

MONETARY TRENDS IN THE UNITED
STATES: A REGIONAL ANALYSIS

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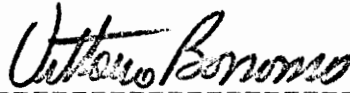
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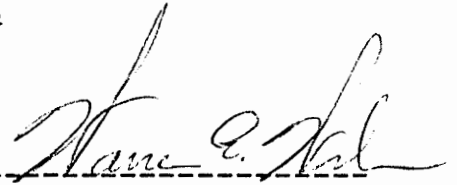
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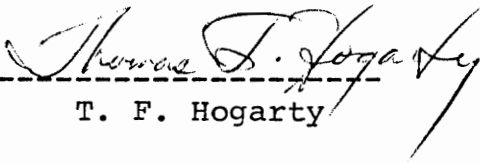
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INTRODUCTION

"It would come as no surprise to find that a velocity series for the Eastern half of the U.S. was nearly identical to a velocity series for the Western half."

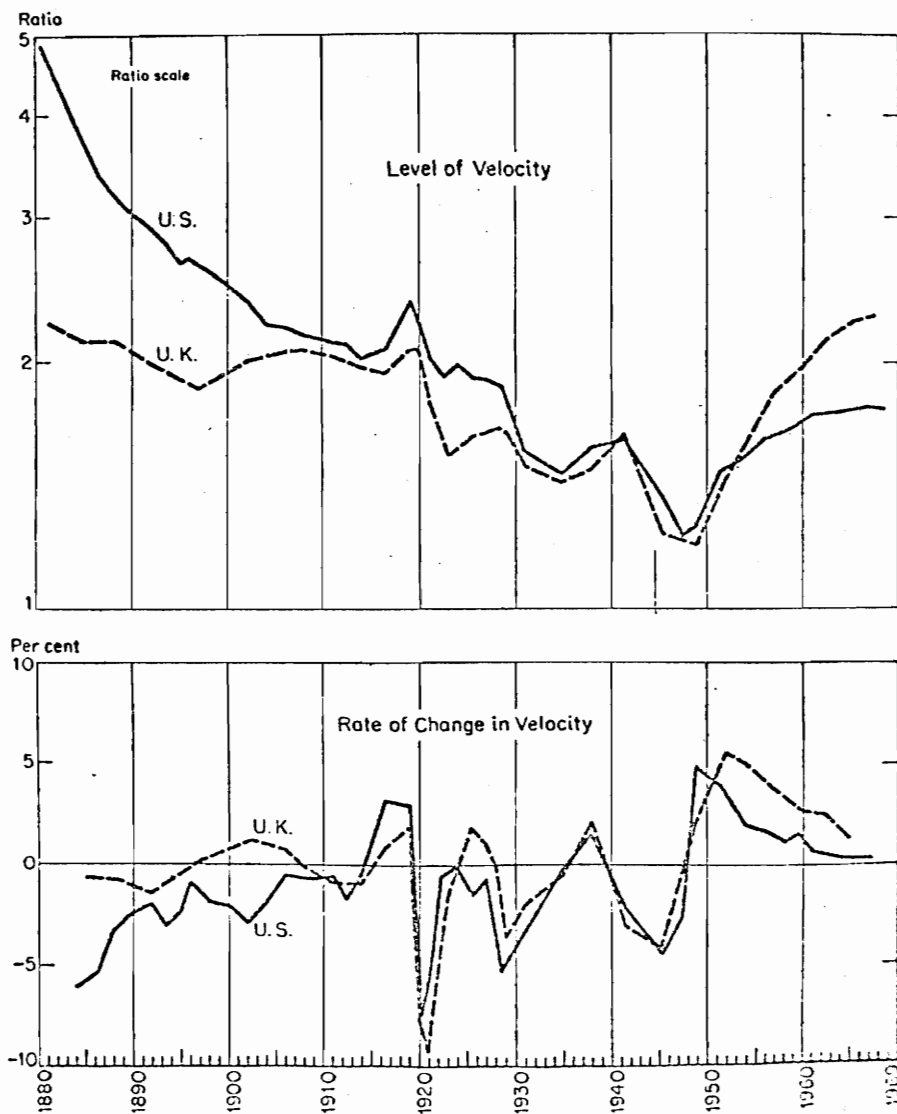
Milton Friedman and A.J. Schwartz

Professors Milton Friedman and Anna Schwartz have recently been investigating monetary trends in the United States and the United Kingdom, the results of which will ultimately be published by the National Bureau of Economic Research. In two preliminary reports on this study, much emphasis has been placed on the "near-identity" of the M2 velocity series of the two countries.¹ As the chart in Figure 1 illustrates, the two series exhibit surprising similarities with respect to both velocity levels and changes, although one might argue that "near-identity" overstates these similarities. In any case, Friedman and Schwartz feel that the closeness of the two velocity series has several major implications:

¹Milton Friedman and Anna J. Schwartz, in Annual Report of the National Bureau of Economic Research-1972, pp. 29-32, and Milton Friedman, "Monetary Trends in the United States and the United Kingdom," The American Economist, XVI, (Spring-1972), pp. 4-17. The money measure in these velocity series is M2, which includes currency, demand deposits and time deposits.

FIGURE 1

M2 VELOCITY IN THE UNITED STATES
AND THE UNITED KINGDOM



Source: National Bureau of Economic Research,
52nd Annual Report, (1972), p. 31.

- (1) The U.S. and U.K. are in the same economic world; that is, they are part of the "same economic total in a very fundamental sense."
- (2) Attempts to identify the determinants of velocity should not place emphasis on "phenomena that are peculiar to a single country", but rather concentrate on forces common to the two countries.
- (3) In respect to the demand for money, "it looks very much as if the conditions of demand for money are the same for both countries and have been the same for over 90 years."¹

As the quote at the beginning of this thesis indicates, Friedman and Schwartz feel that their preliminary results suggest that similar results would be obtained in any analysis of velocity trends among regions within any single country, e.g. the U.S. Obviously the U.S. is a closely integrated economic unit in comparison to the economic world in which the U.S. and the U.K. are contained. The question of the similarity of velocity trends for regions within the U.S. is a central topic of this thesis.

Friedman adds an additional hypothesis for velocity in the U.S.; namely, that velocity will be relatively less stable for small areas than for broader regions. To predict the change in total income in Illinois, Friedman would prefer the change in the U.S. money supply to the change in the Illinois money stock since:

...there are going to be all sorts of random and erratic factors that will distort the money supply in Illinois alone and its relation to income. A broader total will be much more stable. Illinois

¹Friedman, The American Economist, pp. 11-13.

has to move the way the rest of the U.S. moves.¹

The major purpose of this paper will be to test several of the hypothesis advanced by Friedman in his preliminary reports on monetary trends in the United States and the United Kingdom. The testing procedures here will center on inter-regional monetary trends in the United States; data from other countries will not be tested. As far as we can ascertain, the regional data developed for this research is unique in that money stocks were calculated on a state by state basis, a procedure which required the estimation of state currency stocks (demand and time deposits are available on a state basis).

Although several issues from monetary economics will be discussed here, an emphasis will be placed on income velocity. This topic always receives much attention from quantity theorists, since velocity forms the link between the money supply and nominal income. Thus the study of velocity, including its stability and its major determinants, are an important part of the quantity theorists' explanation as to how changes in the money supply affect economic activity.

In the first chapter of the thesis, I discuss in detail the implications and possible interpretations of the one economic world hypothesis. I consider velocity levels as well as changes in velocity, using several regional delineations. The data that will be utilized throughout this thesis is described

¹Ibid., p. 12.

and presented in the appendix to that chapter. In Chapter II, I consider what shall be called Friedman's Illinois hypothesis; namely, that the national money supply is a better predictor of state income than the state money supply.

In Chapter III, the recent research by J.P. Gould and C.R. Nelson, which seems to indicate that velocity changes in the U.S. have followed a random walk, is examined and evaluated. The implications and relevance of the Gould-Nelson findings to Friedman's work will be discussed, along with an extension of some of Gould and Nelson's empirical tests to our regional data.

In Chapter IV additional topics raised by Friedman's research are examined. For example, I consider the question: what are some of the determinants of velocity and what influence have financial institutions had on velocity changes? Chapter V contains a summary of the major findings of this research.

CHAPTER I

VELOCITY TRENDS IN THE UNITED STATES

On an intuitive basis, it seems that a virtual identity of the velocity series of two regions is more than enough to indicate the existence of one economic world (i.e., the existence of interregional economic integration); and that the only necessary condition is that changes in the velocity series of the two regions move in the same direction. Velocity displays a distinct cyclical pattern, rising in prosperous times and falling during depressions.¹ If two countries (or two regions) have similar patterns of economic activity, their velocity series will change in the same direction, even though velocity levels may be quite different. If the velocity series of two areas move together for an extended period, this certainly implies that common forces are influencing both economies; perhaps interdependencies in the export-import market or in financial markets cause incomes and money stocks to move consistently in the same directions. Friedman would say that excess cash balances in region A would be spent on goods and

¹Wartime prosperity may be an exception to this. WWI prosperity was not an exception; velocity did increase. However, in WWII velocity fell significantly, perhaps because of rationing and the low interest rate policy of the Treasury, factors which did not influence the WWI situation.

services, some of which would come from region B. He would go on to argue that excess cash balances would spread out over regions (or countries) via financial markets, in the form of loanable funds seeking the highest rate of interest.¹ Friedman does not mention the possibility that both countries could be heavily influenced by some common force, such as a war effort, a drought, or similar fiscal and monetary policies.

In the case of the U.S. and the U.K., it is not hard to offer a plausible explanation for the similar movements in velocity. First of all, it should be noted that the two series do not move together in all periods (see Figure 1), particularly from 1885-1915, 1924-1927, and 1949-1952. The period which comes closest to a "near-identity" as to direction and rate of change in velocity for the two countries is the period from 1910-1948. Prior to 1910, there were several periods when the series moved in opposite directions. Since 1948, both countries have experienced an upward movement in velocity, but not necessarily at the same rate. Probably the common forces influencing both economies for the 1910-1948 period were the two World Wars and the Great Depression; the U.S. and U.K. were very much of the same economic world during those periods. In more normal times, the velocity series of the U.S. and U.K. have gone their separate ways to some ex-

¹Friedman, The American Economist, pp. 14-15.

tent, indicating that economic interdependencies between the U.S. and U.K. were the strongest during crises periods.

There is no reason to expect that the ratio of Y to M (velocity levels) for any two segments of one economic world should be equal, unless the factors which determine the demand for money are similar and that these factors are changing in a uniform manner. Possible factors here are income levels, wealth, interest rates, financial institutions, and others. Obviously, there are important differences in some of these determinants in the case of the U.S. and Great Britain, as well as among regions of the U.S. Why then, is there a fairly close correspondence between velocity levels in the U.S. and Great Britain? One possible explanation is that Great Britain approximates the median region in the U.S.¹ Of course, this explanation implies that interregional velocity levels in the U.S. are different. This brings us to our examination of the evidence concerning interregional velocity changes and levels in the U.S.

The Evidence - Velocity Changes

To estimate the relationship between changes in regional velocity and changes in national velocity, we used the follow-

¹Another possibility is the net effect of the conditions which determine the demand for money is roughly the same. Perhaps the effect of higher per capita incomes in the U.S. is offset by the tendency for the costs of holding money to be higher in the U.S. relative to Great Britain.

ing regression:

$$\Delta \log V_r = \alpha + B(\Delta \log V) + \mu$$

where V_r is regional velocity and V is United States velocity.¹ In effect, this regression tests how closely regional velocity changes follow changes in national velocity. Two measures are of crucial importance here:

- (1) The R^2 's indicate how consistently regional velocity follows changes in national velocity. This is perhaps the best measure of interregional economic integration. If the changes in the velocity series of a state or region are perfectly correlated with changes in U.S. velocity, the R^2 will be 1.0. This would be a strong indication that regional Y and M are heavily influenced by economic activity outside the region, or perhaps by internal factors which are homogeneous across all regions.
- (2) The B coefficients estimate the elasticity of regional velocity relative to U.S. velocity. If the B coefficient differs significantly from 1, this means that the magnitude of the regional change is significantly different from the percentage change in U.S. velocity. If the B coefficient is not significantly different from 0, this means the magnitude of the regional change is unrelated to the percentage change in national velocity.

Table 1 summarizes the results of the above regression for the M2 measure of velocity. The "regions" here are the 48 states; the time period is 1929-1971.

The most striking characteristic of the results in Table 1 is the wide range and overall diversity of the R^2 's.

¹Maximum likelihood estimators were employed here to surmount autocorrelation problems. To do this, the SEARCH option of the Regression Analysis Program for Economists (RAPE) was used (by William J. Raduchel of Harvard). The regional velocity series use personal income as the income measure, since this is the only income measure available on a state by state basis.

TABLE 1

STATE M2 VELOCITY CHANGES RELATIVE TO NATIONAL
M2 VELOCITY CHANGES, 1929-1971.

$$\Delta \log V_R = \alpha + B(\Delta \log V) + \mu$$

State	R ²	B Coefficient	Standard Error of B
Alabama	.548	.87190	.12672
Arizona	.304	1.1489	.27847
Arkansas	.240	.77675	.22132
California	.828	1.0962	.080014
Colorado	.537	.96546	.14353
Connecticut	.781	1.0327	.08763
Delaware	.516	1.0252	.15908
Florida	.231	.64934	.18983
Georgia	.662	.84883	.097114
Idaho	.344	1.1528	.25505
Illinois	.529	* .58437	.089174
Indiana	.581	.93768	.12745
Iowa	.153	.58860	.22165
Kansas	.525	1.0515	.15999
Kentucky	.628	.91949	.11337
Louisiana	.524	1.0079	.15389
Maine	.673	1.0770	.12031
Maryland	.573	1.0328	.14271
Massachusetts	.338	1.0743	.24067
Michigan	.120	.62758	.27246
Minnesota	.626	.91248	.11283
Mississippi	.471	1.1960	.20289
Missouri	.781	* .80332	.06820
Montana	.333	.95937	.21718
Nebraska	.137	.60348	.24244
Nevada	.088	.71301	.36708
New Hampshire	.693	.87961	.093692
New Jersey	.818	.91012	.068816
New Mexico	.363	.92441	.19599
New York	.509	.97987	.15420

TABLE 1--Continued

State	R ²	B Coefficient	Standard Error of B
North Carolina	.265	.67545	.18000
North Dakota	.086	.74653	.38908
Ohio	.530	.82213	.12390
Oklahoma	.580	1.0147	.13820
Oregon	.555	.93239	.13355
Pennsylvania	.846	* .80299	.05478
Rhode Island	.756	.98675	.089577
South Carolina	.110	.59558	.27084
South Dakota	.175	1.1277	.39256
Tennessee	.444	.73952	.13244
Texas	.624	.87012	.10806
Utah	.338	.85052	.19055
Vermont	.619	.91026	.11437
Virginia	.666	.95537	.10837
Washington	.573	.87657	.121177
West Virginia	.463	* .70974	.12229
Wisconsin	.361	.83753	.17830
Wyoming	.596	.97470	.12843

* = Significantly different from 1 at the 95% level.

This indicates that some states are relatively isolated from external economic forces or are only sporadically affected by them, while other states are more heavily and consistently influenced by outside economic activity. For instance, North Dakota's velocity series is the least correlated with the national series (R^2 of .086), while Pennsylvania follows the national series the most closely (R^2 of .846). Generally speaking, states in the Northeast tend to have higher R^2 values, while states in the South and West have lower R^2 values. There are several notable exceptions to this generalization; for instance, California has one of the highest R^2 (.828), while Massachusetts' R^2 value is relatively low (.338).

The amount of information derived from the B coefficients is somewhat limited by the rather large standard errors associated with many of them; apparently there is a high degree of instability in the relationship between many state velocity series and the national series. For the M2 measure of velocity, all the B coefficients except for two (Nevada and North Dakota) are significantly different from 0, indicating the magnitude of state velocity changes is significantly related to national velocity changes in 46 of 48 cases. There were only four cases where B differed significantly from 1, indicating that the states were more heavily and consistently influenced by internal economic forces as opposed to aggregate external

influences.¹

For the M1 measure of velocity the results are similar; B is significantly different from 1 in seven cases, while the coefficients of determination fall in approximately the same range as with the M2 measure.² Again, this wide variance in the R²'s indicates that some states are relatively unaffected by external economic activity while other states are more heavily influenced by outside forces.

The state groupings which serve as proxies for the Federal Reserve Districts display a somewhat different pattern. Table 2 summarizes the results of the same regression for both the M1 and M2 measures of velocity for these 12 regions (see Appendix I for exact state groupings). The major difference between the results for these broader regions and those of the states is that the R²'s associated with the 12 regions are generally higher and vary over a narrower range (from .50 to .91 for the M2 measure). Undoubtedly the use of broader regions promotes greater stability in regional velocity series.

¹The states where B was significantly different from 1 were Illinois, Missouri, Pennsylvania and West Virginia. The high standard errors associated with many other states' B coefficients prevented us from placing them in this same category.

²B was significantly different from 1 for Michigan, New Jersey, New York, Ohio, Vermont, and once again Pennsylvania and West Virginia. Also, Nevada and North Dakota have B coefficients which do differ significantly from 0. It should be noted that high standard errors were again associated with many of the coefficients.

TABLE 2
 VELOCITY CHANGES OF THE PROXY FEDERAL
 RESERVE DISTRICTS RELATIVE TO
 NATIONAL VELOCITY CHANGES
 $\Delta \log V_R = \alpha + B(\Delta \log V) + \mu$

Proxy Federal Reserve District	District Number	M1 1929-71			M2 1929-71		
		B	Standard Error of B	R ²	B	Standard Error of B	R ²
Boston	1	1.011	.088	.774	.956	.116	.637
New York	2	*1.368	.179	.599	.980	.154	.509
Philadelphia	3	*.826	.051	.869	.915	.045	.913
Cleveland	4	*.759	.118	.513	.822	.124	.530
Richmond	5	.818	.103	.617	.832	.099	.644
Atlanta	6	.925	.116	.620	.886	.100	.657
Chicago	7	*.847	.056	.853	*.764	.118	.516
St. Louis	8	.958	.089	.748	.862	.085	.724
Minneapolis	9	1.036	.152	.544	.958	.150	.503
Kansas City	10	.995	.141	.560	.987	.129	.598
Dallas	11	.892	.12	.591	.874	.107	.630
San Francisco	12	.919	.097	.698	1.104	.073	.853

*Significantly different from one

Whether or not these broader areas are superior regional delineations is a moot point. One could argue that state data is too disaggregated and unstable; while on the other hand, one could argue that aggregation of the states into broader regions "averages out" the states which deviate from regional patterns.

The greater stability of the regional series is also evidenced by the lower standard errors of the B coefficients in Table 2. For the M1 measure of velocity, B is significantly different from 1 in four cases, while for the M2 measure B is significantly different from 1 in only one case.¹ Once again, the overall picture here is one where regional velocity series tend to change with the national velocity series, with the magnitudes of the regional changes being significantly different from the national change in a few cases. This tendency for regional Y/M to change with national Y/M is evidence that one economic world does exist to some extent, meaning that significant interregional economic relationships are present.

Another way of looking at this same problem is to consider the data on just a yearly basis; for instance, if national velocity is increasing, how many states (or regions) are following along with increases in that same year? Table 3

¹For M1, B is different from 1 for Districts 2-4, and 7. For M2 the only case is District 7.

summarizes the results of whether first differences in velocity are positive or negative, for both the M1 and M2 measure of velocity. Several important patterns are obvious in this table:

- (1) The majority of states and regions follow the change in the national measure of velocity in most years.
- (2) In almost all years there are at least a few states where velocity changes in the opposite direction from the national change. Even when broader regions are used, there is opposite movement in approximately two-thirds of the years in question.
- (3) The distinct cyclical nature of velocity is quite apparent, particularly with the M2 measure of velocity. The changes associated with the depression, WWII, and the recessions of the 1950's are all apparent.

Of course, this analysis does not take into account the magnitude of the changes; nevertheless, it is additional evidence that state and regional velocity changes don't always follow the national change. One may still argue that the U.S. is "one economic world", but such a statement would have to be qualified by adding that some regions or states are more a part of that "world" than others. The coefficients of determination in Tables 1 and 2 may be the best summary measures of economic interdependencies. In any case, there is diversity in interregional changes in velocity. The question really involves the degree of economic integration among regions, and not the existence or nonexistence of one economic world.

TABLE 3

FIRST DIFFERENCES IN STATE VELOCITY AND REGIONAL VELOCITY
RELATIVE TO NATIONAL VELOCITY, 1929-1971

Year	$\Delta U. S.$	<u>M1 Measure</u>				$\Delta U. S.$	<u>M2 Measure</u>			
		$\Delta State$		$\Delta Region$			$\Delta State$		$\Delta Region$	
		+	-	+	-		+	-	+	-
1929-30	-	4	44	1	11	-	3	45	0	12
1930-31	-	7	41	0	12	-	5	43	0	12
1931-32	-	9	39	0	12	-	8	40	0	12
1932-33	-	26	22	6	6	+	36	12	8	4
1933-34	+	32	16	7	5	+	35	13	8	4
1934-35	-	18	30	3	9	+	28	20	7	5
1935-36	-	12	36	1	11	+	30	18	8	4
1936-37	+	18	30	6	6	+	22	26	8	4
1937-38	-	20	28	3	9	-	13	35	0	12
1938-39	-	15	33	2	10	-	23	25	7	5
1939-40	-	15	33	2	10	-	33	15	9	3
1940-41	+	38	10	10	2	+	47	1	12	0
1941-42	+	31	17	10	2	+	46	2	12	0
1942-43	-	0	48	0	12	+	1	47	1	11
1943-44	-	4	44	1	11	-	1	47	1	11
1944-45	-	0	48	0	12	-	0	48	0	12
1945-46	-	5	43	1	11	-	2	46	0	12
1946-47	+	43	5	12	0	+	43	5	11	1
1947-48	+	47	1	12	0	+	47	1	12	0
1948-49	-	26	22	5	7	-	23	25	5	7

TABLE 3--Continued

Year	ΔU. S.	M1 Measure			ΔU. S.	M2 Measure				
		ΔState	ΔRegion	ΔState		ΔRegion				
		+	-	+	-	+	-	+	-	
1949-50	+	44	4	11	1	+	45	3	11	1
1950-51	+	46	2	12	0	+	48	0	12	0
1951-52	+	28	20	7	5	+	25	23	8	4
1952-53	+	29	19	10	2	+	25	23	8	4
1953-54	+	29	19	7	5	-	9	39	12	0
1954-55	+	38	10	11	1	+	38	10	12	0
1955-56	+	46	2	12	0	+	46	2	12	0
1956-57	+	46	2	12	0	+	41	7	12	0
1957-58	+	32	16	10	2	-	11	37	2	10
1958-59	+	28	20	8	4	+	26	22	8	4
1959-60	+	44	4	12	0	+	42	6	12	0
1960-61	+	39	9	11	1	-	19	29	4	8
1961-62	+	46	2	12	0	-	20	28	2	10
1962-63	+	28	20	9	3	+	6	42	1	11
1963-64	-	36	12	11	1	-	16	32	4	8
1964-65	+	43	5	12	0	-	30	18	9	3
1965-66	+	41	7	11	1	0	24	24	6	6
1966-67	+	38	10	12	0	-	12	36	4	8
1967-68	+	38	10	10	2	+	27	21	9	3
1968-69	+	37	11	11	1	+	34	14	11	1
1969-70	+	46	2	12	0	+	43	5	12	0
1970-71	0	24	24	9	3	-	1	47	0	12

The Evidence - Velocity Levels

It is clear that significant differences in interregional velocity levels do exist in the data. Table 4 presents the means, standard deviation, and minimum and maximum values for the entire U.S. and the 48 states for the period 1929-71, and also the velocity levels for the years 1900 and 1920. For the M1 measure of velocity, there are 13 cases where the state means are not significantly different from the U.S. mean at the 95% confidence level for the period 1929-71. In the case of the M2 measure, the existence of interregional differences in velocity levels is even more impressive; only two states (Maine and Pennsylvania) have means which are not significantly different from the national average at the 95% confidence level.

The picture is somewhat similar for the state groupings which are proxies for the Federal Reserve District (Table 5). For V1, 6 of 12 regions are not different from the national average, while for V2 only one region's mean is not significantly different from the aggregate measure. These results imply that the factors which determine the demand for M1 (mainly a transactions demand) are more uniform across the U.S. than the factors which determine the demand for M2 (which includes a sizeable asset demand).

Obviously, a virtual identity of velocity levels is not a prerequisite for the existence of one economic world. Economic integration does not imply homogeneity in the factors which determine the demand for money. The fact that velocity

TABLE 4

MEAN LEVELS, STANDARD DEVIATIONS, AND MINIMUM AND
 MAXIMUM VALUES OF STATE VELOCITY FOR 1929-1971,
 AND STATE VELOCITY LEVELS FOR 1900 AND 1920.

	1900	1920	M1 Velocity		1929-71		1900	1920	M2 Velocity		1929-71	
			Mean	S.D.	Min.	Max.			Mean	S.D.	Min.	Max.
Alabama	5.82	4.00	3.19	.71	1.84	4.93	5.14	3.02	2.22	.32	1.52	2.97
Arizona	7.27	3.29	3.09	.63	1.76	4.27	6.93	2.46	2.09	.36	1.44	3.17
Arkansas	7.14	3.51	2.89	.75	1.71	4.41	6.62	2.90	2.13	.42	1.53	2.96
California	3.39	3.10	3.23	.65	1.99	4.58	1.68	1.61	1.57	.25	1.14	2.08
Colorado	2.41	3.10	2.73	.62	1.62	4.13	2.21	2.12	1.84	.22	1.31	2.32
Connecticut	3.76	3.54	3.19	.66	2.06	4.40	1.00	1.34	1.20	.18	.82	1.43
Delaware	3.69	2.78	1.98	.49	1.14	3.06	2.45	1.70	1.26	.24	.84	1.87
Florida	5.27	2.75	2.77	.58	1.62	3.88	4.82	1.92	2.00	.31	1.37	2.70
Georgia	5.87	3.86	3.21	.72	1.90	5.25	4.56	2.52	2.24	.27	1.57	2.94
Idaho	5.84	3.10	2.82	.60	1.57	3.86	5.21	2.22	1.90	.34	1.27	2.91
Illinois	2.74	2.91	2.27*	.50	1.56	3.25	2.23	1.94	1.49	.13	1.22	1.87
Indiana	3.63	3.40	2.78	.48	1.79	3.69	3.21	2.18	1.84	.19	1.35	2.22
Iowa	4.26	2.73	2.51*	.54	1.45	3.54	2.28	1.25	1.63	.20	1.15	2.07
Kansas	4.48	2.76	2.41*	.51	1.44	3.63	4.18	2.09	1.82	.22	1.30	2.56
Kentucky	3.87	3.63	2.72	.52	1.64	3.88	3.48	2.67	1.93	.18	1.43	2.38
Louisiana	4.43	2.75	2.52*	.50	1.51	3.62	3.85	2.03	1.83	.22	1.27	2.37
Maine	4.80	4.88	3.49	.63	2.10	4.56	1.29	1.50	1.31*	.19	.79	1.61
Maryland	2.91	3.52	3.42	.79	2.17	5.11	1.63	1.86	1.87	.44	1.18	2.68
Massachusetts	2.25	2.73	2.46*	.68	1.46	3.72	.93	1.28	1.03	.33	.66	2.19
Michigan	3.72	3.93	3.40	.61	2.25	4.69	2.27	1.97	1.88	.26	1.32	2.68
Minnesota	3.79	2.90	2.75	.58	1.81	4.13	2.90	1.43	1.52	.16	1.19	1.86
Mississippi	7.31	3.74	2.74	.62	1.64	4.29	6.52	2.57	1.97	.30	1.41	2.93
Missouri	3.05	2.45	2.26*	.44	1.55	3.21	2.65	1.85	1.60	.14	1.27	2.03

TABLE 4--Continued

	1900	1920	M1 Velocity				1900	1920	M2 Velocity			
			Mean	S.D.	Min.	Max.			Mean	S.D.	Min.	Max.
Montana	3.91	2.99	2.52*	.53	1.46	3.55	3.44	1.80	1.69	.25	1.22	2.47
Nebraska	3.78	2.09	2.35*	.51	1.45	3.35	3.25	1.42	1.76	.23	1.28	2.52
Nevada	6.11	3.02	2.79	.60	1.63	4.55	4.97	1.88	1.83	.39	1.24	3.09
New Hampshire	5.89	6.05	4.05	.77	2.47	6.23	1.27	1.48	1.12	.16	.75	1.33
New Jersey	4.79	3.67	3.21	.49	2.15	4.02	2.75	1.95	1.58	.21	1.20	1.83
New Mexico	4.94	3.98	3.15	.64	1.73	4.64	4.44	3.05	2.41	.43	1.54	3.50
New York	1.28	1.56	1.43	.47	.81	2.98	.82	1.05	.72	.12	.55	1.23
North Carolina	8.14	3.80	3.48	.71	2.08	4.87	6.68	2.52	2.44	.34	1.72	3.41
North Dakota	8.22	2.85	2.54*	.67	1.39	4.17	5.48	1.29	1.53	.36	.99	2.70
Ohio	3.60	3.27	3.00	.60	1.92	4.17	2.44	1.98	1.73	.18	1.28	1.98
Oklahoma	8.77	2.56	2.31*	.46	1.45	3.16	8.28	2.11	1.77	.24	1.35	2.50
Oregon	3.77	2.85	3.19	.69	1.82	4.52	3.15	2.04	1.87	.21	1.33	2.50
Pennsylvania	2.46	2.85	2.42*	.47	1.60	3.39	1.80	1.78	1.32*	.14	1.07	1.54
Rhode Island	2.32	2.97	2.90	.66	1.78	4.16	.87	1.34	1.12	.16	.76	1.36
South Carolina	4.29	3.96	3.65	.79	2.18	6.16	2.81	2.22	2.86	.46	1.95	4.39
South Dakota	6.60	2.66	2.48*	.54	1.53	3.74	4.32	1.30	1.66	.35	1.24	2.93
Tennessee	4.26	3.65	2.74	.53	1.74	3.80	3.88	2.50	1.78	.21	1.39	2.21
Texas	5.31	2.88	2.28*	.43	1.42	3.13	5.23	2.57	1.75	.23	1.30	2.37
Utah	2.85	3.91	3.12	.70	1.83	4.32	2.06	2.16	1.76	.22	1.28	2.53
Vermont	5.38	5.87	3.71	.71	2.43	5.57	1.28	1.21	1.10	.20	.60	1.32
Virginia	4.77	3.50	3.55	.55	2.22	4.35	4.01	2.25	1.99	.20	1.60	2.70
Washington	4.31	3.76	3.36	.73	1.94	5.00	3.63	2.38	1.94	.21	1.35	2.43
West Virginia	3.36	3.56	3.00	.51	2.00	3.80	2.69	2.32	1.98	.20	1.55	2.39
Wisconsin	4.14	3.89	3.12	.58	1.97	4.41	2.79	1.99	1.71	.18	1.24	2.00
Wyoming	5.52	2.85	2.66	.50	1.68	3.49	4.62	2.12	1.79	.26	1.39	2.48
United States			2.43	.52	1.58	3.49			1.38	.16	1.08	1.65

*--Not significantly different from U.S. Mean at 95% confidence level.

TABLE 5

MEAN LEVELS, STANDARD DEVIATIONS, AND MINIMUM AND
 MAXIMUM VALUES OF VELOCITY FOR THE PROXY FEDERAL
 RESERVE DISTRICTS, 1929-1971

Proxy Federal Reserve District	M1 Velocity					M2 Velocity			
	District Number	Mean	S.D.	Min.	Max.	Mean	S.D.	Min.	Max.
Boston	1	2.67*	.62	1.75	3.77	1.04	.19	.77	1.58
New York	2	1.43	.42	.812	2.98	.72	.115	.55	1.23
Philadelphia	3	2.64*	.49	1.74	3.60	1.40*	.16	1.11	1.63
Cleveland	4	3.01	.60	1.92	4.17	1.73	.18	1.28	1.98
Richmond	5	3.21	.56	2.07	4.18	2.04	.20	1.57	2.44
Atlanta	6	2.85	.57	1.71	3.99	1.99	.245	1.42	2.57
Chicago	7	2.67	.51	1.81	3.71	1.63	.14	1.30	1.86
St. Louis	8	2.44*	.46	1.60	3.39	1.74	.15	1.36	2.14
Minneapolis	9	2.65*	.54	1.69	3.85	1.55	.17	1.22	2.05
Kansas City	10	2.44*	.49	1.49	3.49	1.80	.20	1.31	2.48
Dallas	11	2.32*	.43	1.44	3.17	1.79	.24	1.31	2.42
San Francisco	12	3.16	.65	1.89	4.50	1.64	.23	1.23	2.06
United States		2.43	.52	1.58	3.49	1.38	.16	1.08	1.65

*Not significantly different from U.S. Mean (95% Confidence Level)

levels in Great Britain are similar to the U.S. velocity average simply places Britain in the same group as Maine, Pennsylvania and the Third Federal Reserve District; those other regions which just happen to mirror the U.S. average.

The use of a very broad regional delineation does not change the results. Table 6 gives average velocity levels, etc., for 1929-1971 for the North, South and West (see Appendix for exact delineations). There is only one case (V1 for the North) where the mean velocity level does not differ significantly from the U.S. mean.

There are two other points concerning Table 6 which are worth noting. First, the standard deviations of the regional velocity series are similar to the standard deviations of the U.S. velocity series, once again indicating that the use of broader regions adds stability to the series. Secondly, the South has had the highest average velocity levels for both V1 and V2 for the period in question. An attempt to explain these interregional differences in velocity will be undertaken in Chapter IV.

In an attempt to compensate for the lack of data prior to 1929, estimates of velocity levels were derived for each of the states for the years 1900 and 1920.¹ The most striking thing

¹The income estimates for 1900 and 1920 were by Richard Easterlin in Population Redistribution and Economic Growth, United States 1870-1950 (Philadelphia: American Philosophical Society, 1957, 1960). (With S. Kuznets, D.S. Thomas, E.S. Lee, A.R. Miller and C.P. Brainard).

