

Treasury-Federal Reserve Study of the
U.S. Government Securities Market

EFFECTS OF OPERATIONS IN COUPON ISSUES ON INTEREST RATES
AND FLOWS OF FUNDS OVER SHORTER TIME INTERVALS

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Operations in coupon issues, undertaken upon occasion since early 1961, have had the following purpose, as stated in the Board of Governors Annual Report for 1961:

...the purchasing of securities in the intermediate- and longer-term areas, as contrasted with the short-term area, offered the possibility of supplying reserves without creating direct pressure on short-term rates. Also, such purchases, by having a moderating influence on long-term interest rates relative to short-term rates, might have the effect of facilitating the flow of funds through the capital and mortgage markets, thereby encouraging the progress of recovery.¹

In this paper an attempt is made to evaluate the extent to which these policy objectives have been achieved over shorter time periods.

At the outset, it should be noted that conclusions with respect to the success of operations in coupon issues can at best be only tentative. The short period of time over which the policy has been administered provides relatively few observations to test against prior experience. Moreover, the behavior of interest rates and flows of funds is a very complex multivariate function. It is extremely difficult even to identify all of the variables affecting these magnitudes, much less to discern the precise quantitative significance of each. Still it is important to investigate the effect of operations in coupon issues. Partial knowledge, though inconclusive, is a better guide to policy than no knowledge at all.

With respect to procedure, two types of tests are employed, both involving comparison of periods in which coupon operations were relatively intense to periods in which they were not. First, we look at the early phase of the present cyclical

¹Board of Governors of the Federal Reserve System, Annual Report, 1961, p. 40.

expansion (during which the System was particularly active in coupon issues) relative to similar phases of past expansions when operations were confined largely to bills. Second, we look at subperiods in the present expansion, comparing periods of more activity in coupon issues to periods of less activity. The question: does any consistent pattern emerge in the behavior of interest rates and flows of funds during these contrasting time periods?

Intercycle Comparisons

Authority to operate in coupon issues was granted to the manager of the open market account in February 1961. This date happened to coincide with the trough of the 1960-1961 recession. In addition, during the four months following the grant of authority, official operations in coupon issues were at a relatively high level. (Indeed, these months represent the single most intense period of operations, both in dollar amounts and as a per cent of total dealer transactions.) The combination of these two developments -- the grant of authority coinciding with the cyclical trough and the relatively intense utilization of this authority during the ensuing four months -- greatly facilitates intercycle comparison. If operations in coupon issues did indeed have the desired effects on interest rates and flows of funds, then the behavior of these variables in the early period of recovery from the 1960-1961 recession may differ from that in similar phases of past cycles when the "bills usually" operational procedure prevailed.

Chart I shows an index of long- and short-term interest rates on Government securities during the eight months surrounding the cyclical troughs of the 1953-1954, 1957-1958 and 1960-1961 recessions. Following the 1960-1961 trough, the long-term rate did indeed lag behind the upward movement which characterized the other recoveries, suggesting that operations in coupon issues may have had some moderating influence.²

²It should be noted that the upturn in long-term rates in the fourth month following the 1957-1958 trough may be due in part to the fact that System policy was shifted in the direction of less ease in July of 1958.

The behavior of rates on short-term Governments is shown in the second panel of Chart I. During the early months of 1961, when rather heavy official purchases of coupon issues took place, the short-term rate remained relatively stable at a level above that of 1957-1958 and only slightly below 1953-1954. This could be interpreted in several ways. By purchasing coupon issues, the System may have helped keep downward pressures off short-term rates thus helping to maintain rates at the generally higher levels prevailing during the 1960-1961 recession; in the absence of System action, rates might have fallen. Alternatively, one could reason that, though the index of short-term rates remained at a high and more stable level in 1961 than in 1957-1958, the 1961 performance differed little from that in 1953-1954, hence one cannot conclude with a high degree of certainty that operations in coupon issues served to differentiate the 1961 experience from earlier periods. Certainly the effect of operations in coupon issues appears to be less clear-cut in the case of short-term than in long-term rates.

With respect to flows of funds, System action was designed to "have a moderating influence on long-term interest rates relative to short-term rates, [which] might have the effect of facilitating the flow of funds through the capital and mortgage markets..." If the action were indeed successful, one might expect a relatively large flow of funds in the 1961 recovery in those markets sensitive to such a "moderating influence," that is, in the markets for corporate bonds, state and local government securities, and mortgages.

