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appears to fall in an intermediate category. Thus there seems to be a strong correlation between industry velocity and degree of coincidence between receipts and expenditures.

Industry differences in velocity probably are caused in part by factors other than those mentioned above. However, the role of such factors appears to be minor, and their analysis will not be pursued here.

DIFFERENCES BETWEEN THE CORPORATE AND NON-CORPORATE SECTORS

We saw in Chart 3 that non-corporate velocity was substantially lower than corporate velocity throughout 1939–56. One obvious reason for this persistent difference is the heavy representation of agriculture in the non-corporate sector. In 1955, for instance, 32.1 per cent of non-corporate cash was held by the farm subsector. Although non-corporate velocity in that year was 12.6, farm velocity was only 4.7, while velocity of unincorporated businesses was 15.8. Corporate velocity in 1955 was 18.6; hence about half the differential between corporate and non-corporate velocities would disappear if agriculture were excluded from the calculations.

On the other hand, the unincorporated and incorporated business sectors differ in industrial composition. Trading firms, which usually have high velocity, are much more important in the former sector. Furthermore, unincorporated firms within any industry are probably smaller, on the average, than corporations. One would therefore expect the velocity of unincorporated firms to exceed that of corporations. Why such is not the case is a problem that cannot be examined here.

V. Why Velocity Has Risen since the End of the War

Earlier we considered and rejected two possible explanations of the postwar velocity rise. In Section II we saw that the similar behavior of three aggregate velocity measures since 1946 argues against hypotheses that imply differential behavior of velocities. In Section III we saw that the postwar velocity rise cannot be explained by weight shifts in favor of low-hoarding sectors. Insofar as weight shifts have had any effect at all, they have been velocity-reducing. We turn now to other explanations of postwar velocity behavior.

A strong case can be made for the view that much of the postwar velocity rise has been simply a recovery from abnormally low wartime values. The important question is *how much* of the rise has resulted from war-related factors, how much from more fundamental

and persistent forces. Clearly, the question can be answered only if we understand the nature of velocity changes during the war.

In an earlier study based entirely on aggregate data, I concluded that income velocity fell during the war for four major reasons:[34] an understatement of prices and income in official statistics (i.e., velocity fell less than the charts indicate, when actual prices and transactions are taken into account); a redistribution of money from high- to low-velocity sectors; an increased demand for money as people moved about the country and as the uncertainties of demobilization drew closer; and the accumulation of liquid assets of all types because of reduced opportunities to purchase consumer goods during the war.

The sectoral data of Section III partially confirm this analysis. For instance, the importance of weight shifts between 1939 and 1946 may be estimated by recomputing non-financial velocity in 1946 with 1939, rather than 1946, weights. Non-financial velocity was 9.0 in 1939 and 6.5 in 1946; it would have been 7.4 in 1946, had the 1939 weights been applicable in the later years. Thus more than one-third of the decline in non-financial velocity during 1940–46 resulted from weight shifts, consisting principally of a decline in the corporate sector's share of total money and a rise in the shares of the consumer, non-corporate, and federal sectors. It must be emphasized that these weight shifts have tended to persist since the end of the war. Hence, insofar as velocity fell during the war because of weight shifts, the subsequent rise in velocity cannot be regarded as "a recovery from abnormally low wartime values."

Other sector data that tend to confirm the conclusions of the earlier study but also support the hypothesis of a postwar return to normal velocity levels are reviewed below. However, for the corporate sector a rather different interpretation is needed.

IMPLICATIONS OF CORPORATE VELOCITY BEHAVIOR, 1939–47

Evidence presented in Section III strongly suggests that the decline in corporate velocity after 1941 was, to a great extent, a basic change unrelated to the special circumstances of a wartime economy. Chart 6 revealed a wide disparity in the velocity experience of large and small firms during the war. Large-firm velocities did decline slightly in 1942 and 1945, but the fall in aggregate corporate velocity during the war resulted largely from the severe decline among small and medium-sized firms, particularly the former. It is clear

34. *Studies in the Quantity Theory of Money*, pp. 227–29.

that most of this decline was not caused by wartime controls: by 1948, long after the controls had been lifted, small-firm velocities were still far below their 1939 and 1941 levels (Chart 6 and Table 9). Large-firm velocities, on the other hand, were already well above their 1941 peaks by 1947. Apparently, velocity had fallen permanently for small and medium-sized firms relative to large firms.

