

THE FINANCING OF TVA

ARNOLD R. JONES*

INTRODUCTION

The Tennessee Valley Authority's (TVA) investment in power, flood control, navigation, chemical, and other fixed assets exceeds two and a half billion dollars. Capital expenditures are expected to reach \$160 million in the current fiscal year—1961—and will probably exceed \$200 million next year. Capital expenditures of about the same range are expected during each year for the foreseeable future. Power revenue in fiscal 1960 was \$242 million; fertilizer revenue was \$17 million. Expenditures for operation and maintenance of all programs were \$170 million last year but will increase steadily as the power system and other activities grow.

These figures offer a glimpse of the size of TVA's financing responsibility. Large as the expenditures are, they are dwarfed by those of many government agencies. It is not, however, the size of TVA's expenditures that is of most interest. The interest in TVA's financing centers on its methods and policies; for a government agency, they have been unique. TVA now has three sources of funds: (1) appropriations, (2) revenues, and (3) electric power bonds. Each source will be discussed in this paper. The fact that TVA may use its revenues and bond proceeds without annual appropriation by Congress is of great importance in the stability of its self-financed activities.

It is the purpose of this article to review these methods and policies, past and future, identifying the important ways in which they are unique and have contributed to effective management.

I

SCOPE OF OPERATIONS

1. General

Congress granted to the TVA a considerable measure of the administrative freedom and flexibility customarily found among private corporations. TVA is a federal corporation created by the Tennessee Valley Authority Act of 1933.¹ Its three-member Board of Directors is appointed by the President subject to confirmation by the Senate.² It is an independent agency in that its Board is responsible directly to the President and Congress, and not to one of the traditional departments.³ Within

* B.S. in Business 1927, University of Kansas; Certified Public Accountant. Assistant Budget Director and State Accountant, State of Kansas, 1933-37; Dean, Financial Administration, Kansas State University, 1945-56; Deputy Director, U.S. Bureau of the Budget, 1956-57. Member, Board of Directors, Tennessee Valley Authority. The manuscript of this article was completed in April 1961.

¹ 48 Stat. 58 (1933), 16 U.S.C. § 831 (1958).

² 48 Stat. 59 (1933), 16 U.S.C. § 831a (1958).

³ 48 Stat. 63 (1933), 16 U.S.C. § 831h (1958).

broad limits, the Board of Directors determines the financial policies for TVA's programs, including the establishment of the prices at which power and fertilizer are sold.⁴ Yet this freedom is not unlimited. The TVA Act states, for example, that while electric rates shall be as low as feasible, the power program must be self-supporting and self-liquidating.⁵ Congress has amended the Act from time to time, and on three occasions amended importantly the manner of financing the power program.

Financially, TVA's programs and activities fall into two categories. One is power operations. The other includes all nonpower activities—flood control, navigation improvement, fertilizer and munitions development, agriculture, forestry, and other resource development programs.⁶ Power has used appropriations only for capital additions; all operating expenses of this program (and part of its capital requirements) have been financed from revenues. Although some of the nonpower activities produce revenue, none is expected to be self-supporting. As with similar services provided by the Government all over the nation, both the current expenses and the capital additions of TVA's *nonpower* activities are supported by appropriations.

2. Fertilizer and Agriculture Research

Substantial income is obtained from the sale of fertilizer and chemical products and is used to meet part of the operating expenses. Appropriations are necessary, however, to pay for plant construction costs and a part of the operating costs.

TVA does not operate as a commercial fertilizer supplier; its activities in this field are concerned with research, development, testing, and education in order to carry out two main peacetime objectives: (1) development of new and improved fertilizers and of processes for their manufacture, and (2) testing and demonstrating the value and best methods of using modern fertilizers as an aid to soil and water conservation and increased efficiency of farm operations.⁷ Amounts of fertilizer produced, although substantial, are limited to the quantities needed to carry out the educational programs and represent less than two per cent of national tonnage. Output in 1960 was about 250,000 tons.

TVA prices its fertilizers and fertilizer materials in such a way as to promote development objectives rather than to produce maximum revenues. Prices are set sufficiently below the price of commercial fertilizers to encourage farmers, retail dealers, agricultural college personnel, and fertilizer manufacturers and wholesale distributors throughout the country to try new products and take part in special educational programs. Most of the fertilizers are used in the distributor-demonstration program, where a limited price differential is provided.

⁴ *E.g.*, 48 Stat. 61, 64 (1933), 16 U.S.C. § 831d, i (1958).