TABLE 6
 MEAN LEVELS, STANDARD DEVIATIONS, AND
 MINIMUM AND MAXIMUM VALUES FOR THE
 NORTH, SOUTH AND WEST, 1929-1971

	<u>M1 Velocity</u>				<u>M2 Velocity</u>			
	Mean	S.D.	Min.	Max.	Mean	S.D.	Min.	Max.
<u>North</u>	2.21*	.523	1.46	3.24	1.17	.144	.92	1.44
<u>South</u>	2.86	.521	1.81	3.87	1.94	.174	1.46	2.41
<u>West</u>	2.78	.552	1.70	3.94	1.67	.177	1.26	2.14
<u>United States</u>	2.43	.517	1.58	3.49	1.38	.163	1.08	1.65

* Not significantly different from U.S. average (95% confidence level).

in this period is the tremendous drop in velocity from very high levels in the rural, less developed states, while velocity increased in the urbanized, higher income states (note Table 4). The rapid spread of the banking system into rural areas is a possible explanation for the large declines in velocity; in effect, the availability of banking services made it much more attractive and less costly for individuals and businesses to hold more of their assets in the form of money. In any case, the fact that velocity was moving in opposite directions in various states during this period seems to indicate that the regions of the U.S. were much less of one economic world than they are now. More will be said concerning this in future chapters.

Summary

Several major points have been established in this chapter:

- (1) Generally, interregional changes in velocity tend to follow one another for the 1929-1971 period; however, the extent and consistency of such patterns is quite varied, particularly with respect to the states. Nevertheless, this is evidence of economic integration. Our data for 1900 and 1920 implies just the opposite; namely, a lack of significant economic integration, as evidenced by states' velocity series moving in opposite directions.
- (2) There are definitely significant differences in interregional velocity levels in the United States, implying that the factors which determine velocity are also different. This evidence indicates that homogeneity in velocity levels across regions is not a characteristic that is always associated with interregional economic interdependencies.

CHAPTER II

THE ILLINOIS HYPOTHESIS

Professor Friedman implies that Canada and the U.S. are also part of the same economic world by using a different type of evidence. He refers to studies which show that changes in Canadian income are more closely related to the U.S. money stock than to the Canadian money stock.¹ This is the basis for his prediction that changes in Illinois income are better related to changes in the U.S. money stock than to changes in the Illinois money stock (this proposition will be referred to as the Illinois Hypothesis). Friedman states that "Illinois must move with the United States" in respect to Y, but seems to imply that the same is not true of M (and thus velocity). He argues that the Illinois money stock is subject to random shocks, and that such instability makes it a poor predictor of state income.²

In effect, Friedman is saying that there is very loose relationship between state money and state income, which allows external forces (changes in national money) to dominate

¹Friedman, The American Economist, p. 11, 12. As far as we can ascertain, these studies remain unpublished.

²Ibid., pp. 11-13.

the states' income movements. However, Friedman offers no empirical support for his statement that state money stocks are subject to random shocks. Since he implies that such shocks are unrelated to income, it seems safe to assume that he is speaking of transactions that are mainly financial in nature. It is true that there could be large fluctuations of this type in the very short-run, but it seems that some sort of equilibrium will soon be reached where money supply equals money demand. If a region suffers a sharp outflow in deposits, a scarcity situation will develop in the loanable funds market, interest rates will go up, and funds will begin to flow back in again. This type of mechanism would promote stability in regional money stocks, and assuming that the causation runs from money to income, it seems logical that regional money would do as well or better than national money in predicting state income, particularly if the state in question is growing at a significantly faster or slower rate than the U.S. average.

On the other hand, we have the Canadian-U.S. tests which seem to imply that changes in broad monetary measures are more closely related to the incomes of sub-regions. More specifically, it seems to indicate that external forces are more important to income determination than internal ones in the case of Canada. In turn, this could imply a number of things:

- (1) That external forces are very strong, with production and financial markets heavily influenced by U.S. activity.
- (2) That internal forces are conflicting and inconsistent,

(i.e., perhaps Canada is not one economic world, and thus the relation between aggregate Canadian income and aggregate Canadian money is very weak).

Emphasis here will not be placed on these Canadian-U.S. tests. Our data will be used to test the Illinois Hypothesis over the 48 states. It is not clear that the results will shed any light on the Canadian-U.S. situation; factors such as (1) and (2) above could easily make the results here noncomparable to the U.S.-Canadian case.

Empirical Tests of the Illinois Hypothesis

A good starting point here is to see how closely state money stocks follow their national counterparts. If the state figures are subject to sudden and random changes, the relationship should be a loose one. The following regressions were tested:

$$(A) \quad \Delta \log M1_i = \alpha + b \Delta \log \overline{M1} + \mu$$

$$(B) \quad \Delta \log M2_i = \alpha + b \Delta \log \overline{M2} + \mu$$

where $M1_i$ and $M2_i$ are regional figures and $\overline{M1}$ and $\overline{M2}$ are national figures. The b coefficients may be interpreted in the same way as in Chapter I. Although a large number of b coefficients differed significantly from 1, (35 of 48 for (1) and 42 of 48 for (2)), the standard errors of these coefficients were relatively small, and almost all the R^2 were above .8. This implies several important points:

(1) There is a relatively stable relation between state

money and national money, as evidenced by the high R^2 .

- (2) The coefficients (which are elasticities) indicate that states share quite unequally any change in the national money supply. If M_i does affect Y_i significantly, this is very important.

As a further check on the relation between state money and national money we compared first differences of M2 across the 48 states for each year (1929-71) and compared them with the national change (as in Table 3). Table 7 summarizes the findings for the 42 observations (first differences for 43 years). Once again this does not appear to be a situation where state money is loosely related to national money. State money supplies, as a whole, do move with the national money supply, but at different rates of change as indicated by the b coefficients in regression (B). The only period in which a majority of states moved opposite the national change in M2 was 1929-30, when increasing money supplies in 12 states (mainly in the Northeast) outweighed decreasing money supplies in the other 36 states.

Table 7 also shows how many states followed the national change in personal income for the same time period. As was the case with M2, most states again follow the national change, particularly in the 1929-33, 1939-43, and the 1964-1971 periods when the U.S. economy was experiencing strong cyclical movements.

An interesting question here is: are the minority of states which are moving opposite the national change in M2 in

TABLE 7

CHANGES IN STATE MONEY AND STATE INCOME
RELATIVE TO THE U.S. CHANGE

	Money Supply (M2)			Income			Number of States Where Income Follows Money	
	U.S. Change	State +	Change -	U.S. Change	State +	Change -	+ Change in Money	- Change in Money
1929-30	+	12	36	-	0	48	0 of 12	36 of 36
1930-31	-	7	41	-	0	48	0 of 7	41 of 41
1931-32	-	0	48	-	0	48		48 of 48
1932-33*	-	3	45	-	12	36	0 of 3	33 of 45
1933-34*	+	43	5	+	47	1	42 of 43	0 of 5
1934-35	+	48	0	+	48	0	48 of 48	
1935-36	+	48	0	+	44	4	44 of 48	
1936-37*	+	45	3	+	44	4	41 of 45	0 of 3
1937-38*	-	7	41	-	5	43	1 of 7	37 of 41
1938-39	+	48	0	+	46	2	46 of 48	
1939-40	+	48	0	+	48	0	48 of 48	
1940-41	+	48	0	+	47	1	47 of 48	
1941-42	+	46	2	+	48	0	46 of 46	0 of 2
1942-43	+	48	0	+	48	0	48 of 48	
1943-44	+	48	0	+	45	3	45 of 40	
1944-45	+	48	0	+	38	10	38 of 48	
1945-46	+	48	0	+	43	5	43 of 48	
1946-47*	+	41	7	+	47	1	40 of 41	0 of 7
1947-48*	+	40	8	+	47	1	39 of 40	0 of 8
1948-49*	+	25	23	-	16	32	10 of 25	17 of 23

TABLE 7--Continued

	Money Supply (M2)			Income			Number of States Where Income Follows Money	
	U.S. Change	State +	Change -	U.S. Change	State +	Change -	+ Change in Money	- Change in Money
1949-50	+	41	7	+	48	0	41 of 41	0 of 7
1950-51	+	43	5	+	48	0	43 of 43	0 of 5
1951-52	+	48	0	+	45	3	45 of 48	
1952-53	+	48	0	+	44	4	44 of 48	
1953-54*	+	45	3	+	30	18	29 of 45	2 of 3
1954-55*	+	47	1	+	45	3	44 of 47	0 of 1
1955-56	+	41	7	+	48	0	41 of 41	0 of 7
1956-57*	+	33	15	+	47	1	33 of 33	1 of 15
1957-58	+	48	0	+	44	4	44 of 48	
1958-59	+	48	0	+	45	3	45 of 48	
1959-60	+	40	8	+	48	0	40 of 40	0 of 8
1960-61*	+	46	2	+	45	3	43 of 46	0 of 2
1961-62	+	48	0	+	48	0	48 of 48	
1962-63	+	48	0	+	45	3	45 of 48	
1963-64	+	48	0	+	45	3	45 of 48	
1964-65	+	48	0	+	48	0	48 of 48	
1965-66	+	48	0	+	48	0	48 of 48	
1966-67	+	48	0	+	48	0	48 of 48	
1967-68	+	48	0	+	48	0	48 of 48	
1968-69	+	46	2	+	48	0	46 of 46	0 of 2
1969-70	+	44	4	+	48	0	44 of 44	0 of 4
1970-71	+	48	0	+	48	0	48 of 48	

*-Years in which both state income and state money moved opposite their national counterparts.

any given year the same states which are moving opposite the national change in personal income? There are only 11 periods where this comparison can be made, since in most years all the states are following national changes in either income or money, or both. In these 11 periods, there are 77 states where M2 is moving opposite the national change in M2; and only in 21 of these cases is state income moving with state money. It should be noted that 17 of these 21 cases occurred from 1948-49 (see last column of Table 1). The period from 1948-49 is the only one in our data where the national change in money was opposite the national change in personal income; the stock of money fell in a minority of the states (23), while income fell in a majority (32). In any case, changes in state money which are opposite changes in national money are generally poor predictors of changes in current state income.

This appears to support Friedman's contention that changes in national money are a better predictor; however, the above analysis has several major flaws:

- (1) Only the directions of changes are considered, and not the magnitudes of the changes. Income changes could be a function of the rate of change in the money supply, a possibility which the above analysis completely overlooks.
- (2) There is no allowance made for the effects that past changes in the money supply might have on current income, a factor which all monetarists consider very important. In respect to this, it is interesting to note that some of the states which most frequently move opposite national money changes are also the ones which frequently move opposite national income changes, not in the same years, but

in many cases a year or two before or after (Nebraska, North Dakota, and South Dakota are the best examples of this). With this limited number of observations, there appears to be no discernible trend of income following money or vice-versa. There are also several states which move against national M2 relatively frequently, but almost always have income changes which follow national income (Delaware, Massachusetts, Maine, Oregon, Rhode Island, New York, and Washington are in this group).

In any case, the above analysis is at best a first approximation; a more direct test is needed.

A Direct Test of the Illinois Hypothesis

The preceding evidence gives some support to Friedman's Illinois hypothesis; let us now proceed to a more direct test. Equation (1) states a relationship which allows for state income to be a function of either state or national money, or both.

$$\begin{aligned}
 (1) \quad \Delta Y_{i_t} &= (\mu)\beta\Delta\bar{M}_t + (1-\mu)\beta\Delta M_{i_t} + (\mu)\beta_1\Delta\bar{M}_{t-1} \\
 &+ (1-\mu)\beta_1\Delta M_{i_{t-1}} \dots + (\mu)\beta_n\Delta\bar{M}_{t-n} \\
 &+ (1-\mu)\beta_n\Delta M_{i_{t-n}}
 \end{aligned}$$

Y_i is state income, \bar{M} is national money, and M_i is state money. The β coefficients in (1) will be constrained by forming a single variable for each time period, consisting of both money measures; for instance, for the first time period:

$$X1 = (\mu)\Delta\bar{M}_t + (1-\mu)\Delta M_{i_t}$$

A search program will then be employed to find the value of μ where the sum of the squared errors are minimized, a procedure which will weight the relative importance of national money and state money. Next, these results from regression (1) will be used to test the following two hypothesis:

$H_1 : \mu = 0$ - The acceptance of this means national money is insignificant.

$H_2 : \mu = 1$ - The acceptance of this means regional money is insignificant.

Substituting H_1 ($\mu=0$) in (1) yields:

$$(2) \quad \Delta Y_{i_t} = \beta \Delta M_{i_t} + \beta_1 \Delta M_{i_{t-1}} \dots \beta_n \Delta M_{i_{t-n}}$$

The results of regressions (1) and (2) will then be subjected to chi-square tests to determine if H_1 should be rejected or accepted. The rejection of H_1 indicates that national money is related significantly to state income. Basically, the chi-square tests are comparing the sum of the squared residuals in the following relationships:

$$\Delta Y_i = F (\Delta M_i) - \text{equation (2)}$$

$$\Delta Y_i = F (\Delta M_i, \bar{M}) - \text{equation (1)}$$

If the inclusion of \bar{M} significantly lowers the sum of the squared residuals, we can reject the hypothesis (H_1) that \bar{M} is not related significantly to Y_i . If the inclusion of \bar{M} does not significantly lower the sum of the squared residuals,

we cannot reject H_1 .

The same test for the significance of state money can be implemented by substituting H_2 ($\mu=1$) in (1), which yields:

$$(3) \quad \Delta Y_{i_t} = (\mu)\beta\bar{\Delta M}_t + (\mu)\beta_1\bar{\Delta M}_{t-1}\dots + (\mu)\beta_n\bar{\Delta M}_{t-n}$$

By running regressions (1) and (3) and again using chi-square tests, H_2 can be accepted or rejected. Once again, the sum of the squared residuals of two relationships are being compared. In this case, they are:

$$\Delta Y_i = F (\Delta\bar{M})$$

$$\Delta Y_i = F (\Delta\bar{M}, \Delta M_i)$$

If the inclusion of M_i significantly improves the estimate, we can reject H_2 with the implication being that state money (M_i) does matter. If the inclusion of M_i does little to lower the sum of the squared residuals we cannot reject H_2 .

The Tests

Both hypothesis are to be tested for the 48 states, and the 12 regions. The time period for all regressions was standardized at 1936-71, which allowed the inclusion of 7 lagged first differences.¹ Generally speaking, the standard error of the estimate in all regressions dropped sharply for the first

¹Since preliminary tests showed the constant term to be insignificant, we suppressed the constant in the regressions.

two or three years and then declined slowly, reaching a minimum in most cases at lags five, six, or seven.¹ In order to prevent any selective bias from entering into the testing procedure, the chi-square tests were carried out in all cases at lag seven. Chi-square tests are appropriate here since the test statistic is a likelihood-ratio which is approximately distributed as chi-square when the sample size is large.²

Once again, the results of these tests are characterized by diversity. As Table 8 indicates, state money bears the closest relationship to state income for the greatest number of states at the 99% confidence level, while national money wins out at the .95 confidence level. There are a large number of indeterminate cases at each confidence level, perhaps indicating that:

- (1) State and national money follow one another so closely that it is impossible to distinguish which bears the closest relation to state income, or
- (2) Neither state nor national money are very closely related to state income, thereby introducing "noise" into the tests.

It is interesting to note that significant results at the 99% and 95% confidence levels were generally linked with either very high values ($\mu \geq .996$ for \bar{M}) or very low values

¹ M_2 was chosen as the money measure in all our regressions; since preliminary investigation of the relationship between state income and lagged money measures revealed that in most cases M_2 (both state and national) was more closely related to state income than the respective M_1 measures.

²See Introduction to the Theory of Statistics, by Alexander Mood and Franklin Graybill, (New York: McGraw-Hill, 1963) pp. 298-301.

TABLE 8
 SUMMARY OF THE RESULTS OF THE CHI-SQUARE
 TESTS* ON THE ILLINOIS HYPOTHESIS

STATE RESULTS				
Significant Money Measure	Value of μ	States at Each Confidence Level in Which the Money Measure Yielded Significantly Lower Sums of the Squared Residuals.		
		.99	.95	.90
\bar{M}	$\mu=1$	8	18	21
M_1	$\mu=0$	10	13	17
Indeterminate		30	17	10
REGIONAL RESULTS				
\bar{M}	$\mu=1$	2	5	7
M_1	$\mu=0$	1	2	3
Indeterminate		9	5	2

*The test statistic here is: $X_1^2 = -T \log \left(\frac{L(H_A)}{L(H_0)} \right)$, where T is the number of observations, $L(H_A)$ is the sum of the squared residuals under the alternative hypothesis, and $L(H_0)$ is the sum of the squared residuals under the null hypothesis.

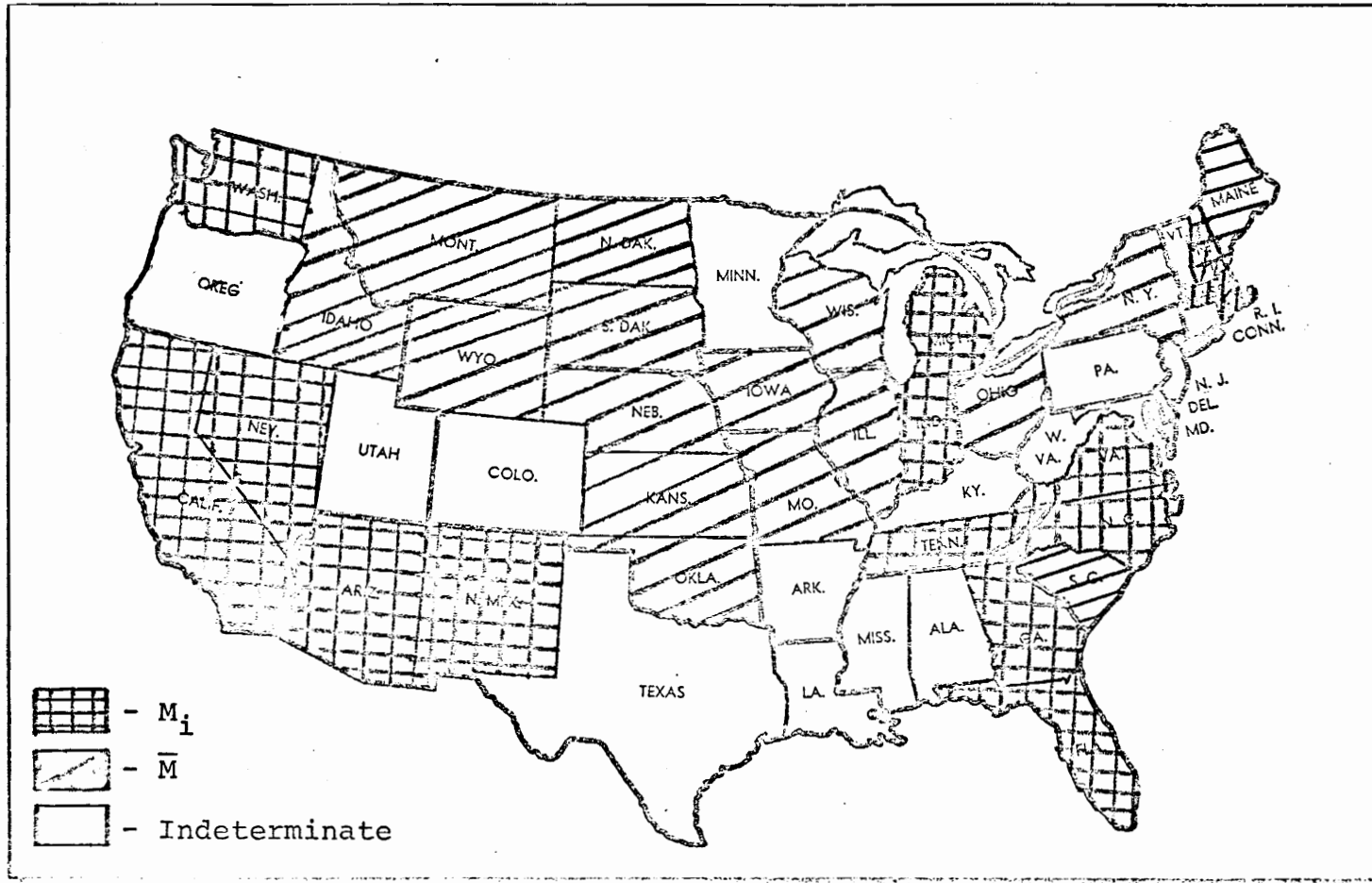
($\mu \leq .006$ for M_i). In addition, μ values were consistent throughout the whole lag structure. This was not the case at lower confidence levels; values of μ often fluctuated tremendously from one lag to the next and did not tend to go towards 0 or 1 as often as with higher confidence levels.

Figure 2 indicates the existence of state groupings as far as the income-money relationship is concerned (at the 95% confidence level).¹ Generally, state money is most significant in the South, and far Southwest, while national money is dominant in the Northeast and Midwest. Our tests of the 12 proxy Federal Reserve Districts tend to substantiate this. Regional money is significant ($\mu=0$) at the 90% confidence level in the Richmond, Atlanta, and San Francisco Districts (which include most of the states where M_i is significant). Districts 1-4 (the Northeast), 7, 9, and 10 have incomes most significantly related to \bar{M} . It is interesting to note that income in District 3 is significantly related to \bar{M} at the 90% level, although the three individual states which comprise it were "indeterminate" in the state analysis (New Jersey at 95%, Pennsylvania and Delaware at 90%). Also, District 10 (Kansas, Nebraska, Colorado, Wyoming, Oklahoma) was significantly related to \bar{M} at the .995+ level (the chi-square test yielded a

¹Seven more states can be classified if the confidence level is dropped to 90%. \bar{M} is significant in Kentucky, Oregon, and Utah while M_i is significant in Arkansas, Louisiana, New Jersey and Connecticut.

FIGURE 2

MONEY MEASURES WITH SIGNIFICANT RELATIONSHIPS TO
STATE INCOME AT THE .95 CONFIDENCE LEVEL



value of 9.56). Districts 8 and 11 were indeterminate, as were several of the states which comprise them (Arkansas and Kentucky in 8, Texas in 11).

Summary

The preceding tests indicate that the relationship between Y_i and M_i and \bar{M} is not a homogeneous one across the whole United States. The existence of distinct regional groupings in Figure 2 indicate that there is a consistency between state income and different money measures that extends over wide geographical areas. Our tests of the 12 proxy Federal Reserve Districts confirm this. This is additional evidence that the United States is not one closely integrated economic world, with the implication being that it is very difficult to generalize accurately concerning regional monetary trends.

Friedman's Illinois Hypothesis appears to be partially correct since national money is most significantly related to state/regional income in a majority of determinate cases. However, there are important exceptions to the Illinois Hypothesis, mainly states in the South and far Southwest (also New Hampshire, Michigan and Indiana). This is convincing evidence that state money cannot be discarded a priori if one is seeking a method to predict state income.

CHAPTER III

THE RANDOM WALK HYPOTHESIS

J.P. Gould and C.R. Nelson have presented evidence that U.S. velocity changes are empirically indistinguishable from a random walk series.¹ Essentially, a random walk means that successive changes in velocity are uncorrelated, resembling the results that would be obtained by repeatedly flipping a fair coin. Gould and Nelson feel that the major implications of this are: first, that it is incorrect to discuss deviations from any trend in velocity, as Friedman and Schwartz do consistently.² Secondly, past values of velocity are of little use in predicting future values, thus short-term forecasting models which utilize velocity may be suspect.

We wish to find if our state and regional data yield results similar to those of Gould and Nelson's, and also if interregional velocity analysis and the one economic world con-

¹J.P. Gould and C.R. Nelson, "The Stochastic Structure of the Velocity of Money" - unpublished first draft manuscript.

²For instance, Milton Friedman and Anna Schwartz state:

..."the postwar rise (in velocity) appears largely a reaction to the prior fall, just as the rise from 1932 to 1937 appears to be a reaction to the fall from 1929 to 1932."

from A Monetary History of the United States, 1869-1960, (Princeton: Princeton University Press, 1963) pp. 641-642.

cept have any relevance in respect to the random walk hypothesis.

Gould and Nelson's Evidence

The evidence presented by Gould and Nelson is based entirely on Friedman and Schwartz's velocity series which uses M2 as a money measure and Kuznets' estimates of NNP (variant III) for the income measure. They do experiment with a post-war quarterly series which uses M1 and GNP, but their results are obscured by seasonal influences. The basic test of the random walk hypothesis was to ascertain if autocorrelation was present in the following relationships:

$$\Delta V_t = f(\Delta V_{t-n}) \quad n=1,2\dots 6$$

Two time periods were used by Gould and Nelson in testing the Friedman and Schwartz data (1869-1960, 1890-1960), since Friedman himself admits that his data prior to 1890 are of questionable accuracy.¹

The results of Gould and Nelson's autocorrelation tests are presented in Table 9, along with t-values of the coefficients which were calculated in our duplication of their results (Gould and Nelson presented only the coefficients and the standard errors). Only at lag three in the case of the

¹Milton Friedman, Dollars and Deficits, (New York: Prentice-Hall, 1968), p. 23.

TABLE 9

GOULD & NELSON'S AUTOCORRELATION TESTS OF
FRIEDMAN'S M2 VELOCITY SERIES

$$\Delta V_t = f(\Delta V_{t-n}) \quad n = 1, 2, \dots, 6$$

Lag	1869-1960		1890-1960	
	Coefficient	T-Value of Coefficient	Coefficient	T-Value of Coefficient
1	-.08	-.78	-.02	-.15
2	.07	.68	-.07	-.56
3	-.20	-2.06	-.18	-1.57
4	.04	.35	-.17	-1.40
5	-.06	-.64	-.08	-.71
6	.09	.87	.17	1.48
Standard Error of Coefficient	.10		.12	

Source--Gould and Nelson "The Stochastic Structure of the Velocity of Money" p. 6. The t-values are from our duplication of their results.

full series is there any significant autocorrelation. Apparently, Gould and Nelson consider this one case of autocorrelation to be unimportant; for they conclude that generally the autocorrelations are small and that the observed velocity series conforms to a simple random walk model.¹

Preliminary Tests

We duplicated Gould and Nelson's autocorrelation tests, and then applied the same tests to our data for the period 1929-71 (see Appendix I). The results for our aggregate series revealed the presence of some significant autocorrelation for both $\frac{PI}{M1}$ and $\frac{PI}{M2}$, perhaps indicating that velocity for the 1929-71 period was not a random walk.

We also applied the same autocorrelation tests to our state and regional data, obtaining mixed and somewhat curious results. A majority of the states displayed some significant autocorrelation for both velocity measures (26 of 48 for V1, and 29 of 48 for V2). For the 12 regions, significant autocorrelation was evident in 7 regional V1 series and in 8 regional V2 series, with velocity series in regions 5, 8, and 9 displaying a random walk for both measures of velocity. Moving to broader regions, the South and the West had significant autocorrelation in both their V1 and V2 series, while the East

¹Gould and Nelson, "The Stochastic Structure of the Velocity of Money," p. 3.

did not display significant autocorrelation in either velocity series. This result is a curious one since for V1, all the regions which comprise the East (1-4, and 7) showed significant autocorrelation, while the aggregate V1 measure for the East showed no significant autocorrelation. Also, 3 of the 4 regions which comprise the West displayed random walks in their V1 series, yet the aggregate V1 series for the West contained significant autocorrelation. Apparently, in the case of the East, aggregation of the data created randomness in the East's V1 series, while in the case of the West disaggregation of the data produced randomness in the V1 series of its component regions.

In any case, no matter what regional delineations are used, significant autocorrelation appears in the majority of the velocity series. We do not wish to dwell on the regional velocity series, since there is the possibility that the use of personal income in the velocity measures here does not offer a fair test of the random walk hypothesis. One possible problem is that state personal income does not bear as stable a relationship to state GNP as aggregate PI does to aggregate GNP. More will be said concerning an optimal income measure in following sections.

Next, we took the Friedman M2 velocity series and split it into various time periods in order to compare it to the above results. The time periods are not exactly comparable, since the Friedman series stops in 1960. The results are quite

surprising; roughly the first half of the Friedman and Schwartz velocity series conforms to the random walk hypothesis, while the latter "half" does not. Table 10 contains the results of autocorrelation tests for four different segments of the Friedman series; the table shows the t-values of the B coefficients in the following regression:

$$(1) \quad \Delta V_t = \alpha_n + \beta_n \Delta V_{t-n} + \mu_{n_t} \quad n=1,2,\dots,6$$

Obviously the first two periods show no significant autocorrelation whatsoever, while the third (1918-1960) displays a slight degree of autocorrelation. Most significantly, the shortest period tested (1929-1960, 32 observations) shows the highest degree of autocorrelation.

One possible explanation of this phenomena is that the U.S. prior to 1910 or perhaps 1920 was not one closely integrated economic world, particularly in respect to financial markets. Thus, the U.S. velocity series for this period displayed a random walk, since it represented the aggregation of at least two basically independent series (the Northeast and the West, for instance). We have some evidence to indicate that velocity was moving in opposite directions in various states between 1900 and 1920 (Table 13). More specifically, velocity fell drastically in rural, underdeveloped states where the banking system was expanding rapidly, while velocity (both V1 and V2) increased in the more developed states where the banking system was growing more slowly. A plausible ex-

TABLE 10
 AUTOCORRELATION TESTS OF FRIEDMAN'S M2
 VELOCITY SERIES - FOUR TIME PERIODS

Lags (n)	*T-Values of the B Coefficients			
	1869-1911	1890-1932	1918-1960	1929-1960
1	-1.346	-1.054	1.798	2.543
2	.867	-.235	-.583	-.364
3	-1.589	-1.010	-.798	-1.607
4	1.225	-.444	-2.071	-2.634
5	-.650	-.654	.373	-.677
6	.213	1.554	.817	.268

*From the Regression: $\Delta V_t = \alpha_n + \beta_n \Delta V_{t-n} + \mu_{nt}$ $n=1,2,\dots,6$

planation for the large decline in velocity in many of the rural states is that the expansion of the banking system increased the demand for money (interest-bearing deposits, loans, etc.), thereby lowering velocity (Chapter IV will deal with this in detail).

In any case, what happens if one computes aggregate velocity for the 48 states, some of which have velocity series which are increasing, and some of which have series which are declining? A random walk could easily result, since in effect, there is no one pattern for the United States as a whole, but rather several regional patterns.

Additional Evidence of Regionality

Evidence as to the existence of distinct regionalization prior to 1910 or 1920 can also be found by looking at interest rate differentials. Interregional interest rate differentials on business loans were as high as 8% in the 1870's, and steadily declined to where the maximum differential was about 1.5% in 1910, (which is still high compared to today's differentials).¹ This lessening of interregional differences in interest rates, at least in part, was brought about by the development of national money markets. One explanation of this is that the "emergency of an effective commercial paper market"

¹Lance E. Davis, "Capital Immobilities, Institutional Adaptation and Financial Development, the United States and England, An International Comparison," Zeitschrift Fur Die Gesamte Staatswissenschaft, CXXIV, (February, 1968), pp. 32,33.

contributed to a situation where: "outside the South, there was apparently a national market by the second decade of the twentieth century".¹ Interregional differentials have continued to decline since that period. A recent study estimates that only about one-sixth of the credit market is characterized by significant differentials (magnitudes of approximately 10%); namely, some home mortgage markets, consumer credit markets, and the market for business loans of smaller denominations.² Increasingly, banks are participating in national money markets (government securities and federal funds), and the recent development of a national market in negotiable certificates of deposit has intensified this pattern, such that:

"The trend in the development of financial markets is away from regional or spatial compartmentalization and toward national homogeneity".³

Of course, this is only part of the explanation as to why the United States is becoming more economically integrated. The other half of the story is in the real goods market, where advancements in transportation and communications play a cru-

¹Ibid., p. 21, 24.

²Mahlon R. Straszheim, "An Introduction and Overview of Regional Money Capital Markets," in Essays in Regional Economics, edited by John F. Kain and John R. Meyer, (Cambridge: Harvard University Press, 1971), p. 238.

³Ibid., p. 237.

cial role. This is outside the scope of this paper, but we might suggest that the period around 1920 was a watershed period in respect to the ownership and use of motor vehicles and telephones.

The evidence presented thus far seems to indicate two things:

- (1) Prior to approximately 1910, a high degree of regionality existed in the United States. This may explain why aggregate velocity displayed a random walk since in effect, there was no true national pattern during this period.
- (2) The degree of regionality has steadily declined, particularly in money markets, so that true national patterns do tend to emerge in the data after 1920, roughly speaking. It is interesting to note here that the degree of autocorrelation in Friedman and Schwartz's velocity series was stronger for the period from 1929-1960 than the period from 1918-1960 (see Table 10). A similar situation was found for another velocity series that was tested for autocorrelating, the 1920-1962 period showed no autocorrelation, while the 1929-1971 period showed some autocorrelation.¹ In the first example above, removal of the 1920's from the data strengthens autocorrelation, while in the second example the 1920's are removed and the 1960's are added. Both cases suggest that data from more recent periods exhibits more definite autocorrelation, which in turn suggests a reduction of regionality that could otherwise obscure patterns in the aggregate measures of velocity. More will be said concerning this in the following sections.

¹The series here was GNP, with the data coming from Historical Statistics of the United States (Revised to 1962), and The Survey of Current Business. For the 1920-1962 period, the highest t-value for any coefficient in the autocorrelation tests was 1.589 at lag 1, while the 1929-1971 series had a coefficient at lag 1 with a t-value of 2.814.

Alternative Velocity Measures

Several other aggregate velocity series were tested for autocorrelation for the period 1929-1971. First of all, four different income measures were selected:

- (1) Gross National Product, as defined by the Department of Commerce.
- (2) Personal income, again from the Department of Commerce (see Appendix, Chapter I).
- (3) Kuznets' Net National Product, variant III. This is the same measure Friedman uses; it corresponds fairly closely with the usual concept of NNP except in the treatment of government expenditures, a significant portion of which are omitted.¹
- (4) Gross National Product minus Federal Government purchases of goods and services (y^*). The basic rationale for using this was that since Federal Government deposits are left out of the money stock, it is consistent to omit Federal Government activities which generate income from the income flow when attempting to measure velocity.

Secondly, two slightly different money measures were selected for both M1 and M2 for the period 1929-1971:

- (1) The money stocks as of June 30 of each year, as described in the Appendix to Chapter I.
- (2) An alternative annual money stock series which differs from the above in that "demand deposits adjusted" are in the data, indicating that items in process of collection have been taken out to avoid double counting.²

¹Kuznets' attempts to exclude intermediate goods and services provided by the government and only includes final goods and services. See Capital in the American Economy by Simon Kuznets, (Princeton: Princeton University Press, 1961), pp. 465-470.

²Data for 1929-1962 are from Historical Statistics of the United States, (revised to 1962). Data from 1963-1971 are from the Survey of Current Business.

