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The Monetary Disequilibrium Hypothesis

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ALBERT EINSTEIN has recently called attention to the yearning of the human mind for simplicity in scientific thought and reminded us of the importance of Mach's principle of economy, interpreted as a logical principle.[1] Economists and other social scientists, as well as physicists, would do well to keep Mach's principle in mind when formulating hypotheses. However, in the study of business fluctuations, which is the segment of economics to which most current developments pertain, we have moved in recent years away from rather than toward generalizations which are at the same time simple and comprehensive.

Many years ago Wesley Clair Mitchell called attention with cogency to the fact that the type of business fluctuations which we have come to call "business cycles" is a characteristic of a money economy.[2] More recently his successor as director of research at the National Bureau of Economic Research has reminded us that such disturbances show an almost uniform co-extensiveness with geographical areas covered by a common monetary system or a closely knit group of monetary systems.[3] What-

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[1] Albert Einstein, "On the Generalized Theory of Gravitation," *Scientific American*, Vol. 182, no. 4, April 1950, p. 13.

[2] Wesley C. Mitchell, "Business Cycles: The Problem and Its Setting" (National Bureau of Economic Reseach, 1927), pp. 61–82. Money, as used in this connection and throughout the present article, includes all instruments commonly accepted and used as means of payments or as cash balances held for later use, *i.e.*, it includes bank deposits as well as currency issued by the government.

[3] Arthur F. Burns, discussion of current research in business cycles, *American Economic Review*, XXXIX, May 1949, p. 82.

ever the basic nature of business cycles, their cause must be a force of great penetrating influence which has an impact everywhere throughout a region within the limits of an associated group of monetary systems. What can there be that is so intimately related to all economic decisions by individuals and enterprises within such a broad area as money itself? Why do we not make a forthright application of the principle of economy in scientific thought and formulate the hypothesis: business fluctuations are results of disturbance in the monetary system?

This hypothesis is not new: it is the dominant strain in business-fluctuation theory developed during the past two centuries. Yet it is hardly discernable in the vast research with respect to business cycles which has been carried on in recent years. In fact, a reverse proposition is implied in the theoretical frameworks embodied in much of the current work on business fluctuations. In the reworking of traditional economic concepts as a basis for the analysis of current data contemporary economists have reviewed one important phase of theory developed during the nineteenth century, namely, the theory of economic equilibrium, and have recast this body of thought in a succinct mold; but they have neglected to do the same with the correlative theory of disequilibrium.[4] It is my own firm conviction that contemporary economic theory will remain in a state of confusion, bogged down in a morass of inverted concepts of causality and sequence, until a clear effort is made by those engaged in business cycle research to examine the validity of the hypothesis that business fluctuations are results of disturbance in the monetary system.

Disequilibrium and the Quantity of Money

THE SOLUTION OF THE SET of simultaneous equations in which the classical theory of equilibrium may be stated, as contemporary economists have pointed out, requires full employment. Under the assumptions of that theory a lapse from full employment, or business depression, is regarded as a disequilibrium situation which is assumed to be temporary, and which may be eliminated either by an increase in the amount of money, or by a cut in prices and wages.[5] The classical economists assumed that the force of competition will produce the latter result and thereby re-

[4] For example, see the article by Lawrence Klein, "Theories of Effective Demand and Employment," *Journal of Political Economy*, LV (April 1947), pp. 108–31; and his book, "The Keynesian Revolution" (New York: Macmillan, 1947), technical appendix, pp. 199–213.

[5] Mr. Klein, who has contrasted the assumptions of the classical theory of equilibrium with those of Keynesian theory, says, "prices or wages" (*Journal of Political Economy, op. cit.*, p. 109); but I believe "prices and wages" is a better interpretation of classical theory.

store the economy to an equilibrium position. The reasoning that the economy will move, as a result of a specified type of change, from a disequilibrium to an equilibrium situation suggests that the same kind of change operating in the reverse direction might move the economy from equilibrium to disequilibrium. However, the assumption that competitive forces will produce equilibrium by adjusting the level of prices and wages makes it impossible to assume that force to be a cause of disequilibrium. That leaves us with the suggestion that a potent cause of disequilibrium may be a change in the quantity of money.