Actually, this convergence of corporate velocities was already taking place before Pearl Harbor. Velocity declined in all size classes in 1940—presumably because of increasingly easy money

TABLE 9

PER CENT RECOVERY FROM 1941–43 VELOCITY DECLINE BY 1948, NON-FINANCIAL CORPORATIONS, BY ASSET-SIZE CLASSES

SIZE CLASSES*	VELOCITIES		PER CENT RECOVERY FROM 1941–43 DECLINE: [COL. (2) ÷ COL. (1)] × 100
	1941 Minus 1943 (1)	1948 Minus 1943 (2)	(3)
1	14.23	4.83	33.9
2	14.20	5.53	38.9
3	12.18	6.05	49.7
4	9.73	5.43	55.8
5	6.90	5.07	73.5
6	4.34	4.14	95.4
7	3.54	5.61	158.5
8	2.89	4.59	158.8
9	0.11	3.88	3527.3
10	1.47	4.94	336.1
Total, all classes	4.06	5.21	128.3

* See note to Chart 6 for identity of size classes.

and uncertainty about the business outlook—and rose in all classes in 1941. However, while the declines of 1940 were roughly similar percentagewise among size classes, the rises of 1941 were not. For small firms the 1941 velocity rises were extremely modest, and the net movement during 1940 and 1941 was downward. Large firms, on the other hand, raised their velocity ratios substantially in 1941 and over the 2-year period as well.

As a preliminary to our analysis of these changes, let us compare the behavior of size-class velocities with their component ratios—spending to assets and assets to cash—during 1939–47.

Table 10 presents 1939-based indexes of size-class velocities and their components. Velocity and the ratio of assets to cash conformed quite closely to one another, the direction of change being the same

TABLE 10

CORPORATE SIZE-CLASS VELOCITIES AND COMPONENT RATIOS EXPRESSED AS RATIOS OF 1939 VALUES, SELECTED YEARS

SIZE CLASSES*	1941	1943	1946	1947
	Velocities			
1	0.931	0.518	0.504	0.583
2	0.994	0.525	0.564	0.638
3	1.030	0.578	0.653	0.726
4	1.045	0.641	0.748	0.804
5	1.080	0.736	0.900	0.938
6	1.136	0.861	0.993	1.074
7	1.159	0.876	1.092	1.190
8	1.227	0.967	1.110	1.290
9	1.078	1.067	1.160	1.352
10	1.218	1.063	1.118	1.394
	Ratios of Spending to Assets			
1	0.794	1.112	1.523	1.107
2	.788	1.176	1.496	1.260
3	.787	1.266	1.583	1.422
4	.759	1.373	1.691	1.556
5	.718	1.429	1.803	1.685
6	.679	1.544	1.864	1.772
7	.705	1.620	1.947	1.931
8	.748	1.637	1.903	1.916
9	.750	1.970	2.118	2.177
10	0.616	1.873	2.179	2.158
	Ratios of Assets to Cash			
1	1.173	0.466	0.331	0.526
2	1.262	.466	.377	.507
3	1.310	.457	.413	.511
4	1.376	.467	.443	.517
5	1.506	.515	.500	.557
6	1.674	.558	.533	.606
7	1.644	.541	.561	.616
8	1.640	.591	.583	.673
9	1.440	.542	.548	.621
10	1.974	0.568	0.513	0.646

* See note to Chart 6 for identity of size classes.

in thirty-three of forty instances recorded in the table. The ratio of spending to assets, however, conformed with velocity in only thirteen of the forty instances. In all classes this ratio was substantially higher, and the ratio of assets to cash substantially lower, in 1947 than in 1939. The convergence of velocities described above thus resulted largely from dissimilarities in behavior of spending-assets ratios. These ratios approximately doubled over the 8-year period for firms in the four largest classes, compared with a mere 8 per cent rise in the smallest class.

Earlier we saw that differences in the importance of firms without income help explain velocity differences between small and large firms at any point in time. By the same token, the differential velocity movements among corporate size classes are attributable in part to the diminished importance of deficit firms, as business conditions improved after 1940. In 1939, assets of deficit firms made up 27.4 per cent of total non-financial corporate assets; for firms with less than $50,000 assets, this figure exceeded 50 per cent. By 1943 the business climate had changed dramatically. Assets of deficit firms had fallen to 3.9 per cent of the total.

About a quarter of the velocity decline in the smallest class from 1939 to 1943 resulted directly from the increased profitability of business. However, this effect was trivial for firms with more than $100,000 assets and even for small firms after 1943.[35]

In one respect that seems important for velocity analysis the wartime business expansion differed sharply from typical peacetime expansions—credit markets remained easy. Short-term market yields were already extremely low in 1939 and remained under 1 per cent until 1947 or later. Bond yields eased somewhat during the war, while rates on bank loans fluctuated within a narrow range around their low prewar levels. The crude measures of interest costs for profitable firms in Table 5 show some decline in average rates paid

35. Compare the following velocity data for all firms and firms with net income:

	All Firms	Firms with Net Income
Under $50,000 assets:		
1939	34.42	29.31
1943	17.83	17.24
1946	17.34	16.26
$50,000–$100,000 assets:		
1939	30.28	28.90
1943	15.90	15.79
1946	17.09	16.67
$100,000–$250,000 assets:		
1939	26.94	26.56
1943	15.58	15.51
1946	17.60	17.31

by medium-sized and large firms between 1939 and 1943. From 1943 to 1946 the decline accelerated and was experienced by firms of all sizes.

