United States General Accounting Office

GAO

Report to the Assistant Secretary for
Domestic Finance
Department of the Treasury

March 1986

FEDERAL FINANCING BANK

Estimated Effects on the Maturity Composition of the Federal Debt

GAO/GGD-86-43

GAO

United States
General Accounting Office
Washington, D.C. 20548

General Government Division

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March 21, 1986

The Honorable Charles Sethness
Assistant Secretary for Domestic
Finance
Department of the Treasury

Dear Mr. Sethness:

Over the past 12 years an important institutional change has occurred in the way the federal government borrows from the public. In 1973, the Federal Financing Bank (FFB) was created by the Congress for the purpose of consolidating the borrowing activities of various federal agencies.[1] Federal agencies with borrowing needs can now borrow from the FFB rather than directly from the public. The FFB, in turn, borrows from the U. S. Treasury. As a result, the maturity of the federal debt has changed in ways that cannot be observed from officially published data. We here present estimates of these maturity changes and explain how the estimates were made.

Changes in the maturity composition of federal debt may cause changes in "real" economic variables, e.g., interest rates, investment, and prices. Economic research has not shown definitively how strong these effects might be, but they are potentially important. Our work indicates that using the FFB for intragovernment borrowing has shortened the maturity of outstanding federal debt held by the public. As a result, on page 5 we recommend that additional research be done to clarify the relationship between changes in the maturity of federal debt and the behavior of other economic variables.

This report updates the information in our earlier report regarding the effect of the FFB's activities on the maturity of the federal debt.[2] We show that as a result of the FFB's role and because of its borrowing relationship with the Treasury, relatively long-term agency debt has been displaced in the market by short-term Treasury debt. This has had the effect of shortening the average maturity of the federal debt outstanding. For example, in 1983 we estimate the average term-to-maturity of the direct federal debt was shorter by about 13 months than

[1]Among the agencies with securities outstanding at the time of FFB's inception were: The Export-Import Bank, the Federal Housing Administration, the Government National Mortgage Association, the Postal Service, and the Tennessee Valley Authority. See Treasury Bulletin, November 1974, p. 77.

[2]Government Agency Transactions With The Federal Financing Bank Should Be Included On The Budget (PAD-77-70, Aug. 3, 1977).

would have been true if agencies were still borrowing directly from the public rather than from the FFB (all other things unchanged).

Prior GAO and other analyses of FFB activities have primarily focused on matters of budgetary concern.[3] These matters include, for example, the off-budget status of FFB as well as its purchase of agency loan assets and guaranteed loans. However, our 1977 report also discussed the implications for the conduct of federal debt management policy of FFB's borrowing arrangement with the Treasury.[4] We pointed out that since the maturity composition, or average maturity, of agency borrowing differs (or would have differed in the absence of FFB) from the maturity composition of general Treasury borrowing, the operation of the FFB since 197[illegible] and its borrowing relationship with Treasury may have induced a de facto maturity recomposition of the federal debt which, in turn, might affect the relationship between short-term and long-term interest rates. We reported that if, as some researchers suggest, a maturity recomposition of the federal debt affects real economic activity through its effects on interest rates, there is a potentially significant avenue of economic effect stemming from the operations of the Federal Financing Bank.

Our 1977 analysis of FFB-induced changes concluded that the FFB was not, at the time, sufficiently large to materially influence the maturity composition of the federal debt. Nevertheless because of the potential for this to occur, we made the following recommendation to the Congress:

- Currently, it does not seem necessary to change FFB's borrowing arrangement with the Treasury. It results in cost savings to agency borrowers and has no significant effects on debt management or monetary policy.
- Nevertheless, it is important that the Congress be aware of the long-run potential that this arrangement has for undesirable effects on the conduct of debt management and monetary policy. We therefore recommend that the Congress monitor FFB's growth with a view toward determining when, if ever, the indirect costs of the current Treasury borrowing arrangement outweigh the benefits that the practice provides in savings achievable on agency borrowing.[5]

[3]There have been numerous GAO studies and reports detailing the deficiencies in current budget practice with respect to the FFB. A list of these reports is included in app. IV.

[4]PAD-77-70, August 3, 1977.

[5]PAD-77-70, August 3, 1977, p. 41.

Because of the rapid growth of FFB since its creation, we believe that it is now necessary to further examine the effects of the FFB on the maturity composition of outstanding federal debt. Our current study's findings are summarized as follows:

- Since its inception, the Federal Financing Bank's share of total federal debt outstanding has grown from 3.4 percent during 1974 (the first full year of operation) to 11.9 percent of federal debt outstanding by the end of fiscal year 1983. The FFB has, in fact, grown much faster than the federal debt.
- Prior to the establishment of the FFB, agencies financed their programs with debt whose average maturity equaled the average of their loans to program participants. However, since the creation of the FFB, agency borrowing from the public has been displaced by Treasury borrowing from the public, through the FFB.
- We use the average maturity composition of FFB's portfolio of loans to federal agencies and guaranteed loans on behalf of federal agencies to represent agency borrowing from the public. This maturity, as with the agency borrowing that preceded the FFB, is longer than the maturity of Treasury borrowing from the public. The average maturity of FFB's portfolio of loans increased from 6 years and 4 months in 1976 to 11 years and 7 months by mid-1983. During the same period, the average maturity of Treasury debt held by the public increased from 2 years and 9 months to 4 years and 1 month. Thus, the average maturity of FFB's portfolio of loans or, alternatively, the agency borrowing that has been displaced by Treasury borrowing, is longer than Treasury's borrowing. Furthermore, the maturity differential has grown over time.
- As a result of the displacement of agency debt instruments by Treasury debt instruments, the average maturity of the federal debt may be shorter than it would have been in the absence of the Federal Financing Bank. Estimates based on the calculated maturity distribution of the federal debt with no FFB suggest that the average maturity of federal debt in mid-1983 would have been about 5 years, 2 months, if agencies had not had access to the Federal Financing Bank, rather than the actual 4 years, 1 month, average maturity of Treasury's debt. On the whole, there were $60.9 billion more in government securities outstanding that matured within 5 years and an equivalent amount less that matured in 5 years or more as a result of FFB's borrowing relationship with Treasury. The shifting of the maturity of federal debt comprised 7.26 percent of all federal securities outstanding as of the middle of 1983. This figure compares with shifts out of long-term into shorter term securities of slightly less than 4 percent of outstanding federal debt in 1976 and 1977.