⁵ 49 Stat. 1076 (1935), 16 U.S.C. § 831h-1 (1958).

⁶ 48 Stat. 62 (1933), 16 U.S.C. § 831d(l) (1958) (power operations); 48 Stat. 61 (1933), 16 U.S.C. § 831d(a-f) (1958) (fertilizers); 48 Stat. 61 (1933), 16 U.S.C. § 831d(g, h) (1958) (munitions); 48 Stat. 69 (1933), 16 U.S.C. § 831u, v (1958) (conservation and resource development); 49 Stat. 1076 (1935), 16 U.S.C. § 831h-1 (1958) (flood control and navigation).

⁷ 48 Stat. 61 (1933), 16 U.S.C. § 831d(a-f) (1958).

A much smaller amount is utilized in the farm test-demonstration program, which is more intensive, more closely supervised by agricultural college personnel, and more intensively employed as an educational tool. All test-demonstration farmers pay freight and local handling charges as well as part of the cost of the fertilizer. The end price varies with the experimental nature of the fertilizer, the types of crops on which it is to be used, and other factors. It may vary from very little to a considerable part of the cost of the fertilizer. The objective of the pricing arrangement is to give the farmer an incentive to try experimental fertilizers, to demonstrate their use in fertilization programs recommended by the colleges, to keep complete records, and to make farms available for visits and tours.

Sale of fertilizers and by-products in the fiscal year 1960 totaled \$16,712,000. After production and distribution expenses, research on products and processes, and costs of fertilizer testing and demonstrations and agricultural development activities, the net expense of the program was \$4,864,000, of which \$1,024,000 represents provision for depreciation and depletion.

3. *Navigation and Flood Control*

Navigation and flood control services produce no revenues for TVA. In accordance with present national policy on all inland waterways, use of the Tennessee channel by all craft, commercial and recreational, is free. The net expense to TVA in the fiscal year 1960 of navigation operations, including \$1,666,000 in depreciation charges, was \$3,313,000. In addition, the Corps of Engineers, U.S. Army, which operates the locks and maintains the main channel, and the U.S. Coast Guard, which installs and maintains buoys and other navigation aids, expended about \$965,000 and \$317,000, respectively. Reductions in shippers' costs due to the existence of the waterway are now about \$25,700,000 annually.

TVA's flood control expenses, including \$1,235,000 in depreciation, amounted to \$2,932,000 in fiscal 1960. In the same year an estimated \$4,500,000 in damages on the lower Ohio and Mississippi Rivers was avoided. Through the entire period of TVA flood control operations, beginning in 1936 with completion of Norris Dam, the cumulative operation costs totaled \$43.4 million while the cumulative benefits in damage averted—only one of the measures of flood control benefits—amounted to about \$145 million.

4. *The Electric Power Program*

For its power program, the Act requires TVA to follow the system of accounting prescribed by the Federal Power Commission (FPC).⁸ Keeping in mind the differences between a public agency and a privately owned corporation, TVA's power accounts may be compared with those of any electric system which follows FPC procedures. There is no accounting procedure prescribed by law for nonpower activities; procedures are patterned after generally accepted business practice. The usual and accepted distinctions are made between capital expenditures and operating

⁸ 49 Stat. 1077 (1935), 16 U.S.C. § 831m (1958).

expenses. Depreciation is recorded for depreciable assets and is charged to the activities which use the asset. Administrative and other overhead costs also are allocated to the several programs after exhaustive "direction of effort" studies. Annual budget estimates and financial statements are reported by activity, and include on an accrual basis all TVA costs.

In administering the policy of marketing TVA power at the lowest feasible rates, the TVA Board established low wholesale rates for its own power sales and contracted with some 153 municipal and cooperative electric systems to distribute the power at low retail rates. These low rates influence TVA financing directly and importantly. Electricity is universally recognized as a superior form of energy; encouraged by low rates, its use has grown rapidly in the TVA area. Rapid load growth requires the investment of large amounts of new capital. With low rates the amount of cash generated internally is modest relative to the amount of capital invested and to the amount of new capital required. With high rates, capital requirements would be reduced and cash flow (although smaller in absolute amount because of lower sales) might be larger in proportion to investment.

Power revenues are used only to meet obligations of the power program, and not to finance navigation, flood control, or other nonpower activities. Concomitantly, income from the sale of fertilizer and other nonpower activities is not spent on power obligations. Most of the dams built by TVA are multipurpose projects and provide for flood control, navigation, and power. The powerhouses, switchyards, and other facilities used exclusively for power are charged entirely to the power program just as the navigation locks are charged entirely to navigation. But large portions of the structures and the reservoirs serve all three purposes and their costs are shared by the three purposes. Each of the three purposes thus costs less than it would if the projects had been built for any one alone. There is thus a sharing of multipurpose costs among the programs, but this is not an exception to the basic policy that power revenues pay only for power costs.