The fact that velocity failed to rise during the only recent business expansion in which interest rates did not rise certainly suggests that interest rates are a significant velocity determinant. However, it seems unlikely that they alone could have produced the sharp velocity declines among profitable firms during the early war years. To some extent these declines may have resulted from curtailment of business spending because of emergency controls, but the substantial rise in spending-asset ratios from 1941 to 1943 and 1943 to 1946 (see Table 10) does not square well with this interpretation. Furthermore, if this was the reason for convergence of velocities during 1939–43, why did the convergence persist after controls had been removed?

There is another possible explanation for the wartime behavior of corporate velocity. Table 6 shows a substantial decline during 1939–43 in the importance of trade credit among small and medium-sized firms with net income. Among larger firms the reverse was true. Although various interpretations may be placed on these facts, the most convincing is that the war-induced prosperity produced a marked improvement in business credit-worthiness, particularly among smaller firms. Apparently, these firms were able to obtain funds from less costly sources than formerly, and cash balances were no longer a prohibitively expensive luxury.

CORPORATE VELOCITY SINCE 1947

By 1947 the four largest size classes had regained their 1941 velocity peaks, and the wartime episode was clearly over. Corporate velocity continued upward during 1948–50, except for a decline in 1949. The rise in 1948 and the fall in 1949 appear to have been a normal cyclical change that affected most firms in roughly the same manner. The sharp jump in velocity in 1950 was another matter, however: it was much sharper for small firms than for large firms, and the largest size class did not even recover to its 1948 cyclical peak. As a result, small-firm velocity rose more during 1948–50 than did that of large firms. Table 11 reveals that in all but the largest class the velocity rise consisted almost entirely of a rise in the ratio of total assets to cash rather than a rise in the ratio of spending to total assets. The latter ratio actually declined during this period of rapidly rising velocity in four of the five smallest size classes.

We can be fairly certain that these disparate velocity movements in 1950 did not result from a greater reliance on substitute (i.e., non-cash) sources of liquidity by small firms: large and small firms had approximately the same incentives to switch from cash into government securities. In addition, the facts do not support the money-substitute hypothesis. As Table 11 indicates, in all but the three largest size classes the ratio of government securities to cash was lower in 1950 than three years earlier. A substantial redistribution of corporate holdings of government securities took place in this period, but in exactly the opposite direction to that implied by the money-substitute hypothesis.

TABLE 11

PER CENT CHANGE IN VELOCITY, COMPONENT RATIOS, AND RATIO OF GOVERNMENT SECURITIES HOLDINGS TO CASH, NON-FINANCIAL CORPORATIONS, BY SIZE CLASSES, 1947–50

Size Classes*	Per Cent Change in Velocity	Per Cent Change in Ratio of Assets to Cash	Per Cent Change in Ratio of Velocity Numerator to Assets	Per Cent Change in Ratio of Government Securities Holdings to Cash
1.....	24.7	27.5	−2.2	−25.9
2.....	24.9	29.0	−3.2	−24.6
3.....	25.6	27.8	−1.7	−27.7
4.....	22.8	21.7	+0.9	−27.1
5.....	16.0	17.6	−1.3	−22.2
6.....	10.5	10.0	+0.5	−18.5
7.....	13.2	12.5	+0.6	− 9.1
8.....	7.6	4.6	+2.8	+ 7.7
9.....	15.0	12.8	+2.0	+44.6
10.....	11.3	4.5	+6.6	+91.4

* See note to Chart 6 for identity of size classes.

A more plausible interpretation of the events of 1950 is that they resulted from a differential tightening of credit among size classes. Bank loans expanded with great rapidity in the latter half of 1950, but the rate of expansion was considerably less for small than for large firms, at least in manufacturing.[36] Small firms, as we saw in Table 11, were adding to their assets at a faster rate than to their spending, but, to finance this buildup of assets, they were unable or unwilling to go into debt to anywhere near the extent that large firms were.[37] Instead, they liquidated investments and trimmed cash re-

36. See Federal Trade Commission–Securities Exchange Commission, *Quarterly Financial Report of Manufacturing Corporations* (2d quarter, 1951).