Using these data, sixteen aggregate velocity series were constructed and subjected to the autocorrelation test described in the previous section (regression (1)). As shown in Table 11, all sixteen series display some autocorrelation (for simplicity, only the t-value of coefficients which were significant at the 95% level are shown). Several things are worth noting concerning the results: (1) Considering the income measures separately, higher autocorrelation in almost all cases is associated with the M1 measure of velocity as opposed to the M2 measure. This is not at all surprising since (a) velocity attempts to measure how actively money circulates in generating aggregate income, and (b) M1 is held mainly for transaction purposes which generate aggregate income, while M2 includes a sizeable asset demand which can change drastically due to portfolio shifts. Thus it is not surprising that $\frac{Y_t}{M1_t}$ is more closely related to $\frac{Y_{t-1}}{M1_{t-1}}$ than $\frac{Y_t}{M2_t}$ relative to $\frac{Y_{t-1}}{M2_{t-1}}$.¹ Gould and Nelson make no tests utilizing

annual M1 data; they do find autocorrelation in quarterly data using M1, but dismiss it as being seasonal in nature.²

¹ Y_t may be heavily influenced by lagged values of M2, but that is not the issue here. For our tests to show autocorrelation, there must be a consistent relation between current money and current income ($\frac{Y}{M}$) from one time period to the next.

²Gould and Nelson, "The Stochastic Structure of the Velocity of Money," p. 9.

TABLE 11

AUTOCORRELATION TESTS OF ALTERNATIVE
MEASURES OF VELOCITY

T-Values of Significant B Coefficients, 1929-1971*								
Lags (n)	$\frac{PI}{M1}$	$\frac{PI}{M2}$	$\frac{GNP}{M1}$	$\frac{GNP}{M2}$	$\frac{NNP}{M1}$	$\frac{NNP}{M2}$	$\frac{y^*}{M1}$	$\frac{y^*}{M2}$
1	1.961 (2.752)	(2.169)	2.329 (2.814)	2.396 (2.535)	3.941 (4.154)	2.885 (2.887)	4.014 (4.306)	2.583 (2.543)
2							(2.183)	
3						-2.363 (-2.282)		
4		-2.287 (-2.140)		-2.494 (-2.243)				
5								
6								

PI, GNP, From Commerce Department estimates

NNP = Kuznet's NNP, variant III

y* = GNP - Federal Government purchases of goods and services

.0000 = Money measures from our data

(.0000) = Money measures from Historical Statistics of the U.S. Survey of Current Business

* From the Regression $\Delta V_t = \alpha_n + \beta_n \Delta V_{t-n} + \mu_{nt}$

(2) Considering all income measures together, it is clear that the most significant autocorrelation is associated with NNP and y^* (GNP - Government purchase of goods and services). Gould and Nelson use this same NNP along with Friedman's money data (M2 only) to make their autocorrelation tests. We submit that y^* is an income concept more consistent with the definition of velocity. First of all y^* begins with all income (GNP) generated by circulating dollars, while NNP arbitrarily cuts out a chunk of total income (equal to depreciation), which has been quite variable over time. Secondly, y^* excludes all Federal Government purchases of goods and services, while Kuznets' measure does not. In effect, we are simply saying that the best measure of velocity is one that is consistent in omitting any one influence (the Federal Government) from both the numerator and denominator or allowing any one influence (income equal to depreciation) to remain in both the numerator and denominator of the velocity measure.¹

¹Garvey and Blyn argue there is little justification for the use of y^* since government expenditures affect private deposits: "all purchases by the Federal Government result in additions to private balances of the sellers of these goods and services, and thus the level of balances is directly influenced by the amount of Government purchases."

However, Garvey and Blyn are forgetting about the other half of the circular flow. When the Federal Government collects or withholds taxes, or sells bonds to the public, they are siphoning off deposits from the money supply. The expenditure of these funds restores the deposits to the official money supply. See The Velocity of Money, by George Garvey and Martin Blyn, (Federal Reserve Bank of New York, 1970) p. 50.

If a velocity measure is inconsistent as to what is included or excluded in Y and M , then there can be no really fair test of the random walk hypothesis; since the inconsistencies in defining Y and M could easily create stochastic disturbances in the velocity series.

Given the definition of velocity, y^* is the most consistent measure of velocity in this author's judgement, and thus provides us with a fair test of the random walk hypothesis. For the period 1929-1971, at least, we must definitely reject this hypothesis, since there is strong autocorrelation between y_t^* and y_{t-1}^* (and perhaps y_{t-2}^* , see Table 2). It should also be noted that although the use of Kuznets' NNP differs conceptually from y^* , the autocorrelation tests show similar results in both cases. This is most likely due to the fact that Kuznets' NNP omits a substantial part of Federal Government expenditures.

Division of the 1929-1971 Series

Since splitting the Friedman series into two parts yielded interesting results, the same procedure was tried with our data for the 1929-1971 period. The same patterns emerged in all the series tested (the same sixteen series as in the previous section); however, for the sake of brevity, we will report only the results for the velocity series using y^* and NNP as income measures, and measure (2) of the annual money stock. This is not an arbitrary selection, but rather a choice

of the data which we feel offers the best test of the random walk hypothesis.¹

First it might be of interest to compare the results of the same autocorrelation tests from the first "half" of the series (1929-1953) to the whole period (1929-1971) to ascertain if the addition of the latter two decades increases the degree of autocorrelation in the data.² This should happen, according to arguments presented in previous sections of this chapter, since as the U.S. becomes more closely integrated economically, the aggregate velocity series should be less affected by regional independence in velocity movements and thus display a more consistent pattern. Table 12 summarizes the results; again giving the t-value for only the significant coefficients. Of course, higher t-values indicate a lowering of the standard errors associated with the coefficients, which in turn indicates a more stable, consistent relationship. The results lend support to the idea that addition of later time periods tends to increase the stability of the estimates and

¹The rationale for y^* was presented in the previous section (NNP is also included, since results seem to be similar to the y^* measure for the whole period). Also, measure (2) of the annual money stock uses "demand deposits adjusted", while measure (1) does not.

²Since first differences are being used (in $V_t = f(V_{t-1})$), the period from 1929-1953 is reduced by two observations when the actual regressions are run, so that 23 observations remain (1931-1953). Likewise, the latter period was set at 1947-1971, so that 23 observations remained when the data were converted to first differences (1949-1971).

TABLE 12
 AUTOCORRELATION TESTS OF VELOCITY SERIES FROM
 1929-53 RELATIVE TO VELOCITY SERIES
 FOR 1929-1971

*Significant T-Values of B Coefficients				
	$\frac{NNP}{M1}$	$\frac{NNP}{M2}$	$\frac{y^*}{M1}$	$\frac{y^*}{M2}$
<u>1929-1953</u>				
Lag 1	2.766	2.485	2.785	2.310
<u>1929-1971</u>				
Lag 1	4.154	2.887	4.306	2.543
Lag 2			2.183	
Lag 3		-2.282		

*In the regression: $\Delta V_t = \alpha_n + \beta_n \Delta V_{t-1} + \mu_{nt}$

allows us to attach a very high confidence level to our statement that autocorrelation does exist in the data.

Turning now to the second half of the time period (set at 1949-1971), several interesting patterns deserve comment:

(1) For the M1 measures of velocity, no coefficients are significant in the regression, $\Delta V = \alpha\beta\Delta V_{t-1} + \mu$, but almost all the constant terms (lags 1-6) are significant (in prior tests, no constant terms were significant). Since first differences are being tested here, the significant constant terms indicate the presence of a distinct trend in M1 velocity movements for 1949-1971, which may be inconsistent with the random walk hypothesis. (2) The M2 measures of velocity demonstrate a different pattern in the same autocorrelation tests. No constant terms are significant, but coefficients at lags 3 and 4 are significant. This differs from the 1929-1953 pattern where significant coefficients were all located at lag 1.

One possible explanation of the above phenomena is that the earlier period (1929-1953) was dominated by cyclical movements in velocity, more specifically the drastic changes in income brought about by the Depression and WWII. The latter period (1949-1971), as far as M1 was concerned, was dominated by a secular uptrend in velocity. The M2 autocorrelation at lags 3 and 4 (which was negative in all cases in the 1949-1971 period) is perhaps of a cyclical nature also. Thus, it appears that the observed autocorrelation for the longer period (29-71) is the result of both cyclical and trend factors.

Summary

Prior to 1910, and perhaps 1920, the U.S. was not very close to being one economic world. Thus, the aggregate velocity series was influenced by regional velocity series that were moving in different directions, a factor which negated the existence of any true national pattern. After 1920, and particularly after 1929, there is evidence that implies that a national velocity pattern began to emerge, and thus velocity ceased to follow a random walk.

Turning to more technical matters, this chapter suggests two things: (1) that it may be quite enlightening to break up a velocity series into several sub-periods, and (2) a fair test of the random walk hypothesis is perhaps dependent upon the exact way in which income and money measures are constructed in compiling a velocity series.

CHAPTER IV

VELOCITY LEVELS AND INSTITUTIONAL CHANGE

As mentioned earlier, Friedman hypothesizes that since the U.S. and Great Britain have similar velocity series, it follows that the determinants of velocity are similar in the two countries. Again, it is necessary to question Friedman's "near-identity" label on U.S.-U.K. velocity. Wide differences in levels existed prior to 1900 and the series appear to be diverging after 1950. It is doubtful if forces common to both economies can explain these movements. Friedman appears to recognize this when he states:

"At one time in my earlier studies of the demand for money, I was inclined to attribute the decline in income velocity almost entirely to an income elasticity of demand greater than unity, but I now believe, on the basis of this comparison between the U.S. and the U.K., that I did not give sufficient attention to the changing financial institutions and structures in the U.S. which proceeded particularly rapidly in those 30 or 40 years before 1906."¹

Friedman then goes on to point out that no such institutional change took place in Great Britain, thereby qualifying his statement as to the existence of common determinants of velocity, at least prior to the early 1900's:

¹The American Economist, p. 6.

"It was this chart (showing a rapid decline in velocity in the U.S. prior to 1905) that persuaded us that we had attributed too much influence to the income effect in the early period and not enough influence to what we now call the improvement in financial sophistication in the United States - a very rapid increase in the number of banks and spreading urbanization so that people were closer to a bank and it cost less to keep deposits. I should point out that in that first period (before 1905) in the United States, there was a very rapid rise in deposits relative to currency, while there was no corresponding rapid increase in the United Kingdom."¹

The next question is whether or not Friedman's hypothesis concerning common determinants of velocity is applicable to periods after 1906. As mentioned earlier, it should be noted that the determinants of velocity in normal times could possibly be less relevant in crises periods (i.e., WWI, WWII, and the Depression) when inflationary psychology, depression psychosis, and war-time rationing have a great effect on spending and savings decisions. This is a very pertinent point since:

- (1) U.S.-U.K. velocity levels and changes were most highly correlated from 1914-1949, and
- (2) Velocity, stripped to its barest elements, is a result of nothing more than spending and savings decisions.

The desire to substitute real goods for money (spending) will tend to increase velocity, while the desire to hold money (savings) will tend to do just the opposite. Of course, crises such as wars and depressions can drastically alter normal

¹Ibid., p. 11.

spending and savings decisions.

After 1950, the U.S. and U.K. velocity series both increased, but the rate of increase in Great Britain's velocity series is much higher. Friedman takes a very curious position here (in light of his explanation of the period prior to 1906):

"One of the puzzles that has bothered people is rapid rise in velocity in the postwar period in the United States. As we have seen, most of that was really a reaction to the wartime fall, and there isn't much of a rise once that reaction is allowed for. But many people speculated that the reason for the rapid rise in velocity was the growth of savings and loan associations and of mutual savings banks, which provided a substitute for cash and therefore produced a rise in velocity. But if that were the explanation for the United States, what explains the still larger rise in velocity in the U.K.? There has apparently been no such dramatic institutional change in the U.K. as there was in the U.S. Similarly, this consideration immediately rules out many possible hypotheses about the major factors affecting velocity. Whatever they are, they are forces that are common to the United States and the United Kingdom."¹

Friedman is contradicting himself here, since for the period prior to 1906, he is willing to accept institutional changes as an important factor in the U.S., while openly admitting that no such change took place in the U.K.; yet for the postwar period he makes a complete about-face, ruling out savings and loan associations as important factors relative to U.S. velocity on the grounds that no such institutional change occurred in Great Britain. Wouldn't it be more plausible to argue that:

¹Ibid., p. 13.

- (1) The "common determinants of velocity" hypothesis is reasonable for the 1914-1949 period, when the U.S. and U.K. series are very similar.
- (2) Prior to 1906, and after WWII (when the velocity series are different), it is possible that factors peculiar to one country (such as institutional changes) may explain the differences.

The main thrust of the following sections will attempt to lend support to (2) above, concentrating on the determinants of velocity in the U.S. for the earlier period (1900-1920 must be used due to data limitations) and the latter period (1947-1971). By disaggregating the U.S. velocity series into state and regional series, we hope to discover the relationship between velocity and changing financial institutions, as well as other variables such as interest rates, price changes and per capita income.

The Earlier Period

Several economists have suggested the possibility of institutionally induced changes in velocity prior to and during the early 1900's. According to James Tobin:

"During the same period 1880-1915, commercial bank deposits grew relative to mutual savings banks. Mutual savings banks were almost as important as commercial banks around 1880, when the decline in velocity began. Their deposits were 80 per cent as large as those in commercial banks in 1877, 60 per cent as large in 1880, only 25 per cent as large as their rivals in 1915. During these years, of course, the territory covered by mutual savings banks became a smaller part of the continental economy... Perhaps 1880-1915 was the great day for commercial banking, and the decline in velocity

reflects its successful spread.¹

Garvey and Blyn agree with Tobin on this point, stating that:

"at least some of the decline in velocity between 1880 and 1914 is attributable to the growing role of commercial banks as thrift institutions."²

However, they argue that a more important factor was the very limited use of money in rural areas relative to the use of credit:

"In agricultural regions, it was not uncommon for money to be received perhaps only once or twice a year and, then, almost immediately paid out to retire debts accumulated over the previous months... In the newer regions of the 1880's and 1890's, where agriculture and/or mining activities dominated and where banks were relatively few,...it should not surprise us that velocity was quite high."³

This institutional approach is an alternative (not necessarily a conflicting one) to Friedman's luxury good hypothesis, which Friedman himself now recognizes. As a matter of fact, he did not exactly overlook this factor in his original explanation:

"As the real income of the people of the United States rose, and perhaps also as deposits were made more convenient by the spreading of banking facilities, the community came to hold a

¹James Tobin. "The Monetary Interpretation of History," The American Economic Review, LV, (June, 1965), p. 475. It should be noted here that Friedman's velocity series does not include the deposits of mutual savings banks in the denominator.

²Garvey and Blyn. The Velocity of Money, p. 81.

³Ibid., p. 81.

decidedly larger amount of money relative to its income, which is to say, the velocity of money declined."¹

Tests with State Data

Our state data is ideally suited for testing the impact of institutional changes on velocity, since in effect, we can largely isolate rural as opposed to urban areas. Unfortunately, our data limits us to the years 1900 and 1920, since money data is not available for 1880 or 1860 (the other years in Easterlin's state income series). Nevertheless, there were large decreases along with moderate increases in velocity among the various states in the 1900-1920 period (Table 4). To measure the growth of banking systems, we compared the number of banks in 1900 to 1920.² Table 13 is presented as a first approximation of the situation, listing the seven states with the lowest percentage increase in the number of banks along with the seven states with the highest increases. The general trend is quite clear, velocity fell from 1900-1920 in the rural, less developed states while velocity actually increased in many of the more industrialized, urbanized states (which perhaps indicates that the people in these states, at least, did not consider money a luxury good).

¹Friedman and Schwartz, A Monetary History of the United States, p. 679.

² The data here came once again from All-Bank Statistics.

TABLE 13

STATES WITH THE HIGHEST AND LOWEST
RATES OF INCREASE IN THE NUMBER OF
COMMERCIAL BANKS, 1900-1920

Lowest 7 States	% Increase in # of Banks	V1	V2
		1900 - 1920	1900 - 1920
Rhode Island	- 47%	2.32 - 2.97	.87 - 1.34
Maine	8%	4.80 - 4.88	1.29 - 1.50
New Hampshire	9%	5.89 - 6.05	1.27 - 1.48
Massachusetts	12%	2.25 - 2.73	.93 - 1.28
Connecticut	16%	3.76 - 3.54*	1.00 - 1.34
Vermont	21%	5.38 - 5.87	1.28 - 1.21*
New York	24%	1.28 - 1.56	.82 - 1.05
*-Decrease in velocity			
Highest 7 States			
New Mexico	779%	4.94 - 3.98	4.44 - 3.05
Montana	670%	3.91 - 2.99	3.44 - 1.80
Florida	592%	5.27 - 2.75	4.82 - 1.92
Oklahoma	515%	8.77 - 2.56	8.29 - 2.11
North Dakota	488%	8.22 - 2.85	5.48 - 1.29
Idaho	455%	5.84 - 3.10	5.21 - 2.22
North Carolina	390%	8.14 - 3.80	6.68 - 2.52

To obtain a more comprehensive picture of the situation, the following regression was tested for both V1 and V2:

$$(1) \text{ PCT.}\Delta V = \alpha + \beta (\text{PCT}\Delta\#\text{Banks})$$

The results are summarized below:

	B Coefficient	t-value	R ²
V1	-.085	-4.51	.31
V2	-.11	-5.55	.40

Other tests were attempted; the use of state deposits/state cash was used as an additional explanatory variable that would measure the expansion of the banking system. This variable had very little effect on the results. It should be mentioned here that our currency stocks were estimated by the same procedure as in Chapter I (see Appendix, Chapter I). This procedure assumes that the state currency stock is flowing through the banking system, a somewhat questionable assumption for the states which barely had a banking system in 1900. Admittedly, the number of banks is a rough proxy for the spread of banking systems; nevertheless, the results of regression (1) suggest that institutional changes were an important factor in velocity changes.

Rank correlations were also used on the same variable in regression (1).¹ Once again the results were significant:

¹For a description of the Kendall rank correlation method, see Nonparametric Statistics for the Behavioral Sciences, by S. Siegal, Chapter 9, (McGraw-Hill, New York, 1956).

	Kendall Rank Coefficient	t-value
V1	-.475	-4.76
V2	-.557	-5.58

The negative coefficients here indicate an inverse relationship between velocity levels and the change in the number of banks in the state. In other words, states which received a high ranking as to the change in the number of banks tended to receive a low ranking in respect to velocity changes due to large declines in velocity.

Of course, our explanation for this period is not complete; evidence has been presented that indicates that the decline in velocity (V1 and V2) for the period from 1900 to 1920 was partially the result of the extension of the banking system. A lot of the variation remains "unexplained". However, data limitations prevent a more thorough analysis of this subject.

Institutional Changes and the Postwar Rise in Velocity

Friedman still maintains that institutional change (in the form of savings and loan association expansion) had little to do with the postwar rise in velocity, on the grounds that no similar changes occurred in Great Britain. Previously, in A Monetary History of the United States, Friedman and Schwartz advanced a different explanation to justify this position, a rather complicated analysis which concludes that S & L's were not responsible for the postwar rise in velocity. Their anal-

ysis starts out by assuming the growth of savings and loan associations in the 1920's was the natural growth rate for such institutions. Since velocity did not rise markedly in the 1920's, Friedman and Schwartz maintain that a similar growth rate for SLA's could have occurred in the postwar era without a significant upward effect on velocity; thus only the growth in SLA's above this natural rate could represent substitution of savings and loan shares for time deposits which would have the effect of increasing velocity. This procedure allows Friedman and Schwartz to assume away approximately 40% of the growth of SLA's between 1946 and 1960 (\$22 billion out of \$58 billion as of 1960), a process which Friedman and Schwartz themselves recognize as being "highly arbitrary".¹ The amount of postwar SLA growth above the natural rate (\$29 billion as of 1960) could have influenced velocity in an upward direction according to Friedman and Schwartz:

...The effect of substituting \$29 billion of savings and loan shares for \$29 billion of money would have been to raise velocity in 1960 by about 14%; at the limit, therefore, the growth of savings and loan shares could account at most for one-third of the postwar rise in velocity. And this extreme estimate is probably at least four or five times its actual influence.²

Friedman and Schwartz state that an upward effect of 14% on velocity is way too high since they believe there is a low de-

¹Friedman and Schwartz, A Monetary History of the United States, 1867-1960, p. 671.

²Ibid., p. 672.

gree of substitutibility between SLS's and time deposits; however, their evidence for this hypothesis is rather scanty, depending mainly on the time period of 1954 to 1958 when the behavior of time deposits relative to SLS's did not indicate a high degree of substitutibility.

We do not find Friedman and Schwartz's line of reasoning very convincing for several reasons: first, the idea that SLA growth in the 1920's did not influence velocity in an upward direction is suspect. It is possible that SLA's did have an upward influence on velocity in the 1920's, but the effect was offset by other factors peculiar to that decade. Secondly, the idea that a normal rate of growth for SLA's exists, and that the 1920's typified that growth rate, is highly arbitrary as Friedman and Schwartz admit. Finally, Friedman and Schwartz's evidence on substitutibility is drawn from only a four year time period. The next section presents evidence for a longer time period (1954-71) which conflicts with their findings.

Apparently Tobin does not find Friedman and Schwartz's reasoning here very convincing either, since Tobin ignores their arguments in his review of A Monetary History of the United States; stating in respect to savings and loan associations:

"Their spread has helped increase the velocity of money, just as the spread of commercial banks increased the velocity of currency. To the extent, however, that the spread of SLA's has also taken business from the security markets, the velocity

of money-plus-SLA shares had declined, just as the velocity of currency-plus-bank deposits did before 1915."¹

In effect, Tobin is arguing that there is a much higher degree of substitutibility between commercial bank deposits and SLA's than Friedman argues there is.

Garvey and Blyn side with Tobin on this issue, noting that the velocity of M2-plus-SLA shares has declined irregularly since 1951, with the implication being that SLA shares are substitutes for time deposits. In addition, Garvey and Blyn state:

"Indeed, the shift in asset-holder preferences suggests not so much that cash and the near moneys are substitutes as that money is becoming as "inferior" asset in relation to money substitutes. Undoubtedly, rising interest rate levels provide much of the explanation as to why money has become an inferior asset, compared with the other liquidity instruments."²

It would appear to be intuitively obvious that in any area where SLA's and commercial banks compete, there is substitutibility between SLA shares and time deposits, simply because they are so similar in nature (federally insured, comparable rates of interest, etc.). The whole question is a very complex one; however, we can offer some rather straightforward evidence which indicates SLA shares and commercial bank time deposits are substitutes. From 1954 to 1960 SLA's received more than half of the increase in savings of house-

¹Tobin, "The Monetary Interpretation of History", p. 475.

²Garvey and Blyn, The Velocity of Money, p. 85-86.

holds; while from 1961 to 1968 their share of the gain began to contract, falling to a low of 20% in 1967. Their share of the increase in household savings bounced back to 43% in 1971, after some slight improvement in 1969 and 1970. The share of increased savings going to commercial banks during this period followed an almost opposite pattern, indicating the SLA's were gaining at the expense of the commercial banks or vice-versa. From 1954-1960 the commercial banks share of increased savings was only 30%, but steadily improved to 60% in 1966 and remained above the 1954-1960 percentages for the rest of the sixties. However in 1971, commercial banks' share of increased household savings fell to 40%, the same year that the share going to SLA's took a big increase.¹ This pattern is certainly one which is compatible with the argument that SLA shares and commercial bank deposits are reasonably close substitutes.

In any case, we do not wish to belabor the issue of substitutibility, since it is possible to show that SLA activity increases velocity by another method. First, let's assume SLA's grow with little effect on time deposits (as Friedman argues). Secondly, consider the lending activities of SLA's - a very high proportion of their assets are in the form of mortgage loans (roughly 85%), an activity which will help generate an increase in Y, with no direct effect on M (assuming SLA's are not growing at the expense of time deposits). If

¹All data here are from the 1972 Savings and Loan Fact Book, (U.S. Savings and Loan League, Washington, D.C.), pp. 11, 12.

SLA shares are growing at the expense of time deposits, the immediate effect will be to reduce M2, which would also act to increase velocity. Now it is crucial to point out that the exact same activity by a commercial bank (lending money that is spent on new goods and services), will have the opposite effect on velocity. Since the bank loan adds to the money supply and since this ΔM is proportionately larger relative to M than the ΔY (income generated when the loan is spent) relative to Y, the immediate effect will be to lower velocity. This will be true as long as Y is greater than M, (i.e., velocity is greater than 1).

In short, the crucial difference is that commercial banks create money in the process of lending while SLA's do not; thus the lending functions of banks will tend to have the immediate effect of lowering velocity while SLA's will do the opposite. Of course, similar activities by other non-bank financial institutions will have the same effect - they are turning over funds which generate higher levels of income, thereby increasing velocity. The important thing here is that the proportion of new lending done by commercial banks has apparently decreased relative to non-bank institutions, due to the rapid growth of SLA's, credit unions, and pension funds.¹

¹For instance, SLA shares increased from \$8.5 billion in 1946 to \$174.5 billion in 1971 and credit union savings increased from \$4 billion to \$18.5 billion over the same period. Commercial bank time deposits went from \$33.4 billion to \$238.2 billion, a much lower rate of increase. (From 1972 Savings and Loan Fact Book, p. 15)

This growth of the non-bank sector could explain much of the postwar rise in velocity, just as the growth of the commercial banking system can explain a significant part of the decline in velocity prior to 1920.

Our data is ideally suited for testing this proposition since:

- (1) Velocity levels do differ significantly from region to region (state to state), as Chapter I demonstrates.
- (2) There is wide variation among states as to the importance of savings and loan associations.

The next section will deal with empirical testing of the factors which contributed to the postwar rise in velocity.

Tests for the Determinates of Velocity

The major concern here is with the M2 measure of velocity, since this is the measure used by Friedman and Schwartz. Possible determinates of velocity that will be tested here are per capita personal income, time deposits, savings and loan deposits, interest rate levels, and price levels.¹ Time de-

¹The data sources are:

- (1) Time deposits - same data described in Appendix I.
- (2) Per capita personal income - from the Commerce Department's survey of state personal income.
- (3) Savings and Loan deposits - from various issues of the Savings and Loan Fact Book (U.S. Savings and Loan League, Washington, D.C.) and The Savings and Home Financing Source Book (Federal Home Loan Bank Board, Washington, D.C.).
- (4) Interest rates - from the Federal Reserve Board's quarterly survey of short-term business loans (courtesy of Mrs. Francis Weaver). Proxy rates were obtained for the twelve regions described in Appendix I by taking the interest rates for a major financial center in each region (quarterly rates were

posits, per capita income and savings and loan deposits are available on a state by state basis for the whole period (1947-1971), while only rough regional proxies are available for interest rates and price levels for the period 1950-71.

The use of regression analysis on cross-section data appears to be the most promising method for "explaining" interregional variation in velocity levels. The following regression was tested on cross-section data for the fifty states and D. C. from 1947-1971:

$$(1A) \quad \log V2 = c + (A)\log PCPI + (B)\log SLS \\ + (C)\log TD + \mu$$

where V2 is the M2 measure of velocity, PCPI is per capita personal income, SLS is savings and loan deposits, and TD is time deposits. The results are presented in Table 14 for each of the 25 years.

The results exhibit a strong and distinctive pattern. In all 25 years, the B coefficients (the elasticity of V2 in respect to SLS) are positive and significant. This is strong evidence that higher levels of SLA activity in any state lead to higher levels of velocity and vice-versa. As already men-

averaged to obtain annual rates).

(5) Price levels - from the Bureau of Labor Statistics Survey of consumer prices in major U.S. cities. Again, the price level in a major city in each region was chosen as a proxy for the whole region and quarterly observations were averaged to obtain annual values.

TABLE 14

DETERMINANTS OF STATE M2 VELOCITY LEVELS,
 1947-71, CROSS-SECTION REGRESSION RESULTS
 $\log V_2 = C + (A)\log PCPI + (B)\log SLS + (C)\log TD + \mu$

Year	R ²	A Coefficient (t-value)	B Coefficient (t-value)	C Coefficient (t-value)
1947	.5035	.0249 (1.024)	.1456 (5.269)	-.2037 (-6.877)
1948	.5077	.0370 (1.499)	.1431 (5.064)	-.2032 (-6.836)
1949	.5160	.0266 (1.083)	.1546 (5.515)	-.2039 (-6.987)
1950	.5569	-.0908 (-3.795)	.1355 (5.004)	-.1805 (-6.355)
1951	.4377	-.0445 (-.3800)	.1076 (3.272)	-.1882 (-4.964)
1952	.3337	-.0258 (-.2029)	.0705 (2.458)	-.1516 (-4.086)
1953	.2906	-.0041 (-.0309)	.0798 (2.304)	-.1510 (-3.565)
1954	.3304	-.0491 (-.3816)	.0892 (2.679)	-.1556 (-3.876)
1955	.3200	-.0653 (-.4695)	.0847 (2.510)	-.1505 (-3.629)
1956	.3681	-.0001 (-.0010)	.0968 (3.263)	-.1624 (-4.398)
1957	.3695	-.0329 (-.2300)	.1026 (2.813)	-.1820 (-4.186)
1958	.4632	-.1090 (-.8235)	.1283 (3.836)	-.2041 (-5.195)
1959	.4198	-.0535 (-.4047)	.1418 (4.284)	-.2023 (-5.160)

TABLE 14--Continued

Year	R ²	A Coefficient (t-value)	B Coefficient (t-value)	C Coefficient (t-value)
1960	.4496	-.0444 (-.3539)	.1373 (4.334)	-.2069 (-5.459)
1961	.4647	-.0905 (-.7049)	.1545 (4.869)	-.2109 (-5.582)
1962	.5529	-.1488 (-1.261)	.1566 (5.528)	-.2213 (-6.477)
1963	.4660	-.0366 (-1.145)	.1621 (5.593)	-.1996 (-6.183)
1964	.5300	-.1693 (-1.256)	.1871 (5.941)	-.2366 (-6.572)
1965	.5543	-.2228 (-1.611)	.1835 (5.973)	-.2341 (-6.448)
1966	.5488	-.2004 (-1.413)	.1884 (6.082)	-.2376 (-6.504)
1967	.5296	-.1650 (-1.145)	.1849 (5.976)	-.2316 (-6.253)
1968	.5111	-.1778 (-1.198)	.1861 (5.866)	-.2290 (-5.912)
1969	.3730	-.0723 (-.4563)	.1751 (4.643)	-.2232 (-4.845)
1970	.4092	-.0648 (-.4233)	.1919 (5.344)	-.2385 (-5.338)
1971	.4117	-.0966 (-.6329)	.1761 (5.177)	-.2288 (-5.384)

tioned, the explanation for this is twofold:

- (1) To the extent that SLA shares substitute for time deposits, growth in the money stock is restrained since time deposits are included in M2 while SLA shares are not.
- (2) SLA activity turns over funds, a major portion of which is spent for new housing, thereby increasing Y (and thus Y/M).

On the other hand, all the C coefficients (the elasticity of V2 in respect to time deposits) are negative and significant in all cases, indicating that time deposit levels vary inversely with velocity levels. Thus, the substitution of SLS's for TD's will tend to increase velocity. The consistency and significance of the B and C coefficients indicate that such substitution has taken place in the periods in question. The A coefficients (the elasticity of V2 in respect to per capita personal income) are insignificant except for one year, 1950.

These results imply that current income is not an important determinant of velocity relative to the level of wealth in the states and more importantly, relative to how economic units choose to hold that wealth. To the extent that time deposits are the preferred financial asset, velocity levels will tend to be lower; to the extent that non-bank financial assets are chosen, velocity will tend to be higher.

Regression results for the twelve regions are interesting in comparison to the state results. For the twelve regions, regression (1A) was again tested on cross-section data for 1950-1971, with the addition of two more explanatory var-

iables; interest rates (D coefficients) and price levels (E coefficients). Because of a lack of data for 1947-1949, only the first three variables (PCPI, SLS, and TD) were used. Table 15 summarizes the results of these regressions. The results are strikingly similar to those for the state tests; all the B (SLS) coefficients are positive and significant and all 25 C (TD) coefficients are negative and significant. The other variables (per capita income, interest rates, and price levels) have only a few significant coefficients (all in the 1950-1951 period). Perhaps this reflects weaknesses in our proxy measures for interest rates and price levels; however, a glance at the R^2 's here reveals there is not much room for additional explanatory variables, although SLS and TD accumulation are certainly influenced by income levels and interest rates.

These high R^2 's in the regional cross-section analysis raise some very interesting questions, since some are two or three times as high as the R^2 's in the state tests. The additional explanatory variables (interest rates and price levels) have little to do with the high regional R^2 's, since most of their coefficients are insignificant.¹

¹The cross-section analysis was repeated using only SLS and TD as explanatory variables. The R^2 's were almost as high or higher relative to the regressions using all five variables, with the exception of regressions for the years 1952-1956 where the R^2 's were approximately 5% lower for the regressions using only SLS and TD as explanatory variables.