II

TVA'S UNIQUE FINANCING AUTHORIZATION

1. *Use of Revenue*

One authorization, available to TVA since the beginning, stands out above all others by its contribution to efficient management. This is the authority to use revenue from the sale of power, fertilizer, or any other product, or from the disposition of property, in the operation of its dams and in conducting its power and fertilizer activities.⁹ By contrast, the funds received by a federal agency are as a rule passed directly to the General Fund of the United States Treasury; even those activities which produce revenue usually must rely on appropriations to meet their current expenses as well as capital requirements.¹⁰

⁹ 49 Stat. 1079 (1935), 16 U.S.C. § 831y (1958).

¹⁰ *E.g.*, 57 Stat. 19 (1943), 16 U.S.C. § 835c-2 (1958) (Columbia River Basin Project).

TABLE I
THE FINANCING OF TVA'S PROGRAMS AT A GLANCE†

Programs	Fiscal Year	ASSETS IN BILLIONS AT YEAR-END		BUDGETED EXPENDITURES (in Millions)						Totals*
				Appropriated Funds			Proceeds & Borrowings			
		Amount	%	Assets	Operations	%*	Assets	Operations	%*	
1. Flood control	1961	\$.167	7.4	\$ 1	\$ 2	100.0	—	—	—	\$ 3
	1962	.167	6.9	1	2	100.0	—	—	—	3
2. Navigation	1961	.177	7.8	7	2	100.0	—	—	—	9
	1962	.192	7.9	19	2	100.0	—	—	—	21
3. Power	1961	1.859	82.4	1	—	.3	\$151‡	\$146	99.7	298
	1962	2.023	83.0	—	—	—	198§	157	100.0	355
4. Fertilizer and munitions	1961	.034	1.5	1	4	19.2	—	21	80.8	26
	1962	.035	1.4	3	4	25.0	—	21	75.0	28
5. Other (watershed protection and improvement, reimbursable services, general facilities)	1961	.020	.9	1	1	28.6	—	5	71.4	7
	1962	.020	.8	1	1	22.2	—	7	77.8	9
6. Totals	1961	2.257	100.0	11	9	5.8	151‡	172	94.2	343¶
	1962	2.437	100.0	24	9	7.9	198§	185	92.1	416¶

† Source: Compiled from the records of the TVA.

* % of total program expenditures.

‡ Including \$50 million from borrowings.

§ Including \$140 million from borrowings.

¶ Excluding transfers to the Treasury—\$51 million in 1961 and \$50 million in 1962.

In the past twenty-seven years, TVA's gross revenue from the sale of power totaled \$2.2 billion. Fertilizer revenues over the same period amounted to \$300 million, and sales of surplus property brought in another \$50 million. These funds have been available for financing current operations and, subject to limitations to be described later, for capital investment. During the same period, the Board returned to the Treasury \$185,059,019 from power proceeds and \$41,527,420 from nonpower proceeds. In addition, \$65.1 million in bonds sold to the Treasury and the Reconstruction Finance Corporation were retired. These payments were entirely aside from the payments made to the Treasury under the 1959 revenue bond financing amendment, described later in this article.

2. Bonds

Also unusual has been the willingness of Congress to let TVA issue bonds to supplement appropriations and revenues as a source of funds for capital investment. The original Act of 1933 authorized the sale by TVA of up to \$50 million of bonds for the construction of dams, steam plants, or other power facilities.¹¹ In 1935, the Act was amended to authorize the sale of another \$50 million of bonds to permit TVA to lend money to municipal and cooperative electric systems for the purchase

¹¹ 48 Stat. 66 (1933), 16 U.S.C. § 831n (1958).

of existing distribution facilities, thereby avoiding unnecessary duplication.¹² In 1939, the Act was again amended, this time repealing all previous bond authorizations, but providing a new authorization for the sale of up to \$61.5 million in bonds to finance the acquisition by TVA and by local electric systems (in part with funds borrowed from TVA) of the facilities of certain private utilities in Tennessee, Alabama, and Mississippi.¹³

Under the 1933 authorization, TVA sold \$8.3 million in bonds to the Reconstruction Finance Corporation during 1938 and 1939. Under the 1935 authorization, \$272,500 in bonds were sold to the U.S. Treasury in 1938. Under the 1939 amendment, TVA issued \$56.5 million of bonds during 1939 and 1940; these were also sold to the Treasury. In all, TVA issued \$65.1 million of bonds under these early authorizations. All of these bonds have long since been retired through payments out of power revenues.