This hint regarding the origin of disequilibrium was a real corollary of the classical theory of equilibrium, as is indicated by the specific simplifying assumptions or abstractions from reality which were made by the classical economists. Ricardo, for example, asserted that changes in the quantity of circulating medium affect only prices and not profits, an assertion which was recognized by his classical successors as true only in the long run, that is, for the new equilibrium position.[6] Alfred Marshall underpinned the entire body of theory presented in his *Principles*, except when he made a specific exception, with an assumption of a unit of money constant in purchasing power, and described the disastrous effects of a unit of money fluctuating in value.[7]

The historical fact is that the classical theory of equilibrium was accompanied in its development by a concomitant theory of disequilibrium, applying to the circumstances under which the monetary condition for the maintenance of equilibrium is not met in the real world. This theory of monetary disequilibrium was stated by David Hume two centuries ago and was developed in much detail by Ricardo's contemporaries, Attwood, Bollman, Joplin, and Thornton. It was recognized by Marshall in writings other than his *Principles*, and implicitly accepted in that great work. It was developed more thoroughly by Marshall's contemporaries in the United States. It was so widely understood that it is proper to say that it was not only a logical corollary of the classical theory of equilibrium but also as integral a part of the body of economic thought developed in the nineteenth century and the first quarter of the twentieth.

[6] David Ricardo, "Principles of Political Economy" (1817), pp. 29–32 in *The Works of David Ricardo* (London: John Murray, 1888); and Alfred Marshall, "Ricardo's [illegible] of Value," Appendix I, "Principles of Economics," eighth edition (London: MacMill[illegible] Co., 1920), pp. 813–21.

[7] Alfred Marshall, "Principles of Economics," eighth edition, pp. 62 and 59[illegible] "Remedies for Fluctuations of General Prices," *The Contemporary Review*, LI [illegible] 1887), pp. 355–75.

Some Assumptions in the Classical Theory

THERE ARE SEVERAL important assumptions with respect to the nature of the real world underlying the theory of monetary disequilibrium which were by-passed in the classical theory of equilibrium.

First, a change in the level of prices is a process which takes a period of time, and affects prices of various items sequentially rather than simultaneously.

Second, some prices are greatly influenced by custom or contract and move less readily than other prices; specifically, wages and contractual elements in business costs tend to be sluggish relative to prices of output.

Third, these differential movements of prices and also prospective further changes in prices have significant effects upon business profits and prospects and hence upon business plans, especially with respect to investment decisions and to holdings of cash relative to receipts and expenditures.

Fourth, the economy is not static; more specifically, we live in a world where population is growing, technological developments are increasing production per worker, and other developments tend to increase the volume of transactions (in quantity terms) relative to the output of final products.

Fifth, as a result of the foregoing and of the stability of customs (such as the periodicity of income payments) which affect the rate of circulation of money, the economy needs for equilibrium a continuous increase in the quantity of money.

Sixth, it is theoretically possible for monetary disequilibrium to persist for months or years, and observations indicate that many such situations have occurred.

Seventh, the actual quantity of money reflects primarily the behavior of banks or of a government treasury issuing circulating medium; and the nature of banks is such that they have a tendency to carry forward the expansion of money to the limit permitted by interbank relationships and the laws under which they operate.

Eighth, in the United States, subsequent to establishment of the national banking system, the chief restraint on the banks, limiting their expansion and occasionally necessitating contraction, is the amount of their legal reserves.

Ninth, the impact of monetary disequilibrium is intensified by sequential changes in the rate of circulation of money.

Tenth, changes in the quantity of money which are not consonant with

the rate of expansion needed for equilibrium also change the amount of funds available in the money loan market; thus they constitute the force which produces a departure of the market rate of interest from the equilibrium rate, and consequently disturbs property values and mutual adjustment of savings and investment decisions.