TABLE 15

DETERMINANTS OF M2 VELOCITY LEVELS FOR THE 12 REGIONS,
1947-71, CROSS-SECTION REGRESSION RESULTS

$$\log V_2 = c + (A)\log PCPI + (B)\log SLS + (C)\log TD + \mu$$

$$\log V_2 = c + (A)\log PCPI + (B)\log SLS + (C)\log TD + (D)\log i + (E)\log PL + \mu$$

Year	R ²	A Coefficient (t-value)	B Coefficient (t-value)	C Coefficient (t-value)	D Coefficient (t-value)	E Coefficient (t-value)
1947	.7870	-.3050 (-.9248)	.3294 (3.034)	-.2868 (-3.339)		
1948	.7698	-.2572 (-.7328)	.3486 (3.078)	-.3009 (-3.571)		
1949	.8064	-.3338 (-.9666)	.3801 (3.525)	-.3067 (-3.808)		
1950	.9392	-.7926 (-3.146)	.3752 (4.844)	-.2098 (-3.448)	-.8585 (-3.054)	-1.963 (-.4894)
1951	.9524	-.8193 (-3.255)	.4526 (6.026)	-.2541 (-4.311)	-.8475 (-2.406)	-6.132 (-1.759)
1952	.8809	-.5045 (-1.332)	.5242 (4.320)	-.3239 (-3.877)	-.5225 (-1.6785)	-5.822 (-.9170)
1953	.8988	-.5572 (-1.438)	.4882 (5.404)	-.2972 (-3.914)	-.9607 (-1.395)	-.8184 (-.2707)
1954	.9185	-.3907 (-1.095)	.4872 (5.680)	-.3270 (-4.176)	-.7453 (-1.096)	-1.805 (-.5104)

TABLE 15--Continued

Year	R ²	A Coefficient (t-value)	B Coefficient (t-value)	C Coefficient (t-value)	D Coefficient (t-value)	E Coefficient (t-value)
1955	.9207	-.4128 (-.8955)	.4884 (5.983)	-.3258 (-4.030)	-.6735 (-.8342)	-2.001 (-.5687)
1956	.8323	-.2817 (-.5730)	.3151 (3.012)	-.2567 (-2.756)	-.8218 (-.7973)	2.530 (.5859)
1957	.9061	-.2188 (-.6227)	.3966 (4.089)	-.3107 (-4.122)	-1.217 (-1.319)	.0517 (.0145)
1958	.8966	-.9277 (-1.734)	.4141 (4.082)	-.3641 (-3.397)	.0136 (.0221)	.3740 (.1032)
1959	.9309	-.3005 (-.7965)	.4161 (5.631)	-.3248 (-5.192)	-.7917 (-.7404)	1.004 (.3419)
1960	.9160	-.1518 (-.3135)	.3948 (4.398)	-.3308 (-3.895)	-.4420 (-.3480)	.4618 (.1242)
1961	.9285	-.1884 (-.3851)	.3903 (4.567)	-.3402 (-4.410)	.1778 (.1971)	.7231 (.2190)
1962	.9245	-.0797 (-.1621)	.4147 (4.483)	-.3663 (-4.418)	-.3080 (-.2898)	-.7860 (-.2271)
1963	.8835	-.0073 (-.0450)	.3162 (4.899)	-.2378 (-5.854)	-.5194 (-.7314)	-1.879 (-.8617)

TABLE 15--Continued

Year	R ²	A Coefficient (t-value)	B Coefficient (t-value)	C Coefficient (t-value)	D Coefficient (t-value)	E Coefficient (t-value)
1964	.9425	-.1585 (-.3688)	.4291 (6.850)	-.3662 (-5.026)	-.1659 (-.1825)	-1.470 (-.6279)
1965	.9490	.0233 (.0545)	.4446 (6.184)	-.4269 (-5.791)	-.1258 (-.1437)	-.8803 (-.4330)
1966	.9365	-.0231 (-.0486)	.4130 (5.931)	-.4227 (-5.870)	-.0589 (-.0350)	-.1705 (-.0781)
1967	.8969	-.1709 (-.2741)	.3663 (4.412)	-.3709 (-3.669)	1.149 (.7954)	.0722 (.0275)
1968	.9161	-.3187 (-.5509)	.3390 (4.298)	-.3150 (-3.325)	1.913 (1.460)	.6235 (.2390)
1969	.8091	-.2235 (-.2939)	.3166 (2.724)	-.3680 (-2.741)	1.492 (.6242)	.9376 (.2560)
1970	.8107	-.2160 (-.2578)	.3336 (2.906)	-.3620 (-2.411)	-.8209 (-.3243)	.4122 (.1198)
1971	.8172	-.1297 (-.1259)	.3042 (2.266)	-.3693 (-2.352)	-.5081 (-.2954)	-.4402 (-.1418)

As would be expected, there are also pronounced differences in the B (SLS) and C (TD) coefficients for the state regressions relative to the regional regressions. Examination of these coefficients (without any statistical tests) reveals that:

- (1) For the states (Table 14), the SLS coefficients are uniformly lower (in an absolute value sense) than the TD coefficients. Most of the SLS coefficients are in the .10-.20 range, while all of the TD coefficients fall in the -.15 to -.24 range.
- (2) For the regions (Table 15), the picture is entirely different. The SLS coefficients are consistently higher than the TD coefficients in most years, with the exception of the 1966-1971 period. Also, all the coefficients here are consistently higher than in the state case, particularly with respect to the SLS coefficients.

The major question which all this raises is: Why does the use of broader regions lead to higher R^2 's, higher coefficients, and a reversal (in most years) of the relative strengths of the SLS and TD coefficients? A clue to the answer to this question lies in Chapter I, where it is mentioned that velocity series are more stable across broader regions than in the case of individual states. Apparently, state velocity series are relatively unstable and this variation is not entirely "explainable" by variations in state SLS and TD's, as evidenced by the relatively low R^2 's in Table 14. One plausible explanation for this is that if large amounts of SLA deposits and TD's happen to cross state lines (at the time the data are collected), state totals will be radically affected, whereas regional totals will not be affected at all. This would help explain the greater stability of the regional ve-

locity series. This may be a partial explanation of the higher regional R^2 's. However, we cannot accept this line of reasoning entirely, since it conflicts with the results of Table 14; if state velocity levels were largely explained by SLS's and TD's crossing state lines, the R^2 's in Table 2 should be higher.

Another possible explanation is once again related to the "one economic world" concept. Suppose income in state A is partially determined by M2, SLS's and other non-bank financial activity in surrounding states, or by income in surrounding states. The question of whether money determines income here or vice-versa is not the issue; the issue is whether state income is influenced by regional income, TD's and SLS's. Outside influences on state M2 should be apparent in our data (if state A is losing TD's to state B, for instance), but our explanatory variables for the states have no way of picking up outside influences on income. Regional data does pick up this influence, as well as providing a more stable monetary and SLS series. Thus, regional Y/M is perhaps more consistent in showing the "true" relation between income and money. If this is the case, it offers a realistic answer to the question of why regional variables do a better job of explaining regional velocity than state variables do in explaining state velocity. Continuing with this line of reasoning, it appears as if SLA activity has had a particularly strong upward effect on velocity levels in some regions, especially

for the 1952-1965 period. The high B coefficients in Table 15 are evidence of this.

The evidence presented here suggests strongly that SLA's have indeed had an upward effect on the M2 measure of velocity. Table 15 indicates their greatest influence was in the fifties and early sixties, while commercial banks rallied in the late sixties (note the downtrend in the B coefficient from 1966 on). This is entirely consistent with our observations earlier in this chapter in respect to commercial bank activity relative to SLA activity. All this supports the views of Tobin and Garvey and Blyn; while it conflicts with the theory of Friedman and Schwartz. In all fairness to Friedman and Schwartz, it should be mentioned that their published work on this topic dealt with the period prior to 1960.¹ Had they had the benefit of another decade of empirical observations, their conclusions may well have been altered.

Summary

The results here indicate that institutional changes can have an important influence on M2 velocity levels. In the earlier period, prior to 1920, the spread of the commercial banking system lowered velocity, while in the postwar period the growth of savings and loan associations (and perhaps other non-bank financial institutions) fostered an increase in ve-

¹Friedman and Schwartz's A Monetary History of the United States, 1867-1960, was published in 1963.

locity. Variation in TD and SLS levels have strong "explanatory" power regarding variations in regional velocity levels, as evidenced by the fact that in all years, for both states and regions, every TD and SLS coefficient is significant. It should be noted that a more exact measure of the impact of SLA's might be obtained by using as an independent variable a ratio of SLA shares to total savings deposits (SLS's plus TD's). Nevertheless, considering the results obtained here, it is difficult to defend the position that velocity is not affected by institutional change.

CHAPTER V

SUMMARY AND CONCLUSIONS

The preceding research has focused attention on several topics concerning the velocity of money in the United States. The issues in question were developed in preliminary studies by Friedman and Schwartz, and by Gould and Nelson. In all fairness to them, it should be emphasized that much of their work on these topics was strictly of a prefatory nature. Indeed, several of Friedman's statements discussed here might be accurately labeled as passing thoughts on how things might be. Nevertheless, perhaps even Friedman's most idle speculations can provide grist for the mills of lesser economists.

The one common theme throughout this research on inter-regional velocity is the concept of one economic world. In Chapter I we argued that the degree of similarity in inter-regional velocity changes is the best indicator of the extent of economic integration among regions. If economic activity in Region A influences economic activity in Region B, and vice-versa, then it follows that money stocks and income would tend to change in a similar fashion in both regions; and thus the velocity series would do likewise. The evidence shows that generally this is the case in the United States for the 1929-71 period; regional or state velocity changes do tend to

follow changes in aggregate velocity, although some regional velocity series follow their national counterpart much more closely than others. The R^2 's presented in Tables 1 and 2 are probably the best summary measures of the degree of economic integration in the United States for the period in question. It is evident that some regions, particularly some states in the South and West, are relatively isolated or sporadically influenced by trends in external economic activity.

We do not agree with Friedman's contention that similar interregional velocity levels are a characteristic always associated with economic integration. Similar velocity levels might be a characteristic of one economic world, but the absence of such similarity does not preclude the existence of significant interregional economic relationships. The evidence shows the United States to be a case in point. Significant economic integration exists in the United States, yet there are definitely significant differences in interregional velocity levels. Generally, this holds true for both narrow and broad regional delineations, particularly in respect to the M2 measure of velocity.

According to Friedman, the existence of significant difference in velocity levels means the conditions which determine the demand for money are different.¹ We certainly found this to be the case with the M2 measure of velocity; regional development of certain financial institutions had an important

¹Friedman, The American Economist, p. 13.

impact on interregional velocity levels prior to 1920 and after WWII (the 1920-45 period was not tested). Differences in interregional M1 velocity levels were not as pronounced as with the M2 measure (35 of 48 states, and 6 of 12 regions had mean M1 velocity levels significantly different from the U.S. mean). We did not try to explain these M1 differences since Friedman's work deals mainly with the M2 velocity measure. However, it is worth noting that interest rates (the opportunity cost of holding M1 balances) are similar across regions; this would seem to indicate that the interest elasticity of the demand for M1 is different across regions, or else the interest rate is not an important determinant of M1 velocity in some regions. The fact that interest rates across regions almost always change in the same direction while velocity levels do not (see Table 3), would seem to indicate that, at least for a minority of states (regions) in some years, M1 velocity is determined by other forces.¹ This is one possibility for further research, although the task might be complicated if one considers the real opportunity cost of holding M1 balances. Nominal interest rates may be quite similar across regions, but real interest rates could vary much more since there are wide interregional differences in

¹Henry A. Latane has concluded that M1 velocity from 1909 to 1958 can be explained by interest rates without any use of income trends. See "Income Velocity and Interest Rates: A Pragmatic Approach", Review of Economics and Statistics, (November 1960), pp. 443-449.

cost of living indexes.¹

In Chapter II we investigated Friedman's "Illinois Hypothesis", the proposition that national money is a better predictor of changes in state income than state money is. This hypothesis was based on Friedman's contention that state money stocks (and thus state velocity) were unstable. We found some evidence which supports this; first, state velocity series were unstable relative to the velocity series of broader regions, and secondly, in our direct tests of the Illinois Hypothesis we found national money was the best predictor in a majority of both state and regional cases. However, we also found evidence in our direct tests that conflicted with this hypothesis. In numerous cases, state money was the best predictor of state income, particularly at the 99% confidence level where state money was most significantly related to state income in a majority of the determinate cases. The state groupings in Figure 2 indicate that money-income relationships are consistent across broad regions, with regional money dominant in the South and Southwest and national money dominant in the Midwest and parts of the Northeast (our tests of the 12 regions confirm these observations). It is also worth noting that most of the "indeterminate" states are in two regions.

The results of these direct tests of the Illinois Hypothesis indicate that the United States is not one economic

¹These indexes are published by the Bureau of Labor Statistics, Bulletin 1570, starting in 1966: City Workers' Family Budget (Autumn, 1966).

world to the extent that Friedman believes it is. He implies that external forces (changes in national money) consistently dominate regional income movements, and that internal forces (changes in state money) are relatively weak and inconsistent. However, our evidence indicates that regional conformity to national trends is somewhat mixed, not only in respect to velocity changes, but also in respect to the relationship between state income and the national money stock.

This implies that manipulation of the national money stocks may have little effect on income in a number of states, and that any significant change in the national money stock may be distributed unequally among regions. The existence of such a situation might provide justification for regionally oriented monetary policy (perhaps differential changes in reserve requirements across regions). One might argue that such a regional policy would be offset by the functioning of national money markets, whereby loanable funds would flow to areas where demand is the strongest, once again intensifying interregional differences in monetary growth rates. Similar interest rates across the United States are evidence that this happens to some extent; however, the availability of loans must be considered along with the cost. The whole issue might be summed up as follows: Suppose a region is given lower reserve requirements to stimulate credit expansion in that area, would banks (a) lower interest rates and send the funds out of the region, or (b) maintain similar rates and make loans more

available to customers within that region? To the extent that (a) occurs, the monetary policy would be ineffective, perhaps providing justification for the regional application of fiscal policy. Of course, throughout this whole discussion the assumption has been that money determines income. Perhaps for some states or regions, there is reverse causation where state money stocks are most closely related to lagged values of state, regional or national income. This is another interesting possibility for further research.

The concept of one economic world is also relevant for the research of Gould and Nelson, which deals with the question of whether or not velocity follows a random walk. We do not believe that Gould and Nelson's use of a long term velocity series (1869-1960, 1890-1960) offers a fair test of the random walk hypothesis. The reason for this is that prior to the 1920's the U.S. economy was not one economic world to any significant degree, as indicated by regional velocity movements in different directions for the 1900-1920 period (upward in the Northeast, downward in the West and South).

The existence of large interregional interest rate differentials prior to 1900 is additional evidence of the absence of one economic world in the United States. Is it realistic to expect autocorrelation to appear in a velocity series which represents aggregation of Y/M for several different economic worlds, particularly when the respective velocity series are moving in opposite directions? Perhaps this is an explanation

as to why autocorrelation is absent in the velocity series of earlier periods, but becomes more apparent in later periods (all velocity series tested for the period 1929-71 showed some degree of autocorrelation).

We also argue in Chapter III that a fair test of the random walk hypothesis requires a consistent method of measuring velocity. For example, is it consistent to exclude Federal Government deposits from M and allow Federal Government purchase of goods and services to remain in Y ? Or is it consistent to exclude a part of Y equal to depreciation (the use of NNP) while including in M the dollars which generate that portion of Y ? Keeping in mind that depreciation and Federal Government purchases have varied widely in the past, is it not possible that the inconsistencies mentioned above could introduce randomness into a velocity series? To prevent such a possibility and insure a fair test for autocorrelation in a velocity series, it is necessary to allow any sector or any type of economic activity to influence both Y and M , or to remove that influence from both Y and M . The use of y^* was an attempt to meet this guideline.

Chapter IV concentrates on interregional velocity relationships in two time periods; first, the period prior to 1920 when velocity displayed a major downtrend, and secondly, the post-WWII period when a moderate uptrend in velocity occurred. Our research indicates that changing financial institutions played a critical role in both of these velocity

trends.

In the earlier period, the rapid expansion of the commercial banking system in the rural states fostered a rapid increase in the demand for money (decrease in velocity), as banking services became more convenient and financial sophistication developed. Our data for this period, although somewhat scanty, tends to confirm this viewpoint. In the post-WWII era, an opposite chain of events took place. Non-bank financial institutions, primarily Savings and Loan Associations, spread rapidly relative to commercial banks. These institutions were making an increasing proportion of total loans, thereby helping to generate higher levels of income, but not adding to the money supply as commercial bank loans do. The function of non-bank financial institutions is comparable to the company store in a mining town of the 1880's, which extended credit to their customers until payday, thereby encouraging a higher level of economic activity with no change in the money supply - a procedure which could only result in higher levels of velocity. In the late 1800's and early 1900's the spread of commercial banking discouraged this type of activity and fostered a velocity downtrend, while the rapid growth of non-bank financial institutions in the postwar period had just the opposite effect. The cross-section regression analysis of regional velocity in the postwar period yields strong evidence in favor of the latter proposition.

The results of these last two chapters are important to

the controversy surrounding the behavior of velocity in the United States in the postwar period. Stephen W. Rousseas, author of a text in monetary economics, concludes a lengthy discussion on the recent behavior of velocity by stating:

This institutional approach to changes in velocity, and the evidence of the postwar period in particular, leads to a damaging conclusion with regard to Friedman's hypothesis of a stable velocity function. The stability of this function provides a direct and predictable link between the supply of money and the level of economic activity. If, however, the behavior of velocity over the long run is not predictable, and if it also varies unpredictably in the short run in response to induced changes in the availability of credit, then the link is broken. "Velocity," write Garvy and Blyn, "is not constant over time..., nor is it a stable function of 'permanent' income or wealth alone, or so strongly dependent on one single determinant, such as interest rates, as to make possible firm projections of its behavior in the long run, and certainly not in the short run." If this is so, and the evidence does tend to support this conclusion, then not much is left of Friedman's theory.¹

Our evidence does not support this view that velocity is unpredictable in nature. First of all, our results show that some autocorrelation is present in the first differences of various velocity series for the 1929-71 period. This indicates that changes in velocity do not follow an entirely random pattern, and that past changes in velocity are useful in predicting future changes. Secondly, our cross-section regression results in Chapter IV indicate that the development of Savings and Loan Associations have had a significant and

¹Stephen W. Rousseas, Monetary Theory, (New York: Alfred A. Knopf, 1972), p. 220-21. The Garvy and Blyn quote is from The Velocity of Money, p. 78.

consistent effect on interregional velocity levels. This enhances our ability to predict velocity changes, as long as there are no drastic and sudden shifts in the development of financial institutions. Contrary to Garvy and Blyn's statement above, M2 velocity in the postwar period has been strongly dependent on one determinant; namely, whether or not savers choose time deposits or savings and loan shares.

We would also argue that velocity would be more closely related to permanent income, if only money were defined in a more consistent fashion. Friedman's contention that money is a luxury good (that velocity falls as income goes up) would be much more credible if he allowed savings and loan shares and mutual bank deposits in his definition of the money supply.¹ Are not such deposits also viewed as temporary abodes of purchasing power? After all, money is as money does; it is socially defined (although some economists insist on ignoring the obvious). It would seem logical to include in the money stock those things which the average person (not the average economist) considers as money. As far as the general public is concerned, money in the bank is money in the bank; it makes little difference whether the bank is a commercial bank or a savings bank (almost all are federally insured and pay comparable rates of interest). The commercial banks have been

¹Garvy and Blyn point out that if this definition of money were used, "velocity would have declined irregularly during the entire period from 1951 on (to 1969)." The Velocity of Money, p. 182.

and still are advertising themselves as full-service banks in an attempt to differentiate themselves from various types of savings banks; this is just one more bit of evidence that time deposits and savings and loan shares are close substitutes in the eyes of the public.¹ In any case, if one accepts the proposition that money is socially defined (it is what people think it is), then it is rather difficult to justify the exclusion of mutual savings deposits and savings and loan shares from the money supply. This approach is closely related to the discussion in Chapter III where we argued that if one wishes to investigate trends in velocity, it is necessary to obtain a measure of velocity that is consistent with the concept.

Once again, the above discussion brings to mind many topics for further investigation. Undoubtedly, the results in Chapters I-IV would be changed significantly if S&L shares were included in the money stock; for instance, interregional differences in velocity would be reduced and there would be no postwar rise in aggregate M2 velocity. We would also hypothesize that inclusion of SLS's in the money stock would:

- (1) Increase the degree of autocorrelation in the first differences of U.S. velocity, and
- (2) Strengthen regional money as a predictor of regional income.

¹More sophisticated evidence of this sort can be found. See V. Karuppan Chetty, "On Measuring the Nearness of Near-Moneys," The American Economic Review, LIX (June 1969), 270-281.

Hopefully such topics as these will stimulate further research, and the data in Appendix I will prove useful in the pursuit of such topics.

APPENDIX I

DESCRIPTION AND PRESENTATION OF THE DATA

Personal Income

The only aggregate measure of income that is consistently available for states is personal income. The use of this income measure poses no real problems for velocity measurement since PI has maintained a fairly stable relationship to GNP over the years in question (approximately 70% of the values of $\frac{PI}{GNP}$ are in the .78 to .82 range, with a high of .86 (1946) and a low of .77 (1941). It should be noted that Friedman uses NNP for income in his velocity measures, and this income measure has varied more widely in relation to GNP than PI has. Whether or not the stability of PI in respect to state GNP is similar to the national relationship between the two is impossible to determine since data on state GNP is not available. Chapter III will have more to say concerning the choice of an optimal income measure for computing velocity; there is no use in belaboring the issue here since personal income is the only income data that are available on a state by state basis.

Sources

1900, 1920 - Easterlin's estimates from Population Redistribution and Economic Growth, United States, 1870-1950, Volume I.

1929-1947 - From Personal Income by States, Since 1929, by Charles F. Schultz and Robert E. Graham, (Washington, D.C.: U.S. Department of Commerce, 1956).

1947-1971 - From various issues of Survey of Current Business.

The period from 1948-1965 reflects revisions made in 1966 (see the August issue (1966) of the Survey of Current Business). The period from 1958-1971 reflects revisions in the methods used to estimate labor income made after 1966.

The Money Data

Estimates of M1 and M2 were compiled for the same period for which income data was available (1929-1971). All money figures are money stocks as of June 30 of the respective years. Since data is not available on a monthly basis, the June 30 figures are the closest we could come to yearly averages. Data on both demand and time deposits is available by state in the sources listed below, while state currency stocks had to be estimated.

Estimates of State Currency

The following method was used to estimate state currency holdings.

- (1) State vault cash (of all banks) as a percentage of total vault cash (all U.S. banks) was calculated.
- (2) This percentage was then multiplied with U.S. currency in the hands of the non-bank public to get an estimate of state currency.

It is assumed here that vault cash holdings are a reasonable proxy for the demand for cash, since currency in cir-

ulation is continually flowing through the banking system.

The fact that currency could be counted as part of a bank's reserves starting in 1959 should not cause serious estimating problems, since vault cash held above and beyond the public's demand should eventually be wiped out by high seasonal demands and rising incomes. Also, the only way for high levels of vault cash to accumulate is to have relatively high levels of currency in circulation. If a state is attracting currency from other areas, this will be reflected in higher vault cash levels, irregardless of the motives for holding that vault cash.

In addition, it should be kept in mind that currency is a relatively minor portion of the total money supply. Thus, minor errors in currency estimation will not seriously impair the validity of the monetary series (particularly M2).

Sources

1900, 1920, 1929-1954 - Measures of vault cash, demand deposits, and time deposits by states came from All-Bank Statistics, (Washington, D.C.: Board of Governors of the Federal Reserve System, 1956). All commercial banks are included in the data, along with mutual saving banks which are mainly found in the Northeast. Demand deposit figures exclude interbank deposits and Federal Government deposits.

1955-1971 - Data for this period came from June issues of Assets, Liabilities, and Capital Accounts: Commercial and Mutual Savings Banks, better known as FDIC Call Reports, (Washington, D.C.: Federal Deposit Insurance Corporation). It was necessary to add state and local government deposits to the deposit classifications here in order to make the deposit series consistent with that in All-Bank Statistics.

Comparison of Aggregate Velocity Series

Figures 3 and 4 provide a comparison of our aggregate velocity series with that of Friedman and Schwartz's'. Figure 3 contains our data which utilizes personal income as the income measure for both M1 and M2. Figure 4 depicts Friedman and Schwartz's' data from A Monetary History of the United States, 1867-1960, with the M2 series extended to 1970 using Gould and Nelson's extrapolation (the M1 series stops in 1960).

Generally speaking, our velocity series follow Friedman and Schwartz's' closely; our attempts to place all the data on one graph were frustrated by the similarity of the two series, particularly in the postwar period. Any difference observed could be explained by a detailed examination of the data:

- (1) Our series uses personal income, while Friedman and Schwartz utilize Kuznets' NNP as the income measure.
- (2) Our money data contains all-bank deposits as of June 30 of each year, while Friedman and Schwartz's' money measure is a monthly average of commercial bank deposits (which excludes mutual savings banks).

Regional Delineations

It is possible to group states into broader regions in any number of ways. Since we hope to make use of some Federal Reserve data in Chapter IV, one grouping which will be used is a 12 region one, where states are grouped as closely as possible to the 12 Federal Reserve Districts. Exactness is not possible here since in most cases the actual Federal Re-

FIGURE 3

M1 AND M2 VELOCITY FOR THE
UNITED STATES, COMPUTED
FROM DATA IN APPENDIX I

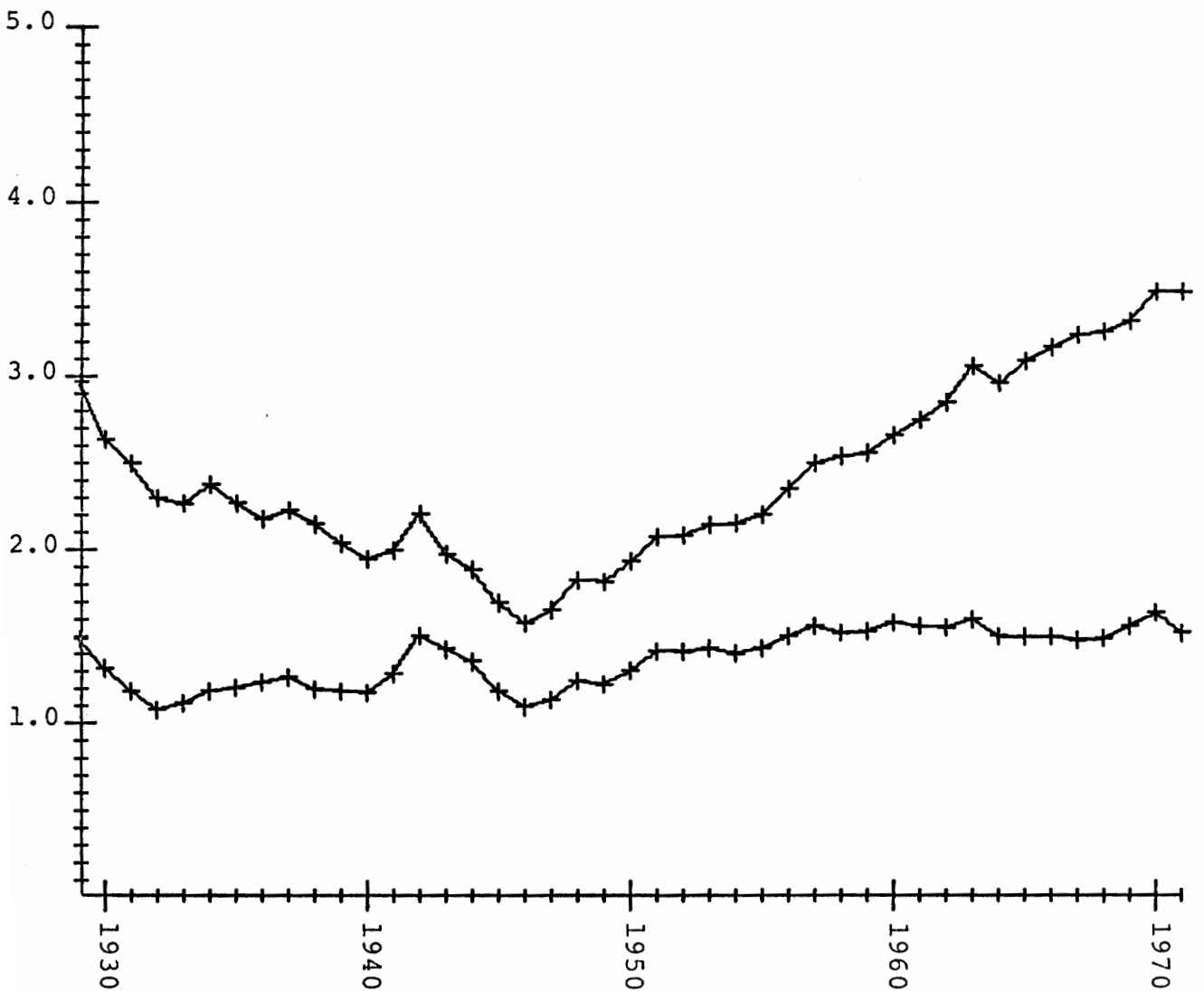
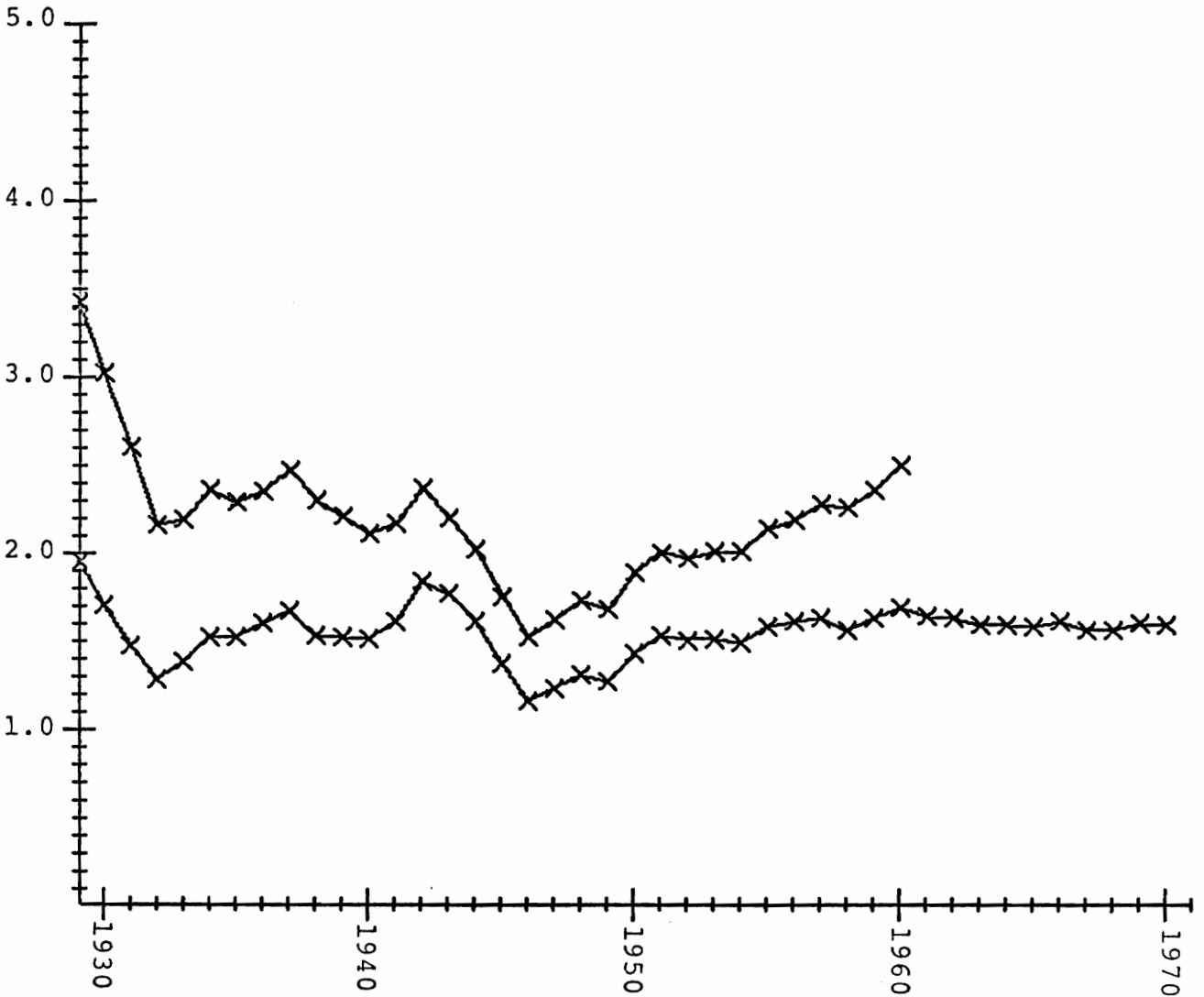


FIGURE 4
 FRIEDMAN AND SCHWARTZ'S M1 (1929-60)
 AND M2 (1929-71)* VELOCITY SERIES
 FOR THE UNITED STATES



*M2 velocity for 1961-1971 is taken from Gould and Nelson's extrapolations of the Friedman and Schwartz series.

serve Districts cut across state boundaries.

Proxy Regions for the 12 Federal Reserve Districts

- I Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut
- II New York
- III New Jersey, Delaware, Pennsylvania
- IV Ohio
- V Maryland, Virginia, North Carolina, South Carolina, West Virginia, Washington, D. C.
- VI Alabama, Georgia, Florida, Tennessee, Mississippi, Louisiana
- VII Iowa, Wisconsin, Michigan, Illinois, Indiana
- VIII Arkansas, Missouri, Kentucky
- IX Minnesota, Montana, North Dakota, South Dakota
- X Kansas, Nebraska, Colorado, Wyoming, Oklahoma
- XI Texas, New Mexico
- XII California, Washington, Oregon, Idaho, Nevada, Utah, Arizona, Hawaii, Alaska

To obtain broader regional delineations, the 12 regions above can be collapsed into three groups:

- North - Regions I-IV, VII
- South - Regions V, VI, VIII
- West - Regions IX-XII

Presentation of the Data

Tables 16.1-16.52 contain money, income and velocity data for all 50 states, Washington, D.C., and the United States as a whole. The data are presented on a state by state basis in alphabetical order, with the aggregate data at the end (Table 6.52).