Chart II shows an index of the cumulative flow of funds through these three markets during the four months following the cyclical troughs of the 1953-1954, 1957-1958, and 1960-1961 recessions. During the 1961 recovery, with the System active in coupon issues, corporate bond flotations were substantially larger than in the earlier periods.³ Real estate credit extended was roughly similar in

³In the corporate bond index, two different base periods were used: (a) average of flotations during the trough month and months immediately preceeding and following the trough, (b) average of flotations during the three months preceeding the trough. The second base period was employed, both in the corporate index and in the total index because flotations in the first base period appeared abnormally depressed.

all three periods. State and local flotations in 1961 lagged behind the 1954 period but exceeded the 1958 experience. Finally, a combination of the three flows into a single cumulative index (the last panel of Chart II), produces a margin in favor of the 1961 recovery period.

In summary, then, a cycle-to-cycle comparison of early recovery periods yields some indication that operations in coupon issues may have had some effect in the direction envisaged by the System. The index of long-term interest rates remained relatively stable; though the index of short-term rates was not consistently higher than in past recovery periods, there was little downward pressure on these rates; indexes of flows of funds, both in important individual sectors and in the aggregate were relatively large in the 1961 recovery.

Again it should be emphasized, however, that the available evidence should be classified more as indicative than conclusive. The observations are few in number; there were many forces influencing interest rates and flows of funds in the various cycles so that it becomes difficult indeed to disentangle the specific results of official operations in coupon issues.

From the intercycle comparisons, let us now turn to intracycle data. Does there appear to be some differential impact on interest rates and flows of funds in periods of greater and lesser intensity of coupon purchases during the present business expansion?

Intracycle Comparisons

To throw some light on this question, the present cyclical expansion was divided into four subperiods reflecting considerable variation in intensity of operations in coupon issues. These periods were as follows:

Table 1

Monthly Average of Net Official
Purchases of Coupon Issues

	<u>1 Year and Over to Maturity</u>		<u>5 Years and Over to Maturity</u>	
	<u>Dollar Amount (millions)</u>	<u>Per Cent of Total Dealer Transactions</u>	<u>Dollar Amount (millions)</u>	<u>Per Cent of Total Dealer Transactions</u>
1. March 1961 through July 1961 ... Active Phase	515.2	6.9	272.7	13.5
2. Jan. 1962 through July 1962 ... Passive Phase	134.9	2.0	14.4	0.5
3. Aug. 1963 through Nov. 1963 ... Active Phase	336.7	4.5	249.9	6.5
4. Dec. 1963 through May 1964 ... Passive Phase	51.5	0.6	52.4	1.2

The behavior of interest rates during these periods is shown in Chart III. Rates on long-term governments (computed on an index basis with the first month of each period as base) shows a pattern of upward rather than downward pressure during the periods of active official operations in coupon issues. This upward pressure is evident relative both to the base periods of the active phases and relative to the behavior of interest rates in the passive periods.

At least two interpretations of the behavior of long-term rates are possible. On the one hand, it could be argued that official operations had little effect in moderating upward pressures in the long end of the market during the active phases. On the other hand, one could argue that it was the very rise in rates that brought official action into the market in the first place, and that in the absence of official action, rates would probably have gone even higher than they did. One thing may be said in any case: the effect of official action is less than clear-cut.

This latter statement also holds true for the behavior of short-term Government rates. (Panel 2 of Chart III). In the first active phase, short rates held at a low level both relative to the base month and relative to the behavior of rates in the passive periods. In the second active phase,

short rates rose relative to the base month and relative to one of the passive periods. Such disparate behavior complicates any effort to assess the effect of System action on short-term rates.

An examination of weekly changes in interest rates on government securities likewise produces no clear cut conclusion with respect to the interaction of official operations in coupon issues and the behavior of interest rates. Table II compares the direction of movement in official purchases and in long-term rates on Government securities during the active and passive periods.