Eleventh, if the force impinging on the quantity of money, such as the state of bank reserves, can be observed ahead of change in the quantity of money, or is itself of such character as to have a direct effect on the securities market, the disturbance to property values and to investment decisions may begin ahead of the monetary disequilibrium as observed in statistical data.[8]

Contemporary Neglect of the Traditional Theory

THE NEGLECT of the traditional theory of monetary disequilibrium by contemporary economists is reflected in the choice of variables and equations utilized in business cycle research projects. Nowhere in the publications resulting from these projects, so far as I have been able to ascertain, are there suitable measures of the quantity of money or stock of cash, nor of other variables such as monetary velocity and the volume of bank reserves, which figure importantly in the theory of disequilibrium as applied to present day conditions.[9] Nor is consideration given in these publica-

[8] These various assumptions pervaded so much economic literature of the nineteenth century and early part of the twentieth that supporting documentary references seem superfluous. However, in view of the obvious lack of acquaintance with that literature on the part of contemporary economists some illustrative references may be desirable. Points 1–3: Henry Thornton, "Paper Credit of Great Britain," 1802 (reprinted, London: George Allen and Unwin Ltd., 1939); [Erick Bollman], Letter to Alexander Baring, Esquire, on the present state of the currency in Great Britain, *American Review of History and Politics*, II (1811); Thomas Attwood, "Prosperity Restored" (1817); Joseph French Johnson, "Money and Currency" (Boston: Ginn & Co., 1905), pp. 124–34. Points 4–6: *Report of the United States Monetary Commission* (Senate Report No. 703, 44th Congress, 2nd session, 1877), pp. 49–66; George M. Weston, "Money" (New York: Homans, 1882); S. Dana Horton, "Silver and Gold and Their Relation to the Problem of Resumption," 3rd edition (Cincinnati: Robert Clarke & Co., 1895), and address, May 19, 1881, *Proceedings of the International Monetary Conference*, Paris, France (Cincinnati: Robert Clarke & Co., 1881). Points 7–8: see writers referred to by Harry E. Miller, "Banking Theory in the United States Before 1860" (Cambridge: Harvard University Press, 1927), and Lloyd W. Mints, "A History of Banking Theory in Great Britain and the United States" (University of Chicago Press, 1945). Point 9: Thomas Attwood, "Letter to Nicholas Vansittart" (1817); *Report of the United States Monetary Commission, op. cit.;* and Herbert J. Davenport, "Economics of Enterprise" (New York: The Macmillan Company, 1913), pp. 300–4. Points 9–10, Davenport, *op cit.*, chs. XVII and XVIII; Joseph French Johnson, *op. cit.*, pp. 127–30; and the well-known practice prior to establishment of the Federal Reserve System of using the reserve ratio of all national banks or of those in central reserve cities as a leading factor in stock market and business forecasting.

For quotations on these points from some of these authors, see my "Monetary Theory and the Price Level Trend in the Future," in five monographs on Business Income (New York: Study Group on Business Income, American Institute of Accountants, 1950) pp. 161–93.

tions to the rate of growth of the money supply and therefore of bank reserves which is needed for maintenance of equilibrium, nor to measurement of the relationships of stocks of these variables to the equilibrium values; nor to the observed lapses of time between disturbances in reserves, in the quantity of money, and in the velocity of money.[10] In addition, insufficient attention has been given to the inadequacies of the specific statistical data which have been utilized. In the case of the money supply, for example, the year-end figures on which all investigations rely heavily are affected far too much by temporary influences to provide a series reflecting the real movements with sufficient accuracy.[11] That is to say, contemporary business-cycle analysts have avoided even a look at the facts most pertinent to the reasoning underneath the belief that monetary policy is of primary importance in both the maintenance and disruption of full employment.[12]

When a broad scientific generalization such as Darwin's principle of natural selection or Einstein's theory of relativity is announced and its significance is grasped by other scientists, it is followed by several widespread developments in scientific work in the field to which it pertains.[13]

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[9] Such measures are not to be found in the publications of the National Bureau of Economic Research, nor in those of the Cowles Commission for Economic Research; and there is no hint of such measures in the first report on the University of California business cycle project (Robert A. Gordon, "Business Cycles in the Interwar Period: the 'Quantitative-Historical' Approach," *American Economic Review*, XXXIX, May 1949, pp. 47–63). For the absence of such measures in books on business cycles and in periodical literature of the decade subsequent to 1936 see my article, "The Misplaced Emphasis on Business-Fluctuation Theory," *Journal of Business of the University of Chicago*, October 1946, to be reprinted in Lutz and Mints, *Readings in Monetary Theory*, (Philadelphia: The Blakiston Company, forthcoming volume).

