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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.

federal government). This measure covers the period 1869 to date.⁷ Throughout this study it will be designated the "Friedman-Schwartz income-velocity series"; the term "income velocity" will refer solely to the first measure. The aggregate deposit turnover used in this study is the ratio of debits against demand deposits to the average volume of such deposits during each year, 1919 to date, as computed by the Federal Reserve System. For 1939-56 another aggregate measure—non-financial velocity—can be computed from Federal Reserve flow-of-funds accounts. It is the ratio of total non-financial uses to total demand deposits plus currency. Chart 1 shows these aggregate velocity measures; their average growth rates per year since 1946 are listed in Table 1 (part A).

For the purposes of this study, two important facts emerge from examination of Chart 1 and Table 1 (part A). First, income velocity has been rising fairly steadily since the end of the war at an annual average rate of 4.2 per cent. This is in contrast to the 1920's, when income velocity was essentially stable, and to the period 1929-46, when it declined sharply. The Friedman-Schwartz measure of income velocity has also risen during 1946-58, but at the more modest rate of 2.8 per cent per year. Second, deposit turnover, non-financial velocity, and income velocity have displayed nearly identical trends in the postwar period. This has not always been the case, as reference to the experience of the late 1920's and early 1940's indicates.

The second fact has important implications for an understanding of the first. Some velocity determinants affect income velocity and transactions velocity identically, others differentially.⁸ The latter include the degree of vertical integration, the relative importance of barter, and the volume of financial transactions per dollar of income. The postwar rise in income velocity might be rationalized by the

7. For a full description of this income-velocity series see Milton Friedman, *The Demand for Money: Some Theoretical and Empirical Results* (NBER, Occasional Paper No. 68 [1959]), Table 1. The fact that the present study pays scant attention to the Friedman-Schwartz series in no way implies an adverse judgment of this series, either conceptually or otherwise. On the contrary, for the analysis of secular movements in velocity the Friedman-Schwartz series is certainly the most reliable one available. For short-run analysis of the relatively recent past, however, there are many reliable income-velocity series, and the conceptual advantages of one over another are not clear cut. In this study emphasis is placed on comparing aggregate and sector velocity behavior. Since the current Federal Reserve deposit turnover series refer only to demand deposits, it seemed advisable to work primarily with income and non-financial velocities that were similarly defined.

8. For brief discussions of velocity theory see Friedman, "The Supply of Money and Changes in Prices and Output," in *Relationship of Prices to Economic Stability and Growth*, and my article, "Cost-Push versus Demand-Pull Inflation, 1955-57," *Journal of Political Economy*, February, 1959, pp. 7-8.

wave of mergers; in deposit turnover alone, by the increased trading of securities. But the parallelism in the movements of income velocity, deposit turnover, and non-financial velocity means either that these velocity determinants were negligible in the postwar period or that they almost completely offset one another. We can therefore reject all hypotheses that imply differential behavior of velocities.

Of course, there remain a large number of hypotheses to explain the postwar velocity rise. As I shall demonstrate below, however, we can eliminate some of them by means of sector analysis.

TABLE 1
GROWTH RATES OF AGGREGATE AND SECTOR VELOCITIES
SELECTED PERIODS, 1946-58

	Average Growth Rate per Annum* (Per Cent)
A. Aggregate series	
1. Deposit turnover, all sectors	
a) 1946-56	4.7
b) 1946-58	4.8
2. Non-financial velocity, all sectors	
a) 1946-56	4.6
b) 1947-56	3.7
3. Income velocity (time deposits excluded)	
a) 1946-56	4.6
b) 1946-58	4.2
4. Friedman-Schwartz income velocity series	
a) 1946-56	3.2
b) 1946-58	2.8
B. Geographic sectors, deposit turnover	
1. New York City	
a) 1946-56	6.9
b) 1946-58	7.0
2. Six other centers	
a) 1946-56	4.3
b) 1946-58	4.2
3. Other centers	
a) 1946-56	3.8
b) 1946-58	3.9
C. Flow-of-funds sector velocities	
1. Consumer	
a) Including withheld income, 1946-56	5.5
b) Excluding withheld income, 1946-56	4.9
2. Corporate, 1946-56	2.5
3. Non-corporate, 1946-56	5.2
4. Federal	
a) 1946-56	10.4
b) 1947-56	5.4
5. State and local, 1946-56	4.2
6. Insurance, 1946-56	6.3
7. Other investors, 1946-56	2.9

* Average growth rates computed by fitting linear regressions to logarithms of velocities.