation of this problem is to be free from any objection, the price level (or a value of money in the usual sense) must not play any role within it. The concept of changes in the value of money would then have to be replaced by that of deviations from the problematic intertemporal prices equilibrium. Although I can no longer adhere to all that I wrote on that occasion, I still believe that an approach to a solution of the problems arising in this context is to be found in my article on "Das intertemporale Gleichgewichtssystem der Preise und die Bewegungen des Geldwertes", *Weltwirtschaftliches Archiv,* vol. 28, July 1928 [reprinted as chapter 5, this volume.—Ed.].

[7]Compare in this connection Gottfried von Haberler, "Die Kaufkraft des Geldes und die Stabilität der Wirtschaft", *Schmollers Jahrbuch,* vol. 55, 1932.

SEVEN

PRICE EXPECTATIONS, MONETARY DISTURBANCES, AND MALINVESTMENTS[1]

I

The most characteristic feature of the work of our generation of economists is probably the general endeavour to apply the methods and results of the pure theory of equilibrium to the elucidation of more complicated 'dynamic' phenomena. Perhaps one might have expected all generations of economists to have striven to approach nearer to reality by gradually relaxing the degree of abstraction of pure theory. Yet advance in this direction was not great during the fifty years preceding, say, 1920. The development of economics has not proceeded along the systematic lines of the textbook which advances step by step from the general to the particular. The answers to the pressing questions of real life could not wait till the slow progress of pure theory provided a scheme which would allow for immediate application in the more practical work.

It seems that as regards the attitude towards the application of pure theory to the most complicated phenomena of economic dynamics, crises, and industrial fluctuations, we can distinguish three main types. In many instances the men who most strongly felt the urgency of the problems existing in this field and attempted to solve them had little knowledge of the state of economic theory. This group includes, in addition to numberless cranks, several clear thinkers of rich experience to whom we are greatly indebted. A second group of men which is hardly less important consisted of scholars who, although well versed in current theoretical speculation, regarded it as of little use for the task in which they were mainly interested. Both groups have considerable achievements to their credit, and I shall later have occasion to mention some important contri-

[1]This essay reproduces the main argument of a lecture delivered on December 7, 1933, in the *Sozialökonomisk Samfund* in Copenhagen and was first published (in German) in the *Nationalökonomisk Tidsskrift,* vol. 73, no. 3, 1935, and later (in French) in the *Revue de Science Economique,* Liège, October 1935. [First published in F. A. Hayek, *Profits, Interest and Investment* (London: George Routledge & Sons, 1939; reprinted, Clifton, N. J.: Kelley, 1969, 1975.—Ed.]

butions from about 1850 onwards which we owe to them. It is by no means clear that this debt is smaller than that which we owe in this field to the third group, namely to those scholars who attempted—as may appear to us, prematurely—to apply an over-simplified and defective theory to these complicated phenomena. Although their endeavour to justify in this way their concentration on pure theory and to demonstrate its usefulness was undoubtedly right, and although their instinct that only this path would ultimately lead to a really satisfactory explanation was right, the result of these early attempts, from the celebrated *Théorie des Débouches*[2] onwards, was frequently to press the problems into the straitjacket of a scheme which did not really help to solve them.

II

It was only the modern development of equilibrium analysis together with the increasing awareness of the conditions and limitations of the applicability of the equilibrium concept which has taught us to recognize the nature of the problems existing in this field and which has indicated the paths towards their solution. And even if the different students of these problems proceed along different routes, it is probably true today to say that in all countries with a great theoretical tradition the efforts of the younger men in our subject is directed towards bridging the gulf between 'statics' and 'dynamics'. To some the differences which exist here between different 'schools' may appear very large. Yet whether the different individuals, in their zeal to advance, stress the deficiencies of the existing 'static' theory more or less strongly appears to me to be based much more on differences of temperament than on differences in the aims or in the methods used. I believe that the great majority of the younger economists share the belief that the continuity of the development can be preserved and that only this will help us to reach our goal.

What we all seek is therefore not a jump into something entirely new and different but a development of our fundamental theoretical apparatus which will enable us to explain dynamic phenomena. Not very long ago I myself still believed that the best way to express this was to say that the theory of the trade cycle at which we were aiming ought to be organically superimposed upon the existing theory of equilibrium. I am now more inclined to say that general theory itself ought to be developed so as to enable us to use it directly in the explanation of particular industrial fluctuations. As has recently been shown very convincingly by Frederick

[2]Jean Baptiste Say (1776–1832), "Théorie des Débouches" [Theory of Markets], contained in his *Traité d'Economie Politique* [1803], translated as *A Treatise on Political Economy* (Philadelphia: Claxton, Remsen & Haffelfinger; reprinted, New York: Kelley, 1971).—Ed.]

Lutz,[3] our task is not to construct a separate theory of the trade cycle, that is of a construction of a detailed scheme which will fit all actual trade cycles, but rather a development of those sections of general theory which we need in the analysis of particular cycles—which often differ from one another very considerably.

A great part of this work will certainly consist in the elaboration of particular chapters of general theory, especially of the theory of capital and the theory of money, in the direction of a more careful analysis of the processes resulting from any change in the data. It is, however, the common peculiarity of all such attempts to make the theory more realistic that they soon bring us back to the fundamental problem of all economic theory, that is to the question of the significance of the concept of equilibrium and its relevance to the explanation of a process which takes place in time. There can be no doubt that here some of the formulations of the theory of equilibrium prove to be of little use and that not only their particular content but also the idea of equilibrium as such which they use will require a certain amount of revision.