[10] Some business cycle investigators (*e.g.*, Lawrence Klein, in his recent book, "Economic Fluctuations in the United States, 1921–1941," New York: John Wiley & Sons, 1950), have confined their analysis to annual data. It has long been recognized that, to be significant for study of the sequences and causal relationships involved in business fluctuations, data for such variables as reserves and the money supply must be for shorter periods of time than a year.

[11] *E.g.*, it appears practically certain that the amount of adjusted deposits, as included in the usual computation of the money supply, was 4 or 5 per cent larger on the last day of December 1928 than it was during most of the latter half of the year or during most of the subsequent half-year period.

[12] The significance of this avoidance of attention to the theory of the effects of monetary policy might be summarized by an analogical question. How much attention would we give to an investigator who set up a lot of equations inter-relating the volume of water at specific dates in our large rivers, the amount of water passing through the lower parts of the rivers, the depth and configuration of the river beds, the contours of the surrounding land, and the rainfall of the area—all of which are pertinent to the problem of floods—and then determined his parameters with annual data and concluded that he found no evidence that variation in rainfall in the upper river basins has a causal influence on floods in the lowlands?

[13] Sometimes, of course, such a generalization may lie dormant and occasion little comment for many years.

These include: (1) search of current factual data and of historical records for examples of its application; (2) experimentation to test some corollary of the generalization or some conclusions drawn from it relating to phenomena not previously observed; (3) predictions of future events, or conditional predictions contingent upon the occurrence of specified conditions, and observations to see whether such predictions are fulfilled; (4) arrangement in a related and orderly fashion of many facets of theory previously more or less isolated from each other; (5) proliferation of many additional theoretical details; (6) discard of many earlier theoretical frameworks; and (7) retention and reinterpretation of many principles enunciated by formulators of discarded theories; thereby fitting such principles into the general framework of the unifying generalization.

Inasmuch as the generalization that disturbances in the monetary system result in disturbances to business and employment was enunciated in the middle of the eighteenth century, illustrations of these developments may be found in tracing the history of the theory of monetary disequilibrium in the nineteenth century and the first quarter of the twentieth. However, such developments have been relatively few during the second quarter of the twentieth century. This situation, I venture to predict, will soon be reversed: such developments will, I believe, represent a major part of the refinements and progress in economic theory during the third quarter of the twentieth century.

Statistical Corroboration of Elements of the Hypothesis

DEVELOPMENT OF STATISTICAL SERIES pertinent to the theory of monetary disequilibrium and their analysis in the light of that theory show that the ups and downs of business during the period between the two world wars uniformly conformed with the hypothesis that business fluctuations are the result of disturbances in the monetary system and that the originating forces impinged on bank reserves.[14] Economic developments since the close of World War II fall into line with the same relationships. Similar conclusions for the century preceding 1918 are suggested by a preliminary examination of data for the reserves for national banks prior to 1917, a cursory resumé of developments in banking in the United States prior to establishment of the national banking system, and a comparison of the periods when disturbances in the banking system were apparent with business cycle annals and turning points as described by the National Bureau of Economic Research. One of the most promising

[14] See my articles: "Banks and Business Fluctuations," *Estadística*, March 1950, pp. 59–68; and "Theory of Turning Points in Business Fluctuations," *Quarterly Journal of Economics* (forthcoming issue).

fields of economic research which should be cultivated intensively during the next decade is a careful historical study of the relation of banking disturbances to business fluctuations during the century prior to World War I.