Table 2

Comparison of Direction of Movement in Official
Operations in Coupon Issues and Long-Term
Interest Rates on Government Securities During
Periods of Active and Passive Official Operations, 1961-1964
(Weekly Data - Seasonally Adjusted)

	<u>Total No. of Weeks</u>	<u>Moved in Opposite Direction</u>	<u>Moved in Same Direction</u>	<u>Indeterminate</u>	<u>Movements in Opposite Direction as a % of Total</u>	<u>Movements in Opposite Direction and Indeterminate Weeks as a % of Total</u>
Active Periods	39	9	14	16	23	64
Passive Periods	56	19	23	14	34	59

If official operations did indeed have a directly ascertainable influence on long rates, one might expect this effect to show more clearly in the periods of active operations, when official purchases were more extensive and prolonged. During these active periods, one might expect official operations and long-term rates to move more consistently in opposite directions, an increase in purchases producing a decline (or at least no change) in rates and a decrease in purchases removing downward pressures on rates.

In fact, and as may be seen in Table 2, movements in an opposite direction occurred in only 23 per cent of the active weeks and in 34 per cent of the passive weeks. If the indeterminate weeks (weeks in which no change occurred in interest rates) are added in with the opposite direction weeks (on the theory that no change indicates downward pressure in the expansion phase of the cycle), then the active periods are brought more into line with the passive periods. Sixty-four per cent of the weeks in the active period were opposite or no change; fifty-nine per cent of the weeks in the passive period were opposite or no change. Yet still, one would hardly be justified in labeling this difference (64 vs 59) significant. On the basis of this test, there again appears no clear-cut evidence of the effectiveness of official operations in coupon issues.

The same direction of movement test applied to short-term rates on Government securities is shown in Table 3.

Table 3

Comparison of Direction of Movement in Official
Operations in Coupon Issues and Short-Term Interest
Rates on Government Securities During Periods
of Active and Passive Official Operations, 1961-1964
(Weekly Data - Seasonally Adjusted)

	<u>Total No. of Weeks</u>	<u>Moved in Same Direction</u>	<u>Moved in Opposite Direction</u>	<u>Indeterminate</u>	<u>Moved in Same Direction As a % of Total</u>	<u>Moved in Same Direction and Indeterminate Wks. As a % of Total</u>
Active Periods	39	19	15	5	49	62
Passive Periods	56	26	18	12	46	68

Here, too, there is little suggestion that a moderation of official operations in bills significantly relieves downward rate pressures and hence permits bill rates to rise more than they otherwise might. Bill rates and coupon

purchases move in the same direction in 49 per cent of the active weeks and in 46 per cent of the passive weeks. When indeterminate weeks (no change in rates) are added in both the active and passive periods, the relative percentages change only slightly: in the active phase, 62 per cent of the weeks were in the same direction or indeterminate; in the passive phase, 68 per cent of the weeks moved in the same direction or were indeterminate.

If no clear-cut impact on interest rates appears immediately evident as a result of official operations in coupon issues, is there still some reason to expect that differences in flows of funds might be observable in the active and passive phases? There indeed is such reason. The impact of official operations on the interest rate structure may be masked by other market factors, yet the impact may in fact exist and may influence the flow of funds. Long rates, for example, could rise despite heavy operations in coupon issues, but the rise could be moderated by official action and this moderated rise could stimulate a greater flow of funds in the period of active operations. Alternatively, it is possible for the effect of official operations on flows of funds to be transmitted to the market more through expectation than through some immediately observable impact on interest rates. Official operations, for example, could give rise to expectations of stability in capital and mortgage markets and thus to confidence in the continuity of a given range of rates. Such confidence could encourage flows of funds during active phases of official operations.

How in fact did flows of funds behave during the active and passive periods? Is there any significant difference in the two phases which could support the hypothesis that official operations do in fact have an impact on flows of funds?

As a first approach to answering these questions, simple percentage differences were computed between average monthly flows of funds in the active and passive phases of official operations. The results are shown in the table below.

Table 4

Per Cent Change in Flows of Funds	
Average Month in Passive Periods	
to	
<u>Average Month in Active Periods</u>	
Real Estate Credit	+ 1.4
Corporate Bonds	+ 12.8
State and Local Government Securities	- 5.5
Total of Real Estate and Securities Flotations	+ 3.5

As may be seen in Table 4, flows of funds were greater in the average month for the active periods in all sectors except state and local government flotations. Especially notable is the 12.8 per cent by which corporate bond flotations in the average active month exceeded corporate flotations in the average passive month. Also notable, any influence of trend in the flotations series would tend to work in favor of greater flows in passive rather than active periods because the sequence of phases ran: active, passive, active, passive.

