

CHANGING YIELD SPREADS IN THE U. S. GOVERNMENT BOND MARKET¹

FLOWER BONDS BLOOM, THEN WILT

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The differentials, or spreads, among the yields of individual U. S. government bond issues vary significantly over time. This variability was particularly noticeable in the last two months of 1976 and the first month of 1977. The rapidly changing configuration of U. S. bond yields over this period is largely attributable to changes in the tax code implemented by the Tax Reform Act of 1976. This article specifies the determinants of U. S. bond yield spreads. In particular, these spreads are explained by two factors, referred to in the article as the "capital gains effect" and the "flower bond effect." The first effect occurs because some U. S. bonds carry coupons well below market yields, while the second effect occurs because some U. S. bonds have a special feature enabling them to be used at par value for estate tax purposes.

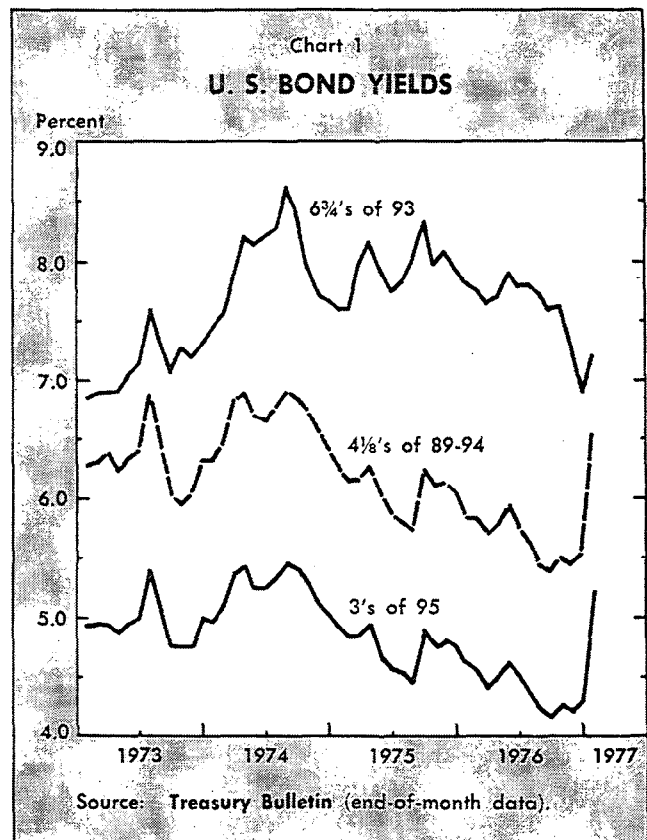
The article proceeds as follows. First, it provides a framework for analyzing how the capital gains and flower bond effects contribute to U. S. bond yield spreads. Then it reviews the impact of these effects on U. S. yield spreads from the mid-1960's to the passage of the Tax Reform Act, attempting for the latter part of this period to decompose selected spreads into parts attributable to the two effects. Lastly, it discusses the impact of the 1976 Tax Reform Act on U. S. bond yield spreads.

Factors Contributing to U. S. Bond Yield Spreads

As of the beginning of this year, there were 15 outstanding U. S. bond issues maturing or callable in 10 years or more. Six of these issues were sold prior to June 1963 and have coupons ranging from 3 to 4½ percent. The other nine were issued after January 1973 and have coupons ranging from 6¾ to 8½ percent. This article focuses on a representative sample of these issues, namely the 3's of 95, the 4½'s

of 89-94, and the 6¾'s of 93. (The first number refers to the coupon of the bond and the second refers to the call date, if there is one, and maturity date.) Chart 1 shows the movement in the market yields of these three bonds since January 1973, when the 6¾'s of 93 were first issued. Not only are there significant differences among the yield levels, but the spreads between them vary substantially.

Intuitively, it appears paradoxical that investors would allow yield differentials to persist on bonds of equal quality and roughly equal maturity, such as those shown in Chart 1. The explanation, however,



¹ This article is adapted from a section of [2].

is straightforward. Virtually all calculated yield series are *before-tax* yield series generally computed under the assumption that the bond is *held to maturity*.² In this framework the yield is the discount rate r that equates the bond's price P to the present value of the future cash flows associated with holding it. If a bond with a par value of \$100 pays a constant return C each year and matures in N years, then the yield is determined by the formula

$$(1) \quad P = \sum_{n=1}^N \frac{C}{(1+r)^n} + \frac{100}{(1+r)^N}$$

The formula has two aspects that contribute to spreads between U. S. bond yields. First, it calculates a *before-tax* yield when in fact the relevant yield to an investor is, abstracting from risk considerations, the *after-tax* yield that equates the price of a bond to the present value of the future *after-tax* returns. Income accruing to long-term bonds is alternatively subject to the relevant marginal income tax rate, to the capital gains tax rate, or in some cases, to no tax rate. Consequently, a wide range of *before-tax* yields can provide the same *after-tax* yield.

The price of a bond that is "seasoned" (i.e., old or outstanding) will deviate from its par value in order to keep the yield in line with current market yields. In particular, a bond with a coupon below current market yields will sell at a discount (price below par) in order to raise the yield to a level equivalent to that of comparable newly-issued bonds. For such a discount bond, the *after-tax* yield r^* is determined by the formula

$$(2) \quad P = \sum_{n=1}^N \frac{C(1-t)}{(1+r^*)^n} + \frac{(100-P)(1-cg)}{(1+r^*)^N} + \frac{P}{(1+r^*)^N}$$

where t is the marginal income tax bracket of the investor, and cg is the tax rate on long-term capital gains.³ The interest income C is taxed at the relevant personal income or corporate income tax rate, while the capital gain at maturity ($\$100-P$) is taxed at the lower capital gains tax rate.

A low coupon seasoned U. S. bond selling at a discount will require a lower *before-tax* yield than a

new issue bond for two reasons. First, the tax rate applied to the long-term capital gain at maturity of the discount bond is below the marginal tax rate. Second, a larger part of the tax is deferred to a later period. For given marginal and capital gains tax rates, any number of combinations of coupons and *before-tax* yields as calculated by formula 1 will provide the same *after-tax* yield as calculated by formula 2.

