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THE POSTWAR RISE IN THE VELOCITY OF MONEY

A SECTORAL ANALYSIS*

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I. INTRODUCTION

EXCEPT FOR BRIEF and mild declines during business contractions, the velocity of money in the United States (i.e., the ratio of the volume of expenditures to the stock of money) has increased steadily since the end of World War II. This is true for concepts of money that include and exclude time deposits and for such differing concepts of expenditures as total non-financial payments, debits to demand deposits, and the several variants of national income. Further-

* This study was initiated during the 1958-59 academic year, which I spent as research associate at the National Bureau of Economic Research. Although it is not part of any larger research project at the bureau, the study does bear a close relationship to other bureau work, past and present. Sections III-V are devoted mainly to a detailed treatment of business liquidity along the lines of Friedrich Lutz's *Corporate Cash Balances, 1914-43: Manufacturing and Trade* (New York, NBER, 1945). Similarly, the analysis of money flows contained herein represents a somewhat different approach to the problems that Morris Copeland treated in his *A Study of Moneyflows in the United States* (New York: NBER, 1952). And, of course, the velocity estimates from Federal Reserve flow-of-funds accounts would not have been possible without Copeland's innovations in money-flow accounting.

Among current research activities at the National Bureau, this study relates most closely to Milton Friedman's work on the money stock in the United States. However, Friedman is examining the behavior of money over a much longer time span, mainly in terms of aggregative data, while the present study largely ignores the period before 1939 and places major emphasis on sectoral data.

Preliminary findings, which have since been amended in some respects, were presented in hearings before the Joint Economic Committee, May 26, 1959 (*Employment, Growth, and Price Levels, Hearings*, Part IV). I gratefully acknowledge the contributions made to this study by Gary S. Becker, Phillip D. Cagan, Milton Friedman, George Garvy, Anna J. Schwartz, and Martha M. Selden. Thanks are also due to Murray Shields, Willis J. Winn, and Donald B. Woodward, of the National Bureau's board of directors. Joan Tron carefully edited the study, and H. Irving Forman drew the charts. Nancy Byrne ably assisted me by carrying out most of the computations and by offering good advice at many points.

more, it is true for most other prosperous economies as well.¹ By 1957, a measure of one income-velocity concept in the United States—the ratio of annual GNP to total demand deposits plus currency—reached a level not experienced since 1931 (Chart 1).

A persistent peacetime rise in income velocity is unique in American history. Indeed, the trend of the income velocity of total deposits plus currency was clearly downward for several decades prior to World War II.² Postwar velocity behavior is all the more puzzling because the major factor thought to be responsible for the earlier downward trend—advancing per capita real income—has continued to operate since the end of the war.³

This paper has two objectives: to explain the upward trend in velocity since 1946 and to develop a sectoral approach to velocity analysis. One way to pursue the first goal is to relate velocity to a few measurable variables, such as interest rates, yields on money substitutes, and real income per capita. In a study of the 1919–51 period, I computed relationships of this sort yielding high multiple correlation coefficients.⁴ However, these regression equations have performed poorly for later years.

Another approach to understanding velocity movements, generally neglected by monetary theorists,⁵ is to analyze velocity by eco-

1. Based on an analysis of GNP/money ratios (computed from various issues of *International Financial Statistics* [International Monetary Fund, Washington, D.C., monthly]) of all countries for which data are available for at least four consecutive years during 1950–58. The postwar trend of velocity has been upward in the following countries: Argentina, Belgium, Brazil, Canada, Ceylon, Denmark, Finland, Iraq, Ireland, Israel, Netherlands, New Zealand, Norway, Paraguay, Sweden, Switzerland, Union of South Africa, United Kingdom, and United States. In two advanced countries—Austria and West Germany—velocity was stable; it declined in France and Italy. Velocity was also stable in fourteen, and declined in ten, relatively underdeveloped economies.

2. However, deposit turnover rose sharply during 1924–29 (see Chart 1). If time deposits are not counted as money, the statement in the text must be modified. On this basis there was no trend in income velocity during 1919–29. What happened before 1919 is an open question, since we cannot adequately separate demand and time deposits much before that date. On the trend of income velocity see my "Monetary Velocity in the United States," in Milton Friedman (ed.), *Studies in the Quantity Theory of Money* (Chicago, 1956), pp. 187–91 and 237.