That this concept of equilibrium has in the past not always had the same meaning and that this meaning has often not been very clear can hardly be denied. This is at least true of the application of the concept of equilibrium to the phenomena of a competitive society, while if applied to the economic activities of an isolated person or of a centrally directed communist system it probably has a definite meaning. While in this latter case we can legitimately speak of a necessary equilibrium between the decisions which a person will make at a given moment, it is much less clear in what sense we can apply the same concept to the actions of a great number of persons, whose successive responses to the actions of their fellow beings necessarily take place in time, and which can be represented as a timeless equilibrium relationship only by means of unrealistic special constructions.

Equilibrium analysis certainly needs, if we want to apply it to a changing competitive system, much more exact definitions of its basic assumptions than are commonly given. The realistic significance of the tendencies towards a state of equilibrium, traditionally described by pure theory, can be shown only when we know what the conditions are under which it is at least conceivable that a position of equilibrium will actually be reached.

The main difficulty of the traditional approach is its complete abstraction from time. A concept of equilibrium which essentially was applicable only to an economic system conceived as timeless could not be of great

[3]Frederick Lutz, *Das Konjunkturproblem in der Nationalökonomie* (Jena, 1932).

value. Fortunately in recent times there have been considerable changes on this very point. It has become clear that, instead of completely disregarding the time element, we must make very definite assumptions about the attitude of persons towards the future. The assumptions of this kind which are implied in the concept of equilibrium are essentially that everybody foresees the future correctly and that this foresight includes not only the changes in the objective data but also the behaviour of all the other people with whom he expects to perform economic transactions.[4]

It is not my intention to enter here more fully into these recent developments of equilibrium analysis and I hope what I have said will suffice to explain certain conclusions which I want to draw from them as to the study of dynamic phenomena. It appears to me that from this new angle it should at last become possible to give somewhat more definite meaning to certain concepts which most of us have been using somewhat loosely. I am thinking in particular of the statement frequently made that a whole economic system (or a particular price, as, for example, the rate of interest) either is or is not in equilibrium.

It is evident that the various expectations on which different individuals base their decisions at a particular moment either will or will not be mutually compatible; and that if these expectations are not compatible, those of some people at least must be disappointed. It is probably clear also that expectations existing at a particular moment will to a large extent be based on prices existing at that moment and that we can conceive of constellations of such prices which will create expectations inevitably doomed to disappointment, and of other constellations which do not bear the germ of such disappointments and which create expectations which—at least if there are no unforeseen changes in external circumstances—may be in harmony with the actual course of events. This consideration appears to me to provide a useful starting point for further developments of the theory of industrial fluctuations.

III

Every explanation of economic crises must include the assumption that entrepreneurs have committed errors. But the mere fact that entrepreneurs do make errors can hardly be regarded as a sufficient explanation of crises. Erroneous dispositions which lead to losses all round will appear

[4]Since the above was written I have further elaborated and partly revised this discussion of the relationship between equilibrium and foresight in a paper on "Economics and Knowledge", published in *Economica,* February, 1937. [Reprinted in F. A. Hayek, *Individualism and Economic Order* (Chicago: University of Chicago Press, and London: Routledge & Sons, 1948).—Ed.]

probable only if we can show why entrepreneurs should all simultaneously make mistakes in the same direction. The explanation that this is just due to a kind of psychological infection or that for any other reason most entrepreneurs should commit the same avoidable errors of judgment does not carry much conviction. It seems, however, more likely that they may all be equally misled by following guides or symptoms which as a rule prove reliable. Or, speaking more concretely, it may be that the prices existing when they made their decisions and on which they had to base their views about the future have created expectations which must necessarily be disappointed. In this case we might have to distinguish between what we may call justified errors, caused by the price system, and sheer errors about the course of external events. Although I have no time to discuss this further, I may mention that there is probably a close connection between this distinction and the traditional distinction between 'endogenous' and 'exogenous' theories of the trade cycle.

The most interesting case, for our present purpose, of such decisions of entrepreneurs where the outcome depends entirely on the correctness of the views *generally* held about future developments, is, of course, the case of investments in so far as these are affected by the situation of the capital market in general and not by the special position of particular industries. Here the same cause may bring about malinvestments not only in one or a few but in all industries at the same time. The success of almost any investment made for a considerable period of time will depend on the future development of the capital market and of the rate of interest. If at any moment people begin to add to the productive equipment, this will, as a rule, represent only a part of a new process which will be completed only by further investments spread over a period of time; and the first investment will therefore prove to have been successful only if the supply of capital makes the expected further developments at later dates possible. In general, it is probably true to say that most investments are made in the expectation that the supply of capital will for some time continue at the present level. Or, in other words, entrepreneurs regard the present supply of capital and the present rate of interest as a symptom that approximately the same situation will continue to exist for some time. And it is only some such assumption that will justify the use of any additional capital to begin new roundabout methods of production which, if they are to be completed, will require continued investment over a further period of time. (These further investments which are necessary if the present investments are going to be successful may be either investments by the same entrepreneurs who made the first investment, or—much more frequently—investments in the products produced by the first group by a second group of entrepreneurs.) If these expectations are

to be realized, it is necessary not that the supply of capital during the relevant period remains absolutely unchanged, but, as I have tried to show on another occasion,[5] that during no interval of time should it fall by more than has before been utilized to start new processes (as distinguished from continuing uncompleted ones).