The second aspect of formula 1 that contributes to spreads among U. S. government bond yields is the assumption that the bond is held to maturity. This assumption may not hold for an important class of bonds, namely those that are redeemable at *par value* for estate tax purposes regardless of their market value. These bonds are often purchased with the expectation that they will be retired well before maturity. If such a bond is purchased at a discount, the expected yield rises as the expected holding period declines, because the capital gain when the bond is retired is spread over a shorter period of time.

U. S. bonds redeemable at par for estate tax purposes are widely and irreverently called "flower" bonds because of the association between flowers and funerals. In addition to their par value redeemability, these bonds had a second notable feature prior to the 1976 Tax Reform Act. Under then-existing tax law, beneficiaries computed the gain or loss on inherited property on the basis of the fair market value of the property on the date of the decedent's death. In the case of flower bonds, this value was the par value of the bond. Consequently, no capital gains tax had to be paid on the difference between the purchase price and the par value of the bond. (The capital gain was not completely tax free, however, since it became part of the decedent's estate and was, therefore, subject to estate taxation.) In summary, prior to the recent changes in the tax code, flower bonds used for estate tax purposes had two features that lowered their *before-tax* yield-to-maturity as calculated by formula 1. First, they provided relatively tax-free capital gains. And second, *because* they were discount bonds, their relatively short expected holding period raised their expected yield.

For completeness, it should be noted that a third factor, length of time to maturity, can also contribute to differentials between U. S. government bond yields. This factor is relatively unimportant, however, for bonds that have a maturity of 15 years or longer, such as those considered in this article; therefore it is ignored.

² The effects on observed yield differentials of call provisions, default risk, and tax treatment are discussed in the context of the yield-to-maturity formula in [1].

³ The formula is more complicated for a bond selling at a price greater than its par value because the investor has the option of accepting a capital loss at maturity or annually taking part of the premium paid for the bond as a deduction against current interest income.

U. S. Bond Yield Relationships Prior to 1973 In the latter half of the 1960's and the early 1970's, virtually all long-term U. S. government bonds had two characteristics that affected their relative yields. First, they carried coupons below current market yields and, as a result, sold at prices below their par values. This occurred because as yields in the mid-1960's rose above the Congressionally-legislated 4¼ percent interest rate ceiling on new Treasury bonds, the Treasury was unable to sell new issues. When market yields continued to rise in the late 1960's, the discount on outstanding U. S. bonds became progressively larger.

Because they were selling at a discount, the before-tax yields on these low coupon U. S. bonds were depressed relative to the yields on new issues of taxable bonds in other sectors. An approximate measure of the impact of a low coupon on a bond's before-tax yield can be derived by using its before-tax yield series to construct a "new issue equivalent" yield series that, given marginal and capital gains tax rate assumptions, would provide the same after-tax yield. Specifically, the after-tax yield-to-maturity for any discount bond can be calculated from formula 2 after making marginal and capital gains tax rate assumptions and using the appropriate coupon and maturity. The after-tax yield can then be converted into its corresponding new issue equivalent by the formula

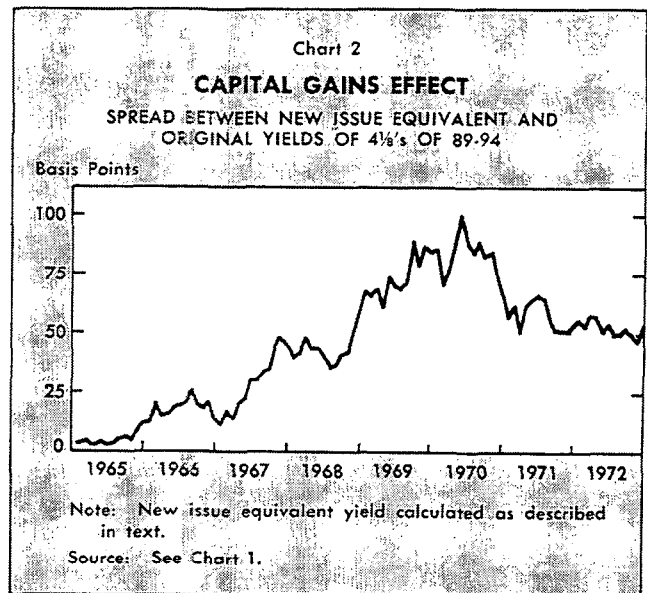
$$\text{new issue equivalent yield} = \text{after-tax yield}/(1-t).$$

The effect of the low coupon on the observed yield series is then calculated as the spread between the reconstructed new issue equivalent and the original yield series for the low coupon bond. This spread is a measure of the capital gains effect on the low coupon bond yield.⁴

Chart 2 shows the spread between the new issue equivalent and original yield series for the 4¼'s of 89-94. Corporate marginal and capital gains tax rates applicable in each period were used to construct the new issue equivalent yield series.⁵ The spread between the new issue equivalent and original yield series rises and falls with the level of interest rates

⁴ It should be emphasized that this procedure is valid only over a period when the low coupon bond's yield is unaffected by the flower bond provision. If the flower bond provision is pulling down the low coupon bond's yield, thereby decreasing the differential between its yield and coupon, the estimate of the capital gains effect calculated in the manner described here will be biased downward.

⁵ It is argued in [2] that the corporate tax rates are appropriate rates to use to calculate new issue equivalent yields for low coupon U. S. bonds and that other reasonable assumptions result in new issue equivalent yield series that are not very different from those derived using corporate tax rates. [3] concludes that the best tax rate assumptions to use in adjusting the yields on low coupon discount bonds are slightly lower than the corporate tax rates.



since the higher the interest rate level, the greater the discount for a bond with a fixed low coupon and, hence, the greater the capital gain at maturity. The spread reached a peak of 100 basis points in May of 1970. Consequently, given the tax rate assumptions, the capital gains tax effect was responsible for 100 basis points of the rise in the spread between the observed yields on newly-issued bonds and the yield on the 4¼ percent coupon U. S. bond over this period.⁶

The second characteristic of U. S. bonds affecting their before-tax yields over this period was that virtually all of them could be used for estate tax purposes. Of these, the ones actually purchased because of this feature tended to be the lowest coupon bonds, such as the 3's of 95 and the 3½'s of 98, which were selling at the largest discounts. Evidence of this is seen in the table, which shows the amount of six flower bond issues outstanding at the end of each year from 1965 through 1976. The net decline from year to year is a measure of the amount used for estate tax purposes. The amount outstanding of the 3's of 95 declined steadily throughout the period, and the amount outstanding of the 3½'s of 98 declined steadily beginning in the late 1960's. There was no decline in the amount outstanding of the 4¼'s of 87-92, the 4¼'s of 89-94, and the 4's of 88-93 until 1971, however, and the decline was extremely small until 1973.