37. Thus firms in the smallest class increased accounts and notes payable by less than 4 per cent in 1950, and in the next to smallest class by 11 per cent; the largest

quirements in relation to other assets, with a consequent rise in velocity.[38]

Another factor that probably affected corporate velocity in 1950 was the Korean War and the partial military mobilization that accompanied it. Wholesale prices climbed by about 15 per cent in the last half of 1950, and expectations of inflation (or shortages) were widely held. In this situation businessmen hurriedly built up inventories. To some extent, cash balances were drawn down to finance this buildup, and velocity rose. Inventories data clearly indicate that small firms participated in this speculative surge to a much greater extent than did large firms.[39]

Beginning in 1951, there were important new developments. Although business conditions were good throughout most of the 1951–53 period, velocity fell moderately in the seven smallest size classes. At the same time it rose sharply in the two largest classes and moderately in the remaining class (class 8). A substantial convergence of size-class velocities had set in again. In all classes, velocity fell in 1954, a recession year, and rose in 1955, a year of vigorous recovery; and, in all classes, velocity was markedly higher by the reference-cycle peak year, 1957, than in 1953. However, the rates of increase during 1954–57 were uneven, varying directly with corporate size, and moderate additional convergence resulted.

Table 12 shows percentage changes in size-class velocities for the entire period 1950–57. Large firms, which hold the lion's share of corporate cash, were responsible for most of the velocity rise in this period. Table 12 and Chart 7 analyze these velocity changes in terms of their component ratios. As was true during 1948–50, velocity increases during 1951–57 consisted almost entirely of increases in the ratio of assets to cash. The table also shows, however, that these increases were not caused by shifts from cash to government securities: the ratio of government securities holdings to cash fell in all but the smallest class in this period; for non-financial corporations as a whole this ratio fell from 0.69 in 1950 to 0.54 in 1957.[40]

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class (class 10) increased these items by 28 per cent, while class 8 increased them by 46 per cent. The same tendency was true of bonds and mortgages payable. Computed from *Statistics of Income* (1949 and 1950), Part 2, Table 6.

38. The four smallest size classes reduced their investments in 1950, while the others (except class 9) increased them—sharply in the case of the largest class.

39. See *Statistics of Income* (1950), Part 2, Table 6.

40. On the other hand, the declines in this ratio were generally higher for small firms than for large firms, indicating that corporate holdings of government securities were redistributed from small to large firms—a change that is consistent with the observed pattern of velocity movements.

Corporate velocity movements during 1951–57 appear to have resulted from at least three distinct factors. First, the tendency for velocity to decline during 1951–53, except in the three largest size classes, seems to represent a reversal of that part of the 1950 rise that resulted from inventory speculation. We noted above that small firms participated in the 1950 movement to a greater extent than did large firms. It is not surprising, therefore, to find that small firms were more greatly affected by the cessation of inflationary pressures after early 1951. Second, there was a very modest redistribution of

TABLE 12

PER CENT CHANGE IN VELOCITY, COMPONENT RATIOS, AND RATIO OF GOVERNMENT SECURITIES HOLDINGS TO CASH, NON-FINANCIAL CORPORATIONS, BY SIZE CLASSES, 1950–57

Size Classes*	Per Cent Change in Velocity	Per Cent Change in Ratio of Assets to Cash	Per Cent Change in Ratio of Velocity Numerator to Assets	Per Cent Change in Ratio of Government Securities Holdings to Cash
1.....	4.4	− 2.5	+ 7.1	+12.5
2.....	0.8	+ 0.4	+ 0.4	−39.5
3.....	2.3	+ 3.1	− 0.8	−41.4
4.....	9.0	+ 8.3	+ 0.6	−32.1
5.....	10.8	+ 8.1	+ 2.5	−20.6
6.....	15.5	+13.7	+ 1.6	−19.8
7.....	13.0	+11.4	+ 1.4	−18.8
8.....	17.9	+22.5	− 3.7	−18.2
9.....	38.0	+18.8	+16.2	− 3.2
10.....	57.5	+50.1	+ 5.0	−14.6

* See note to Chart 6 for identity of size classes.

corporate holdings of government securities from small to large firms. Thus the two largest classes held 67.8 per cent of the total in 1950, compared with 71.0 per cent in 1957. We have already seen, however, that these holdings declined relative to cash, except in the smallest class. At most, therefore, this change played a minor role in the *differential* velocity movements during 1951–57; it does not explain the generally rising trend of corporate velocity, nor was it sufficiently powerful to account for much of the size-class differentials that we have observed.