A further attempt to isolate any significant difference in flows during the active and passive phases was made by examining deviation of monthly flows from trend. As shown in Chart IV, trend lines were fitted by the least squares method to the real estate series, corporate bond flotations, state and local government issues, and to the total of the three. If System operations did tend to stimulate greater flows of funds, then flows during the active phase months should be more often above the trend line than flows during the passive

phase months, or for that matter, flows during months of "moderate" System operations. Summary results of the trend line test are shown in Table 5.

Table 5

Trend vs. Actual Flows of Funds During
Periods of Active, Moderate, and Passive
Operations in Coupon Issues, 1961-1964

(Monthly Data, Seasonally Adjusted)*

I. Flows of funds coterminous with System operations

	Per Cent of Months Above the Trend Line		
	<u>Active Operations</u>	<u>Moderate Operations</u>	<u>Passive Operations</u>
Real Estate	67	59	38
Corporate Bonds	67	35	38
State and Local	44	65	54
Total of Real Estate and Securities Flotations	56	59	31

II. Flows of funds lagged one month behind System operations

	Per Cent of Months Above the Trend Line		
	<u>Active Operations</u>	<u>Moderate Operations</u>	<u>Passive Operations</u>
Real Estate	67	59	33
Corporate Bonds	78	29	42
State and Local	33	71	50
Total of Real Estate and Securities Flotations	67	59	33

III. Flows of funds lagged two months behind System operations

	<u>Active Operations</u>	<u>Moderate Operations</u>	<u>Passive Operations</u>
	Real Estate	56	65
Corporate Bonds	67	41	27
State and Local	56	71	36
Total of Real Estate and Securities Flotations	56	65	18

*The number of months included in the three phases are as follows:

	<u>Coterminous</u>	<u>1 month lag</u>	<u>2 month lag</u>
Active Phase	9	9	9
Moderate Phase	19	19	19
Passive Phase	13	12	11

Though the number of observations are relatively few and thus the percentages in Table 5 cannot be categorized as statistically significant, still the table is interesting and perhaps indicative. Moreover, it tends to support the results obtained in the simple "percentage difference" test.

Section I of the table indicates the percentage of months in the active, moderate, and passive periods which were above the trend line; Sections II and III show the percentage of months above the trend line in the three periods but with flows lagged one and two months behind official operations.

In Section I, there is a notable difference in months above the trend line in the real estate and corporate sectors (and some indication of difference in total flows) as we move from active to moderate to passive operations in coupon issues. The difference is even more pronounced when flows of funds are lagged one month behind official operations. In this latter case, for example, 78 per cent of the months are above the trend line in the corporate sector during the active phase; only 29 per cent of the months are above the trend in the moderate phase, corporate sector and 42 per cent in the passive phase, corporate sector. A general deterioration in the relationship between flows and official operations occurs when flows are lagged two months behind official operations.

It is interesting to note that the strongest relationship seems to exist in the corporate sector, while the weakest relationship occurs in state and local government issues, as was the case in the simple percentage comparison of flows in active and passive periods.

To summarize what has been said thus far, a cycle-to-cycle comparison of early recovery periods indicates that operations in coupon issues may have had some effect in the direction envisaged by the System. In the period of heavy operations in coupon issues following the February trough of the 1960-1961 recession, long-term interest rates remained relatively stable when compared to

similar phases of past recovery periods, and short-term rates, though not consistently higher than in past recovery periods, exhibited little indication of downward pressure. Moreover, flows of funds in several of the individual sectors and in the aggregate were relatively large in the 1961 recovery. During active and passive phases of System coupon purchases in the 1961-1964 period there was little clear-cut evidence of a differential effect of coupon purchases on interest rates. However, there was a definite suggestion that the System may have had an impact on flows of funds.

Thus far we have been concerned with shorter time spans within the 1961-1964 period of official participation in the coupon market. It also may be instructive to view the period as a whole. An examination of the entire period provides a greater number of observations with respect to official operations, interest rates, and flows of funds. One might have greater confidence in the relationships already suggested if these same relationships can be shown to exist for the period as a whole.

The 1961-1964 Period Viewed as a Whole

Month-to-month comparisons of changes in the level of official operations and in long-term interest rates over the 1961-1964 period yield the following results.

Table 6

Comparison of Direction of Movement in Official Operations in Coupon Issues and Long-Term Interest Rates on Gov't Securities, Feb. 1961-May 1964.