Very large and unforeseen fluctuations of saving would therefore be sufficient to cause extensive losses on investments made during the period preceding them and therefore to create the characteristic situation of an economic crisis. The cause of such a crisis would be that entrepreneurs had mistakenly regarded a temporary increase in the supply of capital as permanent and acted in this expectation. The only reason why we cannot regard this as a sufficient explanation of economic crises as we know them is that experience provides no ground for assuming that such violent fluctuations in the rate of saving will occur otherwise than in consequence of crises. If it were not for the crises, which therefore we shall have to explain in a different way, the assumption of the entrepreneurs that the supply of saving will continue at about the present level for some time would probably prove to be justified. The decisions of the entrepreneurs as to the dates and quantities of consumers' goods for which they provide by their present investments would coincide with the intention of the consumers as to the parts of their incomes which they want to consume at the various dates.

IV

It is, of course, a well-known fact that the current supply of money-capital is not necessarily identical with the amount of current savings. All sorts of monetary disturbances, shortly described as changes in the quantity of money and changes in the velocity of circulation of money but in fact much more variegated in nature than these terms at first suggest, may change the supply of money capital independently of the supply of savings. This means, however, that entrepreneurs will often base their decisions about their investment plans on a symptom which in no way indicates even the current willingness of the consumers to save, and therefore provides no guide whatever for a forecast of how they will distribute their income in the future between consuming and saving. Entrepreneurs will make their decisions about the volume of their investments, i.e., about

[5]Compare the article on "Capital and Industrial Fluctuations", *Econometrica,* vol. 2, no. 2, April 1934 (now reprinted as an appendix to the second edition of *Prices and Production* (London: Routledge & Kegan Paul, 1934), where I have also somewhat more fully explained the distinction between complete and incomplete processes of production alluded to in the text.

the quantities of consumers' goods they will produce at various dates, as if the present distribution of monetary demand between consumers' goods and investments corresponded to the way in which the consumers divide their income between consuming and saving. The result of this must be that the proportion in which entrepreneurs will divide their resources between production for the near future and production for the distant future will be different from the proportion in which consumers in general want to divide their current income between current consumption and provision for consumption at a later date.

In such a situation there exists evidently a conflict between the intentions of the consumers and the intentions of entrepreneurs which earlier or later must manifest itself and frustrate the expectations of at least one of these two groups. The situation is certainly not one of equilibrium in the sense defined before. A condition of equilibrium would require that the intentions of the two groups are at least compatible. It precludes a situation in which current prices, and particularly current rates of interest, create expectations concerning the future behaviour of some members of the society which are entirely unfounded. An equilibrium rate of interest would then be one which assured correspondence between the intentions of the consumers and the intentions of the entrepreneurs. And with a constant rate of saving, this would be the rate of interest arrived at on a market where the supply of money capital was of exactly the same amount as current savings.

If the supply of money capital is increased, by monetary changes, beyond this amount, the result will be that the rate of interest will be lowered below the equilibrium rate and the entrepreneurs will be induced to devote a larger part of the existing resources to production for the more distant future than corresponds to the way in which consumers divide their income between saving and current consumption. At the time when the entrepreneurs make this decision the consumers have no possibility of expressing their wishes with sufficient emphasis since their money incomes are as yet unchanged while the expansion of credit has increased the fund available for investment. The investment of these funds, however, must in the course of time increase total income by nearly the full amount of these funds, either because wages are raised in order to attract people away from producing consumers' goods towards producing capital goods, or because the funds are used to employ formerly unemployed workers. This will certainly tend to increase the intensity of the demand for consumers' goods—how far will depend on how consumers distribute their additional money income between consuming and saving.

The first point which we must keep in mind here is that this increase in aggregate money incomes cannot mean an increase of real incomes

and is much more likely to mean a decrease of real incomes to many individual consumers. However great the amount of money at the disposal of the consumers, they can never consume more than the current supply of consumers' goods—and if the new investments have led to a diversion of already employed factors into longer processes of production, this must lead, to that extent, to an actual decrease of the current output of consumers' goods. The increase in the returns from the existing permanent resources in consequence of the new investments will not come until much later. But even when the first results of the new investments begin to come on the market, this increase in the output will amount to only a fraction of the additional incomes and, as will appear in a moment, it is this relation between the increase in incomes and the increase in the output of consumers' goods which is relevant to our problem.

There is little reason to assume that, in the circumstances we are considering, the share of the increased money incomes spent on current consumption will be diminished. The willingness to save on the part of the consumers will have been little affected by these changes; and their capacity to save will, if anything, have decreased. Only in so far as redistributions of income have taken place during the whole process, favouring those more inclined to save at the expense of those less inclined to save, a certain increase in the proportion of the income actually saved may be expected. But whether the consumers divide their additional money income in the old proportion between current consumption and saving, or whether the proportion is slightly more favourable to saving, the increase in money incomes will in any case lead to an increase in the monetary demand for consumers' goods and therefore to an increase in the prices of consumers' goods.