In 1959, the Act was again amended to authorize the sale of bonds to finance power facilities, with the amount limited to no more than \$750 million outstanding at one time.¹⁴ This new bond authorization will be most important to TVA in the coming years. In November 1960, TVA sold \$50 million of power system bonds at competitive bids to private investors. This was the first time that TVA obtained financing from private investors.

3. Appropriations

A measure of freedom has been granted to TVA even in the use of appropriations. This proved most helpful in effective management and cost control. Although requests for appropriations are supported with detailed estimates of specific projects and activities, most appropriations to TVA are granted as a lump sum technically available to all programs authorized under the TVA Act.¹⁵ If work on one project is delayed and all of the funds originally estimated are not required, the remaining appropriations may be used for other authorized activities where a need exists. Furthermore, since 1948, appropriations to TVA have remained available until expended.¹⁶ Such freedom was particularly useful during the years when a market for TVA power was being developed, and appropriations were the major source of new capital. There is no certain way of forecasting the specific facilities which must be constructed, nor the time schedule for construction, until after the customer contracts for his needs.

More often than not, appropriations to federal agencies are granted for specific activities and are not transferable. They frequently are granted for one year only, expiring at the end of the fiscal year unless obligated. This can lead to year-end scurrying in an effort to obligate all appropriations to avoid losing them by ex-

¹² 49 Stat. 1078 (1935), 16 U.S.C. § 831n-1 (1958).

¹³ 53 Stat. 1083 (1939), 16 U.S.C. § 831n-2, 3 (1958).

¹⁴ 73 Stat. 280 (1959), as amended, 16 U.S.C. § 831n-4 (Supp. II, 1959-60).

¹⁵ See, e.g., the original appropriation, 48 Stat. 275 (1933).

¹⁶ 61 Stat. 574 (1947).

piration. There has been no occasion for TVA to engage in such practices. Needless to say, were TVA's freedom abused, it would not long exist.

III

FINANCIAL BACKGROUND

TVA's financing methods and its financial policies have shifted during the years, and it will be useful to summarize them by periods. Moreover, an understanding of TVA today requires some knowledge of its past.

1. *The Early Years: 1933-1939*

During the early years, appropriations were relied upon to provide capital funds for all of TVA's programs including power, and for current operating expenses of all programs except power. The major financial need was to secure capital for the construction of dams. Taming the waters of the Tennessee River and its tributaries for flood control, navigation, and hydroelectric power was the primary purpose of the projects. There were other very significant resource development activities, including the renovation of the World War I fertilizer and munitions facilities at Muscle Shoals,¹⁷ but these did not require the large sums needed for dam construction.

Wilson Dam and the related power and chemical facilities at Muscle Shoals, which had been built during and after World War I, were transferred to TVA in 1933 from the War Department. Even though the amounts of power which could be produced at Wilson Dam were limited, a firm market for capacity production was not immediately available. Revenues from the sale of power to neighboring utilities and to the few other customers which gradually came on the line were sufficient to cover current expenses, but provided little margin for reinvestment in new facilities.

Throughout the years the power program has been self-supporting. Electric rates were established at levels which have produced revenue to cover operating and maintenance expenses of the power system, depreciation, the payments in lieu of taxes required by the TVA Act, and a return to cover the Government's cost of money. This return for the 1933-1960 period has averaged almost four per cent per annum.

By the end of 1939, the properties of most of the privately owned utilities in the area now served with TVA power had been acquired by TVA and the municipal electric systems and rural electric cooperatives distributing TVA power. Mention already has been made of the bonds which were issued to assist in financing these acquisitions.

The largest of these utility transfers involved the properties of the Commonwealth & Southern Corporation (C&S). David E. Lilienthal, representing TVA, and Wendell Willkie acting on behalf of C&S, in 1939 arranged the transfer of the

¹⁷ 48 Stat. 61 (1933), 16 U.S.C. § 831d(d, f) (1958).

Tennessee Electric Power Company properties to TVA and to municipal and cooperative electric systems. The total purchase price was \$78,464,000.