⁶ In actuality, the spread between new issue prime corporate rates and the market yield of the 4¼'s of 89-94 rose by more than 200 basis points through mid-1970. It is argued in [2], however, that other factors such as differential call risk and default risk can explain the additional rise in the spread.

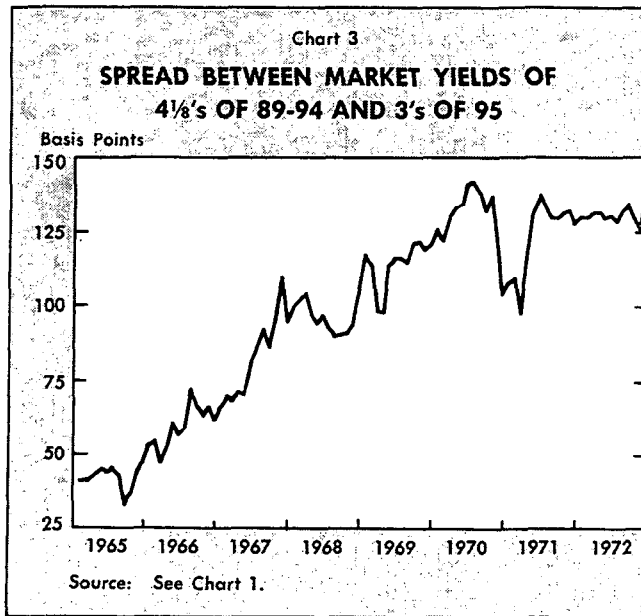


Chart 3 shows the spread between the market yields of the 4½'s of 89-94 and the 3's of 95. The spread widened considerably in the latter half of the 1960's. Part of the rise can be attributed to the greater capital gains effect on the yield of the lower coupon 3's of 95. Most of the rise, however, occurred because the flower bond provision had a much greater depressing influence on the yield of the 3's of 95 than on the yield of the 4½'s of 89-94. In fact, the argument can reasonably be made on two grounds that the yield of the 4½'s of 89-94 (and similar coupon bonds) was affected very little by the flower bond provision over this period. First, the evidence on outstanding flower bonds in the table indicates that there was relatively little demand for the 4½'s

of 89-94 (and similar coupon bonds) related to their flower bond provision through the early 1970's. Second, when new high coupon bonds (6¾ percent or higher) were issued again in the 1970's, the differentials between their yields and the yield of the 4½'s of 89-94 could initially be fairly well explained by the capital gains effect alone.

U. S. Bond Yield Spreads From 1973 Through Late 1976 In the early 1970's two developments occurred that were to affect significantly the spreads among U. S. government bond yields. First, the 4¼ percent ceiling on new U. S. bond issues was lifted to permit the issue of some high coupon bonds at current yields. Second, effective March 1971, Congress eliminated the extension of flower bond privileges on new U. S. bond issues, thereby insuring a steadily declining stock as outstanding issues purchased for estate tax purposes were retired over time. The table shows the decline in the stock of flower bonds in recent years.

The presence of newly-issued high coupon U. S. bonds in the 1970's makes it possible to get a more precise measure of the impact of the flower bond provision on low coupon U. S. bond yields by decomposing the spread between the yields of a high coupon bond and a seasoned low coupon bond into the part attributable to the capital gains effect and the part attributable to the flower bond provision of the low coupon bond. The capital gains effect can be calculated as follows. First, the after-tax yield of a high coupon bond is calculated using formula 2. Second, using formulas 1 and 2, the before-tax yield for a specific low coupon bond is constructed that provides the *same* after-tax yield as the high coupon bond.

AMOUNT OF FLOWER BONDS OUTSTANDING

	(\$ millions)											
	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
3½'s of 90	4900	4894	4885	4873	4819	4727	4537	4262	4018	3750	3545	3086
4¼'s of 87-92	3818	3817	3817	3816	3814	3809	3794	3765	3695	3605	3490	3028
4's of 88-93	250	250	249	249	249	248	245	240	230	224	220	191
4½'s of 89-94	1560	1560	1559	1559	1558	1554	1543	1514	1470	1384	1312	1146
3's of 95	2207	2006	1801	1610	1408	1253	1108	959	851	757	692	626
3½'s of 98	4413	4395	4367	4307	4207	3999	3706	3365	3132	2901	2652	2261
TOTAL	17148	16922	16678	16414	16055	15590	14933	14105	13396	12621	11911	10338

Note: End-of-year data for all flower bonds with a maturity of 1990 or later.

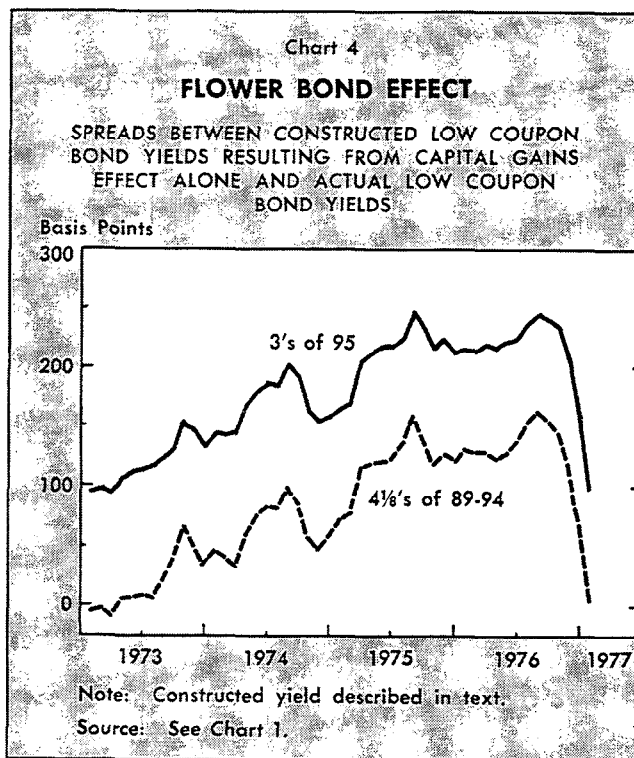
Source: Treasury Bulletin.