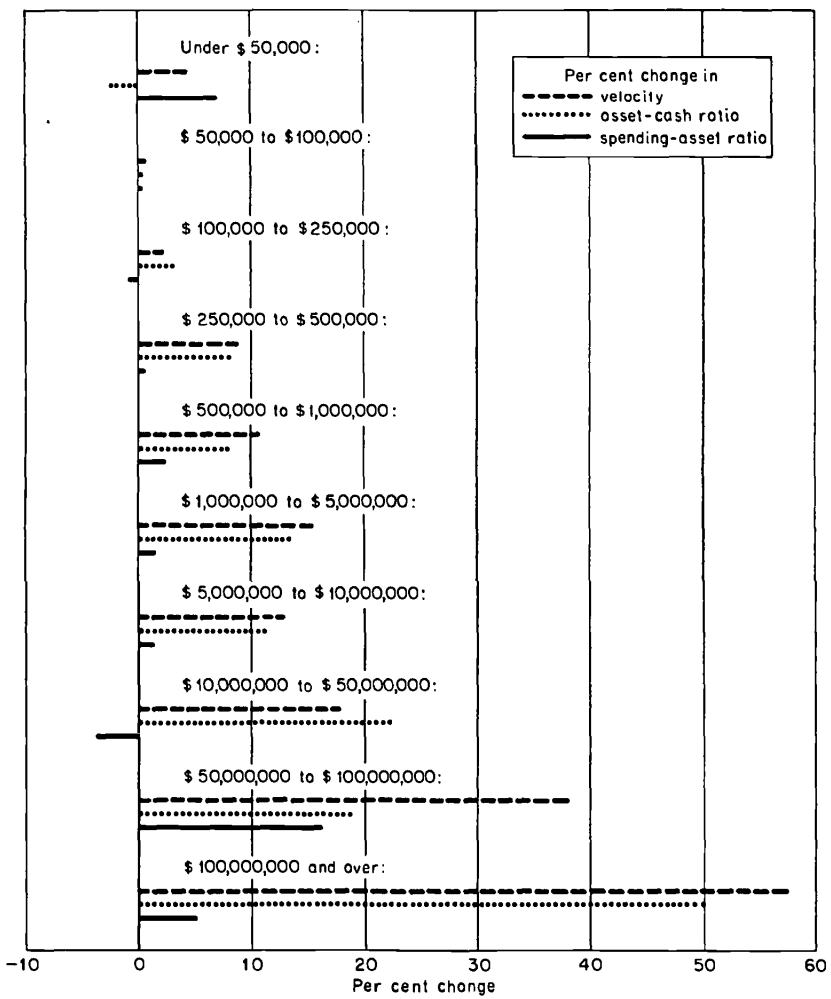
A third factor—the rising cost of holding money—seems a more promising explanation of these corporate velocity changes. The fact that interest rates rose during 1951–57 needs no documentation. The rise, particularly on short-term debt, was evident in all parts of the credit market. The question remains: Were interest-rate changes

during 1951–57 great enough to account for the observed velocity changes, and, if so, how can they explain the size-class differentials?

There seems to be no way of providing a definitive answer. Plausible arguments were presented above in support of the hypothesis that corporate velocity is a function of the cost of holding money; this hypothesis helps explain both size-class differentials at any

CHART 7

PER CENT CHANGES IN VELOCITIES, ASSET-CASH RATIOS, AND SPENDING-ASSET RATIOS, 1950–57, NON-FINANCIAL CORPORATIONS, BY SIZE CLASSES*



* Source: Table 12.

point in time and differential movements over time. During 1951–57 rates charged by banks on short-term loans to business rose from about 2¾ per cent to nearly 4¾ per cent in New York City. Commercial paper rates rose comparably, and bond yields rose by more than 50 per cent.[41] These were substantial changes, in my judgment fully adequate to account for velocity rises of the order actually experienced.

The differential velocity movements in this period present a greater problem. They can be partly explained by the fact that bank rates rose more on large loans than on small loans.[42] However, the size-class differentials depicted in Table 8 are much greater than one would expect solely because of a diminished spread between rates on large and small loans, particularly when it is recalled that

TABLE 13

PER CENT CHANGE IN CORPORATE VELOCITY, BY MAJOR INDUSTRY DIVISION, 1950–57

Major Industry Division	Per Cent Change in Velocity
Public utility	51.4
Agriculture, etc.	33.7
Mining and quarrying	32.2
Manufacturing	31.6
Trade	16.7
Service	12.6
Construction	11.5

small-firm velocity rose little in this period, despite significant increases in the cost of borrowed funds. It is possible that small firms, with a higher cost of holding money, had reached a relatively inelastic part of the demand curve for money by 1951. On this interpretation, even if the spread between the cost of holding money for small and large firms had remained constant during 1951–57, most of the actual convergence of size-class velocities might well have taken place.

The preceding discussion accounts for the rise in corporate velocity during 1951–57 and for the differential movements among size classes. In addition, it has the great merit of being consistent with differential movements among industries during this period. Table 13 gives percentage changes in velocity, 1950–57, by major industry

41. *Federal Reserve Chart Book on Financial and Business Statistics,* Historical Suppl. (September, 1958), pp. 41–46.