This transaction was believed to have been the largest sale of utility properties up to that time. Certainly it was the most significant. For the first time, exclusive responsibility for meeting the power requirements of a major region was assumed by the federal government, acting through TVA. All power producing properties which were used to serve the public—as distinct from the dams which the Aluminum Company of America had built to supply its own plant at Alcoa, Tennessee—had been acquired by TVA, together with the transmission lines and substations that welded the generating plants into a coordinated system. Twenty-two cities and eleven rural electric cooperatives purchased the local distribution properties, either incorporating them into existing systems or organizing new systems. TVA alone produced power for public consumption. Locally owned distribution systems retailed the power; but they had long-term contracts with TVA to supply their entire power requirements. The consequences of TVA's new public-utility responsibility should have been self-evident, but seemingly came as a surprise to many when, in 1948, TVA requested funds for the Johnsonville Steam Plant.¹⁸

The ultimate capacity of the river was large compared with what had been developed or compared with the region's apparent power requirements. By 1939, only four dams had been placed in operation by TVA but many more were under construction or in the planning stage. (To date, TVA has constructed twenty dams; number twenty-one is under construction.) It appeared at the time that responsibility for meeting the region's power supply would be handled conveniently for years to come, as TVA continued the gradual development of the river's full hydroelectric potential. Eventual steam generation was contemplated, but not for several years, as was made clear by J. A. Krug, TVA's Manager of Power, in testimony before a House Committee that year.¹⁹

2. *The War Years: 1940-1945*

War had an immediate impact on TVA. The construction of dams was speeded up to provide electric power for the defense industry, particularly aluminum for airplanes. The fertilizer plants at Muscle Shoals were converted to the manufacture of phosphorous and other chemicals for war. Sixty per cent of the phosphorous used during World War II for munitions purposes was produced by TVA. Some resource development activities were slowed down, or abandoned, as peacetime activities gave way to defense.

With the speedup of construction to meet the threat to national security, large amounts of capital were required. Appropriations were made available to TVA when their defense need became apparent. At one time, no less than twelve dams were under construction. A large steam plant—the largest in the South at that

¹⁸ See *infra*, text at note 27.

¹⁹ *Hearings on S. 1796 Before a Subcommittee of the House Committee on Military Affairs, 76th Cong., 1st Sess. III-12 (1939).*

time—was built. Generating capacity increased from one million kilowatts in 1940, to two and a half million in 1945.

There were several reasons for the unusually rapid load growth in the TVA area. Primary among them was the fact that TVA was in a better position than other power systems to provide quickly very large quantities of electric power. A number of dams were already under construction. Work on these could be speeded up; and additional generating units could be ordered over and above what had been intended for initial installation. Other projects were well along on the drawing boards, and these could be speeded into construction. Industries which require large amounts of power—electrometallurgical and electrochemical plants, for example—locate where power costs are low, and the TVA region is one of the logical sites for such industries. Financing was also important: not only the availability of funds, but also the speed with which they could be raised. TVA lacked the financing freedom and flexibility of private utilities. Yet when a defense industry needs a substantial supply of power to manufacture war products for the Armed Forces, appropriations can flow more quickly than private industry could mobilize the capital.

Aluminum Company of America located an aluminum reduction plant in Tennessee and erected a system of hydroelectric plants on tributaries of the Tennessee River long before TVA started. To meet the aluminum needs of the airplane industry, Alcoa expanded its Tennessee operations, and the Reynolds Metals Company located a new plant near Wilson Dam, Alabama. The aluminum industry uses tremendous quantities of power, and both companies relied heavily on TVA for their power supply. Chemical industries, which likewise require large quantities of power, also located in the region. Then, of course, there was the secret Manhattan Project, now known as the Oak Ridge plant of the Atomic Energy Commission, which required very large amounts of power.

3. *The Cold War and Korea: 1946-1954*

With the end of World War II, the financial relationship between TVA's power program and the nation was reviewed in detail by Congress²⁰ and by TVA. Power revenues during the fiscal year of 1945 exceeded \$39 million, and net income was nearly \$18 million. Adding back depreciation, the net proceeds from power operations exceeded \$26 million. The TVA Board found that these proceeds exceeded by some \$7 million the amount needed in the conduct of the power business, and, during the fiscal year of 1946, the \$7 million was paid to the United States Treasury as prescribed by section twenty-six of the Act.²¹ An additional \$5 million of proceeds from fertilizer, munitions, and other nonpower activities also was paid to the Treasury.

These were the first payments under section twenty-six; and they aroused considerable interest. The House Committee on Appropriations requested TVA to

²⁰ See, e.g., 93 CONG. REC. 6801-07, 6825-37 (1947).