Our estimates are based on important assumptions and qualifications regarding loan amortization differences between FFB loans and Treasury securities, the nature of agency borrowing behavior that would have existed in the absence of the FFB, and other matters. A complete description of our sources of data, assumptions made, the methodology that forms the basis of our estimates, and our findings may be found in the following appendixes. It is important that the assumptions and qualifications associated with our estimates be kept in mind when interpreting our results.

Treasury, in commenting on this report, questioned one of the major assumptions on which this report is based—". . . that the average maturity of Treasury debt would not be materially affected by agency borrowing in the market rather than from the FFB." We agree with Treasury that this assumption, as with any assumption, is open to empirical verification. However, we feel that there is not a sufficient amount of empirical evidence to show, as Treasury implicitly assumes, that increased issues of long-term agency debt to the public (in the absence of the FFB) would be largely offset by reductions in the ability of Treasury to issue its own long-term debt. (See app. III for Treasury's complete comments and our response.)

It is not our intention to reach conclusions regarding whether changes that may have occurred in the maturity composition of the federal debt as a result of FFB's existence are harmful or beneficial with regard to their effects on interest rates or real economic activity. The conclusions reached in our 1977 report were based on academic research which examined the effects of debt management policy. These studies implied that unless the size of the debt recomposition induced by the Federal Financing Bank was fairly large in relation to the total stock of privately held public debt, interest rate effects resulting from its debt management consequences would not be sufficiently large to provide a basis for concern.[6]

Since our 1977 study, the FFB has grown to more than one-tenth the size of privately held public debt. Moreover, additional research has concluded that the effects of debt management operations on interest rates

[6]William D. Nordhaus and Henry C. Wallich, "Alternatives for Debt Management," in Issues in Federal Debt Management, proceedings of a conference held in June 1973, FRB of Boston, pp. 9-26. Also Arthur M. Okun, "Monetary Policy, Debt Management and Interest Rates: A Quantitative Proposal," in Financial Markets and Economic Activity, edited by Donald Hester and James Tobin, 1967, pp. 142-188; and Robert Haney Scott, "Liquidity and the Term Structure of Interest Rates," Quarterly Journal of Economics, 79 (Feb. 1965), pp. 135-145.

may be greater than had previously been believed.[7] This research also provides a means of tracing the effects of a debt management operation to changes in interest rates and, ultimately, to changes in levels of economic activity. The results of this research, however, are still preliminary and have not received sufficiently widespread testing to be useful in drawing qualitative or quantitative conclusions from the analysis and information we provide in this report.

We recommend that you undertake such research as may be required to discover whether the borrowing relationship existing between the FFB and Treasury is having previously unrecognized effects on "real" economic activity. We believe the key research questions are:

1. Has the maturity recomposition that we describe caused interest rates and, consequently, economic activity to be different from what would have been the case without the FFB?

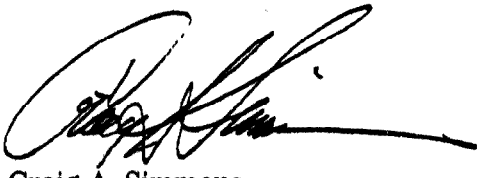
2. If these effects exist, can they be used as an economic policy instrument?

These questions seem to us to be important, both in the narrow context of our findings and in the broader context of a growing federal debt that must be financed and refinanced by Treasury. We welcome Treasury's suggestion that we meet and discuss productive avenues for further research in this area.

[7]This work has been done primarily by Benjamin M. Friedman and Vance V. Roley. Several of their studies examining the relationship of debt management policy to changes in interest rates and economic activity are cited in app. IV.

We are sending copies of this report to interested congressional committees and members, and to the Manager of the Federal Financing Bank in the Department of the Treasury. The report will also be distributed to other interested parties.

Sincerely yours,



Craig A. Simmons
Associate Director

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Abbreviations

FFB	Federal Financing Bank
GAO	General Accounting Office

A Comparison of the Maturity Compositions of Treasury Debt and the FFB Portfolio

When federal agencies borrow from the FFB rather than from the public, one of the effects may be a shortening of the average maturity of the federal debt. This is not apparent from the data on debt maturity that is published by the Treasury. In this report we have estimated the maturity recomposition that has occurred as a result of 1) a reduction in the relatively long-run borrowing from the public that used to be done by federal agencies before they had access to the FFB and 2) a concomitant increase in shorter maturity Treasury debt. The effect of this is essentially the same as if the Treasury were to deliberately refinance maturing long-term securities by issuing new short-term debt.