(Monthly data, seasonally adjusted)

	<u>Total No. of Months</u>	<u>Moved in Opposite Dir.</u>	<u>Moved in Same Dir.</u>	<u>Indeterminate</u>	<u>Moved in Opposite Dir. as % of Total</u>	<u>Moved in Opposite Dir. & Indeterminate as a % of Total</u>
Purchase of Issues						
Maturing in						
1 Yr. & over	40	17	19	4	43	53
5 Yrs. & Over	40	17	19	4	43	53

The direct relationship between long-term rates and official operations does not appear to be significant. Even if the indeterminate movements are included with the opposite-direction movements, the relationship is no more than could be expected on the basis of chance (53 per cent of movements in an "opposite" direction).

Would the relationship be improved if only those months were selected for comparison which were above average for the period in terms of the volume of official coupon purchases? The following table throws some light on this question.

Table 7

Comparison of Direction of Movement in Official Operations in Coupon Issues and Long-Term Interest Rates on Gov't Securities, Feb. 1961-May 1964
(Months in Which Official Operations Were Above Average for Period, Seasonally Adjusted)

	<u>Total No. of Months</u>	<u>Moved in Opposite Dir.</u>	<u>Moved in Same Dir.</u>	<u>Indeterminate</u>	<u>Moved in Opposite Dir. as % of Total</u>	<u>Moved in Opposite Dir. & Indeterminate as % of Total</u>
1 Yr. & over	21	10	9	2	48	57
5 Yrs. & over	14	7	6	1	50	57

Again, the direct relationship does not appear to be a significant one, and the relationship is little improved by counting "indeterminate" months in with "opposite direction" months.

Is there likely to be any improvement if we select from the total of all months certain sets of months in which there was a "continuous" change in the volume of official coupon purchases? In the table below, a "continuous" period is defined as three months or more, with each month showing a continuous change either in the direction of greater or lesser purchases of coupon issues.

How did long-term rates behave during these months of "continuous" official purchases?

Table 8
 Comparisons of Direction of Movement in Official
 Operations in Coupon Issues and Long-Term
 Interest Rates on Government Securities During
 "Continuous" Period
 (Monthly data, seasonally adjusted)

	<u>Total No. of Months</u>	<u>Moved in Opposite Dir.</u>	<u>Moved in Same Dir.</u>	<u>Indeter- minate</u>	<u>Moved in Opposite Dir. as % of Total</u>	<u>Moved in Opposite Dir. & Indeter- minate as % of Total</u>
Purchases of Issues Maturing in						
1 Yr. & over	3	3	0	0	100	100
5 Yrs. & over	17	9	6	2	53	65

Some improvement in the relationship does occur, but the improvement is not marked. Still, the combination of opposite direction and indeterminate months accounts for 65 per cent of total months in the five-year-and-over category. The one-year-and-over category, with only three months, cannot be considered meaningful.

One of the continuous periods selected happened to coincide with the period during 1961-1964 when official purchases hit a low point. If we eliminate this period, we have 13 months for observation in the "five-year-and-over" category. During these 13 months, movement was in the opposite direction or indeterminate in 10 months or about 77 per cent of the time. This provides some indication that official operations in coupon issues, if pursued in the same direction over a continuous period of time, produce results which would be theoretically expected.*

*On the basis of 5- and-over issues, we have 17 months in the continuous-period classification.

Periods of continuously increasing purchases included 7 months and for these months alone the distribution of signs was as follows:

<u>Total</u>	<u>Opposite</u>	<u>Same</u>	<u>Indeterminate</u>	<u>Opposite as a % of Total</u>	<u>Opposite & Indeterminate as a % of Total</u>
7	4	2	1	57	71

(footnote continued)

Applying the same direction of change tests to flows of funds through the mortgage and capital markets during the period 1961-1964, rather inconclusive results appear. Table 9 compares monthly changes in official purchases of coupon issues to monthly changes in new corporate bond flotations, new issues of state and local Government securities, new real estate credit granted, and the total of these three flows. If official operations in coupon issues did indeed have an effect on these flows, we would expect movement in the same direction, i.e., increased purchases of coupon issues should stimulate new security flotations. What in fact happened?