TABLE 16.1
MONEY, INCOME, AND VELOCITY STATISTICS FOR ALABAMA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	36.	174.	289.	856.	4.93	2.97
1930	32.	158.	260.	705.	4.46	2.71
1931	34.	145.	235.	589.	4.08	2.51
1932	33.	110.	184.	427.	3.87	2.32
1933	38.	106.	170.	440.	4.16	2.59
1934	34.	122.	195.	550.	4.50	2.82
1935	34.	143.	221.	584.	4.09	2.64
1936	40.	173.	257.	679.	3.93	2.64
1937	48.	195.	286.	723.	3.71	2.53
1938	42.	182.	274.	677.	3.72	2.47
1939	47.	209.	307.	704.	3.37	2.30
1940	50.	229.	333.	801.	3.50	2.41
1941	61.	294.	404.	1089.	3.71	2.70
1942	113.	439.	556.	1520.	3.46	2.73
1943	183.	672.	801.	1880.	2.80	2.35
1944	268.	821.	977.	2058.	2.51	2.11
1945	306.	1003.	1208.	2161.	2.15	1.79
1946	347.	1177.	1419.	2162.	1.84	1.52
1947	332.	1151.	1405.	2337.	2.03	1.66
1948	333.	1169.	1425.	2571.	2.20	1.80
1949	328.	1153.	1411.	2446.	2.12	1.73
1950	316.	1141.	1401.	2691.	2.36	1.92
1951	327.	1194.	1452.	3077.	2.58	2.12
1952	330.	1275.	1553.	3287.	2.58	2.12
1953	337.	1295.	1594.	3432.	2.65	2.15
1954	324.	1314.	1640.	3314.	2.52	2.02
1955	339.	1388.	1729.	3761.	2.71	2.18
1956	363.	1462.	1819.	4005.	2.74	2.20
1957	404.	1522.	1945.	4261.	2.80	2.19
1958	391.	1524.	2032.	4442.	2.91	2.19
1959	412.	1657.	2213.	4699.	2.84	2.12
1960	439.	1691.	2275.	4887.	2.89	2.15
1961	408.	1627.	2273.	5025.	3.09	2.21
1962	405.	1706.	2461.	5274.	3.09	2.14
1963	422.	1792.	2663.	5666.	3.16	2.13
1964	437.	1898.	2882.	6108.	3.22	2.12
1965	476.	2042.	3185.	6713.	3.29	2.11
1966	523.	2334.	3647.	7245.	3.10	1.99
1967	564.	2427.	3938.	7659.	3.16	1.94
1968	575.	2449.	4245.	8369.	3.42	1.97
1969	577.	2608.	4627.	9163.	3.51	1.98
1970	612.	2696.	4801.	9925.	3.68	2.07
1971	669.	2935.	5602.	10765.	3.67	1.92

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.2
MONEY, INCOME, AND VELOCITY STATISTICS FOR ALASKA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	6.	13.	19.	0.	0.0	0.0
1930	4.	10.	16.	0.	0.0	0.0
1931	5.	10.	16.	0.	0.0	0.0
1932	5.	9.	15.	0.	0.0	0.0
1933	7.	11.	16.	0.	0.0	0.0
1934	7.	12.	17.	0.	0.0	0.0
1935	8.	14.	19.	0.	0.0	0.0
1936	7.	14.	20.	0.	0.0	0.0
1937	9.	17.	23.	0.	0.0	0.0
1938	7.	15.	22.	0.	0.0	0.0
1939	8.	17.	24.	0.	0.0	0.0
1940	10.	20.	27.	0.	0.0	0.0
1941	12.	25.	33.	0.	0.0	0.0
1942	35.	53.	61.	0.	0.0	0.0
1943	63.	90.	100.	0.	0.0	0.0
1944	77.	114.	127.	0.	0.0	0.0
1945	76.	112.	127.	0.	0.0	0.0
1946	73.	109.	125.	0.	0.0	0.0
1947	56.	94.	112.	0.	0.0	0.0
1948	52.	94.	112.	0.	0.0	0.0
1949	54.	99.	117.	0.	0.0	0.0
1950	57.	107.	127.	322.	3.02	2.54
1951	76.	137.	157.	448.	3.26	2.85
1952	66.	141.	169.	494.	3.51	2.93
1953	64.	140.	172.	511.	3.65	2.97
1954	62.	137.	174.	495.	3.61	2.84
1955	61.	134.	176.	505.	3.78	2.87
1956	72.	140.	176.	548.	3.91	3.11
1957	50.	122.	159.	537.	4.40	3.37
1958	54.	125.	165.	528.	4.21	3.19
1959	49.	141.	197.	562.	3.97	2.85
1960	50.	144.	203.	647.	4.48	3.18
1961	58.	156.	228.	633.	4.06	2.78
1962	63.	172.	260.	664.	3.85	2.55
1963	68.	182.	300.	702.	3.85	2.34
1964	62.	201.	320.	788.	3.92	2.46
1965	66.	223.	370.	855.	3.83	2.31
1966	69.	224.	390.	916.	4.09	2.35
1967	78.	246.	427.	1022.	4.15	2.39
1968	90.	268.	482.	1111.	4.15	2.31
1969	89.	294.	480.	1250.	4.26	2.61
1970	96.	335.	602.	1399.	4.18	2.33
1971	88.	348.	691.	1525.	4.39	2.21

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.3
MONEY, INCOME, AND VELOCITY STATISTICS FOR ARIZONA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	15.	69.	108.	254.	3.70	2.36
1930	13.	59.	95.	223.	3.80	2.35
1931	16.	53.	86.	182.	3.45	2.12
1932	24.	45.	68.	134.	2.96	1.96
1933	14.	34.	57.	128.	3.75	2.24
1934	12.	40.	61.	151.	3.76	2.47
1935	12.	47.	67.	176.	3.75	2.63
1936	16.	63.	85.	201.	3.20	2.37
1937	16.	72.	97.	223.	3.08	2.29
1938	12.	65.	93.	218.	3.33	2.33
1939	15.	70.	100.	231.	3.29	2.30
1940	16.	77.	107.	248.	3.21	2.31
1941	19.	89.	120.	309.	3.48	2.58
1942	35.	124.	155.	476.	3.83	3.07
1943	54.	210.	249.	652.	3.11	2.62
1944	81.	256.	308.	640.	2.50	2.08
1945	109.	331.	402.	654.	1.98	1.63
1946	107.	380.	466.	669.	1.76	1.43
1947	100.	392.	486.	749.	1.91	1.54
1948	100.	409.	506.	879.	2.15	1.74
1949	107.	413.	512.	906.	2.19	1.77
1950	120.	434.	534.	1006.	2.32	1.88
1951	139.	504.	606.	1230.	2.44	2.03
1952	128.	559.	673.	1399.	2.50	2.08
1953	141.	596.	726.	1478.	2.48	2.04
1954	134.	586.	743.	1514.	2.58	2.04
1955	150.	664.	843.	1655.	2.49	1.96
1956	179.	726.	919.	1861.	2.56	2.02
1957	151.	710.	956.	2028.	2.86	2.12
1958	145.	753.	1052.	2220.	2.95	2.11
1959	155.	864.	1205.	2455.	2.84	2.04
1960	162.	912.	1296.	2681.	2.94	2.07
1961	184.	944.	1416.	2905.	3.08	2.05
1962	224.	1036.	1640.	3177.	3.07	1.94
1963	244.	1106.	1832.	3362.	3.04	1.84
1964	236.	1115.	1955.	3529.	3.16	1.80
1965	250.	1165.	2155.	3773.	3.24	1.75
1966	264.	1227.	2338.	4110.	3.35	1.76
1967	256.	1194.	2520.	4516.	3.78	1.79
1968	293.	1302.	2802.	5062.	3.89	1.81
1969	314.	1518.	3191.	5765.	3.80	1.81
1970	337.	1617.	3368.	6487.	4.01	1.93
1971	380.	1819.	4051.	7287.	4.01	1.80

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.4
MONEY, INCOME, AND VELOCITY STATISTICS FOR ARKANSAS

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	23.	148.	224.	564.	3.82	2.52
1930	21.	131.	205.	415.	3.17	2.02
1931	21.	102.	158.	386.	3.78	2.44
1932	23.	79.	122.	284.	3.62	2.34
1933	20.	65.	100.	287.	4.38	2.86
1934	17.	75.	114.	333.	4.41	2.91
1935	16.	90.	132.	380.	4.22	2.88
1936	19.	109.	153.	452.	4.16	2.96
1937	24.	124.	170.	470.	3.78	2.76
1938	23.	120.	166.	436.	3.63	2.63
1939	25.	135.	181.	471.	3.50	2.61
1940	25.	142.	190.	501.	3.52	2.63
1941	30.	177.	226.	664.	3.76	2.94
1942	58.	269.	318.	934.	3.47	2.94
1943	86.	403.	453.	995.	2.47	2.19
1944	131.	490.	547.	1190.	2.43	2.18
1945	154.	627.	702.	1270.	2.03	1.81
1946	200.	771.	862.	1316.	1.71	1.53
1947	166.	742.	837.	1320.	1.78	1.58
1948	171.	744.	839.	1597.	2.15	1.90
1949	190.	773.	870.	1474.	1.91	1.69
1950	202.	796.	897.	1575.	1.98	1.76
1951	185.	793.	893.	1763.	2.22	1.98
1952	187.	835.	944.	1823.	2.18	1.93
1953	193.	859.	979.	1842.	2.14	1.88
1954	187.	858.	1003.	1810.	2.11	1.80
1955	195.	882.	1043.	1970.	2.23	1.89
1956	207.	913.	1087.	2035.	2.23	1.87
1957	205.	904.	1105.	2091.	2.31	1.89
1958	212.	909.	1141.	2210.	2.43	1.94
1959	216.	982.	1233.	2421.	2.47	1.96
1960	218.	981.	1272.	2461.	2.51	1.94
1961	243.	1046.	1389.	2704.	2.58	1.95
1962	238.	1081.	1497.	2899.	2.68	1.94
1963	256.	1169.	1677.	3104.	2.66	1.85
1964	257.	1220.	1801.	3387.	2.78	1.88
1965	269.	1291.	1949.	3577.	2.77	1.84
1966	295.	1387.	2177.	3999.	2.88	1.84
1967	335.	1469.	2359.	4236.	2.88	1.80
1968	361.	1546.	2524.	4597.	2.97	1.82
1969	369.	1650.	2851.	5004.	3.03	1.76
1970	364.	1664.	2926.	5517.	3.32	1.89
1971	390.	1824.	3387.	6005.	3.29	1.77

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.5
MONEY, INCOME, AND VELOCITY STATISTICS FOR CALIFORNIA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	213.	1450.	3516.	5502.	3.79	1.56
1930	173.	1278.	3427.	5079.	3.97	1.48
1931	190.	1215.	3381.	4347.	3.58	1.29
1932	256.	1048.	2951.	3381.	3.23	1.15
1933	239.	1027.	2823.	3227.	3.14	1.14
1934	222.	1057.	3003.	3590.	3.40	1.20
1935	233.	1261.	3295.	4020.	3.19	1.22
1936	237.	1481.	3690.	4817.	3.25	1.31
1937	257.	1702.	3886.	5132.	3.02	1.32
1938	257.	1665.	3918.	5088.	3.06	1.30
1939	307.	1803.	4071.	5257.	2.92	1.29
1940	302.	1987.	4311.	5839.	2.94	1.35
1941	361.	2413.	4793.	7331.	3.04	1.53
1942	547.	3022.	5442.	10010.	3.31	1.84
1943	888.	4963.	7739.	13281.	2.68	1.72
1944	1283.	6039.	9427.	14653.	2.43	1.55
1945	1505.	7014.	11339.	15194.	2.17	1.34
1946	1554.	8100.	13190.	16084.	1.99	1.22
1947	1423.	7947.	13437.	16637.	2.09	1.24
1948	1324.	8034.	13690.	17633.	2.19	1.29
1949	1345.	7570.	13350.	17878.	2.36	1.34
1950	1452.	8079.	13949.	19774.	2.45	1.42
1951	1464.	8469.	14462.	22756.	2.69	1.57
1952	1426.	9192.	15701.	25214.	2.74	1.61
1953	1484.	9554.	16507.	27002.	2.83	1.64
1954	1508.	9688.	17128.	27682.	2.86	1.62
1955	1683.	10806.	18669.	30378.	2.81	1.63
1956	1991.	11083.	19177.	33177.	2.99	1.73
1957	1694.	10869.	19494.	35497.	3.27	1.82
1958	1686.	10963.	20942.	37321.	3.40	1.78
1959	1712.	12194.	22753.	40955.	3.36	1.80
1960	1768.	12564.	22862.	42913.	3.42	1.88
1961	1913.	12929.	24836.	45601.	3.53	1.84
1962	2217.	13569.	27234.	48948.	3.61	1.80
1963	2342.	14474.	29556.	52522.	3.63	1.78
1964	2503.	15245.	31850.	56471.	3.70	1.77
1965	2434.	15137.	33619.	60104.	3.97	1.79
1966	2753.	15581.	36041.	65002.	4.17	1.80
1967	2724.	16238.	38461.	69807.	4.30	1.82
1968	3045.	17751.	40970.	76720.	4.32	1.87
1969	3395.	19494.	43955.	83067.	4.26	1.89
1970	3305.	19400.	42618.	88863.	4.58	2.09
1971	3934.	21693.	51090.	94118.	4.34	1.84

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.6
MONEY, INCOME, AND VELOCITY STATISTICS FOR COLORADO

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	36.	198.	318.	642.	3.25	2.02
1930	29.	187.	302.	603.	3.22	1.99
1931	44.	190.	304.	501.	2.64	1.65
1932	63.	174.	273.	380.	2.18	1.39
1933	64.	162.	245.	380.	2.35	1.55
1934	41.	164.	246.	397.	2.42	1.61
1935	41.	186.	273.	477.	2.57	1.75
1936	36.	206.	295.	586.	2.85	1.99
1937	43.	229.	320.	586.	2.56	1.83
1938	36.	211.	299.	564.	2.67	1.88
1939	39.	228.	318.	578.	2.53	1.82
1940	40.	241.	335.	617.	2.56	1.84
1941	46.	268.	362.	728.	2.71	2.01
1942	68.	341.	434.	1010.	2.96	2.33
1943	100.	509.	615.	1185.	2.33	1.93
1944	137.	599.	731.	1195.	1.99	1.63
1945	169.	714.	886.	1317.	1.84	1.49
1946	194.	882.	1094.	1429.	1.62	1.31
1947	180.	877.	1101.	1654.	1.89	1.50
1948	177.	911.	1130.	1810.	1.99	1.60
1949	187.	926.	1147.	1820.	1.97	1.59
1950	206.	1002.	1226.	1970.	1.97	1.61
1951	213.	1052.	1288.	2313.	2.20	1.80
1952	214.	1092.	1371.	2498.	2.29	1.82
1953	227.	1119.	1444.	2528.	2.26	1.75
1954	214.	1129.	1487.	2566.	2.27	1.73
1955	219.	1225.	1602.	2804.	2.29	1.75
1956	242.	1234.	1621.	3066.	2.49	1.89
1957	227.	1213.	1634.	3365.	2.77	2.06
1958	227.	1247.	1732.	3524.	2.83	2.03
1959	241.	1350.	1904.	3752.	2.78	1.97
1960	252.	1379.	1948.	4018.	2.91	2.06
1961	254.	1379.	2048.	4294.	3.11	2.10
1962	273.	1417.	2257.	4559.	3.22	2.02
1963	276.	1488.	2469.	4745.	3.19	1.92
1964	267.	1499.	2618.	4984.	3.32	1.90
1965	275.	1530.	2742.	5295.	3.46	1.93
1966	292.	1586.	2949.	5697.	3.59	1.93
1967	320.	1665.	3222.	6122.	3.68	1.90
1968	353.	1835.	3506.	6855.	3.74	1.96
1969	349.	2037.	3843.	7623.	3.74	1.98
1970	359.	2065.	3860.	8523.	4.13	2.21
1971	390.	2295.	4608.	9457.	4.12	2.05

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.7
MONEY, INCOME, AND VELOCITY STATISTICS FOR CONNECTICUT

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	59.	390.	1281.	1641.	4.21	1.28
1930	63.	389.	1309.	1493.	3.83	1.14
1931	70.	373.	1317.	1310.	3.51	0.99
1932	115.	334.	1204.	1017.	3.04	0.84
1933	114.	328.	1181.	964.	2.94	0.82
1934	97.	317.	1175.	1079.	3.40	0.92
1935	97.	340.	1209.	1173.	3.45	0.97
1936	108.	399.	1283.	1345.	3.37	1.05
1937	140.	466.	1382.	1442.	3.09	1.04
1938	115.	435.	1343.	1295.	2.97	0.96
1939	118.	469.	1389.	1415.	3.02	1.02
1940	148.	553.	1496.	1566.	2.83	1.05
1941	191.	698.	1677.	2000.	2.86	1.19
1942	302.	897.	1888.	2547.	2.84	1.35
1943	413.	1178.	2263.	2857.	2.42	1.26
1944	454.	1220.	2439.	2883.	2.36	1.18
1945	558.	1359.	2767.	2794.	2.06	1.01
1946	573.	1468.	3049.	3016.	2.05	0.99
1947	601.	1538.	3203.	3333.	2.17	1.04
1948	601.	1562.	3275.	3450.	2.21	1.05
1949	511.	1461.	3196.	3374.	2.31	1.06
1950	471.	1471.	3227.	3779.	2.57	1.17
1951	544.	1716.	3495.	4335.	2.53	1.24
1952	576.	1862.	3747.	4710.	2.53	1.26
1953	607.	1934.	3955.	5087.	2.63	1.29
1954	587.	1925.	4082.	5160.	2.68	1.26
1955	531.	1934.	4215.	5552.	2.87	1.32
1956	477.	1910.	4352.	6029.	3.16	1.39
1957	491.	1897.	4479.	6398.	3.37	1.43
1958	507.	1953.	4713.	6446.	3.30	1.37
1959	531.	1951.	4882.	6785.	3.48	1.39
1960	519.	1997.	5025.	7122.	3.57	1.42
1961	563.	2115.	5364.	7447.	3.52	1.39
1962	603.	2194.	5758.	7999.	3.65	1.39
1963	618.	2297.	6258.	8449.	3.68	1.35
1964	721.	2469.	6773.	9004.	3.65	1.33
1965	725.	2543.	7252.	9765.	3.84	1.35
1966	679.	2626.	7756.	10657.	4.06	1.37
1967	787.	2834.	8533.	11703.	4.13	1.37
1968	817.	3080.	9297.	12674.	4.11	1.36
1969	823.	3252.	9988.	13819.	4.25	1.38
1970	927.	3327.	10454.	14638.	4.40	1.40
1971	946.	3491.	11693.	15322.	4.39	1.31

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.8
MONEY, INCOME, AND VELOCITY STATISTICS FOR DELAWARE

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	7.	82.	145.	240.	2.92	1.65
1930	8.	82.	145.	203.	2.49	1.40
1931	8.	87.	152.	186.	2.13	1.22
1932	12.	75.	138.	144.	1.91	1.04
1933	13.	76.	139.	140.	1.84	1.01
1934	11.	73.	138.	157.	2.14	1.14
1935	13.	89.	156.	174.	1.97	1.12
1936	13.	105.	175.	215.	2.04	1.23
1937	19.	135.	210.	236.	1.74	1.12
1938	18.	130.	208.	201.	1.55	0.97
1939	15.	144.	225.	241.	1.67	1.07
1940	19.	172.	257.	270.	1.57	1.05
1941	23.	207.	293.	315.	1.52	1.08
1942	36.	227.	312.	356.	1.57	1.14
1943	51.	284.	375.	404.	1.42	1.08
1944	71.	323.	426.	424.	1.31	0.99
1945	93.	366.	492.	431.	1.18	0.88
1946	95.	402.	548.	460.	1.14	0.84
1947	94.	426.	577.	500.	1.17	0.87
1948	90.	401.	553.	537.	1.34	0.97
1949	85.	400.	554.	586.	1.46	1.06
1950	83.	423.	603.	684.	1.62	1.13
1951	92.	447.	627.	731.	1.63	1.17
1952	103.	456.	645.	782.	1.71	1.21
1953	102.	462.	657.	835.	1.81	1.27
1954	107.	479.	687.	857.	1.79	1.25
1955	113.	534.	755.	980.	1.84	1.30
1956	116.	537.	770.	1124.	2.09	1.46
1957	110.	514.	764.	1125.	2.19	1.47
1958	114.	535.	818.	1135.	2.12	1.39
1959	130.	537.	834.	1202.	2.24	1.44
1960	116.	575.	882.	1244.	2.16	1.41
1961	121.	556.	879.	1275.	2.29	1.45
1962	116.	585.	936.	1350.	2.31	1.44
1963	111.	611.	992.	1453.	2.38	1.46
1964	124.	656.	1069.	1561.	2.38	1.46
1965	137.	740.	1213.	1704.	2.30	1.41
1966	140.	717.	1265.	1790.	2.50	1.41
1967	151.	749.	1356.	1882.	2.51	1.39
1968	171.	835.	1520.	2070.	2.48	1.36
1969	179.	817.	1290.	2271.	2.78	1.76
1970	168.	783.	1279.	2394.	3.06	1.87
1971	182.	865.	1489.	2610.	3.02	1.75

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.9
MONEY, INCOME, AND VELOCITY STATISTICS FOR DIST. OF COL.

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	27.	173.	275.	615.	3.56	2.24
1930	23.	160.	269.	616.	3.86	2.29
1931	36.	176.	295.	604.	3.43	2.05
1932	53.	175.	296.	539.	3.07	1.82
1933	74.	187.	271.	476.	2.55	1.76
1934	52.	176.	269.	523.	2.96	1.94
1935	59.	201.	304.	592.	2.95	1.95
1936	60.	233.	340.	689.	2.96	2.03
1937	54.	232.	340.	716.	3.09	2.11
1938	50.	222.	330.	699.	3.15	2.12
1939	51.	232.	342.	735.	3.17	2.15
1940	69.	299.	417.	807.	2.70	1.93
1941	76.	355.	480.	921.	2.59	1.92
1942	120.	464.	592.	1154.	2.49	1.95
1943	164.	605.	740.	1339.	2.21	1.81
1944	196.	662.	813.	1346.	2.03	1.65
1945	249.	816.	1002.	1414.	1.73	1.41
1946	281.	945.	1161.	1508.	1.60	1.30
1947	271.	1000.	1227.	1526.	1.53	1.24
1948	244.	975.	1192.	1644.	1.69	1.38
1949	255.	968.	1178.	1700.	1.76	1.44
1950	236.	1025.	1239.	1790.	1.75	1.44
1951	270.	1092.	1300.	1921.	1.76	1.48
1952	270.	1148.	1362.	1978.	1.72	1.45
1953	253.	1126.	1341.	1914.	1.70	1.43
1954	232.	1099.	1352.	1917.	1.74	1.42
1955	235.	1159.	1440.	1949.	1.68	1.35
1956	264.	1199.	1488.	2019.	1.68	1.36
1957	274.	1183.	1494.	2061.	1.74	1.38
1958	259.	1186.	1557.	2132.	1.80	1.37
1959	246.	1229.	1591.	2228.	1.81	1.40
1960	239.	1236.	1576.	2313.	1.87	1.47
1961	239.	1219.	1603.	2380.	1.95	1.48
1962	254.	1292.	1761.	2540.	1.97	1.44
1963	247.	1332.	1876.	2675.	2.01	1.43
1964	260.	1408.	2007.	2827.	2.01	1.41
1965	260.	1470.	2189.	2969.	2.02	1.36
1966	260.	1501.	2341.	3112.	2.07	1.33
1967	267.	1556.	2516.	3320.	2.13	1.32
1968	288.	1657.	2663.	3540.	2.14	1.33
1969	300.	1740.	2793.	3740.	2.15	1.34
1970	341.	1753.	2758.	4116.	2.35	1.49
1971	349.	1860.	3009.	4418.	2.38	1.47

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.10
MONEY, INCOME, AND VELOCITY STATISTICS FOR FLORIDA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	52.	225.	361.	753.	3.34	2.08
1930	44.	176.	269.	683.	3.88	2.54
1931	38.	157.	233.	589.	3.76	2.53
1932	44.	138.	217.	478.	3.47	2.21
1933	50.	140.	209.	440.	3.15	2.11
1934	42.	159.	217.	537.	3.38	2.48
1935	43.	187.	248.	592.	3.17	2.39
1936	51.	236.	302.	726.	3.07	2.40
1937	63.	292.	361.	813.	2.79	2.25
1938	57.	262.	338.	801.	3.06	2.37
1939	60.	299.	384.	892.	2.98	2.32
1940	70.	346.	438.	982.	2.84	2.24
1941	87.	432.	529.	1211.	2.80	2.29
1942	140.	528.	623.	1685.	3.19	2.71
1943	250.	898.	1019.	2459.	2.74	2.41
1944	374.	1175.	1344.	2770.	2.36	2.06
1945	473.	1440.	1680.	2895.	2.01	1.72
1946	481.	1735.	2048.	2813.	1.62	1.37
1947	449.	1650.	1996.	2903.	1.76	1.45
1948	429.	1620.	1970.	3043.	1.88	1.55
1949	422.	1645.	1981.	3177.	1.93	1.60
1950	435.	1813.	2166.	3599.	1.99	1.66
1951	499.	2013.	2389.	4048.	2.01	1.69
1952	504.	2193.	2611.	4554.	2.08	1.74
1953	544.	2362.	2837.	5050.	2.14	1.78
1954	570.	2460.	3017.	5328.	2.17	1.77
1955	602.	2750.	3396.	6070.	2.21	1.79
1956	704.	2981.	3708.	6972.	2.34	1.88
1957	698.	3172.	4127.	7730.	2.44	1.87
1958	770.	3302.	4497.	8453.	2.56	1.88
1959	775.	3714.	4973.	9303.	2.50	1.87
1960	808.	3680.	5003.	9739.	2.65	1.95
1961	866.	3669.	5203.	10248.	2.79	1.97
1962	952.	3909.	5775.	11050.	2.83	1.91
1963	1001.	4077.	6197.	11859.	2.91	1.91
1964	1013.	4328.	6706.	12976.	3.00	1.93
1965	1044.	4527.	7309.	14182.	3.13	1.94
1966	1140.	4890.	8224.	15683.	3.21	1.91
1967	1258.	5205.	9208.	17451.	3.35	1.90
1968	1390.	5972.	10678.	19791.	3.31	1.85
1969	1482.	6814.	12355.	22542.	3.31	1.82
1970	1594.	7040.	12817.	25077.	3.56	1.96
1971	1731.	8035.	15328.	27611.	3.44	1.80

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.11
MONEY, INCOME, AND VELOCITY STATISTICS FOR GEORGIA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	32.	193.	345.	1015.	5.25	2.94
1930	32.	187.	334.	897.	4.80	2.69
1931	34.	180.	313.	750.	4.16	2.39
1932	39.	147.	260.	584.	3.98	2.25
1933	45.	155.	255.	602.	3.88	2.36
1934	43.	174.	282.	712.	4.09	2.52
1935	41.	197.	309.	789.	4.01	2.56
1936	53.	251.	364.	895.	3.57	2.46
1937	58.	268.	382.	946.	3.53	2.48
1938	50.	246.	362.	897.	3.65	2.48
1939	53.	295.	415.	967.	3.27	2.33
1940	57.	325.	451.	1060.	3.26	2.35
1941	76.	409.	542.	1350.	3.30	2.49
1942	124.	544.	679.	1836.	3.37	2.70
1943	206.	846.	998.	2354.	2.78	2.36
1944	288.	1007.	1198.	2638.	2.62	2.20
1945	302.	1201.	1458.	2724.	2.27	1.87
1946	377.	1442.	1750.	2744.	1.90	1.57
1947	387.	1514.	1835.	2890.	1.91	1.58
1948	406.	1516.	1838.	3154.	2.08	1.72
1949	382.	1435.	1753.	3150.	2.20	1.80
1950	378.	1462.	1782.	3574.	2.44	2.01
1951	381.	1570.	1882.	4122.	2.63	2.19
1952	417.	1778.	2111.	4447.	2.50	2.11
1953	432.	1821.	2182.	4581.	2.52	2.10
1954	423.	1793.	2196.	4536.	2.53	2.07
1955	430.	1876.	2315.	5000.	2.66	2.16
1956	421.	1950.	2404.	5350.	2.74	2.23
1957	452.	1949.	2485.	5531.	2.84	2.23
1958	430.	1951.	2574.	5767.	2.96	2.24
1959	444.	2101.	2795.	6211.	2.96	2.22
1960	459.	2185.	2890.	6477.	2.96	2.24
1961	456.	2140.	2979.	6746.	3.15	2.26
1962	444.	2210.	3153.	7280.	3.29	2.31
1963	486.	2372.	3432.	7895.	3.33	2.30
1964	500.	2592.	3822.	8635.	3.33	2.26
1965	544.	2776.	4340.	9531.	3.43	2.20
1966	598.	3080.	4961.	10568.	3.43	2.13
1967	637.	3224.	5438.	11541.	3.58	2.12
1968	673.	3490.	6022.	12784.	3.66	2.12
1969	721.	3880.	6718.	14347.	3.70	2.14
1970	778.	4028.	6879.	15434.	3.83	2.24
1971	867.	4371.	7764.	16786.	3.84	2.16

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.12
MONEY, INCOME, AND VELOCITY STATISTICS FOR HAWAII

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	23.	64.	109.	0.	0.0	0.0
1930	20.	61.	109.	0.	0.0	0.0
1931	20.	62.	112.	0.	0.0	0.0
1932	26.	64.	108.	0.	0.0	0.0
1933	36.	70.	116.	0.	0.0	0.0
1934	33.	63.	110.	0.	0.0	0.0
1935	34.	71.	122.	0.	0.0	0.0
1936	31.	73.	129.	0.	0.0	0.0
1937	44.	91.	150.	0.	0.0	0.0
1938	39.	86.	147.	0.	0.0	0.0
1939	44.	92.	154.	218.	2.36	1.41
1940	61.	114.	181.	246.	2.15	1.36
1941	94.	163.	239.	341.	2.10	1.43
1942	171.	274.	347.	612.	2.24	1.76
1943	195.	334.	452.	778.	2.33	1.72
1944	337.	493.	652.	1028.	2.09	1.58
1945	455.	647.	859.	1009.	1.56	1.17
1946	404.	596.	841.	719.	1.21	0.85
1947	447.	605.	851.	721.	1.19	0.85
1948	324.	486.	710.	723.	1.49	1.02
1949	301.	456.	664.	685.	1.50	1.03
1950	312.	463.	661.	692.	1.49	1.05
1951	334.	493.	675.	793.	1.61	1.17
1952	228.	396.	577.	865.	2.18	1.50
1953	229.	397.	581.	896.	2.25	1.54
1954	200.	371.	564.	908.	2.45	1.61
1955	203.	376.	560.	972.	2.59	1.74
1956	241.	395.	565.	1041.	2.64	1.84
1957	191.	367.	545.	1114.	3.04	2.05
1958	163.	354.	551.	1178.	3.33	2.14
1959	158.	417.	663.	1315.	3.15	1.98
1960	153.	450.	723.	1476.	3.28	2.04
1961	189.	523.	862.	1595.	3.05	1.85
1962	205.	569.	946.	1676.	2.94	1.77
1963	194.	549.	946.	1772.	3.23	1.87
1964	159.	553.	953.	1907.	3.45	2.00
1965	154.	571.	1003.	2014.	3.53	2.01
1966	170.	631.	1121.	2220.	3.52	1.98
1967	186.	660.	1226.	2414.	3.66	1.97
1968	200.	747.	1405.	2700.	3.61	1.92
1969	205.	820.	1601.	3044.	3.71	1.90
1970	229.	849.	1675.	3472.	4.09	2.07
1971	258.	910.	1939.	3694.	4.06	1.91

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.13
MONEY, INCOME, AND VELOCITY STATISTICS FOR IDAHO

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	10.	60.	94.	225.	3.76	2.40
1930	9.	59.	93.	222.	3.76	2.38
1931	9.	52.	84.	168.	3.21	1.99
1932	13.	43.	67.	124.	2.91	1.86
1933	16.	39.	57.	106.	2.74	1.87
1934	12.	46.	64.	179.	3.86	2.78
1935	12.	58.	79.	189.	3.24	2.38
1936	12.	68.	92.	228.	3.34	2.47
1937	17.	82.	109.	212.	2.59	1.95
1938	16.	74.	102.	216.	2.94	2.13
1939	16.	76.	105.	226.	2.98	2.16
1940	16.	83.	114.	242.	2.93	2.13
1941	17.	93.	126.	298.	3.21	2.37
1942	27.	117.	150.	435.	3.73	2.91
1943	42.	188.	229.	501.	2.67	2.19
1944	68.	255.	309.	555.	2.18	1.80
1945	85.	315.	388.	546.	1.74	1.41
1946	91.	379.	468.	595.	1.57	1.27
1947	83.	377.	470.	653.	1.73	1.39
1948	74.	377.	470.	725.	1.92	1.54
1949	82.	382.	480.	712.	1.87	1.48
1950	93.	380.	484.	764.	2.01	1.58
1951	88.	378.	485.	850.	2.25	1.75
1952	82.	401.	526.	932.	2.32	1.77
1953	83.	407.	551.	899.	2.21	1.63
1954	78.	391.	547.	902.	2.31	1.65
1955	84.	411.	577.	951.	2.31	1.65
1956	94.	424.	592.	1047.	2.47	1.77
1957	75.	398.	582.	1104.	2.77	1.90
1958	83.	420.	629.	1161.	2.76	1.84
1959	82.	449.	674.	1227.	2.73	1.82
1960	80.	448.	675.	1238.	2.76	1.83
1961	88.	457.	698.	1310.	2.87	1.88
1962	96.	484.	749.	1410.	2.91	1.88
1963	97.	486.	776.	1409.	2.90	1.82
1964	83.	488.	806.	1459.	2.99	1.81
1965	83.	523.	879.	1668.	3.19	1.90
1966	93.	550.	943.	1681.	3.05	1.78
1967	98.	546.	1022.	1790.	3.28	1.75
1968	106.	572.	1117.	1885.	3.29	1.69
1969	96.	610.	1231.	2148.	3.52	1.74
1970	100.	637.	1296.	2340.	3.67	1.81
1971	109.	692.	1479.	2511.	3.63	1.70

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.14
MONEY, INCOME, AND VELOCITY STATISTICS FOR ILLINOIS

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	283.	2321.	3898.	7280.	3.14	1.87
1930	252.	2187.	3769.	6235.	2.85	1.65
1931	310.	1941.	3259.	5187.	2.67	1.59
1932	497.	1613.	2456.	3780.	2.34	1.54
1933	418.	1639.	2229.	3434.	2.10	1.54
1934	412.	1919.	2582.	3945.	2.06	1.53
1935	381.	2292.	3124.	4484.	1.96	1.44
1936	373.	2687.	3558.	5112.	1.90	1.44
1937	383.	2739.	3691.	5743.	2.10	1.56
1938	371.	2669.	3669.	5116.	1.92	1.39
1939	369.	2888.	3956.	5566.	1.93	1.41
1940	457.	3297.	4415.	5964.	1.81	1.35
1941	514.	3848.	4982.	7153.	1.86	1.44
1942	710.	4440.	5528.	8367.	1.88	1.51
1943	944.	5819.	7024.	9772.	1.68	1.39
1944	1345.	6672.	8177.	10743.	1.61	1.31
1945	1460.	7185.	9183.	11188.	1.56	1.22
1946	1499.	7756.	10201.	12487.	1.61	1.22
1947	1592.	8434.	11197.	13647.	1.62	1.22
1948	1424.	8513.	11481.	15521.	1.82	1.35
1949	1409.	8433.	11530.	14607.	1.73	1.27
1950	1499.	8961.	12149.	15948.	1.78	1.31
1951	1447.	9284.	12539.	17711.	1.91	1.41
1952	1376.	9529.	13016.	18608.	1.95	1.43
1953	1458.	9952.	13654.	19812.	1.99	1.45
1954	1437.	9923.	13859.	19933.	2.01	1.44
1955	1458.	10274.	14320.	21167.	2.06	1.48
1956	1571.	10667.	14825.	23024.	2.16	1.55
1957	1595.	10640.	15012.	24056.	2.26	1.60
1958	1509.	10546.	15294.	24353.	2.31	1.59
1959	1536.	10822.	15763.	25751.	2.38	1.63
1960	1524.	10741.	15919.	26689.	2.48	1.68
1961	1617.	10805.	16763.	27486.	2.54	1.64
1962	1550.	10849.	17911.	28948.	2.67	1.62
1963	1608.	11218.	19679.	30174.	2.69	1.53
1964	1658.	11359.	20840.	32188.	2.83	1.54
1965	1764.	11933.	22727.	35070.	2.94	1.54
1966	2019.	12831.	24794.	38266.	2.98	1.54
1967	2269.	13727.	27121.	40627.	2.96	1.50
1968	2175.	14442.	28755.	43653.	3.02	1.52
1969	2227.	15359.	30268.	47233.	3.08	1.56
1970	2384.	15385.	30303.	49961.	3.25	1.65
1971	2786.	16774.	36110.	53400.	3.18	1.48