In the course of our work, we talked with officials at the FFB. Our estimates of the maturity composition of the FFB's portfolio are derived from a computer file containing date-of-issue information on virtually all loans made by the FFB from its inception in 1973-74 through July 1983. This period is sufficiently long to demonstrate the maturity recomposition effects of the FFB, and we have no reason to think that more recent data would alter our results in any significant way.

The Federal Debt

The amount of federal debt held by the public since 1970 is shown in table I.1. In the early 1970s agency debt as a percent of the total federal debt held by the public averaged around 3 percent.[1] From 1974 on, this percentage declined steadily to 0.2 percent by March 1985. The major reason for this decline is that agencies gained access to funds through FFB.[2] The table shows that FFB holdings since the end of fiscal year 1974 grew from 0.2 percent to about 13.5 percent of total federal debt outstanding at the end of fiscal 1981 and 1982, before declining to 10.4 percent in June 1985. Thus, even though FFB holdings have not grown as fast as Treasury debt since 1981, the FFB portfolio of agency debt is still very large.

[1]Among the agencies with securities outstanding at the time of FFB's inception were: The Export-Import Bank, The Federal Housing Administration, the Government National Mortgage Association, the Postal Service, and the Tennessee Valley Authority.

[2]Note the discussion in Special Analysis E, Borrowing and Debt, The Budget of the United States Government, U.S. Executive Office of the President, Office of Management and Budget, FY 1984, page E-16. Also note that later discussions in this report ignore the small amount of actual agency securities listed in table I.1.

Table I.1: Federal Debt Securities Held by the Public and FFB Holdings

Dollars in billions

End of fiscal year[a]	Total federal debt	Total public debt securities (Treasury debt)[c]	Total agency securities	As percent of total federal debt	Total FFB holdings	As percent of total federal debt
1970	284.9	274.9	10.0	3.5	•	•
1971	304.3	294.4	9.9	3.3	•	•
1972	323.8	315.0	8.8	2.7	•	•
1973	343.1	333.9	9.1	2.7	•	•
1974	346.1	336.0	10.0	2.9	0.6	0.2
1975	396.9	387.9	9.0	2.3	13.3	3.4
1976	480.3	470.8	9.5	2.0	22.4	4.7
T.Q.	498.3	488.3	9.7	1.9	26.5[b]	5.3
1977	551.8	543.4	8.5	1.5	35.4	6.4
1978	610.9	603.6	7.4	1.2	48.1	7.9
1979	644.6	638.9	5.8	0.9	64.2	9.6
1980	715.1	710.0	5.1	0.7	82.6	11.6
1981	794.4	789.8	4.6	0.6	107.3	13.5
1982	929.4	925.6	3.7	0.4	124.4	13.4
1983	1,141.8	1138.2	3.6	0.3	136.1	11.9
1984	1,312.6	1309.2	3.4	0.3	144.8	11.0
(June) 1985	1,463.8	1460.5	3.3	0.2	151.6	10.4

Source: Various Treasury Bulletins and the Federal Financing Bank News, 1974-1983.

[a]For fiscal year 1976 and prior years, the fiscal year ended June 30. The transition quarter spans July to the end of September 1976, and subsequent fiscal years end September 30.

[b]Figure is for period ending October 15, 1976.

[c]Includes FFB holdings.

The FFB's Portfolio Is a Reasonable Proxy for Estimating the Terms of Agency Borrowing From the Public

In order to measure the actual effect of the FFB's operations on the maturity composition of federal debt, we would have to compare the maturity composition of Treasury's debt (with FFB in existence) with the maturity composition of the combined Treasury and agency debt that would have existed if the FFB had never been created. As is often true in policy analysis, both of these situations cannot have simultaneously occurred. Since the FFB does exist, it is necessary to estimate the maturity composition of total federal debt that would have occurred in its absence.

If FFB had not been created, it is reasonable to believe that agencies would have continued to sell securities to the public. Although it cannot be known for certain what characteristics such public security sales might have had, Treasury data published prior to and shortly after the FFB began to operate suggest that the average maturity of agency debt, particularly that held by private investors, was fairly long.[3]

FFB records are the best source of information available today concerning what the terms of agency issues to the public might have been. Agency borrowing from the FFB for direct or guaranteed lending is likely to closely resemble what the agencies would have done if borrowing from the public or making commitments to guarantee private sector loans. One reason is that the agencies themselves set all the terms of their borrowing from FFB, except the interest rate. In view of this, and because our estimate of the maturity of the FFB's portfolio is very similar to the maturity of agency debt prior to 1974, we assume that the maturity composition of the FFB portfolio can be used to represent the maturities of securities that agencies would have issued to the public had the FFB not existed.

The Term to Maturity of FFB's Portfolio Is Longer Than That for Treasury Debt

In this section, we measure the actual maturity distribution of the Federal Financing Bank's portfolio and compare it with that of Treasury.

The Maturity Distribution of Treasury Debt

The actual maturity distribution and average length of Treasury debt from 1970 to March 1985 is shown in table I.2. The average maturity of Treasury debt actually peaked in 1965 (not shown on the table) at 5 years and 4 months. Between then and 1976, the average maturity declined rather steadily, reaching a low of 2 years and 7 months. Since then, a conscious Treasury policy of debt lengthening has continued almost uninterruptedly, with average maturity reaching 4 years and 6 months by the end of FY 1984.