This increased intensity of the demand for consumers' goods need have no unfavourable effect on investment activity so long as the funds available for investment purposes are sufficiently increased by further credit expansion to claim, in the face of the increasing competition from the consumers' goods industries, such increasing shares of the total available resources as are required to complete the new processes already under way. That this requires a continued expansion of credit proceeding at a progressive rate and that this, even apart from all legal or traditional obstacles, cannot be continued indefinitely, even if it were only because it would inevitably lead to a cumulative rise in prices which earlier or later would exceed any limit, is not difficult to see.[6] What is mainly of interest

[6]See in this connection my article in *Econometrica*, op. cit., particularly pp. 161ff [reprinted in *Prices and Production*, op. cit., pp. 148ff.—Ed.].

for our present purpose is, however, what will happen when the inevitable moment comes when the demand for consumers' goods begins to rise not only absolutely but also relatively to the funds available for investment.

V

We have now reached the point where the conflict between the intentions of the consumers and the intentions of the investors begins to manifest itself—the conflict caused by the distortion of the capital market by credit expansion. The entrepreneurs, who have begun to increase their productive equipment in the expectation that the low rate of interest and the ample supply of money capital would enable them to continue and to utilize these investments under the same favourable conditions, find these expectations disappointed. The increase of the prices of all those factors of production that can be used also in the late stages of production will raise the costs of, and at the same time the rise in the rate of interest will decrease the demand for, the capital goods which they produce. And a considerable part of the newly created equipment designed to produce other capital goods will stand idle because the expected further investment in these other capital goods does not materialize.

This phenomenon of a scarcity of capital making it impossible to use the existing capital equipment appears to me the central point of the true explanation of crises; and at the same time it is no doubt the one that rouses most objections and appears most improbable to the lay mind. That a scarcity of capital should lead to the existing capital goods remaining partly unused, that the abundance of capital goods should be a symptom of a shortage of capital, and that the cause of this should be not an insufficient but an excessive demand for consumers' goods, is apparently more than a theoretically untrained mind is readily persuaded to accept. Yet the truth of these apparent paradoxes appears to me to be established beyond doubt. Before I proceed to explain them further it is perhaps not inappropriate to show that some of the most experienced observers of the crises of the mid-nineteenth century had been constrained to accept them.

Their explanations of these crises were usually expressed in terms of an excessive conversion of circulating capital into fixed capital, induced by the creation of 'fictitious capital',[7] and leading in the end to a scarcity of 'disposable' or 'floating' capital which made a completion of many of

[7]On the origin of this term, see now Jacob Viner, *Studies in the Theory of International Trade* (New York: Harper Brothers, 1937), p. 196n.

the newly started ventures impossible. The author who mainly developed and popularized this doctrine in connection with the great railway booms and the following crises in the middle of the nineteenth century was the first editor of the *Economist,* James Wilson.[8] It was later taken up by a group of Manchester economists and finally introduced into academic economics by Bonnamy Price[9] in England and Courcell-Ceneuil and V. Vonnet in France. And Yves Guyot even summed up the fundamental idea in the following characteristic sentence (I quote from the English translation of his *La Science Economique*): "Commercial and Financial Crises are produced, not by over-production, but by over-consumption."[10]

Perhaps it may be claimed that a doctrine which gained such wide acceptance right at the beginning of the systematic study of industrial fluctuations cannot be as much opposed to sound common sense as it seems to appear to many today after a century of propaganda in favour of under-consumptionist explanations. That these early attempts did not have a more lasting success was probably due to the vague meaning of the various capital concepts which they had taken from the City jargon of the time. It is not difficult to see that with this very imperfect conceptual apparatus the adherents of this theory must have found it difficult to explain convincingly what they had rightly seen and to defend their accounts against criticisms. Even today we have not yet quite outgrown the stage in which the ambiguity—or rather lack—of meaning of the various concepts of capital which we still employ is a constant obstacle to real understanding. This is not least true of the term of 'scarcity of capital' itself, and of the closely related concept of 'free capital' to which it refers. Even if we connect fairly clear ideas with the term 'scarcity of free capital', and even if the term is often used with advantage, nevertheless it is in a sense misleading and will easily lead one to ask meaningless questions. The difficulty is that the term appears to refer to some single, measurable entity, some amount of money or 'subsistence fund' which represents the 'free capital' and which in real life simply does not exist. What we actually mean when we speak of scarcity or abundance of free capital is simply that the distribution of demand between consumers' goods and capital goods compared with the supply of these two kinds of goods is either relatively favourable or relatively unfavourable to the former.

[8][James Wilson, *Capital, Currency and Banking* (London: D. M. Aird, 1847.—Ed.]

[9][Bonnamy Price, *Chapters in Practical Political Economy* (London: C. K. Paul, 1878).—Ed.]

[10]Yves Guyot, *Principles of Social Economy* (London: Sonnenschein, and New York: C. Scribner's Sons, 1884), p. 249. For a slightly fuller account of these theories of the middle of the nineteenth century see the appendix to the third chapter of the second edition of *Prices and Production,* op. cit.