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.15
MONEY, INCOME, AND VELOCITY STATISTICS FOR INDIANA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	131.	554.	964.	1973.	3.56	2.05
1930	121.	550.	904.	1681.	3.06	1.86
1931	142.	479.	826.	1431.	2.98	1.73
1932	143.	413.	671.	1022.	2.48	1.52
1933	140.	372.	528.	982.	2.64	1.86
1934	109.	370.	576.	1184.	3.20	2.05
1935	117.	457.	706.	1397.	3.05	1.98
1936	132.	548.	822.	1608.	2.94	1.96
1937	162.	632.	941.	1838.	2.91	1.95
1938	137.	589.	906.	1605.	2.72	1.77
1939	146.	648.	977.	1767.	2.73	1.81
1940	155.	696.	1040.	1898.	2.73	1.83
1941	190.	818.	1180.	2526.	3.09	2.14
1942	290.	1082.	1444.	3209.	2.97	2.22
1943	439.	1586.	1994.	3899.	2.46	1.96
1944	617.	1912.	2429.	4116.	2.15	1.69
1945	752.	2253.	2928.	4271.	1.90	1.46
1946	742.	2465.	3266.	4419.	1.79	1.35
1947	722.	2550.	3417.	4925.	1.93	1.44
1948	753.	2683.	3580.	5624.	2.10	1.57
1949	749.	2661.	3574.	5388.	2.02	1.51
1950	809.	2832.	3767.	5998.	2.12	1.59
1951	772.	2926.	3868.	6938.	2.37	1.79
1952	755.	3023.	4036.	7326.	2.42	1.82
1953	817.	3233.	4334.	8073.	2.50	1.86
1954	810.	3283.	4442.	7653.	2.33	1.72
1955	820.	3419.	4608.	8265.	2.42	1.79
1956	877.	3489.	4716.	8875.	2.54	1.88
1957	867.	3450.	4746.	9187.	2.66	1.94
1958	864.	3418.	4835.	9192.	2.69	1.90
1959	838.	3559.	5037.	9817.	2.76	1.95
1960	860.	3597.	5140.	10271.	2.86	2.00
1961	877.	3604.	5318.	10542.	2.93	1.98
1962	867.	3699.	5527.	11214.	3.03	2.03
1963	904.	3861.	5809.	11869.	3.07	2.04
1964	919.	4025.	6287.	12640.	3.14	2.01
1965	960.	4221.	6998.	14067.	3.33	2.01
1966	1060.	4610.	7918.	15278.	3.31	1.93
1967	1093.	4768.	8582.	16002.	3.36	1.86
1968	1151.	5147.	9513.	17413.	3.38	1.83
1969	1219.	5486.	10346.	19110.	3.48	1.85
1970	1214.	5577.	10796.	19721.	3.54	1.83
1971	1324.	5718.	11864.	21120.	3.69	1.78

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.16
MONEY, INCOME, AND VELOCITY STATISTICS FOR IOWA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	87.	426.	934.	1419.	3.33	1.52
1930	70.	387.	870.	1255.	3.25	1.44
1931	67.	347.	779.	988.	2.84	1.27
1932	86.	283.	545.	735.	2.59	1.35
1933	75.	205.	328.	633.	3.09	1.93
1934	67.	289.	433.	673.	2.33	1.56
1935	77.	372.	543.	1052.	2.83	1.94
1936	78.	410.	602.	971.	2.37	1.61
1937	95.	449.	663.	1270.	2.83	1.92
1938	84.	425.	641.	1136.	2.67	1.77
1939	92.	460.	686.	1183.	2.57	1.72
1940	93.	492.	732.	1272.	2.59	1.74
1941	108.	561.	811.	1511.	2.70	1.86
1942	163.	718.	971.	2014.	2.80	2.07
1943	248.	1061.	1334.	2321.	2.19	1.74
1944	362.	1355.	1684.	2258.	1.67	1.34
1945	437.	1530.	1941.	2460.	1.61	1.27
1946	513.	1843.	2331.	2978.	1.62	1.28
1947	476.	2054.	2587.	2986.	1.45	1.15
1948	432.	1974.	2510.	4042.	2.05	1.61
1949	451.	1984.	2513.	3392.	1.71	1.35
1950	511.	2069.	2605.	3897.	1.88	1.50
1951	464.	2091.	2623.	4127.	1.97	1.57
1952	450.	2065.	2643.	4338.	2.10	1.64
1953	459.	2117.	2752.	4200.	1.98	1.53
1954	459.	2197.	2895.	4525.	2.06	1.56
1955	448.	2178.	2899.	4307.	1.98	1.49
1956	492.	2207.	2935.	4580.	2.08	1.56
1957	429.	2163.	2935.	5077.	2.35	1.73
1958	434.	2216.	3083.	5200.	2.35	1.69
1959	444.	2289.	3221.	5317.	2.32	1.65
1960	451.	2216.	3157.	5473.	2.47	1.73
1961	508.	2274.	3282.	5742.	2.53	1.75
1962	474.	2289.	3448.	6001.	2.62	1.74
1963	496.	2343.	3652.	6347.	2.71	1.74
1964	455.	2386.	3880.	6643.	2.78	1.71
1965	469.	2527.	4226.	7559.	2.99	1.79
1966	498.	2641.	4628.	8315.	3.15	1.80
1967	570.	2705.	5010.	8509.	3.15	1.70
1968	586.	2853.	5545.	9132.	3.20	1.65
1969	587.	3051.	6013.	9907.	3.25	1.65
1970	591.	3018.	6250.	10613.	3.52	1.70
1971	623.	3132.	7002.	11088.	3.54	1.58

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.17
MONEY, INCOME, AND VELOCITY STATISTICS FOR KANSAS

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	50.	349.	465.	999.	2.86	2.15
1930	40.	311.	420.	882.	2.83	2.10
1931	40.	273.	374.	751.	2.75	2.01
1932	45.	220.	308.	504.	2.29	1.64
1933	46.	215.	294.	471.	2.19	1.60
1934	36.	239.	317.	532.	2.22	1.68
1935	43.	282.	360.	668.	2.37	1.86
1936	42.	314.	392.	713.	2.27	1.82
1937	47.	328.	406.	782.	2.39	1.93
1938	43.	310.	388.	704.	2.27	1.81
1939	46.	325.	403.	694.	2.14	1.72
1940	46.	329.	409.	762.	2.32	1.86
1941	51.	381.	462.	976.	2.56	2.11
1942	82.	503.	585.	1502.	2.98	2.57
1943	139.	816.	902.	1863.	2.28	2.07
1944	192.	980.	1080.	2052.	2.09	1.90
1945	230.	1222.	1354.	1992.	1.63	1.47
1946	236.	1399.	1551.	2012.	1.44	1.30
1947	234.	1460.	1617.	2385.	1.63	1.48
1948	237.	1499.	1657.	2523.	1.68	1.52
1949	240.	1533.	1696.	2477.	1.62	1.46
1950	270.	1593.	1763.	2765.	1.74	1.57
1951	271.	1575.	1747.	3077.	1.95	1.76
1952	263.	1723.	1925.	3524.	2.05	1.83
1953	280.	1788.	2030.	3434.	1.92	1.69
1954	279.	1797.	2071.	3597.	2.00	1.74
1955	286.	1815.	2110.	3626.	2.00	1.72
1956	298.	1784.	2088.	3804.	2.13	1.82
1957	287.	1718.	2068.	4006.	2.33	1.94
1958	307.	1721.	2180.	4443.	2.58	2.04
1959	294.	1801.	2295.	4484.	2.49	1.95
1960	298.	1781.	2312.	4714.	2.65	2.04
1961	339.	1954.	2561.	4945.	2.53	1.93
1962	334.	2008.	2750.	5183.	2.58	1.88
1963	348.	2058.	2926.	5327.	2.59	1.82
1964	323.	2047.	3049.	5581.	2.73	1.83
1965	325.	2073.	3212.	6030.	2.91	1.88
1966	346.	2216.	3495.	6599.	2.98	1.89
1967	390.	2298.	3855.	6902.	3.00	1.79
1968	415.	2366.	4211.	7528.	3.18	1.79
1969	406.	2428.	4540.	8138.	3.35	1.79
1970	406.	2497.	4713.	8808.	3.53	1.87
1971	420.	2605.	5235.	9460.	3.63	1.81

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.18
MONEY, INCOME, AND VELOCITY STATISTICS FOR KENTUCKY

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	42.	263.	484.	1020.	3.88	2.11
1930	39.	252.	467.	853.	3.39	1.83
1931	42.	225.	403.	766.	3.41	1.90
1932	49.	190.	333.	563.	2.97	1.69
1933	54.	184.	309.	554.	3.00	1.79
1934	49.	203.	335.	624.	3.08	1.86
1935	50.	237.	376.	720.	3.04	1.91
1936	54.	271.	418.	803.	2.96	1.92
1937	62.	306.	457.	930.	3.04	2.03
1938	55.	284.	434.	819.	2.88	1.89
1939	63.	316.	462.	855.	2.71	1.85
1940	62.	327.	471.	914.	2.79	1.94
1941	75.	387.	528.	1118.	2.89	2.12
1942	113.	499.	629.	1498.	3.00	2.38
1943	188.	780.	906.	1854.	2.38	2.05
1944	260.	946.	1087.	1986.	2.10	1.83
1945	319.	1183.	1360.	2067.	1.75	1.52
1946	353.	1359.	1565.	2235.	1.65	1.43
1947	324.	1381.	1598.	2383.	1.73	1.49
1948	333.	1405.	1624.	2788.	1.98	1.72
1949	343.	1401.	1630.	2659.	1.90	1.63
1950	373.	1467.	1698.	2881.	1.96	1.70
1951	359.	1478.	1709.	3361.	2.27	1.97
1952	365.	1555.	1801.	3587.	2.31	1.99
1953	386.	1628.	1898.	3752.	2.30	1.98
1954	378.	1596.	1897.	3692.	2.31	1.95
1955	385.	1651.	1977.	3866.	2.34	1.96
1956	415.	1690.	2038.	4107.	2.43	2.02
1957	410.	1739.	2127.	4291.	2.47	2.02
1958	391.	1718.	2155.	4441.	2.58	2.06
1959	404.	1813.	2285.	4667.	2.57	2.04
1960	410.	1823.	2322.	4807.	2.64	2.07
1961	426.	1845.	2394.	5139.	2.79	2.15
1962	394.	1872.	2526.	5444.	2.91	2.16
1963	407.	1979.	2740.	5751.	2.91	2.10
1964	424.	2079.	2951.	5996.	2.88	2.03
1965	450.	2141.	3170.	6553.	3.06	2.07
1966	492.	2267.	3516.	7202.	3.18	2.05
1967	533.	2504.	4026.	7772.	3.10	1.93
1968	556.	2569.	4325.	8518.	3.32	1.97
1969	564.	2785.	4784.	9214.	3.31	1.93
1970	607.	2879.	5006.	9990.	3.47	2.00
1971	658.	3149.	5739.	10830.	3.44	1.89

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.19
MONEY, INCOME, AND VELOCITY STATISTICS FOR LOUISIANA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	33.	280.	412.	866.	3.09	2.10
1930	32.	258.	402.	753.	2.92	1.87
1931	31.	253.	395.	676.	2.67	1.71
1932	37.	190.	312.	514.	2.71	1.65
1933	42.	142.	233.	493.	3.47	2.12
1934	35.	153.	252.	573.	3.62	2.27
1935	37.	191.	285.	638.	3.35	2.24
1936	42.	239.	339.	731.	3.06	2.16
1937	55.	289.	395.	786.	2.72	1.99
1938	50.	292.	402.	790.	2.70	1.96
1939	57.	336.	449.	834.	2.48	1.86
1940	60.	358.	476.	861.	2.41	1.81
1941	73.	411.	529.	1123.	2.73	2.12
1942	118.	525.	637.	1508.	2.87	2.37
1943	216.	799.	925.	2008.	2.51	2.17
1944	346.	1042.	1199.	2179.	2.09	1.82
1945	356.	1170.	1384.	2153.	1.84	1.56
1946	401.	1392.	1655.	2106.	1.51	1.27
1947	359.	1398.	1675.	2272.	1.63	1.36
1948	336.	1440.	1721.	2679.	1.86	1.56
1949	354.	1514.	1802.	2857.	1.89	1.59
1950	369.	1578.	1868.	3021.	1.91	1.62
1951	373.	1616.	1895.	3336.	2.06	1.76
1952	399.	1758.	2068.	3636.	2.07	1.76
1953	424.	1856.	2184.	3858.	2.08	1.77
1954	420.	1959.	2319.	3881.	1.98	1.67
1955	420.	2128.	2524.	4114.	1.93	1.63
1956	493.	2246.	2657.	4547.	2.02	1.71
1957	474.	2253.	2745.	5028.	2.23	1.83
1958	487.	2235.	2825.	5105.	2.28	1.81
1959	507.	2311.	2948.	5361.	2.32	1.82
1960	495.	2263.	2936.	5417.	2.39	1.85
1961	522.	2273.	3079.	5589.	2.46	1.82
1962	522.	2325.	3205.	5908.	2.54	1.84
1963	550.	2468.	3426.	6298.	2.55	1.84
1964	539.	2583.	3641.	6799.	2.63	1.87
1965	570.	2675.	3941.	7412.	2.77	1.88
1966	634.	3003.	4563.	8247.	2.75	1.81
1967	701.	3112.	5041.	9052.	2.91	1.80
1968	781.	3341.	5489.	9887.	2.96	1.80
1969	777.	3442.	5862.	10364.	3.01	1.77
1970	797.	3447.	6146.	11128.	3.23	1.81
1971	854.	3761.	7123.	12010.	3.19	1.69

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.20
MONEY, INCOME, AND VELOCITY STATISTICS FOR MAINE

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	25.	105.	422.	479.	4.56	1.14
1930	25.	109.	429.	460.	4.24	1.07
1931	26.	102.	429.	396.	3.87	0.92
1932	34.	89.	392.	309.	3.47	0.79
1933	40.	77.	295.	307.	3.97	1.04
1934	34.	87.	317.	342.	3.92	1.08
1935	29.	86.	322.	358.	4.17	1.11
1936	39.	107.	350.	420.	3.94	1.20
1937	40.	117.	368.	425.	3.62	1.15
1938	36.	107.	354.	396.	3.69	1.12
1939	35.	113.	362.	417.	3.68	1.15
1940	40.	123.	375.	444.	3.62	1.19
1941	51.	152.	403.	533.	3.50	1.32
1942	79.	196.	442.	712.	3.62	1.61
1943	131.	303.	574.	876.	2.89	1.53
1944	174.	353.	661.	878.	2.49	1.33
1945	194.	395.	760.	856.	2.17	1.13
1946	213.	444.	867.	933.	2.10	1.08
1947	191.	420.	859.	982.	2.34	1.14
1948	192.	424.	863.	1084.	2.56	1.26
1949	182.	413.	852.	1060.	2.57	1.24
1950	177.	411.	847.	1087.	2.64	1.28
1951	191.	430.	862.	1188.	2.76	1.38
1952	178.	444.	900.	1291.	2.91	1.43
1953	177.	447.	933.	1298.	2.90	1.39
1954	188.	457.	964.	1314.	2.87	1.36
1955	182.	467.	1005.	1449.	3.10	1.44
1956	159.	455.	1016.	1534.	3.37	1.51
1957	141.	428.	1011.	1583.	3.69	1.57
1958	161.	460.	1082.	1637.	3.56	1.51
1959	159.	472.	1140.	1696.	3.60	1.49
1960	159.	488.	1183.	1788.	3.66	1.51
1961	156.	479.	1208.	1808.	3.78	1.50
1962	170.	495.	1280.	1876.	3.79	1.47
1963	175.	521.	1369.	1923.	3.69	1.40
1964	187.	548.	1455.	2090.	3.81	1.44
1965	187.	570.	1552.	2262.	3.97	1.46
1966	208.	601.	1675.	2431.	4.04	1.45
1967	217.	629.	1790.	2544.	4.04	1.42
1968	224.	657.	1928.	2762.	4.20	1.43
1969	241.	711.	2091.	2986.	4.20	1.43
1970	256.	760.	2242.	3226.	4.25	1.44
1971	267.	795.	2496.	3416.	4.30	1.37

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.21
MONEY, INCOME, AND VELOCITY STATISTICS FOR MARYLAND

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	40.	319.	812.	1260.	3.95	1.55
1930	40.	313.	828.	1176.	3.76	1.42
1931	46.	294.	830.	1060.	3.61	1.28
1932	61.	262.	730.	858.	3.28	1.18
1933	54.	195.	506.	787.	4.04	1.56
1934	65.	252.	637.	891.	3.54	1.40
1935	83.	319.	705.	943.	2.96	1.34
1936	86.	359.	766.	1076.	3.00	1.40
1937	102.	400.	822.	1164.	2.91	1.42
1938	94.	381.	804.	1118.	2.94	1.39
1939	125.	461.	888.	1186.	2.57	1.34
1940	130.	519.	956.	1309.	2.52	1.37
1941	151.	617.	1059.	1674.	2.71	1.58
1942	188.	734.	1173.	2254.	3.07	1.92
1943	276.	983.	1474.	2709.	2.76	1.84
1944	317.	1067.	1637.	2870.	2.69	1.75
1945	371.	1194.	1879.	2829.	2.37	1.51
1946	409.	1347.	2142.	2924.	2.17	1.36
1947	416.	1386.	2217.	3046.	2.20	1.37
1948	414.	1373.	2203.	3331.	2.43	1.51
1949	389.	1358.	2179.	3392.	2.50	1.56
1950	376.	1382.	2208.	3772.	2.73	1.71
1951	408.	1487.	2306.	4318.	2.90	1.87
1952	445.	1638.	2486.	4721.	2.88	1.90
1953	458.	1695.	2581.	5041.	2.97	1.95
1954	458.	1666.	2624.	5069.	3.04	1.93
1955	458.	1744.	2729.	5467.	3.13	2.00
1956	454.	1759.	2785.	5976.	3.40	2.15
1957	473.	1828.	2907.	6314.	3.45	2.17
1958	486.	1848.	3027.	6567.	3.55	2.17
1959	518.	1945.	3171.	6952.	3.57	2.19
1960	518.	1958.	3213.	7285.	3.72	2.27
1961	475.	1901.	3268.	7800.	4.10	2.39
1962	514.	2014.	3522.	8342.	4.14	2.37
1963	553.	2157.	3806.	8959.	4.15	2.35
1964	588.	2295.	4124.	9749.	4.25	2.36
1965	633.	2462.	4436.	10681.	4.34	2.41
1966	642.	2608.	4796.	11668.	4.47	2.43
1967	663.	2739.	5156.	12590.	4.60	2.44
1968	718.	2973.	5614.	14020.	4.72	2.50
1969	794.	3285.	6133.	15437.	4.70	2.52
1970	836.	3304.	6301.	16877.	5.11	2.68
1971	923.	3656.	7176.	18119.	4.96	2.52

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.22
MONEY, INCOME, AND VELOCITY STATISTICS FOR MASSACHUSETTS

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	119.	1233.	3960.	3862.	3.13	0.98
1930	125.	1255.	4070.	3588.	2.86	0.88
1931	125.	1168.	4045.	3259.	2.79	0.81
1932	190.	1013.	3613.	2650.	2.62	0.73
1933	218.	1007.	3527.	2442.	2.43	0.69
1934	384.	1231.	3740.	2652.	2.15	0.71
1935	617.	1599.	4108.	2804.	1.75	0.68
1936	759.	1889.	4442.	3127.	1.66	0.70
1937	289.	1419.	4001.	3204.	2.26	0.80
1938	751.	1920.	4466.	2954.	1.54	0.66
1939	893.	2135.	4688.	3162.	1.48	0.67
1940	933.	2316.	4864.	3385.	1.46	0.70
1941	1012.	2575.	5125.	3970.	1.54	0.77
1942	717.	2462.	4982.	4711.	1.91	0.95
1943	808.	3041.	5741.	5392.	1.77	0.94
1944	951.	3137.	6112.	5671.	1.81	0.93
1945	1175.	3562.	6940.	5823.	1.63	0.84
1946	1179.	3831.	7624.	6342.	1.66	0.83
1947	1106.	3886.	7844.	6581.	1.69	0.84
1948	1113.	3808.	7810.	7012.	1.84	0.90
1949	991.	3740.	7759.	6971.	1.86	0.90
1950	884.	3728.	7814.	7654.	2.05	0.98
1951	907.	3917.	7998.	8344.	2.13	1.04
1952	1022.	4133.	8372.	8675.	2.10	1.04
1953	1060.	4188.	8641.	9179.	2.19	1.06
1954	1034.	4147.	8870.	9293.	2.24	1.05
1955	915.	4141.	9185.	9891.	2.39	1.08
1956	674.	3943.	9303.	10497.	2.66	1.13
1957	713.	4003.	9547.	11074.	2.77	1.16
1958	804.	4217.	10081.	11438.	2.71	1.13
1959	815.	4359.	10544.	12123.	2.78	1.15
1960	848.	4417.	10825.	12657.	2.87	1.17
1961	699.	4382.	11268.	13220.	3.02	1.17
1962	749.	4508.	12021.	13878.	3.08	1.15
1963	772.	4569.	12748.	14514.	3.18	1.14
1964	917.	4862.	13849.	15392.	3.17	1.11
1965	975.	5039.	14979.	16421.	3.26	1.10
1966	950.	5245.	16005.	17715.	3.38	1.11
1967	1013.	5536.	17083.	19286.	3.48	1.13
1968	1042.	6116.	18636.	21049.	3.44	1.13
1969	1241.	6625.	11442.	22926.	3.46	2.00
1970	1415.	6717.	11291.	24750.	3.68	2.19
1971	1475.	7069.	13066.	26285.	3.72	2.01

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.23
MONEY, INCOME, AND VELOCITY STATISTICS FOR MICHIGAN

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	149.	1022.	2137.	3803.	3.72	1.78
1930	135.	989.	2050.	3186.	3.22	1.55
1931	129.	857.	1869.	2593.	3.03	1.39
1932	140.	630.	1422.	1882.	2.99	1.32
1933	132.	356.	622.	1668.	4.69	2.68
1934	151.	544.	899.	2167.	3.99	2.41
1935	149.	669.	1116.	2554.	3.82	2.29
1936	176.	881.	1405.	3014.	3.42	2.15
1937	243.	982.	1593.	3389.	3.45	2.13
1938	188.	850.	1465.	2891.	3.40	1.97
1939	201.	949.	1601.	3215.	3.39	2.01
1940	209.	1072.	1773.	3610.	3.37	2.04
1941	290.	1445.	2209.	4522.	3.13	2.05
1942	459.	1844.	2611.	5812.	3.15	2.23
1943	680.	2681.	3666.	7269.	2.71	1.98
1944	880.	2982.	4252.	7570.	2.54	1.78
1945	1001.	3206.	4893.	7215.	2.25	1.47
1946	1104.	3380.	5374.	7743.	2.29	1.44
1947	1097.	3480.	5594.	8832.	2.54	1.58
1948	1123.	3589.	5730.	9691.	2.70	1.69
1949	1122.	3580.	5744.	9627.	2.69	1.68
1950	1072.	3900.	6114.	10895.	2.79	1.78
1951	1046.	4184.	6417.	12176.	2.91	1.90
1952	1096.	4369.	6761.	13050.	2.99	1.93
1953	1304.	4929.	7584.	14741.	2.99	1.94
1954	1305.	4865.	7710.	14354.	2.95	1.86
1955	1321.	5189.	8201.	15900.	3.06	1.94
1956	1290.	5127.	8296.	16529.	3.22	1.99
1957	1383.	5194.	8534.	16870.	3.25	1.98
1958	1263.	4942.	8552.	16603.	3.36	1.94
1959	1331.	5143.	8980.	17588.	3.42	1.96
1960	1298.	5228.	9145.	18318.	3.50	2.00
1961	1298.	5120.	9524.	18243.	3.56	1.92
1962	1358.	5234.	10349.	19568.	3.74	1.89
1963	1382.	5441.	11310.	21039.	3.87	1.86
1964	1472.	5830.	12437.	23005.	3.95	1.85
1965	1643.	6351.	13902.	25860.	4.07	1.86
1966	1885.	6873.	15543.	28206.	4.10	1.81
1967	1957.	7062.	17230.	29667.	4.20	1.72
1968	2132.	7681.	19097.	32831.	4.27	1.72
1969	2228.	8143.	20378.	35782.	4.39	1.76
1970	2264.	8164.	20689.	36785.	4.51	1.78
1971	2463.	8678.	22942.	39850.	4.59	1.74

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.24
MONEY, INCOME, AND VELOCITY STATISTICS FOR MINNESOTA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	96.	456.	981.	1539.	3.38	1.57
1930	83.	447.	958.	1423.	3.18	1.49
1931	88.	429.	940.	1198.	2.79	1.27
1932	98.	370.	798.	961.	2.60	1.20
1933	121.	369.	700.	832.	2.26	1.19
1934	63.	355.	685.	964.	2.71	1.41
1935	65.	434.	780.	1214.	2.80	1.56
1936	68.	486.	852.	1285.	2.65	1.51
1937	81.	517.	905.	1469.	2.84	1.62
1938	71.	491.	881.	1359.	2.77	1.54
1939	83.	528.	920.	1432.	2.71	1.56
1940	86.	560.	960.	1467.	2.62	1.53
1941	98.	639.	1042.	1678.	2.63	1.61
1942	143.	765.	1169.	2119.	2.77	1.81
1943	212.	1124.	1586.	2404.	2.14	1.52
1944	316.	1296.	1869.	2519.	1.94	1.35
1945	359.	1458.	2189.	2788.	1.91	1.27
1946	422.	1779.	2669.	3213.	1.81	1.20
1947	394.	1867.	2852.	3511.	1.88	1.23
1948	395.	1947.	2964.	4106.	2.11	1.39
1949	410.	1955.	2982.	3846.	1.97	1.29
1950	451.	2036.	3079.	4227.	2.08	1.37
1951	465.	2049.	3057.	4660.	2.27	1.52
1952	429.	2088.	3166.	4823.	2.31	1.52
1953	433.	2167.	3341.	5079.	2.34	1.52
1954	432.	2220.	3470.	5202.	2.34	1.50
1955	438.	2276.	3588.	5483.	2.41	1.53
1956	497.	2311.	3662.	5778.	2.50	1.58
1957	459.	2290.	3774.	6135.	2.68	1.63
1958	465.	2420.	4054.	6585.	2.72	1.62
1959	461.	2495.	4241.	6787.	2.72	1.60
1960	462.	2486.	4243.	7227.	2.91	1.70
1961	497.	2566.	4471.	7570.	2.95	1.69
1962	495.	2588.	4827.	7858.	3.04	1.63
1963	516.	2648.	5171.	8303.	3.14	1.61
1964	472.	2663.	5477.	8604.	3.23	1.57
1965	494.	2803.	5955.	9523.	3.40	1.60
1966	527.	2886.	6447.	10366.	3.59	1.61
1967	579.	3067.	7143.	11150.	3.64	1.56
1968	614.	3361.	7887.	12205.	3.63	1.55
1969	585.	3594.	7894.	13509.	3.76	1.71
1970	593.	3565.	7926.	14732.	4.13	1.86
1971	623.	3806.	9127.	15564.	4.09	1.71

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.25
MONEY, INCOME, AND VELOCITY STATISTICS FOR MISSISSIPPI

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	21.	133.	234.	570.	4.29	2.44
1930	20.	120.	215.	407.	3.39	1.89
1931	19.	95.	167.	346.	3.62	2.07
1932	22.	78.	136.	252.	3.21	1.85
1933	32.	85.	134.	266.	3.13	1.98
1934	25.	90.	144.	339.	3.76	2.35
1935	26.	100.	160.	361.	3.63	2.26
1936	30.	123.	182.	461.	3.75	2.53
1937	36.	145.	208.	459.	3.17	2.21
1938	34.	150.	214.	426.	2.85	1.99
1939	38.	152.	219.	444.	2.93	2.03
1940	38.	154.	224.	474.	3.08	2.12
1941	47.	182.	255.	684.	3.76	2.68
1942	82.	262.	331.	970.	3.71	2.93
1943	127.	415.	486.	1191.	2.87	2.45
1944	187.	515.	595.	1329.	2.58	2.23
1945	213.	643.	746.	1304.	2.03	1.75
1946	234.	765.	889.	1254.	1.64	1.41
1947	220.	755.	888.	1395.	1.85	1.57
1948	230.	778.	912.	1639.	2.11	1.80
1949	241.	789.	924.	1441.	1.83	1.56
1950	263.	801.	935.	1643.	2.05	1.76
1951	240.	817.	948.	1796.	2.20	1.89
1952	242.	862.	998.	1907.	2.21	1.91
1953	251.	911.	1052.	1943.	2.13	1.85
1954	251.	894.	1053.	1875.	2.10	1.78
1955	251.	915.	1087.	2102.	2.30	1.93
1956	263.	959.	1136.	2141.	2.23	1.89
1957	260.	986.	1197.	2172.	2.20	1.81
1958	267.	1019.	1280.	2349.	2.30	1.83
1959	274.	1077.	1372.	2569.	2.39	1.87
1960	279.	1129.	1444.	2630.	2.33	1.82
1961	297.	1122.	1477.	2819.	2.51	1.91
1962	275.	1151.	1580.	2976.	2.58	1.88
1963	290.	1199.	1705.	3289.	2.74	1.93
1964	291.	1264.	1854.	3420.	2.70	1.84
1965	320.	1364.	2024.	3743.	2.74	1.85
1966	349.	1523.	2285.	4122.	2.71	1.80
1967	393.	1628.	2497.	4425.	2.72	1.77
1968	409.	1760.	2709.	4848.	2.75	1.79
1969	410.	1873.	2955.	5262.	2.81	1.78
1970	437.	1906.	3185.	5755.	3.02	1.81
1971	493.	2038.	3582.	6273.	3.08	1.75

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.26
MONEY, INCOME, AND VELOCITY STATISTICS FOR MISSOURI

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	93.	729.	1119.	2275.	3.12	2.03
1930	92.	772.	1171.	2073.	2.69	1.77
1931	94.	709.	1100.	1838.	2.59	1.67
1932	98.	571.	896.	1379.	2.42	1.54
1933	128.	558.	795.	1276.	2.28	1.60
1934	93.	595.	836.	1394.	2.34	1.67
1935	99.	709.	965.	1602.	2.26	1.66
1936	105.	807.	1084.	1778.	2.20	1.64
1937	116.	855.	1142.	1928.	2.25	1.69
1938	102.	810.	1104.	1809.	2.23	1.64
1939	122.	890.	1193.	1914.	2.15	1.60
1940	133.	947.	1256.	1982.	2.09	1.58
1941	157.	1096.	1412.	2463.	2.25	1.74
1942	203.	1320.	1631.	3097.	2.35	1.90
1943	307.	1786.	2121.	3553.	1.99	1.68
1944	441.	2043.	2447.	3814.	1.87	1.56
1945	542.	2474.	2992.	3984.	1.61	1.33
1946	568.	2867.	3484.	4459.	1.56	1.28
1947	571.	3038.	3689.	4695.	1.55	1.27
1948	578.	3128.	3791.	5338.	1.71	1.41
1949	591.	3147.	3833.	5196.	1.65	1.36
1950	621.	3299.	4013.	5672.	1.72	1.41
1951	663.	3457.	4172.	6245.	1.81	1.50
1952	597.	3594.	4364.	6576.	1.83	1.51
1953	642.	3765.	4598.	6948.	1.85	1.51
1954	626.	3771.	4679.	6974.	1.85	1.49
1955	637.	3869.	4828.	7451.	1.93	1.54
1956	710.	3954.	4948.	7844.	1.98	1.59
1957	661.	3818.	4940.	8053.	2.11	1.63
1958	649.	3900.	5223.	8461.	2.17	1.62
1959	673.	4039.	5380.	8936.	2.21	1.66
1960	684.	4054.	5391.	9142.	2.25	1.70
1961	742.	4043.	5661.	9415.	2.33	1.66
1962	737.	4101.	6021.	9896.	2.41	1.64
1963	741.	4212.	6465.	10407.	2.47	1.61
1964	718.	4354.	6917.	11028.	2.53	1.59
1965	748.	4426.	7430.	11975.	2.71	1.61
1966	781.	4648.	7932.	12874.	2.77	1.62
1967	880.	4913.	8850.	13832.	2.82	1.56
1968	919.	5226.	9586.	15074.	2.88	1.57
1969	903.	5214.	9613.	16140.	3.10	1.68
1970	944.	5528.	10066.	17427.	3.15	1.73
1971	960.	5793.	11279.	18587.	3.21	1.65

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.27
MONEY, INCOME, AND VELOCITY STATISTICS FOR MONTANA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	22.	101.	179.	312.	3.09	1.74
1930	18.	92.	161.	271.	2.96	1.69
1931	21.	86.	147.	207.	2.42	1.41
1932	25.	71.	121.	182.	2.58	1.51
1933	21.	63.	106.	162.	2.55	1.52
1934	16.	67.	108.	197.	2.93	1.82
1935	17.	83.	121.	260.	3.13	2.15
1936	17.	97.	136.	264.	2.71	1.94
1937	21.	103.	145.	284.	2.76	1.96
1938	18.	96.	138.	284.	2.97	2.06
1939	19.	104.	145.	294.	2.82	2.02
1940	23.	115.	158.	318.	2.76	2.01
1941	24.	128.	169.	388.	3.03	2.29
1942	32.	149.	189.	467.	3.13	2.47
1943	43.	225.	268.	545.	2.43	2.04
1944	66.	294.	347.	550.	1.87	1.58
1945	83.	357.	428.	568.	1.59	1.33
1946	107.	451.	539.	657.	1.46	1.22
1947	88.	461.	554.	772.	1.67	1.39
1948	88.	478.	573.	876.	1.83	1.53
1949	96.	504.	601.	788.	1.56	1.31
1950	107.	495.	593.	962.	1.94	1.62
1951	106.	501.	598.	1049.	2.09	1.75
1952	94.	538.	644.	1075.	2.00	1.67
1953	98.	551.	667.	1096.	1.99	1.64
1954	97.	566.	691.	1079.	1.91	1.56
1955	96.	581.	714.	1178.	2.03	1.65
1956	115.	597.	744.	1241.	2.08	1.67
1957	92.	566.	741.	1297.	2.29	1.75
1958	96.	558.	776.	1370.	2.45	1.77
1959	96.	583.	821.	1344.	2.30	1.64
1960	94.	558.	811.	1383.	2.48	1.71
1961	110.	563.	847.	1371.	2.44	1.62
1962	119.	572.	896.	1581.	2.77	1.77
1963	120.	596.	971.	1587.	2.66	1.63
1964	108.	599.	1023.	1592.	2.66	1.56
1965	103.	597.	1071.	1722.	2.88	1.61
1966	111.	626.	1158.	1875.	2.99	1.62
1967	129.	647.	1251.	1915.	2.96	1.53
1968	136.	672.	1339.	2029.	3.02	1.52
1969	130.	704.	1463.	2200.	3.12	1.50
1970	126.	696.	1509.	2400.	3.45	1.59
1971	130.	725.	1708.	2575.	3.55	1.51