[3]For example, the Treasury Bulletin, November 1974, Table TSO-5, p. 77, shows the maturities of securities issued by government agencies. Of the $10.3 billion in outstanding securities about $5.2 billion can clearly be identified by term-to-maturity. The average maturity of this identifiable total is 9.9 years.

The Maturity Distribution of FFB Holdings

We have assumed that the maturity composition of agency debt can be represented by the maturity composition of the FFB's loans. However, the FFB has not calculated this information, nor does it have the data to do so easily. The only sources of consistent historical data for the FFB's holdings are the individual loan folders and the monthly Federal Financing Bank NEWS. In recent years, the FFB has made some use of computers in their operations, but attempts to develop a system that maintains records in a way permitting analytical examination of the entire portfolio have thus far been unsuccessful. In any event, no plans have been made to develop a historical data base covering the period since the FFB's inception.

For almost every loan made by the FFB, the NEWS provides the loan type, the recipient, the date the loan was made, the date of final maturity, the amount, and the interest rate. The loan type is defined as on-budget, off-budget, agency asset, or government-guaranteed loan. The interest rate charged by the FFB on loans equals the Treasury rate on securities of comparable maturity plus 1/8 of 1 percent.

We created a computer file that includes the information taken from the NEWS for each of the approximately 12,000 loans made by the FFB from the beginning of its operations in 1974 through July 1983. All the data are as of the date the loan was made. There is no information on prepayments, guarantee payments on defaults, or rescheduling. With the data in our file we calculated the average monthly maturity of the FFB's loan portfolio. This calculation required an adjustment to the portfolio for each month so that matured loans drop out, other existing loans have their term-to-maturity reduced by 1 month, and new loans are added.

Table I.2: Maturity Distribution of Marketable Interest Bearing Public Debt Held by Private Investors

Dollars in millions

End of fiscal year		Amount outstanding	Maturity classes					Average length	
			Within 1 year	1-5 years	5-10 years	10-20 years	20 years and over	Years	Months
	1970	157,910	76,443	57,035	8,286	7,876	8,272	3	8
	1971	161,863	74,803	58,557	14,503	6,357	7,645	3	6
	1972	165,978	79,509	57,157	16,033	6,358	6,922	3	3
	1973	167,869	84,041	54,139	16,385	8,741	4,564	3	1
	1974	164,862	87,150	50,103	14,197	9,930	3,481	2	11
	1975	210,382	115,677	65,852	15,385	8,857	4,611	2	8
(TQ)	1976[a]	294,595	153,203	94,845	31,247	7,939	7,262	2	9
	1977	326,674	161,329	113,319	33,067	8,428	10,531	2	11
	1978	356,501	163,819	132,993	33,500	11,383	14,805	3	3
	1979	380,530	181,883	127,574	32,279	18,489	20,304	3	7
	1980	463,717	220,084	156,244	38,809	25,901	22,679	3	9
	1981	549,863	256,187	182,237	48,743	32,569	30,127	4	0
	1982	682,043	314,436	221,783	75,749	33,017	37,058	3	11
	1983	862,631	379,579	294,955	99,174	40,141	48,097	4	1
	1984	1,017,488	437,941	332,808	130,417	49,664	66,658	4	6
(Mar)	1985	1,106,798	463,882	388,843	143,745	54,722	77,606	4	8
Percentage distribution									
(TQ)	1976[a]		52.04	32.20	10.61	2.69	2.47		
	1977		49.39	34.69	10.12	2.58	3.22		
	1978		45.95	37.31	9.40	3.19	4.15		
	1979		47.80	33.53	8.48	4.86	5.34		
	1980		47.46	33.69	8.37	5.59	4.89		
	1981		46.59	33.14	8.86	5.92	5.48		
	1982		46.10	32.52	11.11	4.84	5.43		
	1983		44.00	34.19	11.50	4.73	5.58		
	1984		43.04	32.71	12.82	4.88	6.55		
(Mar)	1985		41.91	33.14	12.99	4.94	7.01		

Source: Treasury Bulletin, various issues.

[a]Rather than show two numbers for 1976, we show the outstanding publicly held securities only as of the end of the Transition Quarter.

The maturity structure of the FFB's loan portfolio is shown in table I.3.[4] There is considerable volatility in some maturity categories, particularly in the very short-term holdings. On the other hand, holdings in the 1- to 5-year category (as a percentage of the FFB portfolio) have fallen almost

[4]There are slight differences between the calculated data in this table and the published data in table I.1. These differences result largely from our inability to adjust for amortized loan repayments.

every year, while long-term holdings (over 10 years) have generally increased in relation to FFB's portfolio. As a result of these changes the average length of the portfolio has increased from about 6 years and 4 months in fiscal 1976 to almost 11 years and 8 months by the end of July 1983.

The data in table I.3 on the FFB's maturity composition overstate the actual term-to-maturity of the FFB's portfolio. This is because about one-third of the FFB's holdings are amortized over the term of the loan. That is, repayments of principal are scheduled over the life of the loan with only the final payment due at maturity. On the other hand, all of the Treasury holdings are bills, notes, and bonds that are payable in full at maturity.

It is clear that a Treasury bond with a term-to-maturity of 10 years and a 10-year FFB loan that is amortized with principal payments of 10 percent each year over the life of the loan are not comparable, even though our calculation of table I.3 treats them as such. A better measure would be the weighted average term-to-maturity, which takes account of the payments stream, i.e., the timing of the payments, to calculate the average maturity of an amortized loan.