42. "Bank Rates on Short-Term Business Loans," *Federal Reserve Bulletin,* December, 1958, p. 1421, and Federal Reserve Bank of New York, *Monthly Review,* June, 1958, p. 84.

divisions. The rise was greatest in the public utility industry and least in construction; we saw earlier (Table 7) that large firms are most important in the former and least important in the latter. The relationship between the size structure of industry and the degree of velocity rise during 1951–57 is evident among the other industries as well: both manufacturing and mining and quarrying are characterized by relatively large firms, and both experienced sharp velocity increases; on the other hand, the trade and service industries, where small units predominate, lagged far behind. The only exception is agriculture.

Various other explanations of the rise in corporate velocity after 1950 might be advanced, some of them with a measure of plausibility. For instance, one might argue that the mildness of the 1948–49 and 1953–54 recessions, coupled with the growing realization that international tensions would not soon ease, caused a change in business expectations about the economic future.[43] Another possible factor might be cost pressures, particularly labor costs. Neither of these explanations, however, unlike the cost of holding money, can account for *differential* movements among both size classes and industries. In the final analysis, therefore, we come back to the cost of holding money as the critical variable determining corporate velocity changes, as well as an important variable determining differences among size classes at any point in time.

CONSUMER VELOCITY

The contribution of the consumer sector to non-financial velocity outweighs that of other sectors by a substantial margin (Table A-7). It is regrettable, therefore, that there are no data on cash behavior within consumer subgroups, such as exist for the corporate sector. This is all the more unfortunate because the consumer sector includes such diverse elements as households of greatly varying circumstances and personal trusts. Nevertheless, despite this lack, one can make reasonable inferences about the determinants of postwar consumer velocity behavior. As with corporations, the first problem is to separate the transitory war-related movements from other velocity changes.

One of the more interesting facts shown in Chart 3 is the sizable decline in consumer velocity in 1940 and 1941, before the American

43. Milton Friedman places heavy emphasis on "the public's expectations about the likely degree of economic stability." See his discussion along these lines in *Towards a Firmer Basis of Economic Policy: 41st Annual Report, National Bureau of Economic Research* (New York, 1961), pp. 41–42.

economy was placed under full-scale mobilization. Some of this decline may have resulted from growing concern with the international situation as it affected the economic future. In addition, by 1941 the military buildup was causing many geographical and occupational shifts among the population—factors which may have increased the demand for money. In my judgment, however, neither of these explanations can account for declines of the size experienced, particularly when it is realized that other developments, such as the growing fear of inflation and prospective wartime shortages, were tending to raise consumer velocity. It seems reasonable to conclude that another force—rapidly rising per capita real income—was pulling consumer velocity down in these years. Households apparently wish to "consume" more of the services of cash as their incomes rise; that is, their desired cash balances rise faster than expenditures.[44] It appears that this income effect was largely responsible for the declining trend of income velocity for a century or more prior to World War II.

There is no reason to think that it has not continued to operate since 1939. On the contrary, developments since then are consistent with two important implications of the income effect. Other things remaining the same, a rise in income will cause a decline in household velocity relative to non-household and aggregate velocity; in addition, the household share of total cash will rise.[45] During the 1939–56 period, consumer velocity fell relative to velocity in other fund-flow sectors, and consumer cash holdings rose relative to total cash.

If the above interpretation is accepted, it becomes clear at once that much of the decline in consumer velocity during 1942–45 resulted from the rapid increase in real income per capita rather than from transitory factors associated with wartime economic policy. A straight projection of the 1939–41 trend yields a consumer velocity figure midway between the actual 1947 and 1948 values, but this probably exaggerates the strength of the income effect and underplays the transitory war-induced changes. Whether or not these transitory changes had worked themselves out by 1948 is questionable, since consumer velocity continued to rise during the recession

44. The income effect is discussed further in *Studies in the Quantity Theory of Money*, pp. 205 ff. One can postulate conditions under which the income effect applies to businesses and governments (see Friedman, *The Demand for Money; Some Theoretical and Empirical Results*). However, the effect seems most clearly relevant to households.

45. However, the household share could fall as income rises if a sufficiently extensive decline in vertical integration occurred at the same time.

year 1949. However, by 1949 three years had passed since the armed forces had been demobilized and price controls terminated; the preliminary phase of postwar inflation had come to an end the year before, and non-price rationing was a thing of the past. It therefore seems reasonable to conclude that the postwar adjustment period was over for the consumer sector no later than 1949. Taking this as the pivotal year, then, 1941–56 is subdivided into distinct periods—1941–49 and 1950–56—subject to largely different velocity determinants.