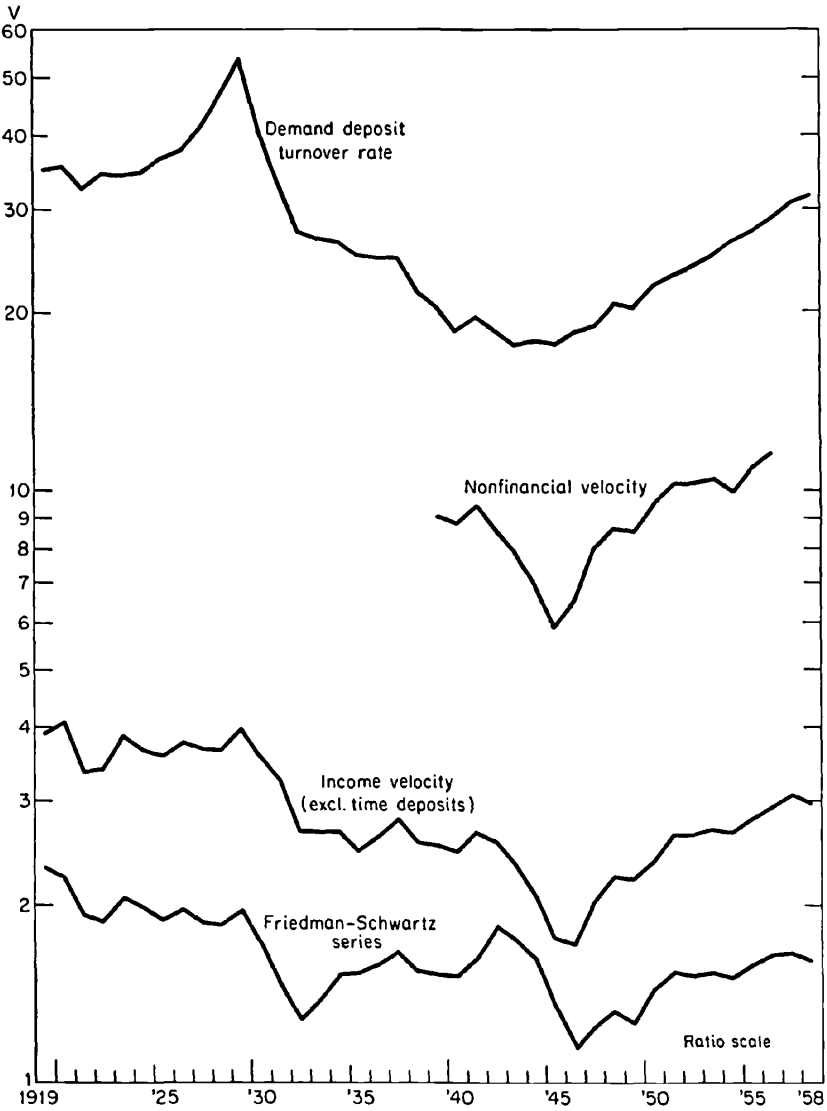
3. Milton Friedman, "The Supply of Money and Changes in Prices and Output," in U.S. Congress, Joint Economic Committee, *The Relationship of Prices to Economic Stability and Growth* (Compendium of Papers Submitted by Panelists, March 31, 1958), pp. 244–45.

4. *Studies in the Quantity Theory of Money*, pp. 214–18.

5. A notable exception is A. G. Hart, *Money, Debt, and Economic Activity* (2d ed.; New York, 1953), pp. 163–65. To my knowledge, the earliest proponent of velocity analysis by sectors was J. M. Keynes in *A Treatise on Money* (New York, 1930), chap. 24. The sector velocity concept has also been discussed by Arthur W. Marget, *The Theory of Prices*, I (New York, 1938), 404–5; George Garvy, "Structural Aspects of Money Velocity," *Quarterly Journal of Economics*, August, 1959, pp. 434 ff.; and others. For additional references see n. 15, below.

CHART 1

FOUR MEASURES OF AGGREGATE MONETARY VELOCITY IN THE UNITED STATES, 1919-58*



* Source: Table A-3.

conomic sectors. Aggregate velocity is a weighted average of millions of payments-money ratios for individual spending units, the weights being the fraction of the total money stock held by each spending unit. Velocity ratios for individual spending units, of course, would be neither feasible to compute nor particularly useful. Velocity can readily be computed for major sectors, however, and these sector velocities can add to our understanding of the behavior of aggregate velocity in several ways. There is no reason to think that the same variables determine velocity for all sectors; the level of real income may be decisive for one, yields on money substitutes for another. Furthermore, attitude changes may be more frequent and marked in some sectors than in others. The effect on aggregate velocity of given changes in circumstances and attitudes may therefore depend on the relative importance of the various sectors. And, of course, mere changes in the weights themselves may very well influence aggregate velocity.

Section II examines changes in aggregate velocity in recent years; Section III, the behavior of a wide variety of sector velocities, particularly since the end of the war; Section IV, the reasons for differences among corporate velocities at any point in time; and Section V, the reasons for the postwar rise in aggregate velocity. Section VI summarizes the results and indicates some of their implications. As we shall see, the sector data developed in Sections III and IV contribute significantly to the broader analysis of Section V.

II. POSTWAR CHANGES IN AGGREGATE VELOCITY

Aggregate monetary velocity is a ratio of spending to money stock for the entire economy. Since there are numerous concepts of both spending and money, there are obviously a great many aggregate velocity concepts as well. These fall into three general classes: deposit turnovers, non-financial velocities, and income velocities. The last is used most widely. For this study, we shall use two measures of income velocity: The first, on which major emphasis is placed, is the ratio of GNP to currency plus demand deposits (including those held by the federal government). So defined, good estimates of income velocity are available for the period from 1919 to date.⁶ The second income-velocity measure, developed by Milton Friedman and Anna J. Schwartz, is the ratio of NNP to currency plus total deposits adjusted at commercial banks (excluding those held by the

6. See Chart 1. All velocity data are given in supplementary tables at the end of this study. The income-velocity series appear in Table A-3.