For most individual economists, as for astronomers, manipulative experiments to test their hypotheses are not possible. However, there is one group of persons who can make experiments to test the practical validity of the hypothesis with which we are dealing. It would be well within the realm of powers and duties of the Federal Reserve authorities to manage the asset-acquisition and relinquishment policies of the Federal Reserve banks in such a way as to cause the effective volume of member bank reserves to grow at a rate permitting a steady growth in the money supply at a reasonable rate. Federal Reserve authorities claim that their policies must be a matter of judgment rather than rules: it would be exceedingly fruitful if they would use that judgment to make such an experiment.[15] Surely this would be more reasonable than some of the experiments in policy which have been made in the past.

The utmost which individual economists can do by way of testing most of their theories by experimentation is to make appropriate preparations for observation of the course of events in the future. Such preparations may, of course, as in the case of astronomical measurements, involve construction of special apparatus or maintenance of records in an appropriate form. Closely allied to such observational experiments is the making of conditional forecasts. In the case of the hypothesis under consideration an economist can make conditional predictions as to the course of events with respect to business fluctuations, contingent on the occurrence of specific conditions in the banking and monetary system. Thus, we may predict for the next few years: (a) if we have an increase in the effective amount of bank reserves of the order of magnitude of 10 per cent or more a year we will have a substantial price inflation and a business boom with much speculation; (b) if we have a contraction of effective bank reserves of the order of magnitude of 5 per cent or more a year we will

[15] For a recent expression of the rôle of judgment in the determination of policy by Federal Reserve authorities see the testimony of Mr. McCabe in the hearings of the subcommittee on monetary, credit, and fiscal policies of the Joint Committee on the Economic Report, 1949, *Monetary, Credit and Fiscal Policies,* pp. 488–93. For an earlier expression see the testimony of Adolph C. Miller in hearings before the Committee on Banking and Currency of the House of Representatives, 70th Congress, 1st session, *Stabilization,* 1928, pp. 107–8.

For a discussion of problems of Federal Reserve policy, see my "Coordination of Monetary, Bank Supervisory, and Loan Agencies of the Federal Government," *Journal of Finance,* June 1950, pp. 148–69.

have depression; (c) if we have a constant volume of effective bank reserves we will continue to have falling prices and a substantial amount of unemployment but will probably avoid a cataclysmic depression; and (d) if the volume of member bank reserves grows steadily at a rate close to but not exceeding 5 per cent per year we will have a period of prosperity with very little unemployment, a relatively stable level of prices of final products, and a continuous advance in national income in both money and real terms.[16]

Possible Aids to the Advance of Economic Theory

IN THE REALM OF DEVELOPMENTS in economic theory we should see within the next quarter of a century a thorough-going analysis and integration of three sets of observations by economists and students of business affairs, namely: (a) observations throughout the nineteenth century regarding the relation of variation in money and the circulating medium to prices and business fluctuations; (b) observations in the latter part of the nineteenth century and the early decades of the twentieth regarding the relation of call loans, other money market phenomena, and stock market speculation to fluctuations in bank reserves on the one hand and to business conditions on the other; and (c) the vast array of statistical economic series collected by the staff of the National Bureau of Economic Research.

The hypothesis that business fluctuations are the result of disturbances in the monetary system gives more promise than any other available hypothesis of providing a principle under which various aspects of business cycles, to which attention has been called in the last annual report of the National Bureau of Economic Research, can be put into orderly fashion and related to each other. These facets include: (1) the dispersion of specific cycles; (2) the tendency of specific cycles toward concensus; (3) "an inner cycle in the distribution of expanding and contracting activities within the external cycle of aggregate activity"; (4) the cyclical behavior of profits; (5) the rôle of inventories; (6) the difference between mild and severe depressions; and (7) the occasional occurrence of abortive revivals.[17]

[16] The average rate of increase in effective bank reserves during the major upswings of the period, 1918–1949, computed on the basis of month-end data, was from 10 to 32 per cent per year; the average rate of change during the major downswings of the same period ranged from 1 per cent increase (or 4 per cent decrease relative to the estimated normal rate of growth) to 62 per cent per year decrease. Computations on the basis of average quarterly data are as follows: upswings, 7 to 39 per cent; downswings, 2 per cent increase to 28 per cent decrease. The extreme rates of decrease occurred during the early months of 1933; the extreme rates of increase during the period from 1933 to the increase in percentage reserve requirements in 1936.