²¹ 48 Stat. 71 (1933), as amended, 16 U.S.C. § 831y (1958).

prepare a report on the federal investment in TVA power facilities and TVA's plans for continuing such payments. In discussions with the Committee, and in its report dated April 1947, TVA defined the financial relationship which it felt had been intended by the Act of 1933 and which should be continued.²² This was not the first time that a congressional committee explored with TVA the full nature of its financial operations and financial responsibilities; but because power operations were now relatively mature and were producing substantial earnings, the discussions were less theoretical and hypothetical than those which had gone before.

It was emphasized by TVA that the United States Government is the owner of TVA, and that the relationships between them should *not* be regarded as those of creditor and debtor. Even if every dollar advanced by the Government had been repaid to it, with interest or dividends, the ownership of the Government would still be one hundred per cent.

Care must be exercised not to confuse the relationship between TVA and the nation with the relationship between TVA and its customers. Occasionally it was suggested that the electric customers in the region were being subsidized because TVA did not pay interest on appropriations and was not required to repay capital appropriations. This overlooks the fact that the electric rates and the power revenues of TVA covered all operating and maintenance expenses, allowances for depreciation to recover during their useful lives the full cost of depreciable assets, payments in lieu of taxes required by the TVA Act,²³ and allowances for the use of all capital irrespective of its source, whether from borrowings, appropriations, or reinvested earnings. Because debt was low, little interest was paid, and allowance for the use of appropriated investment and retained earnings appeared as net income.

The region's customers were paying adequately for the power they received. The manner in which TVA handled power revenues, and the degree of financial freedom granted to it, were administrative and budget matters within the Government and did not involve questions of subsidy. Power proceeds which TVA used to finance new construction paid in advance for facilities which otherwise would be provided from appropriations; proceeds which TVA returned to the Treasury simply offset, or repaid, appropriations previously invested in power facilities. Either way the result is the same, except in respect to the administrative and budget flexibility of TVA's management.

In its report to the Committee, TVA pointed out that the earnings of its hydro system could be expected to fluctuate widely from year to year with variations in rainfall and river flow, but that during the following few years, net revenues after operating expenses but before depreciation charges should average around \$25 million a year. Capital requirements also would vary from year to year but

²² *Hearings on the Government Corporations Appropriations Bill for 1948 Before the Subcommittee of the House Committee on Appropriations*, 80th Cong., 1st Sess. pt. 1, 110, 114 (Report), 119-24 (testimony of Gordon R. Clapp) (1947).

²³ 48 Stat. 66 (1933), as amended, 16 U.S.C. § 831l (1958).

after reinvestment in new power facilities, \$8 to \$10 million a year might be paid to the Treasury.²⁴ As a result of the Committee's recommendations, which were based in part on the TVA report, Congress included legislation in the Government Corporation Appropriations Act, 1948,²⁵ prescribing minimum payments which TVA was to make to the Treasury from power proceeds. Over a period of forty years, TVA was to make payments equal to the outstanding appropriations invested in power facilities, and was to repay the then outstanding bonds—a combined total of \$348 million.

This legislation recognized the need for financial flexibility. One-fourth of the total was to be paid within each of four ten-year periods. There was no annual minimum, except that at least two and a half million dollars were to be repaid annually on bonds. Amounts equal to future power appropriations were to be paid within forty years after initial operative utilization. Through the fiscal year of 1959, when the 1948 Act was replaced by new legislation,²⁶ TVA had paid \$185 million of power proceeds into the general fund of the U.S. Treasury as an offset to appropriations for power facilities and, had repaid the entire sixty-five million dollars of bonds sold some twenty years previously.

The business recession which had been expected by many to occur at the end of World War II did not materialize; and loads on the TVA power system began to increase rapidly. It soon became evident that large amounts of new capital were to be required if TVA was to continue to meet the region's power requirements. Unfortunately, this rising need came at a time when the nation was most eager to reduce wartime debts.

To complicate the matter, two very important questions of policy, which should have been considered settled years earlier, once again had to be faced. The potential capacity of the Tennessee River had been developed to the point where additional steam capacity was needed to bring the system to its most efficient proportion of water power and steam. Furthermore, the region faced the early likelihood of having to rely almost entirely upon steam capacity to meet future load growth. The Wilson Steam Plant had been built adjacent to Wilson Dam during World War I; and the Watts Bar Steam Plant, the first to be constructed by TVA, was constructed during World War II to provide power for airplane aluminum. But the 1948 request for funds to build the Johnsonville Steam Plant—the first steam plant needed to meet the region's growing peacetime power requirements—raised quite different questions.