Third, the differential between the high coupon bond before-tax yield and the constructed low coupon bond before-tax yield is calculated. This differential is the capital gains effect on the spread between the high and low coupon bond yields; it is solely attributable to the difference in coupons of the two bonds. If the low coupon bond's flower bond provision is causing additional downward pressure on the low coupon bond's yield, this yield will fall below the constructed yield that provides the same after-tax yield as the high coupon bond. The difference between the constructed yield and the actual low coupon bond yield can, therefore, be attributed to the flower bond provision and used as a measure of the flower bond effect on the low coupon bond's yield.

Using the 6¾'s of 93 as the high coupon bond, Chart 4 shows the flower bond effect on the yields of the 3's of 95 and the 4⅛'s of 89-94. The chart shows an increase in the flower bond effect that begins in 1973 and subsequently rises sharply. This trend is similar both for the bonds whose yields had already been substantially affected by the flower bond effect, such as the 3's of 95 and the 3½'s of 98, but also for those, such as the 4⅛'s of 89-94 and the 4¼'s of 87-92, whose yields had previously been affected only slightly. According to the estimates in the chart, the flower bond effect on the observed yield of the 3's of 95 rose from 100 basis points in mid-1973 to 250 basis points in September 1976. Over the same period the flower bond effect on the yield of the 4⅛'s of 89-94 went from nil to 160 basis points.

Two factors account for the sharp increase in the impact of the flower bond effect on low-coupon, deep-discount bond yields over this period. First, the stock of flower bonds was steadily declining, and it was widely and correctly expected that there would be no additions to the supply in the future. This circumstance alone would be expected to lead to ever-higher premiums on flower bonds. It was reinforced, however, by rapid rates of inflation, which drove up the value of estates. Since tax laws were not changed to adjust for the impact of inflation on the level of estate taxes, the demand for flower bonds naturally increased. The combination of decreasing supply and increasing demand resulted in a continually increasing flower bond effect on the yields of low coupon U. S. bonds through the third quarter of 1976.

U. S. Bond Yield Spreads Since Passage of the 1976 Tax Reform Act The Tax Reform Act of 1976, passed in October, has had a significant effect



on U. S. government bond yield spreads through its impact on the demand for flower bonds. The Tax Reform Act did not explicitly deal with flower bonds. Thus, bonds that were redeemable at par for estate tax purposes retain that feature. Nevertheless, the Act contained a provision that diminished the appeal of flower bonds. As indicated earlier, prior to the 1976 Act flower bonds, like other investments providing capital gains, were valued as inherited property at their fair market value on the date of the decedent's death; for flower bonds this value was the par value of the bond. Consequently, under the old tax law not only was there the potential of a very rapid capital gain, but it was free from capital gains tax.

The 1976 Tax Act changed the tax basis for inherited property to its cost to the decedent. For certain property, such as flower bonds, beneficiaries may increase the cost basis to the fair market value of the property on December 31, 1976. Consequently, under the new law the difference between the par value of the flower bond used for estate tax purposes and the original cost or market value at the end of 1976, whichever is greater, is subject to capital gains taxation. The extent of the capital gains tax is a complicated matter depending on the individual's estate tax.

A second provision of the Tax Act that has possibly decreased the attractiveness of flower bonds is

the extension from six months to one year (by 1978) of the holding period necessary to apply the long-term capital gains tax rate. It is not yet clear how this will affect "deathbed" purchases of flower bonds which were a common but somewhat controversial matter even under the old tax law.

The flower bond effect on U. S. bond yield spreads diminished greatly following passage of the 1976 Tax Reform Act. As Chart 4 indicates, the flower bond effect on the low coupon yields began to decline around the time of the passage of the Act. The decline in the flower bond effect on the low coupon U. S. yields became more rapid in November and December and accelerated further in January. Interestingly, the changing flower bond effect prior to January was not widely recognized because market yields were falling. Thus, yields on low coupon flower bonds were relatively stable over this period while yields on high coupon U. S. bonds were falling sharply. It was only in January, when increases in the yields on high coupon U. S. bonds were far outpaced by increases in the yields on low coupon bonds, that the impact of the 1976 Tax Reform Act on flower bond yields was widely recognized.

From October 1976 through January 1977 the typical decline in the flower bond effect on low coupon bond yields was about 150 basis points. For the 4 $\frac{1}{8}$'s of 89-94 (and similar coupon bonds, such as the 4 $\frac{1}{4}$'s of 87-92 and the 4's of 88-93) the flower bond effect was almost wiped out. That is, as of the end of January the spreads between the original before-tax yields of these issues and the yields of high coupon U. S. bonds could be almost completely explained by the capital gains effect. For the lowest

coupon bonds, such as the 3's of 95 and the 3 $\frac{1}{2}$'s of 98, the flower bond effect as of the end of January still accounted for about 100 basis points of the differential between the before-tax yields on these bonds and the yield on high coupon bonds.

It should be noted in conclusion that the capital gains effect and the flower bond effect on before-tax U. S. bond yields are of interest not only to investors but also to researchers who use before-tax U. S. bond yield series in studies of risk, studies of interest rate expectations, and studies of the impact of relative supplies of debt on yield differentials. These yield series are frequently used with the implicit assumption that investors respond to before-tax, rather than after-tax, yields. Their use, without proper regard for the impact of the capital gains and flower bond effects on before-tax yield relationships, can be highly misleading.⁷

⁷ [2] discusses several studies that have used U. S. government bond yield series without regard for the possible impact of the capital gains and flower bond effects on the movement of the series.

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PRIVATE DOMESTIC INVESTMENT IN THE CURRENT BUSINESS CYCLE

Thomas A. Lawler

Few business statistics are as important as those that measure private investment. Private investment decisions are often crucial in determining whether a recovery will speed up or falter. Furthermore, over the long run current private investment determines the future productivity of the economy. Analysts have been concerned about the weak behavior of investment in the current recovery. This weakness may just be a reflection of the general sluggishness of the economy. However, if this weakness cannot be explained by cyclical factors alone, then there must be other special factors inhibiting investment. In order to determine the amount of weakness to be attributed to cyclical causes, this article compares the relative behavior of investment and consumption in the current cycle with that of past cycles.¹ It then discusses some possible explanations for any weakness found in the investment sector that cannot be attributed solely to cyclical factors.