VI

More important, however, is another difficulty connected with the traditional concepts of capital. It is this difficulty which seems to me to necessitate a restatement of the Wicksell-Mises theory of industrial fluctuations in the form which I have tried to sketch in this lecture. Prevailing ideas about how capital would normally be kept quantitatively intact in changing circumstances suggested the notion that a period of intense investment activity followed by a period when the value of much of the capital so created was destroyed might be treated as periods of alternating accumulation and decumulation of capital. For most practical purposes this may indeed represent a fairly adequate description of the real facts. Theoretically this way of approach appeared particularly attractive because it seemed to make it possible to describe the conditions of a stable equilibrium in the way which at the present moment is very fashionable; in terms of the correspondence between (net) saving and (net) investment. Yet the first serious attempts exactly to define these two magnitudes, which are supposed to correspond in some quantitative sense, proved that these concepts had by no means a very clear meaning. Both concepts depend, as can be easily shown, on a vague idea that capital is 'normally' kept or preserved constant in some quantitative sense: savings being that part of income which is not consumed we have to know first what income is, that is, we have to determine what part of total (gross) receipts has to be deducted for the amortization of capital; and similarly we can determine the magnitude of new investments only if we first decide what amount of investment activity is required in order merely to maintain old capital. Whether we are able to decide what savings and what investment are depends therefore on whether we can give the idea of maintaining capital intact a clear and realistic meaning.

That this can be easily done is usually taken for granted; in fact, it seems to be regarded as so obvious that a more careful study of the question has mostly been regarded as unnecessary and has hardly ever been attempted. As soon, however, as one makes any serious attempt to answer this question, one finds not only that the concept of the maintenance of capital has no definite meaning, but also that there is no reason to assume that even the most rational and intelligent entrepreneur will ever in dynamic conditions be either willing or able to keep his capital constant in any quantitative sense, that is with respect to any of the measurable properties of capital itself. How entrepreneurs will behave in particular circumstances and whether the value of the capital under their control will experience unexpected increases or decreases in value will, of course, depend on the wisdom and foresight of the entrepreneurs. But, as I hope

to show more fully on another occasion,[11] even if we could assume that entrepreneurs possessed full knowledge of all the relevant future events there would be no reason to expect that they would act in such a manner as to keep the value of their capital (or any other measurable dimension of this capital itself—as distinguished from the income derived from it) at any particular figure.

If the 'Wicksellian' theory of crises were really as dependent on the traditional concepts of saving and investment as would seem to appear from the extensive use of these terms in the current expositions of it, the considerations just advanced would constitute a grave objection to it. Fortunately, however, there is no such necessary connection between that theory and these concepts. In the form in which it has, tentatively and very sketchily, been restated in the earlier part of this lecture, it appears to me to be quite independent of any idea of absolute changes in the quantity of capital and therefore of the concepts of saving and investment in their traditional sense. The starting point for a fully developed theory of this kind would be (a) the intentions of all the consumers with respect to the way in which they wish to distribute at all the relevant dates all their resources (not merely their 'income') between current consumption and provision for future consumption, and (b) the separate and independent decisions of the entrepreneurs with respect to the amounts of consumers' goods which they plan to provide at these various dates. Correspondence between these two groups of decisions would be characteristic of the kind of equilibrium which we now usually describe as a state where savings are equal to investments and with which the idea of an equilibrium rate of interest is connected. A rate of interest below that equilibrium rate would then induce entrepreneurs to devote a smaller share of the available resources to production for current consumption than the share of the income earned by these resources actually spent on consumption. This may mean that entrepreneurs lengthen the investment period by more than is justified by the voluntary 'saving' of the entrepreneurs in the usual (net) sense of the term, or that they do not shorten the existing processes of production sufficiently to take full account of the 'impatience' of the consumers (that is, in the usual terminology, of their desire to consume capital). It need not therefore be capital consumption in the absolute sense of the term, which is the essential characteristic of a crisis (as I have myself suggested on earlier occasions) but merely that the consumers demand a more rapid supply of consumers' goods than is possible in view of the decisions of the entrepreneurs as to the form and

[11]Cf. now my article "The Maintenance of Capital", *Economica, N. S.*, vol 2, August 1935 [reprinted in F. A. Hayek, *Profits, Interest and Investment,* op. cit.—Ed.]

volume of their investments. Practically this correction probably makes little difference, but theoretically the statement of the theory can be made unobjectionable only if we free it from any reference to the absolute quantity of capital.

VII

It is scarcely possible to give in a short lecture more than a mere sketch of the developments taking place at the moment in trade cycle theory. And I need hardly add that in my view this development is still very far from complete and that what we can say today must necessarily be tentative and will probably undergo much further revision as time goes on. But even when at last we are able to state this particular argument in a more unobjectionable and convincing form than we can today, this will not mean an end but only a beginning. Even when we have answered the question how entrepreneurs will react to the expectations of particular price changes there will remain the much more difficult and important question of what determines the expectations of entrepreneurs and particularly of how such expectations will be affected by any given change of present prices. All these questions are still a more or less unworked field in which the first pioneer work has been done by one or two Scandinavian economists. and while I cannot quite agree with Professor Myrdal when he alleges that in my theory there is no room for the role played by expectations[12] —to show how important a place they do play was in fact one of the purposes of this lecture—I am on the other hand in complete agreement with him when he stresses the great importance of this element in the further development of the theory of industrial fluctuations. I have no doubt that in this field the whole complex of the theory of uncertainty and risk, to which Scandinavian economists have recently given so much attention, will become increasingly important.[13]

[12]Cf. Gunnar Myrdal, "Der Gleichgewichtsbegriff als Instrument der geldtheoritischen Analyse", *Beiträge zur Geldtheorie,* ed. F. A. Hayek (Vienna: J. Springer, 1933), p. 385.