During the first of these periods, consumer velocity probably would have fallen because of the rapid income rise, if for no other reason. But there were other reasons for the decline, which, taken together, were more important than the income effect. Three of them were mentioned earlier:[46] (1) understatement of household expenditures because of unrecorded transactions and understated prices; (2) an increased demand for money as people moved about the country and faced uncertainties of various sorts; and (3) a reduction in opportunities to purchase consumer goods during the war. A fourth reason must be added: the high marginal rates of taxation during the war, which reduced the attractiveness of income-earning assets.

The first two reasons are clear enough, though difficult to document. Both probably imply an increased demand for currency relative to demand deposits, and the currency ratio did rise sharply during the war.[47] The third reason requires brief elaboration. There is little question that wartime economic policy did effectively narrow the range of alternatives available to households in disposing of income. Gas rationing and the cessation of civilian automobile production early in 1942 were probably most important in this respect, but spending opportunities were also curtailed by many other changes directly related to the war—for example, the transfer of millions of civilians into the armed forces. The main impact was on expenditures for consumer durables, which fell in 1942 and 1943 and were still well below the 1941 level at the end of the war. The released income did not spill over into spending on non-durables: the ratio of non-durables expenditures to personal disposable income fell sharply during this period. The ratio of total personal consumption ex-

46. See p. 513.

47. For a full discussion of factors responsible for the rise in currency during the war see Phillip D. Cagan, *The Demand for Currency Relative to Total Money Supply* (National Bureau of Economic Research, Occasional Paper No. 62 [New York, 1958]).

penditures to disposable personal income fell from its customary prewar peacetime level of about 0.95[48] to 0.880 in 1941, 0.763 in 1942, 0.753 in 1943, 0.748 in 1944, and 0.809 in 1945.

Granted that wartime economic policy restricted consumption expenditures, the question remains why households added to holdings of cash rather than other liquid assets. The answer seems to be that households allocated their released funds broadly among all types of liquid assets. Life insurance reserves, commercial bank time deposits, savings and loan shares, postal savings—all these, as well as cash and savings bonds, increased substantially during the war. All that was necessary for declining velocity (as we have defined it) was that some, even a minor, part of the newly acquired assets consist of money. Such an outcome, of course, is to be expected on the basis of the theory of optimum income and wealth allocation, given the general stable pattern of asset yields. When these yields are taken net of taxes, as they should be, it is all the more understandable that households were content to build up their cash balances.

Assuming that the rise in consumer velocity during 1946–49 was mainly a reversal of the transitory wartime velocity movements, we are left with the somewhat puzzling phenomenon of a persistent rise in consumer velocity after 1949. Other things being equal, the income effect should have caused consumer velocity to fall in this period, since income per capita rose. Obviously, however, other things were not equal. The outbreak of the Korean War in June, 1950, led to increased purchases of consumer durables, because of anticipated price rises and shortages; consumer velocity therefore rose. Even more enduring forces were pushing consumer velocity upward after 1950: interest rates were rising, especially yields on savings and loan shares and other liquid assets; consumer credit was becoming increasingly available (after Regulation W lapsed early in 1952); and the marginal utility of precautionary balances had decreased. This last factor was a result of numerous social changes during the preceding decade, as well as the unexpected mildness of the 1948–49 recession,[49] and the growing realization after 1950 that the cold war would impart a buoyancy to the American economy for many years to come. It is also possible that consumer demand for money fell because households in this period came increasingly to believe in the inevitability of inflation. Let us examine these forces more closely.

The limited nature of the impact of the Korean War on consumer

48. It was 0.95 in 1929, 0.96 in 1939, and 0.945 in 1940.

49. See Milton Friedman in *Towards a Firmer Basis of Economic Policy*.

velocity is indicated by the behavior of consumption expenditures during 1950 and 1951. Purchases of consumer durables, seasonally adjusted, fell in the final quarter of 1950, after a sharp third-quarter increase. Although they increased again in the first quarter of 1951, in the second quarter of that year they were barely above the 1950 second-quarter figure; in the third and fourth quarters of 1951 these purchases were well below figures of a year earlier. Similarly, the ratio of total consumption expenditures to disposable income, after rising sharply in the first three quarters of 1950, fell even more sharply in the final quarter of the year. The ratio rose again in the first quarter of 1951 but once more reverted to low levels for the remainder of the year. In part these developments may be attributed to Regulation W, which was re-established on September 18, 1950, and remained in effect until May 7, 1952. In any case, it does not seem reasonable to attribute a significant part of the rise in consumer velocity after 1950 to the direct influence of the Korean War.