Cyclical Comparison Method In order to compare the behavior of the consumption and investment series in the current cycle with their behavior in past cycles, charts similar to the Cyclical Comparison Charts used in the Commerce Department's *Business Conditions Digest* are constructed.² Business cycles are defined using the reference peak and trough dates designated by the National Bureau of Economic Research.³ For each series percentage deviations from the reference peak level are calculated for the past five postwar cycles. For each cycle, these deviations are then superimposed on a chart in order to facilitate comparison among cycles. This is done by dating

¹ The Department of Commerce's Personal Consumption Expenditures and Gross Private Domestic Investment series are used to measure the performance of consumption and investment in the different cycles. Gross private domestic investment is composed of residential fixed investment, nonresidential fixed investment, and the change in business inventories.

² See U. S. Department of Commerce, *Business Conditions Digest*, October 1976, p. 117.

³ The peaks and troughs for the past 5 postwar cycles are: peaks: 1948 IV, 1953 II, 1957 III, 1960 II, 1969 IV; troughs: 1949 IV, 1954 II, 1958 II, 1961 I, 1970 IV. The peak and trough dates for the current cycle are 1973 IV and 1975 I, respectively.

each quarter of a given cycle according to how many quarters it is before (—) or after (+) the trough date. An average of the percentage deviations from the reference peak level for each quarter (dated as above) of all the cycles is then calculated to obtain a profile of average postwar cyclical behavior. The maximum and minimum deviations for each quarter are plotted along with this average composite deviation from the reference peak level to indicate the range of variability in past cyclical behavior. The percentage deviations from the reference peak level for the current cycle are plotted along with the average composite deviation series in order that recent cyclical behavior can be compared with past cyclical behavior.

Examination of the Data Chart 1 compares the cyclical behavior of constant dollar GNP in the current cycle with its behavior in past cycles. It shows

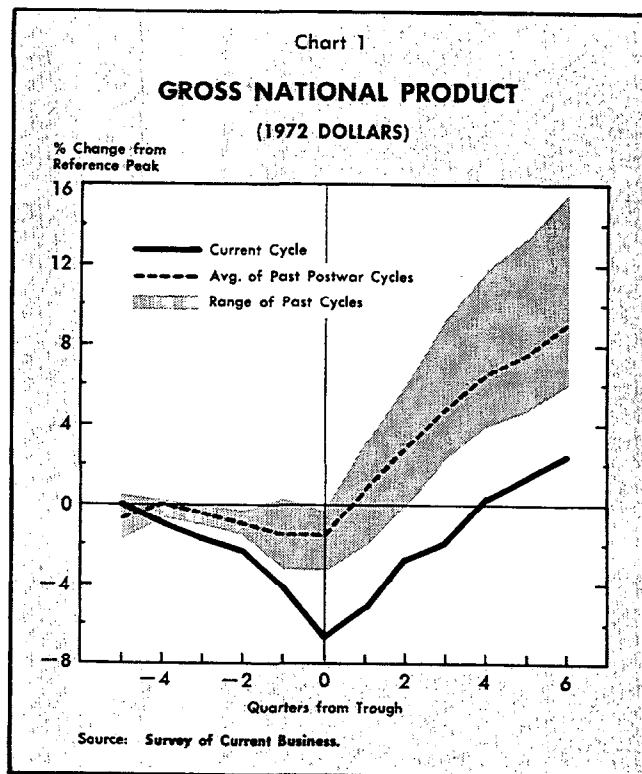
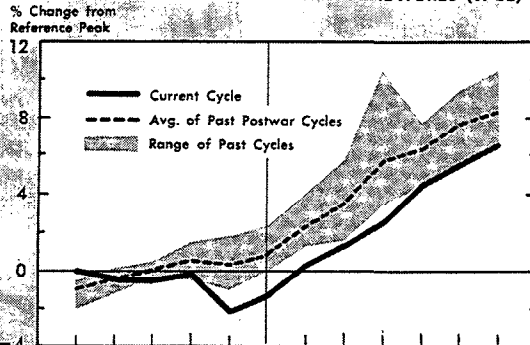
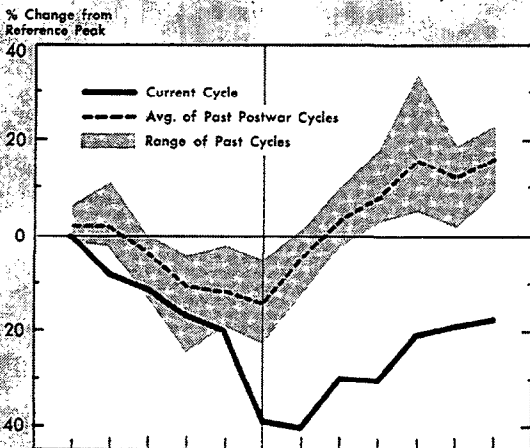


Chart 2
**COMPARISON OF
 CONSUMPTION AND INVESTMENT**
 (1972 DOLLARS)

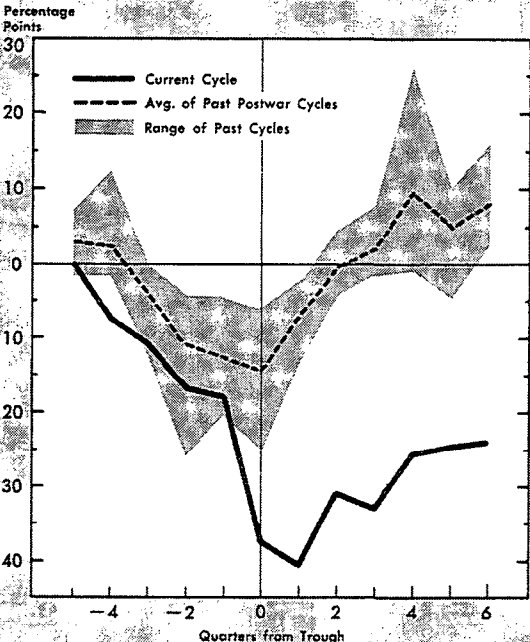
a. **TOTAL PERSONAL CONSUMPTION EXPENDITURES (TPCE)**



b. **GROSS PRIVATE DOMESTIC INVESTMENT (GPDI)**



c. **% CHANGE IN GPDI MINUS % CHANGE IN TPCE**



Source: Survey of Current Business.

that the decline in real GNP is much sharper in the current cycle than in past cycles and that the rate of recovery has been slower. For example, six quarters after the trough date, real GNP is only 2.3 percent higher than the reference peak level for the current cycle, while for the average of past cycles it is 8.96 percent higher. This suggests that both consumption and investment may be recovering more slowly than usual.