[13]See in this connection J. R. Hicks, "Gleichgewicht und Konjunktur", *Zeitschrift für Nationalökonomie,* vol. 4, no. 4, 1933, and "A Suggestion for Simplifying the Theory of Money", *Economica, N.S.,* vol. 2, no. 5, February 1935.

AFTERWORD

Hayek's work on monetary theory is characterized by the originality of his use of a non-monetary context.[1] The classical tradition conducted its analysis of economic relationships in 'real' terms; money was believed to function as a kind of proxy, at worst a 'veil' which obscured more fundamental determinants of prices and incomes. The classical approach was weakest in its treatment of problems of capital and interest where both the empirical and theoretical uniformity of rates of return to investment did not sit easily within analytical models that assumed a distribution of income among marginally variable factors and relatively fixed conditions of production. Not surprisingly, debates over capital and interest were inconclusive; a stopping place, if not a resolution, was attained in 1930 with the publication by Irving Fisher of *The Theory of Interest, As Determined by Impatience to Spend Income and Opportunity to Invest It.*[2]

[1]As Hayek later pointed out, "It is one of the lessons I have learnt in moving from country to country that the intellectual frontiers on which one has to fight shift in the process. I noticed this for the first time in what was then my special field, the theory of industrial fluctuations, when I moved to England. In the German discussion I was regarded as a pronounced representative of monetary explanations of the trade cycle, and my efforts had indeed been directed to emphasizing the role money played in these processes. But in England I encountered a much more extreme form of a purely monetary explanation which regarded the fluctuations of the general price level as the essence of the phenomena. The consequence was that my arguments had soon to be directed against the dominant kind of monetary theory of the trade cycles and to aim at stressing the importance of the real factors, perhaps somewhat to the bewilderment of those who regarded me as a typical representative of monetary explanations". F. A. Hayek, "The Economy, Science, and Politics" [1962], in *Studies in Philosophy, Politics, and Economics* (Chicago: University of Chicago Press, 1967), p. 268.

[2]The book is dedicated "To the Memory of John Rae and of Eugen von Böhm-Bawerk who laid the foundations upon which I have endeavored to build". Irving Fisher, *The Theory of Interest* (New York: Macmillan, 1930). Fisher's account of the determinants of interest found its way into most elementary textbooks. Hayek referred to it as "the most systematic work of the subject which we possess, a formally unimpugnable exposition of the theory of interest". See F. A. Hayek, *The Pure Theory of Capital* [1941], (Chicago: University of Chicago Press, 1975), p. 43.

Fisher, following the first use of the concept by John Rae,[3] began his definitive work with the statement that "[i]ncome is a series of events. . . . [I]t is these events—the psychic experience of the individual mind—which constitute ultimate income for that individual". But this income cannot be measured directly. "We can approximate it indirectly, however, by going one step back of it to what is called real income" and from there "we now go back of his real income, or his living, to his *cost* of living, the money measure of real income". Fisher thus identified three modes, if you will, of attaining income, each of which must be equivalent to the other two. What Fisher did not observe is that what is logically the case with any one mode must also be true of the others. (Otherwise some interesting contradictions would arise, such as the possibility that a choice to increase real income could lead to a loss of psychic income or vice versa.)

There has been little consideration of the possibility that the determinants of psychic income and real income might differ in ways that would make it impossible to use an analysis of the determinants of real income as the basis for explanations of the consequences of economic choices. The apparent difficulty of measuring interpersonal utility, noted by Fisher, would seem to render such a discussion somewhat futile; but this difficulty also means that we accept the equivalence of psychic and real income more as a matter of common sense—call it pragmatism—than of logical demonstration. There is also a strong practical need to accept the possibility of equivalence between money income and real income since we live in a world where most economic transactions are in money; but money toils not, neither does it spin. One is tempted to observe that the possibility, nay virtual certainty, that money income and real income are not equivalent is the bête noire of economics; most of the controversy and much of the folly and desperation of the time between the two world wars stemmed from the lack of consensus as to why and how money affected prices and employment.

Hayek was certainly not prepared to accept the equivalence of Fisher's three modes except under the stringent restrictions he outlined for the use of 'neutral' money. For theoretical reasons, not, of course, practical ones, Hayek disliked money because it made credit possible, which distorted the relative prices of consumer and production goods.[4] (One might

[3]John Rae (1796–1872) maintained that economic activity was motivated primarily by a regard for the future; he emphasized the role of time and inventions. Despite favorable mention by John Stuart Mill, Rae's work did not receive the attention it merited. Hayek discovered an unpublished draft of a letter from Mill to Rae which he published together with a letter from Rae to Mill in *Economica,* August 1943, pp. 253–255.

[4]Hayek's oft-quoted statement was that money was a kind of loose joint in the economic system: "There is little ground for believing that a system with the modern complex credit

say that Keynes disliked not money but gold because he believed it made hoarding possible.) But as Hayek's economic thinking expanded beyond the confines of static equilibrium, his thinking about money also evolved. A turning point of sorts was John Hicks's paper "A Suggestion for Simplifying the Theory of Money", which was read at the London Economic Club in November 1934.[5] Hayek, to avoid muddling the relationship of money to real income, had considered money only as a medium of exchange. Hicks examined reasons for *holding* money, and those reasons had to do with risk. Hayek did not, to our great loss, write the companion volume to *The Pure Theory of Capital* which was to incorporate money into a dynamic theory of economic relationships. Some of his later writing on money did focus on reasons for holding particular forms of money, those which offered stability of value, which might seem to be a capitulation to Fisher. But Hayek's later work beginning with "Economics and Knowledge"—which was his presidential address to the London Economic Club in 1936—opened a door that Fisher had not found; that is, that the measurement of risk may stand as proxy for certain components of psychic income, a link between expectation and satisfaction, which is to say, experience.