(footnote continued)

* Periods of continuously declining purchases included 10 months and for these months alone the distribution of signs was as follows:

<u>Total</u>	<u>Opposite</u>	<u>Same</u>	<u>Indeterminate</u>	<u>Opposite as a % of Total</u>	<u>Opposite & Indeterminate as a % of Total</u>
10	5	1	1	50	60

But if we delete the period of lowest official purchases which occurred in the "declining purchases" category we get the following results:

<u>Total</u>	<u>Opposite</u>	<u>Same</u>	<u>Indeterminate</u>	<u>Opposite as a % of Total</u>	<u>Opposite & Indeterminate as a % of Total</u>
6	4	1	1	67	83

Table 9

Comparisons of Direction of Movements in
 Official Net Purchases of Coupon Issues and Flows of Funds
 Through the Mortgage and Capital Markets, Feb. 1961-May 1964

(Monthly data, seasonally adjusted)

	Coterminous			1 Month Lag			2 Months Lag		
	Moved in Opposite Direction	Moved in Same Direction	Movement as % of Total	Moved in Opposite Direction	Moved in Same Direction	Movement as % of Total	Moved in Opposite Direction	Moved in Same Direction	Movement as % of Total
<u>Real Estate</u>									
Purchases of coupon issues maturing in									
1 Yr. & over	21	19	47	20	19	49	16	22	58
5 Yrs. & over	23	17	42	20	19	49	16	22	58
<u>Corporate Bonds</u>									
Purchases of coupon issues maturing in									
1 Yr. & over	19	21	52	20	19	49	23	15	39
5 Yrs. & over	19	21	52	18	21	54	21	17	45
<u>State & Local</u>									
Purchases of coupon issues maturing in									
1 Yr. & over	20	20	50	22	17	44	14	24	63
5 Yrs. & over	20	20	50	22	17	44	16	22	58
<u>Total</u>									
Purchases of coupon issues maturing in									
1 Yr. & over	21	19	47	21	18	46	17	21	55
5 Yrs. & over	21	19	47	19	20	51	19	19	50

Table 9 , on the whole, shows no close relationship between purchases and flows of funds. The highest percentage of movements in the same direction occurs in the real estate and state and local flows, with the flows lagged two months behind official purchases (63 per cent of movements in the same direction for both flows, calculated on the basis of the 1-year-and-over maturity classification). Total flows show no apparent relationship to official purchases.

Table 10 (page 18), compares changes in official purchases to flows of funds during months characterized by above average official purchases.

There appears to be some improvement in the relationship when only "above average months" are considered. The improvement is registered in all classes of flows and is most apparent on a one-month-lag basis in the five-year-and-over maturity classification (64 per cent of movements in the same direction for the real estate flows, 71 per cent for corporate bonds, 71 per cent for state and local issues and 86 per cent for the total of the three flows).

Finally, a comparison of flows and official purchases during periods of "continuous" official purchases (3 or more months moving in the same direction) yields the following results. (Table 11, page 19).

Table 10

Comparisons of Direction of Movements in
 Official Net Purchases of Coupon Issues and Flows of Funds
 Through the Mortgage and Capital Markets, Feb. 1961-May 1964

(Monthly data, seasonally adjusted, above average months)

	<u>Coterminous</u>			<u>1 Month Lag</u>			<u>2 Months Lag</u>		
	<u>Moved in Opposite Direction</u>	<u>Moved in Same Direction</u>	<u>Same Movement as % of Total</u>	<u>Moved in Opposite Direction</u>	<u>Moved in Same Direction</u>	<u>Same Movement as % of Total</u>	<u>Moved in Opposite Direction</u>	<u>Moved in Same Direction</u>	<u>Same Movement as % of Total</u>
<u>Real Estate</u>									
1 Yr. & over	10	11	52	11	10	48	9	12	57
5 Yrs. & over	11	3	21	5	9	64	6	8	57
<u>Corporate Bonds</u>									
1 Yr. & over	12	9	43	9	12	57	14	7	33
5 Yrs. & over	8	6	43	4	10	71	10	4	29
<u>State & Local</u>									
1 Yr. & over	10	11	52	11	10	48	7	14	67
5 Yrs. & over	9	5	36	4	10	71	5	9	64
<u>Total</u>									
1 Yr. & over	10	11	52	10	11	52	9	12	57
5 Yrs. & over	9	5	36	2	12	86	8	6	43

Table 11

Comparisons of Direction of Movements in
 Official Net Purchases of Coupon Issues and Flows of Funds
 Through the Mortgage and Capital Markets, Feb. 1961-May 1964

(Monthly data, seasonally adjusted, continuous periods)