Considerable controversy arose over whether or not the TVA—or any federal agency—should be permitted to build steam-electric plants except perhaps in wartime emergencies.²⁷ The second point of controversy related to TVA alone, and to no other federal agencies: should TVA be expected to provide indefinitely for

²⁴ *Hearings, supra* note 22, at 110-16.

²⁵ 61 Stat. 576 (1947).

²⁶ 73 Stat. 283 (1959), 16 U.S.C. § 831n-4(e) (Supp. II, 1959-60).

²⁷ See, e.g., 94 CONG. REC. 5523-31, 5537-51, 5601-22 (1948).

the growing power requirements of the region which it served, or did federal responsibility end with the disposal of the power made available at whatever dams or other plants the Government undertook to build as part of its traditional responsibility for flood control, navigation, or national defense? This is not the place to enlarge on either of these questions, except to say that they were resolved in favor of having TVA continue to meet a public utility responsibility to the region served by it and to build steam plants as occasioned by that responsibility.

With Korea, the power requirements of the defense industry, and of the Atomic Energy Commission at Oak Ridge, and later at Paducah, began to grow at a pace which dwarfed anything experienced before. In addition, farm and home use of electricity was pyramiding because of the construction of new homes, the electrification of farms previously without service, and the extensive use of major new appliances. Loads grew beyond expectations.

TVA entered World War II with one million kilowatts of generating capacity and emerged with two and a half million kilowatts. By way of sharp comparison, generating capacity grew from three million kilowatts in 1950, to 7.8 million kilowatts in 1955. In five years of cold war, TVA added five million kilowatts. (Today, the installed capacity of the system is twelve million kilowatts, and another three and one half million are under construction.)

Appropriations were relied upon in this period to provide the major share of the capital for the construction of the steam plants and transmission facilities required to meet the unusually rapid load growth. Through the fiscal year of 1955, ap-

TABLE II
CONDENSED SUMMARY OF SOURCES OF INVESTED FUNDS†
(in millions of dollars, as of June 30, respectively, of selected fiscal years)

	1960	1955	1950	1945	1940
<i>Assets</i>					
Net Power Assets.....	\$1,772.2	\$1,533.8	\$527.0	\$416.6	\$204.5
Nonpower Assets.....	381.6	446.2	388.1	338.5	136.1
Totals.....	\$2,153.8	\$1,980.0	\$915.1	\$755.1	\$340.6
<i>Derived From</i>					
Net U.S. Treasury Funds—Power....	\$1,201.3*	\$1,217.4	\$320.7	\$300.4	\$138.7
TVA Power Bonds Outstanding.....	—	14.0	49.0	61.1	60.6
Advances and Contributions.....	0.6	1.0	1.1	—	—
Retained Power Earnings.....	570.3	301.4	156.2	55.1	5.2
Totals Power.....	\$1,772.2	\$1,533.8	\$527.0	\$416.6	\$204.5
Net U.S. Treasury Funds—Nonpower‡	381.6	446.2	388.1	338.5	136.1
Totals as above.....	\$2,153.8	\$1,980.0	\$915.1	\$755.1	\$340.6

† Source: Compiled from the records of the TVA.

* \$1 billion to be returned to U.S. Treasury in 54 years plus "dividends" on unpaid balance in perpetuity.

‡ Net of revenues and annual program costs.

propriations generally were available for that purpose, although not always in the amount TVA requested.

4. *From 1955 to 1959*

Since 1954, appropriations have been made only for the completion of power construction started, and for nonpower activities. The expenditures from appropriations for power construction will be less than one million dollars during the current fiscal year, and none are budgeted for the fiscal year of 1962.

Substantial sums had been appropriated to build power facilities to meet the load growth occasioned by the cold war, particularly the all but incredible power requirements of the Atomic Energy Commission (AEC). The AEC and other federal agencies now purchase nearly half of all the electric power sold by TVA; their needs are more than double the total electric power sales to every customer in the State of North Carolina. An estimated \$600 million is invested in facilities which serve federal loads.

Sales by TVA to federal agencies reached their peak in 1957, and then leveled off at a high plateau. Since it requires three to four years to complete new generating capacity, the facilities for these loads had all been started earlier. After providing for these high priority loads, there developed a growing reluctance to continue the large appropriations which would be necessary year in and year out to keep pace with the normal peacetime development of the region. The region needs from 800,000 to 1,000,000 kilowatts of new capacity each year. This requires the investment of from \$150 to \$200 million a year. From 1954 until the fiscal year of 1961 when there was a new bond issue, TVA relied solely on its power proceeds to initiate the construction of new power facilities.