In 1926 there was an opportunity for a meeting of the minds on some disputes concerning money, interest and prices. The occasion was the thirty-ninth annual meeting of the American Economic Association where a paper was delivered by Frank A. Fetter of Princeton University, followed by a round-table discussion. Among the discussants were Irving Fisher, W. C. Mitchell, and Frank Knight.[6] In retrospect it is a pity that in 1924

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structure will ever work smoothly without some deliberate control of the monetary mechanism, since money by its very nature constitutes a kind of loose joint in the self-equilibrating apparatus of the price mechanism which is bound to impede its working—the more so, the greater is the play in the loose joint. But the existence of such a loose joint is no justification for concentrating attention on that loose joint and disregarding the rest of the mechanism, and still less for making the greatest possible use of the short-lived freedom from economic necessity which the existence of this loose joint permits". F. A. Hayek, *The Pure Theory of Capital,* op. cit., p. 408.

[5]John Hicks, "A Suggestion for Simplifying the Theory of Money", *Economica,* February 1935. Reprinted in John Hicks, *Critical Essays in Monetary Theory* (London: Oxford University Press, 1967), pp. 61–82. In later correspondence with Hicks, Hayek wrote that "I should, in any systematic exposition, make the causes determining the demand for money the starting point. . . . The main achievement in the right direction was your 'A Suggestion for Simplifying the Theory of Money'." F. A. Hayek, letter to John Hicks, December 4, 1967. A copy of the letter may be found in the Hayek papers in the Archives of the Hoover Institution, Stanford University.

[6]Frank H. Knight (1885–1962), Professor of Economics at the University of Chicago. He later subjected Hayek's use, indeed any use, of the concept of a 'period of production' as a measure of capital to searing criticism. See his essay, "Professor Hayek and the Theory of

Hayek had just set sail for his return to Vienna before the news arrived of the award of the first Rockefeller fellowship which would have enabled him to extend his stay in the United States. Together, Hayek and Fetter might well have had an influence strong enough to overcome much of the resistance each encountered to his own presentation of a common theory.

In his paper "Interest Theory and Price Movements", Fetter set out to restore theory, in particular a theory of interest, to its crucial role in the explanation of business cycles. He arrived at conclusions about the mechanisms at work in the business cycle that were identical to Hayek's ideas on the same subject: "The relation of various particular prices in the general system of prices undergoes rapidly various modifications, notably the relation between capital-valuations of durable and indirect goods with near-finished direct goods".[7] Hayek first acknowledged the merit of Fetter's work in his essay on intertemporal price equilibrium, but he added in a note that Fetter's "most recent and very interesting essay ["Interest Theory and Price Movements"] became known to me only after I had completed this article".[8] Hayek did make use of Fetter's essay in *Geldtheorie und Konjunkturtheorie,* quoting at some length a passage which supported Hayek's contention that the elasticity of credit allowed a monetary rate of interest below the 'equilibrium' rate. Hayek also disclosed the point at which he differed from Fetter: "Prof. Fetter, of course, is also under the influence of the prevailing dogma which holds that the existence of a stable price level is sufficient proof of the absence of all monetary influences".[9] This was true to the extent that Fetter recommended that stability of prices be used as a guide for monetary policy: "If [an official index number of general prices] were followed, that portion of the fluctuations of prices and of the business cycle due to the vicious circle of bank inflation to meet the so-called 'needs of business,' would be

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Investment", *Economic Journal,* vol. 45, no. 177, March 1935. Hayek responded with "The Mythology of Capital", *Quarterly Journal of Economics,* February 1936.

[7]This one sentence is not a summation of Fetter's argument, nor does it capture the wealth of supporting detail that leads to it. Nonetheless it is crucial to his view of the business cycle, and it does not differ from Hayek's. See F. A. Fetter, "Interest Theory and Price Movements", *American Economic Review,* vol. 17, no. l, Supplement, March 1927, p. 89. Reprinted in F. A. Fetter, *Capital, Interest, and Rent: Essays in the Theory of Distribution,* ed. Murray N. Rothbard (Kansas City: Sheed Andrews and McMeel and the Institute for Humane Studies, 1977). The essay is reprinted without the discussion which followed.

[8]See this volume, chapter 5, p. 189.

[9]F. A. Hayek, *Monetary Theory and the Trade Cycle,* p. 180n. In this same note Hayek refers the reader to his essay, "The Monetary Policy of the United States . . .", reprinted as chapter 2, this volume, where he "dealt with the elasticity of bank credit as *the* cause of cyclical fluctuations".

minimized instead of caused or accentuated".[10] Hayek was in complete agreement with Fetter on the destabilizing role of bank credit combined with an 'elastic' currency; but in place of an index of price stability, Hayek offered the concept of equilibrium of supply and demand for future production and consumption, which, if productivity were increasing, would require falling prices.