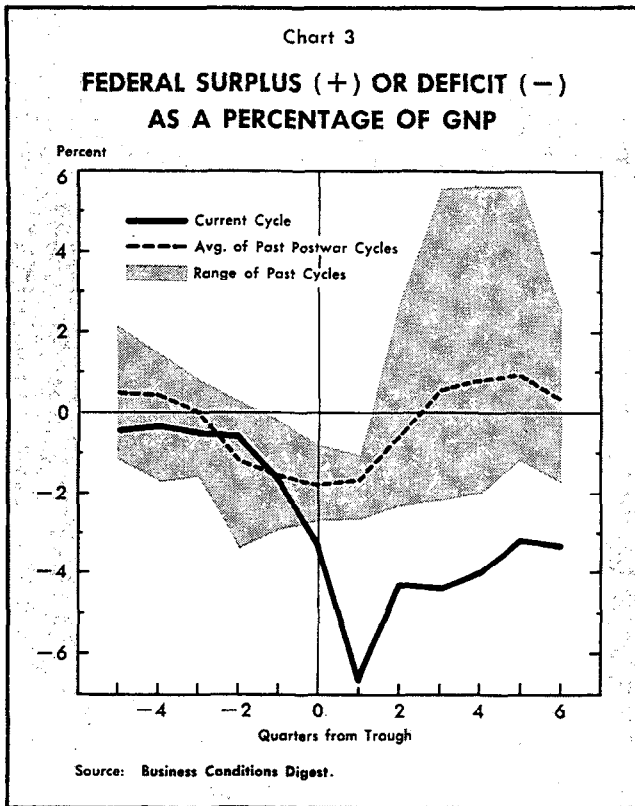
Comparison of Consumption and Investment

Chart 2a shows the cyclical behavior of constant dollar personal consumption expenditures in the present cycle and in the average of past cycles. The chart indicates that on average the recovery of real personal consumption from the initial peak to six months after the trough has been somewhat slower in the current cycle than in past cycles.

Chart 2b compares the recent cyclical behavior of real gross private domestic investment with its past cyclical behavior. Again, the chart indicates the recovery of real gross private domestic investment has been slower in the present cycle than it has been in past cycles. However, comparison of Chart 2b with Chart 2a seems to indicate that the recovery of investment relative to the recovery of consumption has been much weaker in the 1973-76 cycle than in past cycles.

Chart 2c measures the difference between the percentage change from the reference peak level of real gross private domestic investment and the corresponding percentage change for real personal consumption for both the average of past cycles and for the current cycle. This difference measures the relative performance of investment and consumption in the present cycle and in past cycles. The chart shows that the weakness in the current recovery has been much more pronounced in the investment series than in the consumption series. For the average of past postwar cycles, the percentage change from the initial peak to six quarters after the trough for real gross private domestic investment exceeds the corresponding percentage change for real personal consumption by 7.92 percentage points; for the current cycle, the percentage change from the initial peak to six quarters after the trough for real gross private domestic investment is 23.8 percentage points *less* than the corresponding percentage change for real personal consumption.

Reasons for the Weakness in Investment A number of different hypotheses have been put forward to explain this weakness in the investment sector. Three of these are presented below.



The first is that the large Federal deficit in the current cycle has been “crowding out” private investment. Proponents of this view argue that the effect of Government spending financed by borrowing from the private sector is to reduce the amount of savings available for private investment. According to this hypothesis, the total supply of bonds in the capital market increases as Government debt increases. This greater bond supply causes bond prices to fall and interest rates to rise, thereby crowding out private borrowers. Moreover, so the argument goes, since the deficit in the current cycle has mainly financed income transfer programs such as unemployment insurance, that deficit (assuming it crowded out private investment) would tend to increase consumption relative to investment in the recovery.

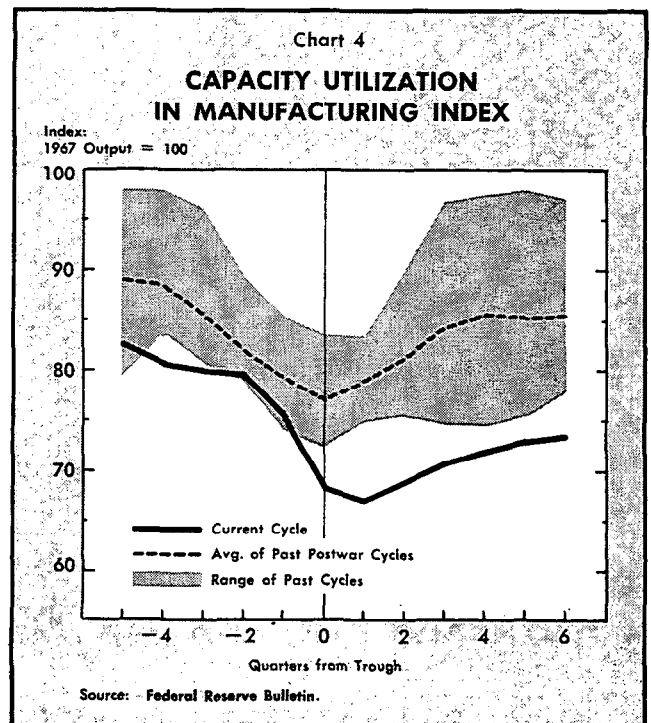
Chart 3 shows the Federal surplus (positive values) or deficit (negative values) as a percentage of GNP for both the current cycle and the average of past cycles. The chart indicates that the deficit as a share of GNP is substantially larger in the recent cycle than in past cycles. Since it has been financed chiefly by sales of bonds to the public as opposed to indirect bond sales to the Federal Reserve,⁴ pro-

⁴ From December 31, 1973 to September 30, 1976, total holdings of Government securities by private investors increased by \$123.9 billion, while total holdings by the Federal Reserve went up by only \$17.9 billion.

ponents of the crowding out hypothesis believe that the deficit in the current cycle has been crowding out private investment.