In order to calculate the weighted average term-to-maturity for a loan, however, it is necessary to know the repayment schedule. For the loans in the FFB portfolio, this is very difficult for several reasons. First, some of FFB's loans are amortized while others are not. Second, the borrowing agency is allowed considerable latitude in determining its own repayment schedule. As a result, there is little uniformity between different borrowers, or, indeed, over time, for repayments by the same borrower. Finally, the FFB has no easily accessible record system on repayment schedules, especially for loans that have been paid off. To get these schedules it would be necessary to examine individual loan folders on a loan-by-loan basis, especially for older loans.

Our inability to adjust the FFB's portfolio for amortized loans means that the maturity composition shown in table I.3 represents an upper limit. The large differences between the average length to maturity of the Treasury and FFB portfolios (in tables I.2 and I.3) lead us, however, to expect that the FFB holdings would still have a significantly longer average maturity even if the appropriate adjustment could be made.

Table I.3: Estimated Maturity Distribution of Federal Financing Bank Holdings

Dollars in millions

End of fiscal year		Amount outstanding	Maturity classes: Within 1 year	1-5 years	5-10 years	10-20 years	20 years and over	Average length: Years	Months
(TQ)	1976[a]	26,868	2,987	18,266	1,861	556	3,197	6	4
	1977	42,350	7,770	15,003	10,926	3,144	5,507	8	2
	1978	48,930	4,939	20,379	12,701	2,966	7,945	8	11
	1979	68,705	14,884	24,576	15,882	3,186	10,177	8	3
	1980	92,120	21,733	29,476	21,831	4,660	14,421	8	9
	1981	104,784	11,602	32,929	28,960	13,555	17,737	9	5
	1982	124,628	14,808	37,581	29,025	20,402	22,811	10	3
(July)	1983	134,327	17,273	27,183	34,731	24,935	30,205	11	7
Percentage distribution									
(TQ)	1976		11.12	67.99	6.93	2.07	11.90		
	1977		18.35	35.43	25.80	7.42	13.00		
	1978		10.09	41.65	25.96	6.06	16.24		
	1979		21.66	35.77	23.12	4.64	14.81		
	1980		25.59	32.00	23.70	5.06	15.65		
	1981		11.07	31.43	27.64	12.94	16.93		
	1982		11.88	30.15	23.29	16.37	18.30		
(July)	1983		12.86	20.24	25.86	18.56	22.49		

Source: GAO estimates.

[a]All figures are for the end of the fiscal year. For 1976, however, the transition quarter (TQ) was used to facilitate comparisons.

In addition to the question of amortized FFB loans, there is another area of difference between our FFB maturity data and the Treasury distribution given in table I.2. The Treasury distribution in table I.2 represents securities held by private investors, netting out government and Federal Reserve holdings. Table I.3, showing FFB maturities, may include loans that could be held by the Federal Reserve since it is likely that the Federal Reserve would have held some of the agency securities if they had been issued publicly in the absence of the FFB. We do not have any way to determine this directly. One possible way to estimate it might be to apply the percentage of Treasury securities outstanding actually held by the Federal Reserve to our FFB data. We did not do this because there is no assurance that such an adjustment would be better than no adjustment. Since Federal Reserve holdings of public debt are predominantly short-term, however, adjusting the privately held FFB maturity distribution by removing the Federal Reserve holdings would likely show a

longer average maturity than shown in table I.3. Thus, for this reason, the maturity length of FFB's portfolio may be somewhat understated.

A Comparison of Treasury and FFB Maturity Distributions

In the previous sections we described the maturity distribution of publicly held Treasury debt and the FFB portfolio. A comparison of these two maturity distributions is contained in table I.4. The short average maturity of the Treasury portfolio is clearly evidenced by the share of its debt that matures in less than 1 year. Indeed, the shortest two categories, taken together, average about 80 percent of Treasury's outstanding, privately held debt throughout the period, showing a gradual fall from about 84 percent in 1976 to about 78 percent by the end of fiscal year 1983. This reflects the gradual lengthening of the Treasury portfolio over the period, as does the (comparable) upward trend in Treasury's holdings of long-term debt.

Table I.4:Percentage Maturity Distribution of Treasury Debt and FFB Holdings (estimated)

	End of fiscal year	Maturity classes				
		Within 1 year	1-5 years	5-10 years	10-20 years	20 years and over
Treasury						
(TQ)	1976	52.04	32.20	10.61	2.69	2.47
	1977	49.39	34.69	10.12	2.58	3.22
	1978	45.95	37.31	9.40	3.19	4.15
	1979	47.80	33.53	8.48	4.86	5.34
	1980	47.46	33.69	8.37	5.59	4.89
	1981	46.59	33.14	8.86	5.92	5.48
	1982	46.10	32.52	11.11	4.84	5.43
	1983	44.00	34.19	11.50	4.73	5.58
FFB						
(TQ)	1976	11.12	67.99	6.93	2.07	11.90
	1977	18.35	35.43	25.80	7.42	13.00
	1978	10.09	41.65	25.96	6.06	16.24
	1979	21.66	35.77	23.12	4.64	14.81
	1980	25.59	32.00	23.70	5.06	15.65
	1981	11.07	31.43	27.64	12.94	16.93
	1982	11.88	30.15	23.29	16.37	18.30
(July)	1983	12.86	20.24	25.86	18.56	22.49

Source: Tables I.2 and I.3.