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.28
MONEY, INCOME, AND VELOCITY STATISTICS FOR NEBRASKA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	50.	271.	439.	811.	2.99	1.85
1930	41.	245.	384.	713.	2.91	1.85
1931	36.	218.	345.	568.	2.61	1.65
1932	41.	162.	252.	424.	2.62	1.69
1933	34.	134.	196.	382.	2.86	1.95
1934	28.	173.	242.	352.	2.03	1.45
1935	28.	203.	270.	552.	2.72	2.04
1936	28.	225.	292.	529.	2.35	1.81
1937	31.	223.	289.	548.	2.46	1.90
1938	28.	213.	276.	533.	2.51	1.93
1939	29.	222.	285.	521.	2.35	1.83
1940	28.	227.	291.	578.	2.54	1.98
1941	32.	256.	319.	697.	2.72	2.18
1942	50.	339.	401.	1010.	2.98	2.52
1943	78.	556.	627.	1226.	2.20	1.95
1944	126.	707.	794.	1302.	1.84	1.64
1945	141.	816.	928.	1407.	1.72	1.52
1946	160.	999.	1131.	1446.	1.45	1.28
1947	156.	1088.	1227.	1574.	1.45	1.28
1948	160.	1082.	1221.	1909.	1.76	1.56
1949	164.	1077.	1216.	1697.	1.58	1.40
1950	180.	1113.	1255.	1978.	1.78	1.58
1951	175.	1153.	1299.	2067.	1.79	1.59
1952	170.	1203.	1357.	2187.	1.82	1.61
1953	170.	1257.	1419.	2125.	1.69	1.50
1954	175.	1260.	1428.	2253.	1.79	1.58
1955	178.	1262.	1428.	2191.	1.74	1.53
1956	198.	1229.	1389.	2274.	1.85	1.64
1957	180.	1197.	1358.	2615.	2.18	1.93
1958	181.	1256.	1429.	2713.	2.16	1.90
1959	181.	1338.	1531.	2757.	2.06	1.80
1960	178.	1286.	1503.	2988.	2.32	1.99
1961	200.	1331.	1598.	3046.	2.29	1.91
1962	203.	1343.	1717.	3274.	2.44	1.91
1963	214.	1354.	1820.	3340.	2.47	1.83
1964	203.	1366.	1919.	3481.	2.55	1.81
1965	204.	1398.	2061.	3851.	2.76	1.87
1966	218.	1438.	2242.	4242.	2.95	1.89
1967	247.	1527.	2492.	4413.	2.89	1.77
1968	266.	1602.	2748.	4653.	2.90	1.69
1969	251.	1694.	3019.	5297.	3.13	1.75
1970	262.	1713.	3155.	5649.	3.30	1.79
1971	273.	1813.	3574.	6077.	3.35	1.70

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.29
MONEY, INCOME, AND VELOCITY STATISTICS FOR NEVADA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	7.	28.	52.	79.	2.80	1.51
1930	5.	22.	43.	76.	3.38	1.75
1931	7.	23.	43.	61.	2.66	1.42
1932	7.	19.	36.	52.	2.71	1.44
1933	4.	11.	16.	48.	4.55	3.09
1934	3.	13.	20.	52.	3.97	2.59
1935	5.	18.	26.	65.	3.71	2.55
1936	4.	22.	32.	83.	3.72	2.57
1937	7.	27.	39.	77.	2.86	1.98
1938	6.	26.	39.	80.	3.08	2.05
1939	7.	28.	42.	90.	3.25	2.16
1940	7.	32.	49.	99.	3.05	2.00
1941	9.	37.	55.	119.	3.20	2.16
1942	17.	60.	79.	215.	3.56	2.71
1943	24.	82.	105.	227.	2.76	2.16
1944	30.	97.	127.	229.	2.36	1.80
1945	43.	123.	161.	233.	1.90	1.45
1946	51.	153.	201.	249.	1.63	1.24
1947	47.	151.	204.	258.	1.71	1.26
1948	42.	148.	204.	283.	1.92	1.39
1949	43.	137.	195.	286.	2.08	1.47
1950	54.	157.	216.	327.	2.08	1.51
1951	59.	170.	232.	378.	2.22	1.63
1952	65.	197.	263.	440.	2.23	1.67
1953	71.	219.	294.	480.	2.20	1.63
1954	68.	247.	328.	519.	2.10	1.58
1955	84.	268.	357.	604.	2.26	1.69
1956	76.	255.	351.	625.	2.45	1.78
1957	62.	258.	361.	673.	2.61	1.86
1958	71.	264.	400.	711.	2.70	1.78
1959	65.	295.	445.	770.	2.61	1.73
1960	77.	303.	475.	829.	2.74	1.75
1961	90.	324.	529.	911.	2.81	1.72
1962	100.	363.	583.	1122.	3.09	1.93
1963	135.	451.	697.	1265.	2.81	1.82
1964	169.	486.	754.	1353.	2.79	1.80
1965	179.	507.	815.	1434.	2.83	1.76
1966	174.	499.	870.	1510.	3.03	1.74
1967	165.	504.	906.	1581.	3.14	1.74
1968	189.	566.	1024.	1792.	3.16	1.75
1969	261.	686.	1218.	2047.	2.98	1.68
1970	264.	699.	1293.	2244.	3.21	1.74
1971	270.	768.	1483.	2460.	3.20	1.66

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.30
MONEY, INCOME, AND VELOCITY STATISTICS FOR NEW HAMPSHIRE

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	11.	52.	291.	322.	6.23	1.11
1930	14.	55.	285.	302.	5.49	1.06
1931	12.	49.	282.	263.	5.36	0.93
1932	15.	46.	271.	204.	4.45	0.75
1933	17.	46.	262.	200.	4.30	0.76
1934	18.	49.	267.	229.	4.69	0.86
1935	17.	52.	272.	238.	4.60	0.88
1936	19.	61.	284.	258.	4.22	0.91
1937	20.	63.	289.	272.	4.32	0.94
1938	17.	61.	287.	259.	4.25	0.90
1939	20.	67.	297.	274.	4.10	0.92
1940	26.	75.	307.	285.	3.80	0.93
1941	31.	90.	323.	347.	3.85	1.07
1942	40.	109.	342.	409.	3.74	1.19
1943	56.	142.	390.	446.	3.15	1.15
1944	65.	154.	429.	482.	3.13	1.12
1945	83.	187.	503.	513.	2.74	1.02
1946	98.	229.	594.	567.	2.47	0.95
1947	94.	225.	610.	615.	2.73	1.01
1948	101.	234.	624.	668.	2.86	1.07
1949	90.	219.	608.	671.	3.06	1.10
1950	83.	218.	610.	704.	3.23	1.15
1951	87.	230.	623.	792.	3.44	1.27
1952	99.	254.	668.	833.	3.28	1.25
1953	104.	262.	705.	884.	3.37	1.25
1954	99.	262.	732.	915.	3.49	1.25
1955	95.	267.	774.	983.	3.69	1.27
1956	82.	263.	809.	1035.	3.94	1.28
1957	88.	265.	833.	1102.	4.16	1.32
1958	98.	277.	879.	1132.	4.08	1.29
1959	94.	292.	939.	1237.	4.24	1.32
1960	100.	309.	976.	1300.	4.20	1.33
1961	109.	320.	1056.	1356.	4.24	1.28
1962	111.	340.	1146.	1442.	4.25	1.26
1963	106.	349.	1240.	1510.	4.33	1.22
1964	121.	371.	1340.	1601.	4.31	1.19
1965	131.	393.	1450.	1728.	4.39	1.19
1966	133.	421.	1586.	1905.	4.53	1.20
1967	137.	439.	1704.	2079.	4.73	1.22
1968	147.	482.	1859.	2286.	4.74	1.23
1969	183.	547.	2036.	2475.	4.52	1.22
1970	193.	566.	2106.	2686.	4.74	1.28
1971	208.	605.	2349.	2877.	4.76	1.23

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.31
MONEY, INCOME, AND VELOCITY STATISTICS FOR NEW JERSEY

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	141.	1026.	2427.	3714.	3.62	1.53
1930	148.	1012.	2422.	3495.	3.45	1.44
1931	199.	992.	2417.	3071.	3.09	1.27
1932	227.	818.	2037.	2440.	2.98	1.20
1933	206.	703.	1790.	2172.	3.09	1.21
1934	190.	704.	1833.	2364.	3.36	1.29
1935	189.	790.	1967.	2565.	3.25	1.30
1936	204.	926.	2096.	2910.	3.14	1.39
1937	240.	1015.	2233.	3068.	3.02	1.37
1938	227.	959.	2176.	2869.	2.99	1.32
1939	220.	961.	2215.	3100.	3.23	1.40
1940	226.	1069.	2311.	3433.	3.21	1.49
1941	326.	1360.	2614.	4085.	3.00	1.56
1942	462.	1619.	2842.	5048.	3.12	1.78
1943	664.	2194.	3550.	6024.	2.75	1.70
1944	783.	2442.	4047.	6520.	2.67	1.61
1945	981.	2875.	4867.	6558.	2.28	1.35
1946	1020.	3207.	5558.	6886.	2.15	1.24
1947	1123.	3302.	5815.	7268.	2.20	1.25
1948	1070.	3294.	5840.	8063.	2.45	1.38
1949	1000.	3231.	5800.	8131.	2.52	1.40
1950	888.	3246.	5873.	8934.	2.75	1.52
1951	970.	3511.	6185.	10151.	2.89	1.64
1952	1137.	3851.	6667.	10934.	2.84	1.64
1953	1164.	3985.	6975.	11750.	2.95	1.68
1954	1166.	4047.	7170.	11957.	2.95	1.67
1955	1106.	4188.	7444.	12688.	3.03	1.70
1956	1103.	4199.	7598.	13719.	3.27	1.81
1957	1266.	4324.	7968.	14550.	3.36	1.83
1958	1270.	4392.	8387.	14823.	3.37	1.77
1959	1299.	4635.	8867.	15849.	3.42	1.79
1960	1303.	4715.	9068.	16526.	3.50	1.82
1961	1172.	4726.	9449.	17333.	3.67	1.83
1962	1274.	4933.	10089.	18430.	3.74	1.83
1963	1356.	5146.	10877.	19372.	3.76	1.78
1964	1581.	5678.	11837.	20515.	3.61	1.73
1965	1603.	5881.	12510.	22105.	3.76	1.77
1966	1696.	6348.	13641.	23862.	3.76	1.75
1967	1720.	6406.	14578.	25638.	4.00	1.76
1968	1864.	7005.	15950.	27987.	4.00	1.75
1969	2106.	7777.	17397.	30423.	3.91	1.75
1970	2370.	8227.	18483.	32930.	4.00	1.78
1971	2482.	8753.	20940.	35146.	4.02	1.68

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.32
MONEY, INCOME, AND VELOCITY STATISTICS FOR NEW MEXICO

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	7.	37.	49.	171.	4.64	3.50
1930	6.	38.	50.	142.	3.73	2.84
1931	6.	32.	43.	125.	3.96	2.94
1932	7.	25.	35.	92.	3.73	2.65
1933	8.	23.	29.	94.	4.17	3.30
1934	7.	29.	37.	112.	3.83	3.01
1935	8.	38.	46.	136.	3.54	2.93
1936	9.	45.	55.	163.	3.63	2.97
1937	10.	52.	63.	178.	3.41	2.82
1938	10.	53.	64.	171.	3.21	2.66
1939	11.	55.	67.	184.	3.34	2.74
1940	11.	57.	71.	199.	3.49	2.80
1941	14.	65.	80.	238.	3.68	2.99
1942	22.	84.	99.	319.	3.81	3.23
1943	36.	142.	160.	404.	2.85	2.53
1944	56.	182.	204.	457.	2.51	2.24
1945	72.	233.	263.	491.	2.10	1.86
1946	88.	294.	332.	509.	1.73	1.53
1947	72.	279.	319.	575.	2.06	1.80
1948	79.	303.	342.	655.	2.16	1.92
1949	80.	314.	354.	719.	2.29	2.03
1950	92.	361.	405.	811.	2.24	2.00
1951	95.	362.	407.	936.	2.59	2.30
1952	101.	413.	471.	1004.	2.43	2.13
1953	102.	431.	500.	1048.	2.43	2.10
1954	99.	434.	512.	1077.	2.48	2.10
1955	102.	469.	559.	1181.	2.52	2.11
1956	125.	486.	600.	1284.	2.64	2.14
1957	109.	496.	623.	1442.	2.91	2.31
1958	121.	527.	670.	1618.	3.07	2.41
1959	119.	575.	735.	1759.	3.06	2.39
1960	127.	567.	747.	1799.	3.17	2.41
1961	145.	606.	813.	1871.	3.09	2.30
1962	163.	631.	867.	1969.	3.12	2.27
1963	168.	632.	927.	2031.	3.21	2.19
1964	153.	652.	971.	2115.	3.24	2.18
1965	154.	663.	1019.	2269.	3.42	2.23
1966	169.	668.	1053.	2380.	3.56	2.26
1967	185.	705.	1164.	2463.	3.49	2.12
1968	213.	761.	1248.	2656.	3.49	2.13
1969	209.	771.	1300.	2908.	3.77	2.24
1970	198.	833.	1460.	3183.	3.82	2.18
1971	224.	955.	1768.	3448.	3.61	1.95

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.33
MONEY, INCOME, AND VELOCITY STATISTICS FOR NEW YORK

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	579.	8461.	15726.	14105.	1.67	0.90
1930	539.	9566.	17252.	13186.	1.38	0.76
1931	566.	8381.	16414.	11379.	1.36	0.69
1932	789.	6934.	14347.	8849.	1.28	0.62
1933	928.	7243.	14339.	8322.	1.15	0.58
1934	916.	7101.	14246.	9070.	1.28	0.64
1935	736.	8410.	15458.	9669.	1.15	0.63
1936	828.	10066.	17146.	10914.	1.08	0.64
1937	898.	10215.	17578.	11339.	1.11	0.65
1938	810.	9733.	17106.	10708.	1.10	0.63
1939	974.	11616.	19111.	11152.	0.96	0.58
1940	1260.	13750.	21457.	11713.	0.85	0.55
1941	1654.	16264.	23974.	13209.	0.81	0.55
1942	1736.	16041.	23445.	15206.	0.95	0.65
1943	2223.	19101.	27048.	17752.	0.93	0.66
1944	2726.	19827.	28869.	19483.	0.98	0.67
1945	3357.	21489.	32267.	20599.	0.96	0.64
1946	3514.	24987.	37430.	22712.	0.91	0.61
1947	3814.	25533.	38907.	23997.	0.94	0.62
1948	3375.	24036.	38248.	26051.	1.08	0.68
1949	3463.	24295.	39114.	26046.	1.07	0.67
1950	3139.	24073.	39649.	27841.	1.16	0.70
1951	3302.	24885.	40702.	30000.	1.21	0.74
1952	3908.	26991.	43918.	31396.	1.16	0.71
1953	3420.	25831.	44242.	33206.	1.29	0.75
1954	3398.	26302.	46368.	34275.	1.30	0.74
1955	3442.	27395.	48761.	36453.	1.33	0.75
1956	3341.	26199.	48941.	38608.	1.47	0.79
1957	3608.	25662.	49929.	40818.	1.59	0.82
1958	3469.	25881.	52955.	41715.	1.61	0.79
1959	3473.	26958.	55458.	44301.	1.64	0.80
1960	3386.	27112.	55987.	46178.	1.70	0.82
1961	3411.	26649.	58738.	47821.	1.79	0.81
1962	3748.	27004.	62536.	50535.	1.87	0.81
1963	3959.	27671.	67322.	52559.	2.98	1.23
1964	4328.	28693.	72785.	55987.	1.95	0.77
1965	4537.	29540.	80026.	59487.	2.01	0.74
1966	4669.	31296.	86159.	63717.	2.04	0.74
1967	4879.	33031.	91251.	68657.	2.08	0.75
1968	5295.	37631.	99557.	75041.	1.99	0.75
1969	5845.	39646.	100761.	80923.	2.04	0.80
1970	6030.	40774.	101150.	86391.	2.12	0.85
1971	6409.	41832.	118563.	91742.	2.19	0.77

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.34
MONEY, INCOME, AND VELOCITY STATISTICS FOR NORTH CAROLINA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	37.	215.	385.	1046.	4.87	2.72
1930	36.	206.	367.	929.	4.50	2.53
1931	43.	185.	313.	789.	4.27	2.52
1932	64.	164.	244.	603.	3.68	2.47
1933	46.	140.	199.	678.	4.85	3.41
1934	46.	173.	253.	809.	4.69	3.20
1935	49.	209.	303.	894.	4.28	2.95
1936	60.	258.	357.	986.	3.82	2.76
1937	70.	278.	385.	1088.	3.92	2.83
1938	63.	264.	372.	1018.	3.85	2.74
1939	69.	301.	415.	1111.	3.69	2.67
1940	71.	324.	445.	1171.	3.61	2.63
1941	96.	411.	540.	1533.	3.73	2.84
1942	167.	588.	718.	2063.	3.51	2.87
1943	286.	888.	1032.	2515.	2.83	2.44
1944	374.	1035.	1210.	2779.	2.68	2.30
1945	458.	1298.	1542.	2892.	2.23	1.88
1946	455.	1508.	1815.	3198.	2.12	1.76
1947	489.	1624.	1966.	3372.	2.08	1.72
1948	513.	1675.	2025.	3732.	2.23	1.84
1949	504.	1502.	1900.	3675.	2.45	1.93
1950	525.	1536.	1925.	4219.	2.75	2.19
1951	504.	1574.	1984.	4691.	2.98	2.36
1952	511.	1697.	2154.	4851.	2.86	2.25
1953	561.	1777.	2261.	5040.	2.84	2.23
1954	562.	1782.	2296.	5120.	2.87	2.23
1955	583.	1892.	2434.	5571.	2.94	2.29
1956	565.	1890.	2456.	5935.	3.14	2.42
1957	583.	1887.	2421.	5980.	3.17	2.47
1958	552.	1879.	2546.	6263.	3.33	2.46
1959	569.	2036.	2708.	6712.	3.30	2.48
1960	612.	2105.	2819.	7123.	3.38	2.53
1961	643.	2149.	2958.	7596.	3.53	2.57
1962	647.	2237.	3167.	8154.	3.64	2.57
1963	671.	2362.	3439.	8606.	3.64	2.50
1964	686.	2503.	3772.	9292.	3.71	2.46
1965	788.	2732.	4258.	10092.	3.69	2.37
1966	876.	3061.	4930.	11341.	3.71	2.30
1967	958.	3175.	5496.	12288.	3.87	2.24
1968	1016.	3447.	6074.	13566.	3.94	2.23
1969	959.	3645.	6631.	15036.	4.12	2.27
1970	1058.	3832.	6848.	16383.	4.28	2.39
1971	1190.	4357.	8092.	17661.	4.05	2.18

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.35
MONEY, INCOME, AND VELOCITY STATISTICS FOR NORTH DAKOTA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	18.	83.	165.	253.	3.06	1.54
1930	13.	70.	142.	208.	2.98	1.47
1931	11.	59.	125.	124.	2.11	0.99
1932	13.	50.	103.	119.	2.40	1.16
1933	11.	42.	82.	98.	2.35	1.20
1934	9.	48.	88.	119.	2.47	1.35
1935	10.	57.	105.	178.	3.11	1.69
1936	10.	60.	107.	152.	2.54	1.42
1937	11.	59.	105.	209.	3.55	1.99
1938	10.	56.	95.	180.	3.22	1.90
1939	10.	58.	95.	202.	3.48	2.13
1940	11.	65.	104.	224.	3.46	2.16
1941	11.	77.	119.	321.	4.17	2.70
1942	17.	108.	154.	381.	3.53	2.47
1943	28.	183.	241.	506.	2.77	2.10
1944	47.	254.	333.	535.	2.11	1.61
1945	59.	302.	405.	549.	1.82	1.35
1946	74.	397.	519.	596.	1.50	1.15
1947	67.	436.	577.	836.	1.92	1.45
1948	71.	467.	621.	813.	1.74	1.31
1949	73.	484.	646.	674.	1.39	1.04
1950	83.	446.	609.	782.	1.75	1.28
1951	83.	439.	595.	794.	1.81	1.33
1952	68.	467.	633.	740.	1.58	1.17
1953	72.	455.	635.	757.	1.66	1.19
1954	75.	460.	646.	766.	1.66	1.18
1955	69.	446.	639.	848.	1.90	1.33
1956	77.	403.	539.	881.	2.18	1.63
1957	66.	405.	572.	905.	2.23	1.58
1958	71.	430.	635.	1030.	2.39	1.62
1959	68.	458.	691.	949.	2.07	1.37
1960	71.	440.	678.	1087.	2.47	1.60
1961	76.	443.	698.	964.	2.17	1.38
1962	80.	435.	719.	1370.	3.15	1.91
1963	83.	491.	835.	1292.	2.63	1.55
1964	77.	493.	881.	1288.	2.61	1.46
1965	76.	495.	931.	1505.	3.04	1.62
1966	78.	515.	1014.	1568.	3.04	1.55
1967	90.	529.	1091.	1596.	3.02	1.46
1968	97.	546.	1210.	1656.	3.03	1.37
1969	92.	636.	1429.	1867.	2.94	1.31
1970	92.	637.	1475.	1897.	2.98	1.29
1971	104.	662.	1628.	2222.	3.35	1.36

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.36
MONEY, INCOME, AND VELOCITY STATISTICS FOR OHIO

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	187.	1298.	2745.	5178.	3.99	1.89
1930	193.	1278.	2820.	4472.	3.50	1.59
1931	214.	1154.	2548.	3804.	3.30	1.49
1932	230.	902.	1933.	2716.	3.01	1.40
1933	212.	715.	1450.	2631.	3.68	1.81
1934	258.	905.	1732.	3087.	3.41	1.78
1935	251.	1072.	1974.	3523.	3.29	1.78
1936	276.	1259.	2244.	4060.	3.22	1.81
1937	375.	1472.	2538.	4432.	3.01	1.75
1938	350.	1369.	2467.	3863.	2.82	1.57
1939	345.	1499.	2609.	4265.	2.84	1.63
1940	372.	1655.	2795.	4606.	2.78	1.65
1941	428.	2046.	3227.	5765.	2.82	1.79
1942	657.	2674.	3870.	7166.	2.68	1.85
1943	999.	3740.	5143.	8641.	2.31	1.68
1944	1259.	4116.	5836.	9160.	2.23	1.57
1945	1558.	4775.	6977.	9326.	1.95	1.34
1946	1574.	5139.	7726.	9853.	1.92	1.28
1947	1501.	5212.	7972.	10880.	2.09	1.36
1948	1597.	5449.	8272.	12269.	2.25	1.48
1949	1515.	5341.	8231.	11749.	2.20	1.43
1950	1459.	5545.	8423.	12930.	2.33	1.54
1951	1511.	5940.	8831.	14894.	2.51	1.69
1952	1480.	6297.	9327.	15942.	2.53	1.71
1953	1655.	6734.	9955.	17423.	2.59	1.75
1954	1739.	6825.	10325.	17397.	2.55	1.69
1955	1678.	7147.	10779.	18762.	2.63	1.74
1956	1691.	7228.	10940.	19992.	2.77	1.83
1957	1793.	7359.	11150.	20959.	2.85	1.88
1958	1719.	7274.	11319.	20637.	2.84	1.82
1959	1770.	7436.	11583.	22035.	2.96	1.90
1960	1808.	7543.	11833.	22762.	3.02	1.92
1961	1669.	7238.	11953.	23008.	3.18	1.92
1962	1722.	7342.	12587.	24208.	3.30	1.92
1963	1776.	7609.	13405.	25189.	3.31	1.88
1964	1877.	7882.	14243.	26878.	3.41	1.89
1965	1965.	8176.	15394.	29383.	3.59	1.91
1966	2149.	8573.	16898.	32201.	3.76	1.91
1967	2238.	8978.	18471.	33788.	3.76	1.83
1968	2309.	9544.	19756.	37098.	3.89	1.88
1969	2446.	10019.	21146.	40424.	4.03	1.91
1970	2699.	10303.	21410.	42501.	4.13	1.99
1971	2385.	10759.	23678.	44833.	4.17	1.89

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.37
MONEY, INCOME, AND VELOCITY STATISTICS FOR OKLAHOMA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	35.	340.	466.	1077.	3.17	2.31
1930	32.	317.	439.	884.	2.79	2.01
1931	28.	248.	365.	718.	2.89	1.97
1932	32.	212.	307.	516.	2.43	1.68
1933	43.	197.	281.	530.	2.69	1.89
1934	31.	219.	298.	590.	2.70	1.98
1935	32.	256.	330.	699.	2.73	2.12
1936	36.	299.	377.	749.	2.50	1.99
1937	40.	333.	413.	861.	2.58	2.08
1938	37.	323.	409.	797.	2.47	1.95
1939	42.	336.	421.	805.	2.39	1.91
1940	41.	341.	421.	867.	2.54	2.06
1941	48.	389.	470.	982.	2.52	2.09
1942	77.	485.	557.	1390.	2.87	2.50
1943	135.	754.	821.	1706.	2.26	2.08
1944	185.	901.	974.	1940.	2.15	1.99
1945	225.	1127.	1220.	1958.	1.74	1.60
1946	257.	1378.	1485.	2000.	1.45	1.35
1947	225.	1415.	1527.	2166.	1.53	1.42
1948	251.	1545.	1661.	2390.	1.55	1.44
1949	259.	1510.	1630.	2460.	1.63	1.51
1950	288.	1596.	1722.	2547.	1.60	1.48
1951	278.	1562.	1716.	2837.	1.82	1.65
1952	280.	1737.	1918.	3087.	1.78	1.61
1953	300.	1741.	1960.	3201.	1.84	1.63
1954	286.	1785.	2048.	3193.	1.79	1.56
1955	296.	1851.	2124.	3390.	1.83	1.60
1956	324.	1878.	2171.	3591.	1.91	1.65
1957	289.	1782.	2137.	3744.	2.10	1.75
1958	320.	1931.	2344.	4000.	2.07	1.71
1959	317.	1945.	2395.	4137.	2.13	1.73
1960	330.	1990.	2475.	4358.	2.19	1.76
1961	352.	2010.	2603.	4561.	2.27	1.75
1962	349.	2104.	2842.	4698.	2.23	1.65
1963	387.	2223.	3088.	4889.	2.20	1.58
1964	352.	2199.	3217.	5231.	2.38	1.63
1965	364.	2221.	3402.	5668.	2.55	1.67
1966	404.	2353.	3711.	6154.	2.62	1.66
1967	448.	2439.	4100.	6675.	2.74	1.63
1968	474.	2592.	4472.	7224.	2.79	1.62
1969	471.	2691.	4829.	7827.	2.91	1.62
1970	501.	2870.	4983.	8570.	2.99	1.72
1971	544.	3060.	5811.	9140.	2.99	1.57

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.38
MONEY, INCOME, AND VELOCITY STATISTICS FOR OREGON

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	31.	170.	294.	647.	3.81	2.20
1930	28.	164.	289.	593.	3.63	2.06
1931	29.	147.	270.	496.	3.38	1.84
1932	33.	113.	212.	373.	3.30	1.76
1933	33.	105.	190.	355.	3.38	1.87
1934	31.	122.	212.	432.	3.55	2.04
1935	30.	147.	238.	464.	3.16	1.95
1936	32.	177.	273.	568.	3.21	2.08
1937	39.	198.	305.	591.	2.99	1.94
1938	32.	173.	291.	580.	3.35	1.99
1939	35.	187.	310.	629.	3.36	2.03
1940	45.	222.	350.	677.	3.05	1.94
1941	45.	270.	405.	897.	3.33	2.22
1942	77.	375.	515.	1286.	3.43	2.50
1943	142.	638.	825.	1720.	2.69	2.08
1944	206.	779.	1028.	1767.	2.27	1.72
1945	221.	903.	1234.	1740.	1.93	1.41
1946	236.	1027.	1410.	1874.	1.83	1.33
1947	227.	1049.	1453.	2071.	1.97	1.42
1948	230.	1084.	1482.	2278.	2.10	1.54
1949	209.	1011.	1401.	2251.	2.23	1.61
1950	204.	1057.	1448.	2482.	2.35	1.71
1951	196.	1099.	1504.	2784.	2.53	1.85
1952	194.	1137.	1618.	2966.	2.61	1.83
1953	196.	1124.	1673.	2990.	2.66	1.79
1954	179.	1095.	1703.	2961.	2.70	1.74
1955	203.	1210.	1894.	3198.	2.64	1.69
1956	199.	1163.	1853.	3422.	2.94	1.85
1957	165.	1100.	1806.	3416.	3.10	1.89
1958	169.	1088.	1907.	3556.	3.27	1.86
1959	164.	1203.	2020.	3804.	3.16	1.88
1960	168.	1172.	2007.	3939.	3.36	1.96
1961	196.	1185.	2149.	4046.	3.42	1.88
1962	217.	1212.	2273.	4287.	3.54	1.89
1963	216.	1253.	2411.	4553.	3.63	1.89
1964	217.	1293.	2552.	4892.	3.78	1.92
1965	219.	1328.	2805.	5333.	4.02	1.90
1966	244.	1400.	3044.	5760.	4.11	1.89
1967	245.	1432.	3315.	6096.	4.26	1.84
1968	281.	1573.	3620.	6631.	4.21	1.83
1969	317.	1762.	3933.	7276.	4.13	1.85
1970	315.	1730.	3801.	7816.	4.52	2.06
1971	350.	1897.	4212.	8470.	4.46	2.01

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.39
MONEY, INCOME, AND VELOCITY STATISTICS FOR PENNSYLVANIA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	380.	2529.	5276.	7531.	2.98	1.43
1930	351.	2447.	5245.	6904.	2.82	1.32
1931	365.	2289.	5125.	5846.	2.55	1.14
1932	398.	1859.	4120.	4406.	2.37	1.07
1933	396.	1714.	3667.	4122.	2.40	1.12
1934	427.	1888.	4023.	4721.	2.50	1.17
1935	407.	2106.	4301.	5049.	2.40	1.17
1936	456.	2442.	4759.	5850.	2.40	1.23
1937	545.	2749.	5139.	6207.	2.26	1.21
1938	481.	2474.	4936.	5553.	2.24	1.13
1939	494.	2676.	5135.	5933.	2.22	1.16
1940	555.	3032.	5509.	6417.	2.12	1.16
1941	701.	3595.	6087.	7646.	2.13	1.26
1942	1018.	4434.	6715.	9154.	2.06	1.36
1943	1446.	5746.	8128.	10678.	1.86	1.31
1944	1717.	6145.	8832.	11470.	1.87	1.30
1945	2140.	7123.	10349.	11641.	1.63	1.12
1946	2270.	7853.	11603.	12576.	1.60	1.08
1947	2289.	8092.	12143.	13756.	1.70	1.13
1948	2250.	8100.	12250.	14716.	1.82	1.20
1949	2149.	7977.	12190.	14553.	1.82	1.19
1950	2033.	8234.	12501.	16189.	1.97	1.30
1951	2063.	8598.	12863.	17753.	2.06	1.38
1952	2073.	8894.	13327.	18617.	2.09	1.40
1953	2227.	9269.	13940.	19938.	2.15	1.43
1954	2118.	9104.	14088.	19515.	2.14	1.39
1955	2116.	9465.	14605.	20669.	2.18	1.42
1956	2153.	9436.	14756.	22295.	2.36	1.51
1957	2276.	9534.	15203.	23414.	2.46	1.54
1958	2243.	9518.	15839.	23594.	2.48	1.49
1959	2436.	9980.	16599.	24719.	2.48	1.49
1960	2263.	9751.	16704.	25451.	2.61	1.52
1961	2256.	9548.	17336.	25747.	2.70	1.49
1962	2225.	9664.	18158.	26918.	2.79	1.48
1963	2338.	10048.	19937.	27876.	2.77	1.40
1964	2477.	10330.	21249.	29936.	2.90	1.41
1965	2584.	10773.	22861.	31943.	2.97	1.40
1966	2767.	11247.	24807.	34783.	3.09	1.40
1967	3037.	11844.	26694.	37062.	3.13	1.39
1968	3172.	12637.	28675.	39938.	3.16	1.39
1969	3282.	13606.	30406.	43301.	3.18	1.42
1970	3478.	13855.	31188.	46579.	3.36	1.49
1971	3543.	14568.	35370.	49349.	3.39	1.40

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.40
MONEY, INCOME, AND VELOCITY STATISTICS FOR RHODE ISLAND

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	36.	169.	533.	596.	3.53	1.12
1930	35.	164.	541.	540.	3.30	1.00
1931	39.	157.	549.	485.	3.08	0.88
1932	50.	142.	504.	390.	2.75	0.77
1933	59.	151.	495.	379.	2.51	0.77
1934	51.	144.	485.	402.	2.80	0.83
1935	45.	149.	486.	433.	2.90	0.89
1936	51.	162.	498.	484.	2.99	0.97
1937	53.	170.	513.	502.	2.95	0.98
1938	47.	164.	502.	465.	2.83	0.93
1939	50.	181.	521.	500.	2.77	0.96
1940	66.	212.	554.	534.	2.52	0.96
1941	76.	263.	606.	685.	2.61	1.13
1942	119.	350.	686.	882.	2.52	1.29
1943	154.	447.	810.	1028.	2.30	1.27
1944	172.	455.	863.	1067.	2.35	1.24
1945	207.	530.	1012.	1067.	2.01	1.05
1946	228.	600.	1149.	1066.	1.78	0.93
1947	212.	604.	1179.	1126.	1.86	0.96
1948	225.	622.	1198.	1175.	1.89	0.98
1949	184.	562.	1133.	1151.	2.05	1.02
1950	174.	563.	1132.	1262.	2.24	1.11
1951	194.	618.	1186.	1384.	2.24	1.17
1952	208.	645.	1229.	1446.	2.24	1.18
1953	215.	659.	1273.	1531.	2.32	1.20
1954	211.	641.	1277.	1523.	2.38	1.19
1955	182.	635.	1305.	1614.	2.54	1.24
1956	176.	629.	1322.	1674.	2.66	1.27
1957	175.	597.	1318.	1701.	2.85	1.29
1958	175.	597.	1390.	1748.	2.93	1.26
1959	181.	597.	1424.	1844.	3.09	1.29
1960	182.	611.	1473.	1895.	3.10	1.29
1961	162.	584.	1533.	1964.	3.36	1.28
1962	174.	607.	1641.	2110.	3.48	1.29
1963	185.	640.	1766.	2193.	3.43	1.24
1964	180.	633.	1927.	2346.	3.71	1.22
1965	217.	712.	2117.	2504.	3.52	1.18
1966	210.	725.	2247.	2740.	3.78	1.22
1967	197.	735.	2412.	2988.	4.06	1.24
1968	225.	805.	2604.	3270.	4.06	1.26
1969	212.	839.	2710.	3453.	4.11	1.27
1970	294.	930.	2746.	3726.	4.00	1.36
1971	278.	951.	3117.	3957.	4.16	1.27