This hypothesis also affords by far the most reasonable explanation of the typical sequences within the business cycle described in the same report: (a) the start of recessions while activity is still expanding and of recoveries while the aggregate is still contracting; (b) gradual spread of recession or recovery over the economic system which reverses the tide of economic activity; (c) the respective timing of three groups of activities —investment decisions, physical volume of production, and disbursement of incomes; (d) the behavior of commercial banks and the leadership of interest rates and bond market phenomena; and (e) the character of statistical indicators of revival and recession.[18]

Less can be said about the character of additional theoretical details, related to this basic hypothesis, which are likely to be developed during the next quarter of a century. However, I would suggest one field in which a significant advance in theory may be expected, namely, the theory of variation in property values relative to variation in value of output, and the significance of that relationship for business fluctuations and for maintenance of economic growth and stability. A correlative development will be a clarification of the dual concept of liquidity-preference which pervaded Keynes' *General Theory*, and of the current controversy and confusion regarding the "interest-elasticity" of the demand for cash balances.[19]

Some Probable Changes in Economic Thinking

As to the discard of earlier theoretical frameworks we can, I think, forecast the elimination from economic thinking, with respect to the origin of lapses from full employment and the conditions of recovery, of the current emphasis on governmental deficits and surpluses, the numerous structures described as "models," and a large part of Keynesian economics. These types of theory will be discarded because it will be found on close observation that the presence or absence of the factors emphasized by them is not closely integrated with the presence or absence of business depression or price inflation, or with the beginnings of upswings and downswings. Nevertheless, there will undoubtedly be a retention from these various theories of many principles which will be found to fit into the framework

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[17] Arthur F. Burns, *New Facts on Business Cycles*, Thirtieth Annual Report, National Bureau of Economic Research, 1950, Part One.

[18] *Ibid.*, pp. 16–22 and 26–9.

[19] See my article, "Monetary Velocity and Monetary Policy," *Review of Economics and Statistics*, XXX (November 1948), pp. 304–14, and my reply to Mr. Tobin's comments in the same *Review* XXXII (August 1950), pp. 256–7.

of the unifying hypothesis that business fluctuations of the order of magnitude now called "business cycles" are the result of disturbances in the banking system.

In conclusion, a brief comment may be made regarding the apparent effect of shocks to the economy other than those originating in the monetary system. Such shocks must be very severe to produce effects of sufficient magnitude to enter into the record of "business cycles." Perhaps the greatest of such shocks which have impinged upon the economy in recent decades have been transitions from peace to war and from war to peacetime activities. Whenever these transitions have been made without an accompanying monetary disturbance, their effects have escaped observation in business cycles, or have been registered only as extremely moderate fluctuations. In fact, in the business cycle measurements of the National Bureau of Economic Research there is only one case of a peak or trough which appears to have been associated with a shock to the economy of such a sort without a preceding or accompanying monetary disturbance. This is the slight depression in the winter of 1918–19 following the armistice at the end of World War I, when there was a sudden large-scale cancellation of war contracts and a lag of a few months in the reconversion of the economic mechanism to ordinary purposes.

McLean, Va.

Public and Private Collaboration in Business

A LARGE AND YET EXPANDING industry, the mass production of penicillin, is still based on the wartime investigations of the United States Department of Agriculture's Northern Regional Research Laboratory at Peoria. It grew from nothing, a few years ago, to an average of about 11 trillion units per month in 1949. This tremendous growth was accompanied by a decline in wholesale price from $20 to less than 10 cents for 100,000 units —commonly one shot, that is. Annual production amounts to somewhere between 75 and 90 tons of the drug. Twelve major companies contribute to this huge output. The effectiveness and availability of this antibiotic paved the way for the introduction of many more useful drugs of the same kind.

T. SWANN HARDING

USDA, Washington