Turning to the FFB's maturity distribution, only in 1976 does its loan portfolio share any similarities with Treasury's. In that year, while its holdings were very small, a large proportion of its loans were in the 1- to

5-year maturity category. As a result, nearly 80 percent of its 1976 portfolio matured in less than 5 years. Even in that year, however, an examination of the shortest and longest maturity categories shows significant differences from Treasury's holdings. FFB loans maturing in less than 1 year were a much smaller share of total holdings than was true for Treasury and the share of loans maturing in 20 years or more was much greater. This pattern has persisted over the entire period. One of the more interesting features of FFB's portfolio in 1983 is its relatively flat distribution across maturity categories. This contrasts sharply with Treasury's concentration for 1983 in the shorter maturities.[5]

[5]One of the interesting results of the FFB's operations is that many guaranteed loans have been converted from contingent claims on the federal government to direct loans. They are still called guaranteed loans because an agency guarantees repayment of the loan to the FFB should the loan recipient default. The guaranteed loan itself, however, now involves a direct outlay of cash by the FFB to the borrower. We have included these guaranteed/direct loans made by the FFB in our assessment of its effects on the maturity composition of the federal debt. Had the FFB not been created, guaranteed lending would probably have continued to represent a contingent claim on the government's resources and therefore not have required funding through agency borrowing. On the other hand, privately funded guaranteed loans do have market effects similar to agency debt and as such their displacement by Treasury borrowing is viewed in this report as sufficiently similar to displacement of agency debt to warrant inclusion in our estimation. Had we netted guaranteed loans out of our estimates, it is unclear what the effect would have been on the average maturity of FFB's portfolio. Assuming no significant difference between the maturity structure of guaranteed and direct loans, the size of the shift out of long-term into short-term securities would have been reduced but its nature would not have changed.

Measuring the Effect of the FFB's Operations on the Maturity of the Federal Debt

We have suggested that by converting agency debt into Treasury debt, FFB operations induced a de facto debt management operation. The agency debt displaced in the market is likely to have been of longer average maturity than the fairly short average maturity of debt which was actually issued by Treasury. Therefore, the maturity composition of current Treasury debt, which includes Treasury's funding of FFB's borrowing, is likely to be short in comparison with the maturity composition of total federal debt that would have prevailed in the absence of FFB. This can be viewed as simply a swap of shorter term debt for longer term debt much as would be done in an actual debt management operation.

In order to verify and measure the size of this maturity shift, we first assume that the maturities of agency borrowings from FFB are identical to the maturities of securities that agencies would have issued to the public had FFB not existed. We also assume that the FFB's existence has had no effect on the overall level of federal credit demands on the public (i.e., the level of the federal debt is unrelated to the FFB's operations). Finally, we assume that Treasury would have pursued the same debt management policy that has actually occurred. That is, while the level of Treasury debt would be lower by the size of the FFB's portfolio, the proportional composition of maturity would be identical.

FFB's Operations May Have Shortened the Average Maturity of the Federal Debt

In appendix I we established that the maturity distribution of Treasury's portfolio and FFB's holdings are quite different. We now combine these data to estimate the distribution of the federal debt that would have existed without the FFB.

To derive this estimate, we assume that all FFB holdings would have been issued in the private market by non-Treasury agencies in the identical maturity ranges of agency borrowing from FFB. We then take the total actual outstanding privately held marketable Treasury debt and subtract out total FFB holdings. This gives us the total Treasury debt not accounted for by FFB. This total is then divided among the maturity categories according to the actual percentage distribution of Treasury debt in table I.4. Note that this net distribution of Treasury's debt is no different from the actual maturity distribution of Treasury debt; only the totals in each maturity category are lower. We then take our FFB data (as a proxy for agency debt) by maturity and add it to the net distribution of Treasury debt. This gives us a new estimated distribution of federal

debt that would have prevailed without the FFB.[1] It is presented in table II.1, along with the percentage distribution by maturity category.

By taking the actual maturity distribution of Treasury debt (table I.2) and subtracting our estimated one (table II.1) we obtain the amounts by which the two distributions differ. The figures in table II.2 show that the actual distribution of federal debt is of shorter maturity as a result of FFB's operations. This indicates that FFB's creation effectively led to a swap of maturities of federal debt much the same as if Treasury had consciously chosen to replace long-term (agency) debt with short-term (Treasury) debt.

In table II.2, positive differences within a given maturity category show that the actual total of Treasury-issued securities is higher than what would have been issued by agencies in the absence of FFB. Negative figures show cases where the actual Treasury totals are smaller than our hypothetical distribution. Given our assumption that the level of the federal debt is the same for both distributions, the differences between the maturity classes sum to zero, and table II.2 depicts the "swap" between maturity classes. To illustrate, if we were to take 5 years as a cut-off between "short-" and "long-" term debt, then at the end of fiscal 1982 actual Treasury issues were $45.6 billion greater in the short-term category and $45.6 billion less in long-term debt compared to our hypothetical distribution.

[1]It should be noted that this is a fairly conservative estimate. It assumes that Treasury would have pursued the same debt lengthening policy with or without the FFB. We make this assumption because we have no way to determine what the Treasury might have done if the FFB had not been created. There are, however, at least two other plausible scenarios under which the FFB would show an even larger effect on federal debt maturity. These alternative assumptions about Treasury's behavior in the absence of the FFB are:

a. Treasury could have continued to sell the same amount (or proportion) of long-term debt as it did prior to the FFB, thus maintaining the relatively short average maturity that existed in the mid-1970s. That is, it would not have engaged in a debt-lengthening operation (which could, in fact, be seen as a deliberate attempt to offset the debt-shortening effect of the FFB).

b. Treasury could have reduced its long-term borrowing because of increased competition from long-term agency debt on the premise that only so much long-term government debt is marketable at "acceptable" rates.