	Coterminous			1 Month Lag			2 Months Lag		
	Moved in Opposite Direction	Moved in Same Direction	Same Movement as % of Total	Moved in Opposite Direction	Moved in Same Direction	Same Movement as % of Total	Moved in Opposite Direction	Moved in Same Direction	Same Movement as % of Total
<u>Real Estate</u>									
1 Yr. & over	2	1	33	1	2	67	2	1	33
5 Yrs. & over	8	9	53	8	9	53	10	7	41
<u>Corporate Bonds</u>									
1 Yr. & over	1	2	67	2	1	33	2	1	33
5 Yrs. & over	7	10	59	7	10	59	8	9	53
<u>State & Local</u>									
1 Yr. & over	1	2	67	1	2	67	1	2	67
5 Yrs. & over	9	8	47	9	8	47	7	10	59
<u>Total</u>									
1 Yr. & over	2	1	33	1	2	67	1	2	67
5 Yrs. & over	9	8	47	8	9	53	9	8	47

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Concentrating on the five-year-and-over category (because of the paucity of observations in the one-year-and-over class), there appears to be little direct relationship between flows of funds and continuing official purchases.

Once more to summarize briefly, the cycle-to-cycle comparison of early recovery periods suggests that official operations in coupon issues may have had some effect in the direction envisaged by the System. The comparison of active, moderate, and passive phases of official operations during the 1961-1964 period provides no statistically conclusive evidence to support the hypothesis, but still, there is a suggestion that official purchases may have had some impact on flows of funds. Looking at the entire period subsequent to the abandonment of "bills usually," there is a suggestion that "continuous" official operations may have some impact on long-term rates and that months of "above average" official purchases -- especially "above average" purchases of issues maturing in five years and over -- may have some impact on flows of funds.

In addition to the direction of change comparisons thus far used to investigate the relationship between official purchases, interest rates, and flows of funds, least-square regressions were run to see if further evidence of relationship could be established. Following is a summary of the regression results.

Official Purchases, Interest Rates,
and Flows of Funds: Regression Tests

Table 12 lists the coefficients of determination found for the various rates and flows during periods of active, moderate, and passive periods of official operations, both on a coterminous basis and with a one-month lag in rates and flows.

Table 13

Coefficients of Determination Between Official
Purchases and Financial Variables - Jan. 1961 to May 1964
(Monthly data, seasonally adjusted)

	<u>Coterminous</u>		<u>One-Month Lag</u>	
	<u>Original Series</u>	<u>First Difference</u>	<u>Original Series</u>	<u>First Difference</u>
Official Purchases				
and Real Estate	(-).0309	(-).0276	(-).0117	(+).0169
Corporate bonds	(+).0620	(+).0234	(+).0328	(-).0047
State & local	(-).0139	(-).0000	(+).0159	(+).0121
Total flows	(-).0104	(-).0016	(-).0515	(+).0090
Long rate	(-).1369*	(-).0054	(-).0692*	(+).0207
Short rate	(-).0259	(-).0001	(-).0137	(+).0000

*Statistically significant at 5 per cent level.

Once more the coefficients are quite low. Yet as before, long-term rates are at least statistically significant.

Would the coefficients be improved if we compared official purchases during "above average" months and "continuous" periods to flows and rates during these same months? First, let us look at the "above average" months in Table 14.

Table 14

Coefficients of Determination Between Official Purchases
and Financial Variables for Months of Above-Average Purchases
Jan. 1961 to May 1964
(Monthly data, seasonally adjusted)

	<u>Coterminous</u>	<u>One-Month Lag</u>
	Official Purchases	
and Real Estate	(-).0190	(-).0098
Corporate Bonds	(+).1218	(+).0357
State & local	(-).0174	(+).0090
Total	(-).0001	(-).0000
Long-rate	(-).1624*	(-).0756
Short-rate	(-).0449	(-).0234

*Statistically significant at 5 per cent level.

Again the coefficients are low, with long-term rates the only variable passing the test for statistical significance. The same low coefficients are also obtained when the financial variables are regressed with official purchases of 5-years-and-over to maturity, as shown below.

Table 15

Coefficients of Determination Between Official Purchases
of Securities of 5 Years and Over to Maturity and
Financial Variables for Months of Above-Average Purchases
January 1961 to May 1964
(Monthly data, seasonally adjusted)

	<u>Coterminous</u>	<u>One-Month Lag</u>
Official Purchases and Real Estate	(+).0014	(-).0003
Corporate Bonds	(+).0339	(+).1116
State & local	(-).0062	(+).2773*
Total flows	(+).0029	(+).0437
Long-rate	(-).0396	(-).0041
Short-rate	(+).0000	(+).0048

*Statistically significant at 5 per cent level.