Fetter did not introduce the concept of equilibrium into his analysis. He maintained that time preferences or valuations were inherent in any exchange and would be found to exist even without the presence of interest. Ultimately "the price system in any period of time viewed statically, contemporaneously, is linked up by countless acts of choice with the price system in succeeding periods of time, into a time-embracing price system. This is an unescapable conclusion from the phenomenon of individual time-valuations".[11] Finally, he left unresolved the difficulty of determining when and how a specific rate of change in the interest rate leads to predictable changes in prices, whether general or relative.

Fisher responded by declaring himself in substantial agreement, subject to some minor clarifications. Frank Knight, on the other hand, in a very brief reply, indicated almost complete disagreement. He believed that "the question of the control of general prices through manipulation of the bank rate *can* be separated from the particular theory of the nature and cause of interest held by Professor Fetter". And, most tellingly in light of his subsequent debate with Hayek over capital theory, he declared himself an adherent of the "productivity" school in interest theory.[12] In

[10]F. A. Fetter, "Interest Theory and Price Movements", op. cit., p. 97.

[11]*Ibid.*, pp. 79–80. Fetter made no attempt to demonstrate how the 'link' would distribute supply and demand between present and future uses, the task that Hayek began and that Arrow and Debreu continued. Nonetheless, Fetter must be given credit for insisting on the use of the concept of "time location".

[12]Frank H. Knight, "Interest Theory and Price Movements—Discussion", *American Economic Review,* op. cit., p. 120. Knight addressed some of the issues raised by Fetter's paper in an article prompted by Fisher's publication in 1930 of *The Theory of Interest,* "Professor Fisher's Interest Theory: A Case in Point", *Journal of Political Economy,* vol. 39, no. 2, Feb.–Dec. 1931. In this essay Knight throws down the gauntlet over what it means to 'determine' prices, which include interest rates, in terms of costs. In his view, the possibility of transferring productive capacity among alternative uses would lead to conditions "which are those properly described as 'constant cost', [in which] purchasers' attitudes and acts 'determine' the relative amounts produced and brought to market; they cannot and do not affect the price. This is the proposition which it seems needs to be put on the loudspeaker and screamed into the ears of economic theorists until they hear it. All this in no way contradicts or invalidates the argument of the time-preference theorist [Fetter] (or the eclectic, like Fisher) that the interest rate measures the relative ('marginal') estimate of present and future on the part of every person in the market. That is perfectly true, but has little or nothing to do with 'determining' the rate (infinitely little, assuming perfect adjustment, at

his paper Fetter acknowledged that although his purpose in writing the paper was to revive the role of theory in the understanding of business cycles, his "approach and treatment has always been rather historical and genetic, with a greater stress on the psychological and human factors. Though begun and largely developed before the term 'institutional economics' was coined, it might even be deemed to be in some respects an essay of that type. Especially, it treats the interest rate not as a thing apart from the general price system, but rather finds its explanation interwoven with the whole process of price formation, from its earliest beginnings to the complex price system of the modern world".[13] W. C. Mitchell was only too gracious in his response, "glad that Professor Fetter feels but slight misgivings at thus joining forces with the institutional theorists. . . . Speaking as one who thinks that careful analysis of pecuniary institutions is essential to the understanding of economic behavior, I welcome Professor Fetter's accession to our ranks".[14] But in retrospect it may be observed that Mitchell and the others were not careful enough. Overlooked was the significance of Fetter's observation that, contrary to the designs of the monetary stabilizers, the long run determinant of prices was the supply of and demand for gold, or what he called "standard money". Fetter pointed out that the example of the Bank of England's use of 'bank rate' to control credit, and which influenced bank lending by maintaining a minimum level of gold reserves, amounted to "a process of readjustment of *relative price levels* and of the stock of international standard money, in different national markets having become more or less out of alignment with world conditions. Fundamentally it is almost entirely unrelated to the problem of the long-time level of general prices either in the particular country or in the world at large".[15]

The implication may be drawn that the supply of and demand for a standard money is beyond the control of any one country; thus it would be only with extreme difficulty (that is, by unrealistic assumptions) that standard money could be other than an exogenous variable in a theory of the influence of money and credit on the size and disposition of income in any one country. As with any exogenous variable, the theorist must take its value (quantity) as given by whatever past or present circumstances dictate.

One may wonder whether it is possible to be other than an 'institu-

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a given moment)". Op. cit., pp. 200–201. If such were the case, Hayek would have his work cut out for him in attempting to produce a theory of capital that would rely on a productivity theory of interest while avoiding the possibility of constant cost determining prices.

[13]F. A. Fetter, "Interest Theory and Price Movements", op. cit., p. 74.

[14]W. C. Mitchell, "Interest Theory and Price Movements—Discussion", op. cit., p. 109.

[15]F. A. Fetter, "Interest Theory and Price Movements", op. cit., p. 98.

tional' economist in approaching any exogenous variable, but particularly in understanding what money is and does. It is tempting to give in to the belief that unwanted monetary effects may be eliminated through institutional manipulation, an approach and methodology which Hayek termed 'constructivism'. But Fisher had already revealed that manipulation of the value of money cannot be done without cost; nor can it be done without risk. The frantic attempts of each and all in the 1930s to save themselves from monetary ruin contributed to the very calamity they feared. Monetary nationalism (which Hayek attacked, in an essay reprinted in *Good Money, Part II*) proved to be only an opening salvo in the war to come.

Stephen Kresge

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SUBJECT INDEX