Table II.1: Estimated Maturity Distribution of the Federal Debt

Dollars in millions

End of fiscal year		Amount outstanding[a]	Maturity classes: Within 1 year	1-5 years	5-10 years	10- 20 years	20 years and over
(TQ)	1976	294,595	142,308	104,461	30,258	7,771	9,797
	1977	326,674	148,185	113,631	39,706	10,479	14,673
	1978	356,500	146,273	135,118	41,603	12,787	20,718
	1979	380,529	163,928	129,116	42,333	18,337	26,815
	1980	463,717	198,096	154,682	52,930	25,415	32,594
	1981	549,863	218,970	180,438	68,414	39,918	42,123
	1982	682,043	271,788	218,839	90,933	47,385	53,098
(July)	1983	835,893	332,720	261,961	112,299	58,381	70,532
Percentage distribution							
(TQ)	1976		48.31	35.46	10.27	2.64	3.33
	1977		45.36	34.78	12.15	3.21	4.49
	1978		41.03	37.90	11.67	3.59	5.81
	1979		43.08	33.93	11.12	4.82	7.05
	1980		42.72	33.36	11.41	5.48	7.03
	1981		39.82	32.82	12.88	7.26	7.66
	1982		39.85	32.09	13.33	6.95	7.79
(July)	1983		39.80	31.34	13.43	6.98	8.44

Source: GAO estimate.

[a]These figures differ slightly from those found in table I.2. The differences are due to rounding errors during the estimation procedure.

Table II.2: Difference Between Actual and Estimated Maturity Distributions of the Federal Debt

Dollars in millions

End of fiscal year		Maturity classes				
		Within 1 year	1-5 years	5-10 years	10- 20 years	20 years and over
(TQ)	1976	10,895	−9,616	989	168	−2,535
	1977	13,144	− 312	−6,639	−2,051	−4,142
	1978	17,546	−2,125	−8,103	−1,404	−5,913
	1979	17,955	−1,542	−10,054	152	−6,511
	1980	21,988	1,562	−14,121	486	−9,915
	1981	37,217	1,799	−19,671	−7,349	−11,996
	1982	42,648	2,944	−15,184	−14,368	−16,040
(July)	1983	43,125	17,769	−19,879	−18,531	−22,484
As a percent of total outstanding						
(TQ)	1976	3.73	−3.26	0.34	0.06	−0.86
	1977	4.02	−0.10	−2.03	−0.63	−1.27
	1978	4.92	−0.60	−2.27	−0.39	−1.66
	1979	4.72	−0.41	−2.64	−0.04	−1.71
	1980	4.74	0.34	−3.05	−0.10	−2.14
	1981	6.77	0.33	−3.58	−1.34	−2.18
	1982	6.25	0.43	−2.23	−2.11	−2.35
(July)	1983	5.16	2.13	−2.38	−2.22	−2.69

Source: Tables I.2 and II.1.

The figures in table II.2 also show the difference between the distributions as a percent of total outstanding debt. Thus, for example, using 5 years as an arbitrary cut-off between short and long debt, the cumulative maturity swap at the end of 1982 represents almost 7 percent [(6.25 + 0.43) and - (2.23 + 2.11 + 2.35)] of total outstanding federal debt. In terms of the effect of FFB's operations on the average maturity of federal debt, the estimates indicate that as a result of the FFB and its borrowing relationship with Treasury, the average term-to-maturity in 1983 has been reduced from about 5 years, 2 months, to 4 years, 1 month.[2]

[2]The average maturity of the estimated distribution for 1983 of 5 years and 2 months was calculated by taking a weighted average. For each maturity category, except the longest, the mid-point (in months) was multiplied by the proportion of the portfolio falling in that category. For the longest maturity category (20 years and over) the term-to-maturity used was 25 years or 300 months. The weighted totals for each category were then added together to get the weighted average term-to-maturity of the portfolio. This is a rough estimate and is used for illustrative purposes only. However, tests using this technique on distributions with known average terms-to-maturity suggest that it is reasonably accurate.

Advance Comments From the Department of the Treasury

Note: GAO Comments Supplementing those in the report text appear at the end of this appendix.

DEPARTMENT OF THE TREASURY
WASHINGTON, D.C. 20220

DEPUTY ASSISTANT SECRETARY

November 8, 1985

Dear Mr. Anderson:

This responds to your letter of September 16, 1985, to Secretary Baker requesting comments on a draft report by the U.S. General Accounting Office (GAO) entitled Estimated Effects of the Federal Financing Bank's Operations on the Maturity Composition of the Federal Debt.

See Comment 1.

The major conclusion of the GAO draft report is that financing Federal agency direct and guaranteed borrowings through the Federal Financing Bank (FFB) has shortened the average maturity of the overall Federal debt (including guaranteed) outstanding. GAO assumes that if FFB borrowers went to market, Treasury's financing needs would be reduced, but its pattern of new issues would be unchanged, while the borrowers from FFB would opt for the long maturities in the market that many obtain from FFB. This assumption is highly questionable, since it does not recognize that there is a limited demand for long-term securities in the marketplace. That is, if longer term agency debt is issued in the market, rather than to the FFB, there will be some reduction in the demand for long term Treasury securities.