Turning now to official purchases during "continuous periods," the regressions produced the following results.

Table 16

Coefficients of Determination Between Official Purchases
Maturing in Five Years or More and Selected Financial
Variables for Periods of Continuous Purchases
February 1961 to May 1964
(Monthly data, seasonally adjusted)

	<u>Coterminous</u>	<u>One-Month Lag</u>
Official Purchases and Real Estate	(-).0342	(-).0511
Corporate bonds	(+).1831*	(+).1892*
State & local	(+).0130	(-).0112
Total flows	(+).0000	(-).0010
Long-rate	(-).1936*	(-).0581
Short-rate	(-).0119	(-).0154

*Statistically significant at 5 per cent level.

Table 17

Continuous Period Excluding a
Four-Month Run of Low Purchases

	<u>Coterminous</u>	<u>One-Month Lag</u>
Official Purchases and Real Estate	(-).0357	(-).0497
Corporate bonds	(+).1534	(+).1267
State & local	(+).0072	(-).0092
Total	(-).0008	(-).0052
Long-rate	(-).2256*	(-).0660
Short-rate	(-).0092	(-).0043

*Statistically significant at 5 per cent level.

As in the other comparisons, the coefficients for continuous periods are low, though some slight correlation is evident for long-term rates and corporate bond issues.

In Conclusion

The regression results, on balance, appear to provide less support than the non-parametric tests for the general hypothesis that a relationship exists between official purchases of coupon issues on the one hand and flows of funds on the other. In interpreting these findings, however, several factors should be kept in mind.

First of all, one probably should not expect to find more than a marginal relationship between official purchases and the financial variables, the latter being subject to so many and diverse influences. Under such conditions, it might reasonably be said that the discovery of any relationship, even a slight one, is significant. Second, it is interesting to note that the one relationship which has appear to be at least of some significance -- that existing between official operations and long-term rates -- is apparent throughout practically all of the various regressions.

With respect to flows of funds and official purchases, the regressions show virtually no correlation while the direction-of-change comparisons suggest that official purchases may have had some impact on flows. In which test is one to place his confidence? Before answering this question, one should consider several points.

1. The simple regression tests do not necessarily tell us that no relationship exists between purchases and flows, they tell us that if such a relationship does exist, the regressions were unable to find it, perhaps because (a) there were insufficient observations, or (b) other factors interfered to obscure a relationship which in fact exists. Hence, what the regressions failed to find, the other tests may have uncovered, even if the findings of the non-parametric tests must still be considered tentative.
2. A possible reason why the direction-of-change comparisons appear to lend more support to the thesis than the regressions concerns the nature of the two measures of association. The regression measure seeks to establish a relationship between the independent and dependent variables based both upon the direction of change and the magnitude of change. The non-parametric tests do not consider magnitude, only direction. Since we know from the non-parametric tests that the direction-of-change comparisons often favor the hypothesis that official operations are effective, then the inconclusive results of the regressions may be due in large measure to magnitudes, i.e., "unfavorable" movements may be in disproportionate amounts (the less frequent case of "unfavorable" movements may be in such large amounts as to "overshadow" the more frequent case of "favorable" movements). But in whatever way magnitude may tend to offset direction,

it would appear from the tests that official operations are more effective in influencing the direction of movement than in influencing the magnitude of movement of the financial variables. To say this another way, the "unweighted" movements provide more support for the theoretical expectation than the "weighted" movements.

In conclusion, then, if one were asked to answer whether sufficient confidence exists in the effectiveness of official operations to warrant their continuance, one might reason as follows:

- a. There is little evidence that official operations produce an unfavorable economic effect.
- b. There is some suggestion, though often not statistically significant, that official operations produce a favorable effect.
- c. One reason why the favorable effect may not be statistically significant is that other factors may sometimes mask a significant relationship in direction of movement between purchases and the other variables. That is, the effect of official purchases may indeed exist but may sometimes be submerged by greater forces of opposing movement.
- d. Since there is little evidence of harm, some evidence of benefit, and some reason to expect that the benefit may be understated, then it would seem that the probability of gain from coupon operations is greater than the probability of loss and thus that operations in coupon issues should continue as long as the combination of problems responsible for initiation of the program continues.