A second explanation is that the severity of the recent recession has created an abnormal amount of excess capacity in the economy, which has acted as a brake on investment spending. According to this view, investment is determined by the difference between the desired capital stock and the actual capital stock. The desired capital stock decreases during recessions and increases during expansions. If, during a severe recession, the desired capital stock decreases substantially more than the actual capital stock, then during the initial part of the recovery increases in the desired capital stock will lead to increased utilization of capacity and not to increased investment. Since the recent recession has been more severe than the past postwar recessions, adherents of this “underutilization” hypothesis believe that it is a cause of the weakness in investment in the current recovery.

Chart 4 depicts the cyclical behavior of the Federal Reserve’s Capacity Utilization in Manufacturing Index, which measures the ratio of actual output to a measure of total output capacity, for the current cycle and for the average of past cycles. The chart indicates that for the current cycle the index is lower on average than past cycles throughout the entire period, and that the recovery of the index to pre-recession utilization rates has been a little slower than usual in



the current cycle. However, it is difficult to determine to what extent this low level of capacity explains the recent weakness in investment.⁵

The third explanation is that recently proposed "antibusiness" legislation, such as stricter antipollution requirements and price controls, plus the erratic behavior of recent monetary and fiscal policy, has scared businessmen away from long-term investments. According to this "scare" hypothesis, the threat of these antibusiness proposals becoming law, as well as the unpredictability of future monetary and fiscal policy, has increased the risk associated with private investment, which is similar to reducing the rate of return on investment. If the current mood of legislators is more antibusiness than it has been in previous cycles, or if current monetary and fiscal policy has been less predictable than past policy, then one would expect consumption to outperform investment in the current cycle. While this hypothesis is difficult to support empirically, adherents point to statements by both business leaders and financial analysts that support it.

⁵ Also, the degree to which this capacity utilization index actually measures the utilization rate of the economy is open to question. It is particularly difficult to measure how much of the existing capital stock is actually usable. This is especially true in recent years, since the rapid rise in energy costs has made many older plants obsolescent.

Obviously, the policy implications of each of these explanations differ. For example, an increased deficit financed by borrowing from the public will have little or no effect on total spending if the crowding out effect is strong. The underutilization hypothesis suggests that if the recovery is going along smoothly, then investment will eventually pick up as pre-recession utilization rates are reached. And if the scare hypothesis has validity, then more cautious and predictable economic policies are needed to restore confidence and induce investment.

It is possible that the weakness in the recovery of investment spending has been the result of a combination of all three of the above explanations. For example, it is possible to have some crowding out occur and at the same time have a low utilization rate inhibiting investment, with an unpredictable Government simultaneously scaring businesses with its policy threats. It is also possible that the weakness in investment has been caused by factors not mentioned.⁶ Whatever the causes, the subject of the determinants of private investment merits continued, careful study.

⁶ Some other possible causes of the weakness in investment include: the adverse effect of inflation on corporate profits; the restructuring of corporate balance sheets weakened by the recession; and the longer time it takes for investment spending to respond to changes in economic activity than for consumption spending to respond.

FARM FINANCIAL AND CREDIT CONDITIONS

Sada L. Clarke

Weather and the cost-price squeeze competed for top billing in the Fifth District's story of farm financial and credit conditions in 1976. Both played important parts, although geography determined which factor got the leading role. In localities where spring freezes, summer drought, or too much rainfall at harvesttime cut deeply into the year's harvest, weather took the spotlight; where weather was normal, the cost-price squeeze was the prime performer.

Weather's fickleness caused output to vary . . .

Where weather played the starring role, it often "played favorites"—at times exerting strongly favorable, at others, unfavorable, influences on local farm production, income, and credit conditions.

Weather's favorable role in crop output in 1976 was accomplished without too much fanfare. Adequate rainfall and a good growing season in many areas aided in producing better yields per acre. The improved yields plus larger acreages combined to produce favorable results for some crops. Cotton output jumped 49 percent. The corn crop increased 25 percent, and peanut production rose 12 percent. Tobacco yields averaged slightly higher, but drought conditions in some areas and cuts in acreage held total poundage down some 6 percent below 1975.

But weather's part in causing sharp declines in production was of unusual scope and severity. With the hard spring freezes, fruit crops suffered severe frost-freeze damage in large areas of the District. The apple crop, a telling case in point, was 29 percent below year-earlier levels. Soybeans were especially hard hit, both by extremely dry growing conditions and by a wet harvesting season, and yields per acre fell sharply. The lower yields in combination with smaller acreage cut soybean production 28 percent. Hay tonnage dropped 18 percent. And because of the shortage of hay and poor pasture conditions,

some farmers were forced to sell their cattle early at low prices.

. . . and the cost-price squeeze tightened.

The squeeze between costs and prices continued to be a major factor in farmers' financial conditions in 1976. But the intensity of the squeeze varied with the type of farming. Costs of materials used in farm production, interest, taxes, and wage rates averaged around 7 percent above a year earlier. Even so, the rise in farm production expenses was slower than in other recent years, reflecting lower prices for fertilizer and seed and relatively small gains for feed and chemicals.

No doubt the role of the cost-price squeeze was not readily recognized by some farmers. For those producing tobacco, cotton, soybeans, peanuts, eggs, and milk, higher prices overshadowed cost pressures. But the lower prices for cattle, hogs, poultry—especially turkeys—and both feed and food grains made the pinch of the cost-price squeeze not only apparent to, but painful for, their producers.

Costs rose faster than income.

Whether the District's farmers remember 1976 as a poor year or as a good one will depend on what combination of crops and/or livestock they produced. Some will almost surely count it a good year. Others will not be so fortunate. But when the cash income from all crop and livestock marketings is added up, total cash receipts may run slightly higher than in 1975. Livestock production has provided the basis for a high and improved level of income from livestock and livestock products. But crop marketings may not be large enough to bring crop income up to the 1975 level. Much will depend on the volume of crops stored for sale later in hopes of a recovery in prices.

All in all, the situation points to only a slight increase in gross farm income in 1976. And with the modest gain in gross income likely to be offset by the rise in production expenses, realized net farm income seems almost certain to fall short of the 1975 figure.

Note: This article is based on summary reports of this Bank's Quarterly Survey of Agricultural Credit Conditions in 1976 and on the latest statistical information from the U. S. Department of Agriculture, the Farm Credit Administration, and the Federal Reserve Bank of Richmond.

Demand for farm loans was strong . . .