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.41
MONEY, INCOME, AND VELOCITY STATISTICS FOR SOUTH CAROLINA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	17.	92.	185.	470.	5.12	2.54
1930	18.	94.	176.	421.	4.47	2.39
1931	21.	87.	155.	358.	4.12	2.31
1932	25.	64.	99.	275.	4.27	2.77
1933	19.	49.	69.	305.	6.17	4.39
1934	25.	78.	104.	360.	4.60	3.45
1935	24.	94.	124.	399.	4.24	3.21
1936	27.	115.	146.	451.	3.91	3.08
1937	31.	133.	165.	482.	3.61	2.91
1938	26.	116.	147.	456.	3.93	3.10
1939	25.	123.	156.	511.	4.15	3.27
1940	29.	137.	173.	584.	4.25	3.37
1941	48.	186.	224.	769.	4.14	3.44
1942	77.	250.	288.	1089.	4.35	3.78
1943	115.	372.	414.	1262.	3.39	3.05
1944	142.	438.	489.	1412.	3.22	2.89
1945	175.	555.	623.	1428.	2.57	2.29
1946	200.	680.	763.	1484.	2.18	1.95
1947	198.	709.	796.	1554.	2.19	1.95
1948	227.	750.	839.	1779.	2.37	2.12
1949	213.	718.	807.	1724.	2.40	2.14
1950	207.	716.	805.	1886.	2.63	2.34
1951	199.	734.	821.	2321.	3.16	2.83
1952	238.	852.	945.	2527.	2.97	2.67
1953	257.	874.	976.	2615.	2.99	2.68
1954	264.	875.	982.	2434.	2.78	2.48
1955	261.	876.	987.	2599.	2.97	2.63
1956	231.	851.	966.	2697.	3.17	2.79
1957	249.	851.	1001.	2810.	3.30	2.81
1958	256.	877.	1049.	2885.	3.29	2.75
1959	262.	932.	1119.	3119.	3.35	2.79
1960	258.	942.	1133.	3283.	3.49	2.90
1961	260.	972.	1179.	3450.	3.55	2.93
1962	271.	1026.	1249.	3733.	3.64	2.99
1963	276.	1072.	1320.	3928.	3.66	2.98
1964	291.	1134.	1399.	4253.	3.75	3.04
1965	332.	1233.	1535.	4702.	3.81	3.06
1966	369.	1389.	1754.	5303.	3.82	3.02
1967	386.	1434.	1880.	5728.	3.99	3.05
1968	400.	1523.	2063.	6353.	4.17	3.08
1969	405.	1646.	2318.	6985.	4.24	3.01
1970	438.	1767.	2517.	7614.	4.31	3.02
1971	520.	2013.	2952.	8274.	4.11	2.80

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.42
MONEY, INCOME, AND VELOCITY STATISTICS FOR SOUTH DAKOTA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	16.	93.	164.	288.	3.09	1.76
1930	14.	86.	153.	248.	2.90	1.62
1931	12.	70.	124.	166.	2.37	1.34
1932	14.	52.	91.	130.	2.52	1.44
1933	11.	44.	72.	89.	2.03	1.24
1934	9.	48.	75.	122.	2.52	1.62
1935	11.	61.	86.	202.	3.29	2.34
1936	11.	69.	95.	160.	2.33	1.69
1937	13.	69.	96.	209.	3.02	2.17
1938	11.	63.	90.	205.	3.24	2.27
1939	12.	69.	97.	219.	3.17	2.26
1940	13.	76.	107.	230.	3.04	2.16
1941	14.	84.	116.	228.	2.71	1.96
1942	23.	118.	151.	443.	3.74	2.93
1943	33.	187.	223.	479.	2.56	2.14
1944	52.	235.	279.	534.	2.27	1.91
1945	63.	274.	331.	600.	2.19	1.81
1946	84.	387.	459.	637.	1.64	1.39
1947	75.	444.	524.	739.	1.66	1.41
1948	72.	456.	540.	916.	2.01	1.70
1949	79.	450.	536.	689.	1.53	1.29
1950	91.	461.	550.	814.	1.77	1.48
1951	92.	462.	552.	942.	2.04	1.71
1952	83.	473.	578.	828.	1.75	1.43
1953	84.	464.	581.	892.	1.92	1.54
1954	86.	466.	600.	916.	1.97	1.53
1955	81.	481.	625.	857.	1.78	1.37
1956	94.	470.	616.	914.	1.94	1.48
1957	72.	443.	610.	1068.	2.41	1.75
1958	80.	476.	679.	1094.	2.30	1.61
1959	78.	536.	770.	981.	1.83	1.27
1960	79.	506.	744.	1218.	2.41	1.64
1961	93.	525.	788.	1227.	2.34	1.56
1962	98.	556.	864.	1407.	2.53	1.63
1963	98.	562.	918.	1350.	2.40	1.47
1964	90.	565.	971.	1320.	2.34	1.36
1965	84.	565.	1021.	1528.	2.70	1.50
1966	89.	598.	1110.	1681.	2.81	1.51
1967	102.	609.	1188.	1731.	2.84	1.46
1968	112.	632.	1284.	1886.	2.98	1.47
1969	105.	668.	1421.	1995.	2.99	1.40
1970	108.	670.	1507.	2107.	3.15	1.40
1971	114.	691.	1668.	2321.	3.36	1.39

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.43
MONEY, INCOME, AND VELOCITY STATISTICS FOR TENNESSEE

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	38.	258.	447.	982.	3.80	2.19
1930	34.	245.	442.	850.	3.47	1.92
1931	36.	209.	375.	732.	3.49	1.95
1932	45.	177.	309.	534.	3.02	1.73
1933	49.	162.	266.	560.	3.47	2.11
1934	44.	181.	304.	667.	3.68	2.19
1935	45.	222.	361.	728.	3.28	2.02
1936	51.	264.	409.	836.	3.16	2.04
1937	59.	299.	454.	918.	3.07	2.02
1938	53.	284.	448.	841.	2.96	1.88
1939	60.	306.	473.	886.	2.89	1.87
1940	63.	329.	506.	995.	3.03	1.97
1941	82.	411.	595.	1290.	3.14	2.17
1942	133.	558.	742.	1640.	2.94	2.21
1943	222.	873.	1070.	2108.	2.41	1.97
1944	322.	1058.	1299.	2464.	2.33	1.90
1945	396.	1296.	1617.	2592.	2.00	1.60
1946	433.	1514.	1900.	2634.	1.74	1.39
1947	403.	1524.	1937.	2776.	1.82	1.43
1948	406.	1564.	1980.	3037.	1.94	1.53
1949	412.	1571.	2018.	3001.	1.91	1.49
1950	439.	1634.	2096.	3295.	2.02	1.57
1951	442.	1690.	2146.	3645.	2.16	1.70
1952	419.	1722.	2231.	3810.	2.21	1.71
1953	460.	1814.	2376.	4080.	2.25	1.72
1954	472.	1830.	2462.	4105.	2.24	1.67
1955	503.	1923.	2601.	4374.	2.27	1.68
1956	523.	1954.	2679.	4671.	2.39	1.74
1957	530.	1959.	2746.	4872.	2.49	1.77
1958	526.	1974.	2885.	5025.	2.55	1.74
1959	544.	2117.	3113.	5394.	2.55	1.73
1960	551.	2159.	3190.	5521.	2.56	1.73
1961	611.	2274.	3430.	5881.	2.59	1.71
1962	593.	2307.	3656.	6255.	2.71	1.71
1963	645.	2464.	4037.	6640.	2.69	1.64
1964	589.	2529.	4439.	7138.	2.82	1.61
1965	642.	2699.	4730.	7850.	2.91	1.66
1966	743.	3040.	5279.	8663.	2.85	1.64
1967	842.	3171.	5689.	9280.	2.93	1.63
1968	829.	3270.	6019.	10214.	3.12	1.70
1969	835.	3455.	6420.	11231.	3.25	1.75
1970	1187.	3801.	7205.	12091.	3.18	1.68
1971	936.	3844.	7997.	13183.	3.43	1.65

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.44
MONEY, INCOME, AND VELOCITY STATISTICS FOR TEXAS

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	129.	917.	1160.	2752.	3.00	2.37
1930	114.	844.	1093.	2399.	2.84	2.19
1931	106.	744.	990.	2044.	2.75	2.06
1932	132.	622.	817.	1561.	2.51	1.91
1933	169.	636.	817.	1524.	2.40	1.87
1934	132.	713.	903.	1720.	2.41	1.91
1935	129.	797.	996.	1950.	2.45	1.96
1936	146.	943.	1149.	2247.	2.38	1.96
1937	172.	1067.	1277.	2548.	2.39	2.00
1938	161.	1059.	1288.	2498.	2.36	1.94
1939	179.	1158.	1399.	2600.	2.25	1.86
1940	178.	1242.	1483.	2776.	2.24	1.87
1941	216.	1470.	1719.	3459.	2.35	2.01
1942	364.	1867.	2098.	4822.	2.58	2.30
1943	622.	2886.	3130.	6464.	2.24	2.07
1944	864.	3534.	3826.	7123.	2.02	1.86
1945	1013.	4358.	4751.	7169.	1.65	1.51
1946	1117.	5206.	5687.	7400.	1.42	1.30
1947	1034.	5321.	5844.	8332.	1.57	1.43
1948	1073.	5715.	6290.	9142.	1.60	1.45
1949	1101.	5680.	6310.	9839.	1.73	1.56
1950	1203.	6305.	6974.	10486.	1.66	1.50
1951	1193.	6407.	7083.	11914.	1.86	1.68
1952	1238.	7019.	7769.	12837.	1.83	1.65
1953	1307.	7267.	8192.	13196.	1.82	1.61
1954	1297.	7423.	8550.	13504.	1.82	1.58
1955	1371.	7800.	9138.	14438.	1.85	1.58
1956	1449.	7905.	9377.	15472.	1.96	1.65
1957	1389.	7749.	9437.	16538.	2.13	1.75
1958	1397.	8000.	10226.	17175.	2.15	1.68
1959	1468.	8388.	10794.	18047.	2.15	1.67
1960	1457.	8310.	10756.	18588.	2.24	1.73
1961	1536.	8576.	11681.	19615.	2.29	1.68
1962	1519.	8966.	12747.	20576.	2.29	1.61
1963	1598.	9252.	13841.	21646.	2.34	1.56
1964	1574.	9459.	14831.	23116.	2.44	1.56
1965	1639.	9757.	15855.	24956.	2.56	1.57
1966	1736.	10205.	17170.	27676.	2.71	1.61
1967	1890.	10720.	18486.	30019.	2.80	1.62
1968	2057.	11727.	20429.	33309.	2.84	1.63
1969	2099.	12661.	22238.	36678.	2.90	1.65
1970	2152.	12846.	22494.	40213.	3.13	1.79
1971	2314.	14077.	26248.	42582.	3.03	1.62

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.45
MONEY, INCOME, AND VELOCITY STATISTICS FOR UTAH

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	9.	66.	142.	284.	4.33	2.00
1930	7.	59.	137.	257.	4.32	1.87
1931	8.	53.	130.	194.	3.65	1.49
1932	8.	41.	89.	160.	3.89	1.79
1933	9.	42.	92.	156.	3.69	1.69
1934	9.	49.	100.	164.	3.36	1.64
1935	9.	64.	115.	206.	3.21	1.79
1936	11.	73.	128.	245.	3.38	1.92
1937	13.	83.	140.	238.	2.88	1.70
1938	11.	76.	134.	241.	3.15	1.79
1939	12.	83.	143.	251.	3.01	1.75
1940	12.	90.	153.	269.	2.97	1.75
1941	15.	105.	171.	332.	3.15	1.94
1942	23.	137.	205.	518.	3.79	2.53
1943	47.	243.	329.	710.	2.92	2.16
1944	63.	271.	380.	652.	2.41	1.72
1945	84.	332.	472.	672.	2.02	1.42
1946	83.	381.	544.	698.	1.83	1.28
1947	78.	385.	550.	749.	1.94	1.36
1948	78.	390.	564.	810.	2.08	1.44
1949	81.	389.	570.	835.	2.15	1.46
1950	89.	408.	592.	911.	2.23	1.54
1951	89.	428.	610.	1053.	2.46	1.73
1952	94.	473.	679.	1116.	2.36	1.64
1953	98.	494.	724.	1166.	2.36	1.61
1954	94.	501.	746.	1165.	2.33	1.56
1955	101.	539.	795.	1272.	2.36	1.60
1956	120.	573.	844.	1381.	2.41	1.64
1957	101.	523.	838.	1482.	2.83	1.77
1958	100.	501.	859.	1549.	3.09	1.80
1959	92.	530.	915.	1678.	3.17	1.83
1960	110.	578.	964.	1774.	3.07	1.84
1961	121.	574.	1008.	1910.	3.33	1.90
1962	127.	600.	1089.	2071.	3.45	1.90
1963	129.	628.	1158.	2156.	3.43	1.86
1964	128.	636.	1228.	2220.	3.49	1.81
1965	132.	645.	1283.	2356.	3.65	1.84
1966	138.	661.	1436.	2517.	3.81	1.75
1967	143.	708.	1533.	2672.	3.78	1.74
1968	151.	737.	1610.	2892.	3.93	1.80
1969	148.	768.	1666.	3116.	4.05	1.87
1970	154.	817.	1706.	3443.	4.21	2.02
1971	160.	881.	1928.	3768.	4.28	1.95

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.46
MONEY, INCOME, AND VELOCITY STATISTICS FOR VERMONT

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	10.	40.	252.	225.	5.57	0.89
1930	10.	37.	243.	205.	5.48	0.84
1931	11.	35.	234.	168.	4.76	0.72
1932	15.	33.	215.	129.	3.96	0.60
1933	16.	32.	182.	121.	3.76	0.66
1934	16.	35.	184.	132.	3.80	0.72
1935	14.	35.	179.	146.	4.19	0.82
1936	15.	40.	184.	165.	4.14	0.90
1937	16.	42.	185.	170.	4.03	0.92
1938	15.	40.	179.	161.	4.07	0.90
1939	16.	44.	180.	172.	3.95	0.96
1940	16.	47.	185.	184.	3.92	0.99
1941	19.	55.	194.	219.	4.00	1.13
1942	26.	67.	203.	261.	3.92	1.29
1943	37.	94.	238.	293.	3.11	1.23
1944	46.	106.	266.	293.	2.77	1.10
1945	59.	129.	316.	319.	2.48	1.01
1946	64.	149.	368.	362.	2.43	0.98
1947	60.	147.	382.	389.	2.64	1.02
1948	62.	150.	387.	407.	2.72	1.05
1949	61.	144.	381.	396.	2.76	1.04
1950	59.	147.	384.	425.	2.90	1.11
1951	62.	156.	398.	482.	3.08	1.21
1952	62.	166.	419.	496.	2.98	1.18
1953	70.	173.	435.	521.	3.01	1.20
1954	64.	166.	437.	526.	3.17	1.20
1955	66.	174.	457.	549.	3.16	1.20
1956	67.	182.	478.	598.	3.28	1.25
1957	62.	174.	481.	619.	3.56	1.29
1958	66.	179.	509.	626.	3.50	1.23
1959	65.	188.	539.	672.	3.58	1.25
1960	67.	194.	553.	715.	3.69	1.29
1961	70.	199.	584.	731.	3.68	1.25
1962	70.	202.	615.	777.	3.84	1.26
1963	71.	216.	670.	798.	3.69	1.19
1964	70.	221.	711.	856.	3.87	1.20
1965	72.	235.	769.	956.	4.07	1.24
1966	72.	250.	833.	1089.	4.36	1.31
1967	84.	279.	908.	1178.	4.22	1.30
1968	89.	303.	993.	1305.	4.30	1.31
1969	90.	327.	1084.	1426.	4.36	1.32
1970	95.	353.	1164.	1541.	4.36	1.32
1971	98.	372.	1300.	1650.	4.44	1.27

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.47
MONEY, INCOME, AND VELOCITY STATISTICS FOR VIRGINIA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	40.	245.	496.	1054.	4.30	2.12
1930	39.	243.	498.	933.	3.83	1.87
1931	50.	235.	485.	899.	3.83	1.86
1932	56.	204.	426.	691.	3.39	1.62
1933	68.	202.	401.	696.	3.45	1.74
1934	63.	222.	438.	780.	3.52	1.78
1935	64.	243.	472.	870.	3.58	1.84
1936	68.	287.	529.	985.	3.43	1.86
1937	81.	322.	581.	1081.	3.35	1.86
1938	75.	307.	572.	1022.	3.33	1.79
1939	78.	331.	605.	1127.	3.40	1.86
1940	83.	358.	640.	1267.	3.54	1.98
1941	120.	474.	777.	1729.	3.65	2.22
1942	184.	652.	959.	2590.	3.97	2.70
1943	298.	951.	1273.	2945.	3.10	2.31
1944	411.	1105.	1469.	3269.	2.96	2.23
1945	518.	1353.	1799.	3375.	2.49	1.88
1946	504.	1496.	2025.	3336.	2.23	1.65
1947	485.	1478.	2050.	3278.	2.22	1.60
1948	496.	1497.	2074.	3624.	2.42	1.75
1949	482.	1483.	2074.	3648.	2.46	1.76
1950	493.	1542.	2157.	4070.	2.64	1.89
1951	496.	1614.	2247.	4763.	2.95	2.12
1952	537.	1782.	2471.	5150.	2.89	2.08
1953	556.	1842.	2590.	5292.	2.87	2.04
1954	567.	1855.	2674.	5338.	2.88	2.00
1955	590.	1974.	2852.	5638.	2.86	1.98
1956	628.	2025.	2956.	6084.	3.00	2.06
1957	646.	2150.	3149.	6349.	2.95	2.02
1958	617.	2123.	3231.	6591.	3.10	2.04
1959	610.	2203.	3411.	6995.	3.17	2.05
1960	598.	2187.	3420.	7340.	3.36	2.15
1961	636.	2242.	3569.	7777.	3.47	2.18
1962	658.	2330.	3841.	8443.	3.62	2.20
1963	733.	2527.	4233.	8983.	3.55	2.12
1964	739.	2652.	4594.	9905.	3.74	2.16
1965	814.	2854.	5061.	10718.	3.76	2.12
1966	864.	3031.	5630.	11684.	3.85	2.08
1967	930.	3170.	6219.	12741.	4.02	2.05
1968	1016.	3460.	6971.	14123.	4.08	2.03
1969	1051.	3753.	7632.	15461.	4.12	2.03
1970	1079.	3902.	8025.	16986.	4.35	2.12
1971	1202.	4366.	9357.	18400.	4.21	1.97

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.48
MONEY, INCOME, AND VELOCITY STATISTICS FOR WASHINGTON

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	41.	274.	485.	1166.	4.25	2.40
1930	39.	262.	490.	1043.	3.99	2.13
1931	41.	236.	467.	851.	3.61	1.82
1932	45.	173.	353.	638.	3.68	1.81
1933	47.	156.	303.	601.	3.84	1.98
1934	49.	201.	358.	707.	3.52	1.98
1935	50.	228.	398.	797.	3.49	2.00
1936	58.	280.	469.	939.	3.36	2.00
1937	69.	324.	534.	1008.	3.11	1.89
1938	61.	293.	509.	995.	3.40	1.96
1939	65.	325.	549.	1058.	3.25	1.93
1940	69.	367.	608.	1152.	3.14	1.89
1941	81.	456.	708.	1562.	3.43	2.21
1942	143.	678.	944.	2291.	3.38	2.43
1943	244.	1069.	1420.	2979.	2.79	2.10
1944	350.	1321.	1778.	3282.	2.48	1.85
1945	408.	1461.	2073.	3190.	2.18	1.54
1946	438.	1652.	2366.	3208.	1.94	1.36
1947	399.	1625.	2363.	3331.	2.05	1.41
1948	394.	1617.	2338.	3608.	2.23	1.54
1949	357.	1550.	2264.	3600.	2.32	1.59
1950	326.	1546.	2275.	3995.	2.58	1.76
1951	410.	1751.	2461.	4414.	2.52	1.79
1952	359.	1713.	2479.	4697.	2.74	1.89
1953	363.	1759.	2595.	4934.	2.80	1.90
1954	326.	1733.	2615.	5035.	2.91	1.93
1955	338.	1822.	2769.	5306.	2.91	1.92
1956	363.	1806.	2802.	5583.	3.09	1.99
1957	317.	1778.	2837.	5912.	3.32	2.08
1958	338.	1816.	2969.	6114.	3.37	2.06
1959	333.	1968.	3190.	6514.	3.31	2.04
1960	339.	1956.	3208.	6680.	3.41	2.08
1961	359.	1960.	3350.	7051.	3.60	2.10
1962	419.	2074.	3611.	7599.	3.66	2.10
1963	418.	2093.	3810.	7738.	3.70	2.03
1964	417.	2120.	4036.	8058.	3.80	2.00
1965	422.	2175.	4351.	8627.	3.97	1.98
1966	468.	2384.	4817.	9876.	4.14	2.05
1967	479.	2451.	5288.	10890.	4.44	2.06
1968	554.	2668.	6068.	12067.	4.52	1.99
1969	584.	2852.	6554.	13118.	4.60	2.00
1970	595.	2719.	6613.	13602.	5.00	2.06
1971	647.	2938.	7542.	14221.	4.84	1.89

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.49
MONEY, INCOME, AND VELOCITY STATISTICS FOR WEST VIRGINIA

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	42.	210.	374.	794.	3.78	2.12
1930	40.	201.	354.	712.	3.55	2.01
1931	35.	175.	317.	623.	3.57	1.97
1932	39.	137.	254.	450.	3.28	1.77
1933	47.	126.	225.	456.	3.61	2.03
1934	45.	153.	260.	551.	3.60	2.12
1935	43.	159.	269.	604.	3.80	2.25
1936	47.	189.	306.	703.	3.73	2.30
1937	57.	210.	332.	754.	3.59	2.27
1938	50.	196.	318.	678.	3.47	2.14
1939	54.	208.	330.	723.	3.47	2.19
1940	57.	225.	352.	777.	3.45	2.21
1941	72.	273.	400.	933.	3.41	2.33
1942	114.	349.	471.	1123.	3.22	2.39
1943	163.	489.	618.	1285.	2.63	2.08
1944	224.	590.	746.	1404.	2.38	1.88
1945	282.	727.	932.	1519.	2.09	1.63
1946	302.	838.	1088.	1683.	2.01	1.55
1947	300.	861.	1124.	1936.	2.25	1.72
1948	327.	944.	1211.	2126.	2.25	1.76
1949	306.	942.	1212.	1994.	2.12	1.64
1950	298.	911.	1176.	2136.	2.34	1.82
1951	293.	914.	1176.	2365.	2.59	2.01
1952	286.	969.	1255.	2462.	2.54	1.96
1953	319.	1004.	1306.	2473.	2.46	1.89
1954	288.	964.	1278.	2347.	2.43	1.84
1955	312.	999.	1320.	2492.	2.49	1.89
1956	322.	1005.	1335.	2768.	2.75	2.07
1957	303.	1024.	1365.	2967.	2.90	2.17
1958	320.	1025.	1393.	2887.	2.82	2.07
1959	310.	1037.	1432.	2968.	2.86	2.07
1960	302.	1030.	1452.	2987.	2.90	2.06
1961	343.	1079.	1532.	3031.	2.81	1.98
1962	295.	1043.	1550.	3124.	3.00	2.02
1963	316.	1109.	1677.	3266.	2.95	1.95
1964	295.	1124.	1743.	3492.	3.11	2.00
1965	318.	1203.	1913.	3728.	3.10	1.95
1966	326.	1261.	2090.	3994.	3.17	1.91
1967	375.	1339.	2291.	4251.	3.17	1.86
1968	376.	1397.	2477.	4487.	3.21	1.81
1969	392.	1461.	2682.	4780.	3.27	1.78
1970	415.	1551.	2938.	5297.	3.41	1.80
1971	438.	1702.	3439.	5789.	3.40	1.68

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.50
MONEY, INCOME, AND VELOCITY STATISTICS FOR WISCONSIN

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	83.	453.	999.	2001.	4.41	2.00
1930	73.	434.	962.	1754.	4.04	1.82
1931	90.	426.	943.	1416.	3.33	1.50
1932	110.	374.	797.	1101.	2.94	1.38
1933	92.	274.	513.	1022.	3.72	1.99
1934	93.	349.	658.	1161.	3.33	1.76
1935	99.	401.	753.	1420.	3.54	1.88
1936	100.	456.	841.	1600.	3.51	1.90
1937	127.	513.	938.	1707.	3.33	1.82
1938	109.	472.	901.	1585.	3.36	1.76
1939	116.	517.	954.	1615.	3.12	1.69
1940	127.	564.	1021.	1740.	3.09	1.70
1941	144.	671.	1138.	2118.	3.16	1.86
1942	220.	859.	1334.	2673.	3.11	2.00
1943	300.	1185.	1752.	3167.	2.67	1.81
1944	419.	1426.	2132.	3312.	2.32	1.55
1945	506.	1685.	2614.	3511.	2.08	1.34
1946	552.	1942.	3099.	3830.	1.97	1.24
1947	541.	1972.	3256.	4204.	2.13	1.29
1948	550.	1969.	3273.	4701.	2.39	1.44
1949	592.	1998.	3268.	4633.	2.32	1.42
1950	593.	2099.	3356.	5078.	2.42	1.51
1951	629.	2227.	3458.	5837.	2.62	1.69
1952	591.	2306.	3601.	6093.	2.64	1.69
1953	623.	2402.	3767.	6265.	2.61	1.66
1954	625.	2457.	3882.	6212.	2.53	1.60
1955	625.	2527.	3959.	6682.	2.64	1.69
1956	703.	2594.	4051.	7211.	2.78	1.78
1957	611.	2520.	4034.	7547.	3.00	1.87
1958	631.	2604.	4332.	7755.	2.98	1.79
1959	666.	2735.	4591.	8376.	3.06	1.82
1960	683.	2804.	4713.	8619.	3.07	1.83
1961	695.	2807.	4889.	8885.	3.17	1.82
1962	714.	2830.	5121.	9396.	3.32	1.83
1963	722.	2945.	5515.	9665.	3.28	1.75
1964	720.	3054.	5902.	10449.	3.42	1.77
1965	739.	3174.	6288.	11345.	3.57	1.80
1966	772.	3306.	6810.	12442.	3.76	1.83
1967	858.	3564.	7604.	13094.	3.67	1.72
1968	912.	3770.	8315.	14208.	3.77	1.71
1969	954.	3994.	8863.	15299.	3.83	1.73
1970	1014.	4038.	9229.	16457.	4.08	1.78
1971	1057.	4252.	10492.	17496.	4.11	1.67

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.51
MONEY, INCOME, AND VELOCITY STATISTICS FOR WYOMING

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	9.	43.	69.	151.	3.49	2.18
1930	8.	39.	65.	132.	3.42	2.04
1931	8.	37.	62.	109.	2.94	1.75
1932	12.	33.	53.	86.	2.63	1.63
1933	13.	33.	51.	84.	2.57	1.66
1934	10.	33.	52.	94.	2.83	1.80
1935	10.	38.	57.	116.	3.07	2.04
1936	10.	42.	63.	130.	3.10	2.07
1937	12.	46.	67.	146.	3.19	2.19
1938	10.	43.	64.	136.	3.20	2.14
1939	12.	49.	71.	145.	2.98	2.05
1940	12.	51.	74.	152.	2.97	2.05
1941	14.	58.	81.	195.	3.36	2.41
1942	21.	73.	95.	235.	3.22	2.48
1943	28.	103.	126.	281.	2.73	2.23
1944	39.	128.	156.	295.	2.31	1.90
1945	52.	162.	197.	302.	1.86	1.53
1946	61.	202.	244.	339.	1.68	1.39
1947	55.	204.	249.	381.	1.87	1.53
1948	55.	221.	266.	429.	1.94	1.61
1949	58.	228.	274.	445.	1.95	1.62
1950	65.	246.	292.	484.	1.96	1.66
1951	62.	253.	299.	556.	2.20	1.86
1952	57.	263.	319.	547.	2.08	1.71
1953	59.	270.	335.	549.	2.04	1.64
1954	58.	274.	344.	533.	1.95	1.55
1955	60.	278.	351.	570.	2.05	1.63
1956	69.	281.	362.	605.	2.15	1.67
1957	55.	267.	357.	645.	2.42	1.81
1958	57.	271.	377.	677.	2.50	1.80
1959	57.	285.	403.	717.	2.51	1.78
1960	59.	290.	414.	750.	2.58	1.81
1961	70.	296.	446.	776.	2.62	1.74
1962	69.	287.	464.	795.	2.77	1.71
1963	69.	290.	491.	813.	2.80	1.65
1964	64.	296.	521.	825.	2.78	1.58
1965	66.	304.	544.	854.	2.81	1.57
1966	66.	302.	570.	893.	2.96	1.57
1967	71.	311.	611.	932.	3.00	1.53
1968	76.	330.	662.	997.	3.02	1.51
1969	75.	357.	723.	1112.	3.12	1.54
1970	74.	366.	753.	1227.	3.36	1.63
1971	80.	403.	873.	1331.	3.30	1.53

* DENOTES SERIES IN MILLIONS OF DOLLARS.

TABLE 16.52
MONEY, INCOME, AND VELOCITY STATISTICS FOR THE U. S.

YEAR	CURRENCY*	M1*	M2*	PI*	V1	V2
1929	3683.	28900.	57706.	85661.	2.96	1.48
1930	3398.	29105.	58437.	76780.	2.64	1.31
1931	3678.	26301.	55370.	65597.	2.49	1.18
1932	4636.	21788.	46538.	50022.	2.30	1.07
1933	4787.	20846.	42231.	47122.	2.26	1.12
1934	4676.	22511.	44928.	53482.	2.38	1.19
1935	4789.	26564.	49692.	60104.	2.26	1.21
1936	5240.	31388.	55371.	68363.	2.18	1.23
1937	5514.	33149.	58112.	73803.	2.23	1.27
1938	5460.	31908.	57142.	68393.	2.14	1.20
1939	6024.	35776.	61446.	72971.	2.04	1.19
1940	6725.	40439.	66731.	78768.	1.95	1.18
1941	8228.	48227.	74929.	96234.	2.00	1.28
1942	10943.	55673.	81793.	123029.	2.21	1.50
1943	15832.	75663.	104506.	149187.	1.97	1.43
1944	20896.	85352.	119238.	161146.	1.89	1.35
1945	25126.	97889.	139739.	165558.	1.69	1.18
1946	26621.	111682.	160674.	176420.	1.58	1.10
1947	26325.	114564.	167100.	189798.	1.66	1.14
1948	25675.	114647.	168876.	209601.	1.83	1.24
1949	25293.	113506.	168964.	206476.	1.82	1.22
1950	25209.	117308.	174174.	227228.	1.94	1.30
1951	25805.	122443.	179824.	254466.	2.08	1.42
1952	26501.	130168.	191466.	271126.	2.08	1.42
1953	27397.	133406.	199484.	286865.	2.15	1.44
1954	27117.	134360.	205655.	289016.	2.15	1.41
1955	27403.	140674.	216052.	309742.	2.20	1.43
1956	28359.	141046.	220018.	332070.	2.35	1.51
1957	28265.	140203.	224589.	350113.	2.50	1.56
1958	28073.	141601.	236060.	360179.	2.54	1.53
1959	28725.	148963.	248789.	382841.	2.57	1.54
1960	28751.	149840.	251962.	398727.	2.66	1.58
1961	29421.	150308.	264767.	414410.	2.76	1.57
1962	30494.	154364.	283421.	440192.	2.85	1.55
1963	31894.	160593.	306185.	493058.	3.07	1.61
1964	33094.	166937.	329170.	494910.	2.96	1.50
1965	34638.	173381.	356825.	535950.	3.09	1.50
1966	37207.	183881.	388606.	583825.	3.18	1.50
1967	39752.	192845.	420229.	625576.	3.24	1.49
1968	42342.	209677.	457553.	684746.	3.27	1.50
1969	44585.	224496.	477121.	746449.	3.33	1.56
1970	47147.	229437.	486005.	801491.	3.49	1.65
1971	50616.	245353.	560956.	857083.	3.49	1.53

* DENOTES SERIES IN MILLIONS OF DOLLARS.

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VITA

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After teaching for several years at Longwood College and Virginia Commonwealth University, he returned to Virginia Polytechnic Institute and State University in 1970 to complete his graduate training. During this period, Mr. Stauffer served as a graduate teaching assistant and also taught part-time at Virginia Western Community College. Currently, he is a temporary instructor in economics at Radford College.

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MONETARY TRENDS IN THE UNITED
STATES: A REGIONAL ANALYSIS

by

Robert F. Stauffer

(ABSTRACT)

This study examines interregional monetary trends in the United States, particularly trends involving the income velocity of money. A unique set of state money data are developed in the dissertation and then used to investigate four major topics. First, the analysis determines that interregional changes in velocity generally follow U.S. changes in velocity, indicating that significant interregional economic interdependencies do exist. However, there are significant differences in interregional velocity levels, implying that the factors which determine the demand for money are different. Secondly, the dissertation establishes that in some cases state money supplies are a better predictor of state income than the national monetary supply is, a result which conflicts to some extent with an hypothesis advanced by Milton Friedman. Thirdly, the study focuses attention on preliminary research by Gould and Nelson which indicates that changes in U.S. velocity appear to follow a random walk. Evidence is presented which conflicts with this finding, and methods by which velocity can most accurately be measured are discussed. Finally, the anal-

ysis considers some of the possible determinants of velocity, concluding that changes in financial institutions are important in this respect. More specifically, it is found that Savings and Loan Associations have had a strong influence on velocity levels in the post WWII era.