Over the years, the Treasury has pursued policies which have been directed in part toward extending the average maturity of the debt. Under these policies, the Treasury has increased the proportion of its financing that has been done in intermediate and longer-term maturities. Treasury long-term bond issues have increased to their current levels as the market's ability to absorb them (as assessed by market participants and experienced Treasury debt managers) has expanded. Long-term Federal agency direct and guaranteed debt issues in the market would compete with Treasury issues for the available long-term investment funds. Since agency and guaranteed issues in general do not have well developed markets and are not interchangeable with Treasury securities or other Federal securities, their interest rates are higher than Treasury rates for obligations of similar maturity, and they are relatively attractive to certain investor groups who might otherwise purchase Treasury issues. Thus, the competition between Treasury and federally-backed securities could be expected to have little effect on the maturity of the broadly-defined Federal debt, but would raise interest costs for Federal programs that currently are financed through the FFB.

See Comment 2.

I question the usefulness of comparing the average length of Treasury debt held by the public with the average length of the FFB's portfolio. While average length is a useful measure to assess progress in easing the Treasury's financing task it can be misleading to compare Treasury and FFB average length. Within the context of overall debt management policies Treasury debt issues in the aggregate meet the overall needs of the Government, while the FFB is just a portion of those needs.

See Comment 3.

Comparing the two average length measures implies that there is something wrong with a gap of a certain size. In this regard, it should be noted that since the FFB commenced operations in 1974 the average length of the Treasury debt has doubled, from about 2 1/2 years to 5 years. While we

See Comment 1.

would not suggest that this marked increase in the average length should be directly related to the growth of the FFB portfolio, the Treasury's ability to issue long term debt during this period was clearly facilitated by the fact that agencies were borrowing from the FFB rather than issuing long term debt directly in the market in competition with Treasury long term issues.

See Comment 4.

Implementing an often-heard recommendation that FFB financing should more closely match Treasury financing would result in severely limiting the flexibility of the FFB's operations without providing any economic benefits. Some advocates of this maturity-matching idea are those who stand to benefit the most from a loss in FFB's flexibility (i.e. investment bankers that would market agency direct or guaranteed borrowing outside of FFB).

In summary we question the basic assumption underlying the GAO study -- that the average maturity of Treasury debt would not be materially affected by agency borrowing in the

See Comment 5.

market rather than from the FFB. Yet we would be happy to discuss this further with your staff, and we would hope that these discussions would provide a constructive basis for further research in this area.

Thank you for this opportunity to comment on the GAO draft report. I hope my comments prove helpful.

Sincerely,

John J. Niehenke
Deputy Assistant Secretary
(Federal Finance)

Mr. William J. Anderson
Director, General Government Division
United States General Accounting Office
Washington, D.C. 20548

The following are GAO's comments on the United States Treasury letter dated November 8, 1985.

GAO Comments

1. Treasury has correctly stated that "GAO assumes that if FFB borrowers went to market, Treasury's financing needs would be reduced, but its pattern of new issues would be unchanged, while the borrowers from FFB [the agencies] would opt for the long maturities in the market that many obtain from FFB." They believe that this assumption may not be valid. There is, however, little empirical evidence to support the alternative assumption implicit in Treasury's comments, i.e., that public issues of long-term agency securities would reduce, correspondingly, Treasury's ability to issue long-term debt, even at the lower levels required with no FFB.

In the sort of simulation undertaken in this report, results depend on the underlying assumptions. We have attempted to make these assumptions as explicit as possible. Other assumptions would yield different results. Consider the assumption implicit in Treasury's comments. For the FFB's operations to have had little effect on the maturity composition of the federal debt, it would be necessary to assume that the market for long-term government bonds (agency or Treasury) is essentially fixed, and further, that it has been fully exploited by Treasury since the inception of the FFB. If this assumption were true, a renewal of agency borrowing from the public would cause Treasury's average maturity to shorten enough to offset most of the lengthening of the maturity of total federal borrowing caused by the new long-term agency issues.

We assume that the maturity composition of Treasury's debt would be unchanged from its actual make-up (though the level of Treasury borrowing would be lower) if the FFB did not exist. This assumption, together with Treasury's, may be seen to define the upper and lower limits of the FFB's potential effects on the maturity composition of the federal debt. If the actual effect falls anywhere between these limits, then the operation of FFB has led to unrecognized changes in the maturity composition of the federal debt, with potential effects on economic activity. We believe that additional research needs to be done to resolve this issue.

2. Our comparison of the maturity distributions of these two portfolios is presented in table I.4 and is done entirely on the basis of categorical data showing the actual composition of the Treasury and the FFB portfolios. Moreover, all of our estimates and calculations use either this same

categorical data or individual loan data. In tables I.2 and I.3, where each distribution is presented alone, the average length of maturity in years shows how each portfolio is changing over time. In the letter we do use average maturities to compare the two distributions as a convenient way to summarize our analysis.

3. While our report shows that the FFB's operations have had some effect on the maturity of the total federal debt, we do not intend to suggest in the report that a particular maturity length is more or less desirable. Further, we do not suggest "that there is something wrong with a gap of a certain size" between the average maturity of Treasury and the FFB.

4. Our report is not suggesting "that FFB financing should more closely match Treasury financing."

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