Farmers' demand for short- and intermediate-term loans was generally strong throughout the year, both at commercial banks and at production credit associations. This general increase in demand for loans stemmed in part from the continued rise in the costs of production and the sharply higher prices of farm machinery and equipment. Strength in loan demand also came from the expansion in poultry and hog operations and from new and expanding dairy operations. Moreover, there was a big demand for loans to build on-farm storage facilities, especially in the Carolinas.

Weather-induced problems also strengthened the demand for loans. After experiencing widespread dry weather conditions in the early fall, some livestock producers borrowed funds to buy feed. By late fall, however, wet weather delayed harvest of some fall crops and increased the demand for loan renewals.

Statistical evidence supports these findings. Short- and intermediate-term farm debt held by member banks at midyear was 14 percent above a year earlier, while the loan volume held by PCAs was up 10 percent. But farmers stepped up their borrowing from PCAs sharply during the third and fourth quarters, particularly so in the third. As a result, the volume of loans made by PCAs for the year as a whole was 18 percent larger than in 1975. And the year-to-year gain in PCA loans outstanding amounted to 14 percent.

Unlike non-real-estate farm loans, demand for farm-mortgage loans in 1976 was comparatively weak. While farm real estate loans held by member banks in mid-1976 were down fractionally from the year-earlier level, outstanding loans held by the Federal land banks showed a gain of 12 percent. But the volume of new money loaned by the Federal land banks during the entire year was 10 percent below that in 1975. Most of the decrease came in the first half of the year and followed on the heels of even larger declines during the second half of 1975. By year-end 1976, loans outstanding at the Federal land banks were 11 percent above the level a year earlier. Could these changes represent a return to a more normal lending pattern when annual loan increases were not so high as they have been in recent years? Reportedly, farmers were less optimistic over farm income prospects in 1976 and hence were hesitant to make large long-term capital investments. Then, too, other lenders—especially life insurance companies—increased their share of the volume of credit-financed farmland transfers during the year.

. . . but fund availability was ample . . .

Bank funds available for making short- and intermediate-term loans to farmers were generally ample throughout the year even though farm loan demand was strong. (By contrast, fund availability for long-term real estate lending was reported to be a continuing problem for some banks.) While loan fund availability varied considerably from bank to bank and state to state, banks with the greatest availability of funds were most often located in the Carolinas. The general availability of loan funds at commercial banks has stemmed both from strong inflows of time deposits and from a continued weak, but improving, business loan demand.

Rarely did one of the surveyed banks report that it had been forced to refuse or reduce a farm loan because of a shortage of funds—further evidence of the availability of ample funds for lending to qualified farm borrowers. Moreover, bankers reporting that they were actively seeking new farm loan accounts usually ranged from 60 to 70 percent of all respondents.

Since bank loan funds were ample, loan referral activity remained fairly weak. Generally, the number of bankers making referrals to correspondent banks was small, probably because many of the sampled banks are either large branch banks or bank holding companies. More banks as a rule reported referrals to nonbank credit agencies, but the volume of these referrals was not unusual.

Banker respondents in this five-state area do not appear to be too enthusiastic about the Farmers Home Administration's guaranteed loan program nor with the provisions whereby commercial banks and production credit associations can jointly participate in making farm loans. Some bankers indicate that too much red tape is involved; others say they would much prefer to have the opportunity to participate with the Federal land banks.

Merchants and dealers, especially those selling farm machinery and equipment, provided a higher volume of loan funds in 1976 by strengthening their lending activity over that in other recent years. Increased selling competition seems to have provided the impetus for this change in lending policy.

. . . and interest rates showed mixed trends.

On the average, bank interest rates on farm loans eased slightly during the first three quarters of 1976, with the most noticeable lowering of rates occurring in the third quarter. Rates on short- and intermediate-term loans softened much more than those

on farm real estate mortgages. This lowering of bank interest rates was in line with the general movement of interest rates during 1976 at PCAs and other major institutional farm lenders and was a boon to farm financing.

But average interest rates charged by banks on short-term farm loans edged upward again during the fourth quarter of the year. Rates charged on both feeder cattle and other farm operating loans averaged 8.89 percent, about the same as a year earlier. Rates reported for intermediate-term loans averaged 9.29 percent, down from the 9.48 percent charged 12 months before, while the average charge of 9.28 percent on farm real estate loans was up fractionally from the average reported for the fourth quarter of 1975. Bank interest charges on farm loans in 1976 generally varied widely, both among banks and by type of loan, with "typical" rates reported by banks ranging from a low of 7 percent to a high of 12 percent.

Farmers' financial conditions vary.

Despite the further tightening of the cost-price squeeze, some weather-induced shortages in cash farm income, and the continued upturn in farm debt, a majority of the District's farmers remain in generally good financial condition. With market values of

farmland continuing to advance during the year, most farm owners are in an improved equity position.

But the cash income position of farmers varies substantially. Better incomes enabled a good many farm producers to meet their loan obligations on time. On the other hand, where cash returns were unfavorable, delinquencies were high—especially in certain sections of Virginia, Maryland, and South Carolina. Many of these farmers, unable to make their loan repayments as scheduled, found it necessary to renew or extend their loan obligations. Some no doubt began 1977 with larger debts or less cash, or both, than they had at the beginning of 1976.

Most of the District's farm lenders, however, will probably remember 1976 as a comparatively good year. Demand for non-real-estate farm loans was strong throughout the year. But bank funds available for making short- and intermediate-term loans to farmers were generally ample, and loan referral activity remained fairly weak. Bank interest rates charged on farm loans showed mixed trends, easing slightly earlier in the year and edging upward again in the fourth quarter. By and large, most bankers had little trouble with repayment rates, renewals, and extensions until the fourth quarter when the rate of loan repayments slowed noticeably and requests for renewals or extensions rose significantly.

THE RELEVANCE OF ADAM SMITH

The Federal Reserve Bank of Richmond is pleased to announce the publication of *The Relevance of Adam Smith*, a reprint of the 1976 *Annual Report's* feature article. This booklet discusses how Smith's ideas, as revealed in *The Wealth of Nations*, appear in contemporary public policy debates regarding, e.g., monopoly and government subsidies and centralized economic planning. It may be obtained free of charge by writing to Bank and Public Relations, Federal Reserve Bank of Richmond, P. O. Box 27622, Richmond, Virginia 23261.