Whether or not inflationary expectations were responsible for an important part of the 1951–56 rise in consumer velocity is more difficult to determine. Inflation was inconsequential during most of the period: wholesale prices were either stable or declining from early 1951 to mid-1955, and the BLS Consumer Price Index changed little from mid-1952 to early 1956. Nevertheless, the mildness of the 1948–49 recession, together with the continuation of the cold war, apparently convinced many that deflation could not be expected for a long time to come and that long-run price-level movements were likely to be upward. The mild 1953–54 recession provided additional support for this view. It is noteworthy that yields on common stocks fell sharply, while bond yields edged upward, throughout the period, possibly indicating a growing concern about the future value of money. At the same time, however, it must be noted that household holdings of equities and tangible assets, which appreciate during inflation, grew no faster than holdings of fixed claims in this period.[50] Everything considered, inflationary expectations, while perhaps a contributing factor, do not seem to have been strong enough to account for a major part of the observed rise in consumer velocity during 1951–56.

Higher interest rates also may have been partly responsible for the rise in consumer velocity after 1950, but it is not at all clear which interest rates are most relevant to the consumer sector. The

50. Based on preliminary estimates by Raymond W. Goldsmith in a manuscript in preparation for the National Bureau of Economic Research series on postwar capital markets.

demand for money of high-income households and personal trusts may well be sensitive to yields on long-term tax-exempt securities and Treasury bills; that of high- and middle-income households, to yields on liquid fixed claims; and that of middle- and low-income households, to costs of consumer and mortgage credit. I know of no way to estimate the relative importance of changes in various kinds of interest rates. All interest rates increased during 1951–56, with the possible exception of rates on consumer instalment loans. Though the latter rates may not have risen, the volume of household debt increased enormously in these years, and the cost of credit became a determinant of the demand for money for a larger proportion of households. The fact that consumer velocity rose even in 1954 suggests that, for this sector, the volume of debt outstanding and the level of yields on fixed claims, both of which rose in that year, are more important velocity determinants than market rates of interest, which fell.

Finally, numerous other social changes that impinge on consumer velocity were taking place at accelerated rates throughout the postwar period. I have mentioned the reduced importance of precautionary balances to households. In part this reflects a reduction in the level of uncertainty (because of the diminishing volatility of personal incomes, for example) and in part the development of noncash buffers against uncertainty. Among the latter changes are the rise of medical and unemployment insurance and, more significantly, the increased availability of credit to households. Credit became more available because of federal government legislation in the residential mortgage field, the growth of credit life insurance, and the increased use of credit cards, to mention only a few of the changes in this area. It is also possible that the great expansion of household debt, most of it instalment debt, decreased the demand for money, for transactions purposes as well as for precautionary purposes, by shortening intervals between receipts and payments for households. Of course, all the velocity determinants mentioned in this paragraph were operating before 1951–56, the period we have been examining, and in some cases they were operating even before World War II. It is not obvious that they suddenly increased in importance after 1950.

We are left in the unsatisfactory predicament of being unable to choose among several plausible alternatives. One thing is clear, however: with the exception of real income per capita, all the factors

that appear to be relevant to the household demand for money were operating to increase consumer velocity after 1950. It is therefore not surprising that consumer velocity did rise during 1951–56, even though we cannot determine precisely why.

POSTWAR VELOCITY CHANGES IN OTHER SECTORS

The two sectors already analyzed have dominated postwar velocity movements, since they hold nearly two-thirds of the total money stock. Nevertheless, three other sectors, smaller in terms of money holdings, also merit brief attention.

The most important of the three is the non-corporate sector, which in recent years has held about one-sixth of all money. We saw in Chart 3 that non-corporate velocity closely resembled consumer velocity in its movements throughout 1939–56 and particularly after 1945. This is not surprising in view of the general lack of rigorous accounting separation between household and business or farm transactions and cash balances, together with the relatively simple decision-making structure within most farms and unincorporated enterprises. The considerably higher *level* of non-corporate velocity presumably results from the importance of high-velocity trading firms in this sector.[51]

Next in importance is the state and local sector. It seems likely that higher short-term interest rates have had an important impact on state and local velocity. Like their business counterparts, financial officers of these governments have discovered that the Treasury bill market affords opportunities for using temporary cash accumulations to supplement income. Higher bond yields undoubtedly have also had some effect on state and local velocity by causing officials to trim cash balances to the minimum in order to reduce high-cost borrowing.

Finally, there is the federal government sector, whose velocity has been influenced in an upward direction by the desire to avoid debt increases—not so much to minimize interest costs but rather as a basic article of political faith. The Eisenhower Administration, in particular, regarded any increase in the national debt as a major evil and recognized that the reduction in cash balances was a substitute for borrowing.

51. The 1957 income of unincorporated enterprises was $43,298,000, of which enterprises in wholesale and retail trade accounted for $11,987,000, or more than one-fourth (U.S. Department of Commerce, *U.S. Income and Output* [Washington, 1958], Table VI-4).