Normally, it would have been impossible for TVA—or for any electric system—to finance load growth from internal funds for so long a period of time. Several unusual factors contributed to TVA's ability to do so. Two business recessions slowed the growth of very large industrial loads; the city of Memphis withdrew as a customer of TVA and built its own steam plant; being ahead of schedule in its Treasury payments under the 1948 Appropriations Act,²⁸ and having considerable flexibility under that law, TVA held payments after 1956 to a nominal sum; the size of the system had grown rapidly as a consequence of sales to federal agencies and net power proceeds were approaching \$100 million a year; although peacetime loads continued to grow rapidly, system earnings were relatively large in comparison with capital requirements once the federal loads leveled off.

IV

THE BOND AMENDMENT OF 1959

Once again, a searching review was made of the financial relationships between TVA and the nation and, particularly, of the manner in which TVA might best

²⁸ See note 25 *supra*.

continue to meet its accepted responsibilities to supply the region's power requirements. Unlike earlier reviews, there was no longer any question about the financial success of TVA's power operations. The public utility responsibility to the area served, and the proved earning capacity of the power system more or less naturally led to the final solution: TVA should be authorized to issue bonds to private investors, but the bonds should be secured only by revenues from the sale of power without pledging the credit of the United States.

This self-financing solution was advanced by TVA and recommended to the Congress by President Eisenhower in his budget message for fiscal 1957.²⁹ It received bipartisan support in the Congress.³⁰ Yet many questions remained to be resolved in hammering out the details of the legislation. In what manner and to what extent should the nation be rewarded financially for its investment in TVA power facilities? Should that reward be subordinate or precedent to the claims of future bondholders? What limits, if any, should be placed on the amount of bonds to be issued? How much administrative freedom should be granted to TVA? The privilege of issuing bonds might offer a source of capital to TVA less subject to legislative control than the funds obtained through appropriations process: should there be prior approval by the Congress of each major project so financed? Should there be a geographic limit on the location of such projects or a boundary of the service area?

In August 1959, the bond financing amendment to the TVA Act finally became law.³¹ Essentially, it authorized the TVA Board to issue electric system revenue bonds, working directly with the financial community. The amount outstanding at any time may not exceed \$750 million. Numerous checks and balances were included, and the more important of these will be discussed below. Yet this new legislation affirms confidence in TVA by continuing to place in the hands of the TVA Board that measure of authority and administrative freedom which is needed to meet its acknowledged responsibilities. All too frequently in Government, responsibility is so divided that there can be no true accountability for deeds done or left undone; even more frequently, the responsibility which does exist is not matched with an equal authority to act.

The amendment is relatively long and detailed. Although of interest to students of finance, it will only be briefly summarized here.

1. As already stated, no more than \$750 million may be outstanding.
2. The funds received may be used only in the conduct of TVA's power program.
3. The bonds are not obligations of the federal government. Both principal and interest are payable solely from TVA's "Net Power Proceeds." Net Power Proceeds, as defined in the amendment, are equivalent to net power income before depreciation and interest expense, plus any proceeds from the sale of power assets.

²⁹ 102 CONG. REC. 561, 579 (1956) (Budget Message of President Eisenhower).

³⁰ See, e.g., 105 CONG. REC. 15339, 15504 (1959) (remarks in the Senate); 105 *id.* 15083, 15085, 15266 (1959) (remarks in the House).

³¹ 73 Stat. 280 (1959), 16 U.S.C. § 831n-4 (Supp. II, 1959-60).

4. TVA is free to determine the terms and conditions of sale of its bonds, but provision is made for coordination with the Secretary of the Treasury. The bonds are not subject to approval by the Secretary except as to time of issue and maximum interest rate. If, however, the Secretary fails to approve within seven days, TVA may issue short-term obligations to the Treasury which the Secretary is obliged to purchase; and if agreement is not reached within eight months, TVA may issue the bonds independently of the Secretary.

5. The amendment requires TVA to make two kinds of payments to the general fund of the Treasury with respect to appropriations invested in power facilities. One is a return or dividend on that investment; the other is a repayment of the appropriations. The annual dividend is equal to the amount of outstanding appropriations multiplied by the Government's average interest rate on marketable securities, both determined as of the first day of each fiscal year. On July 1, 1960, for example, outstanding appropriations totaled \$1.2 billion, and the average interest rate was 3.449 per cent. The dividend payable in the fiscal year of 1961 is \$41.4 million. Of the \$1.2 billion of appropriations investment, \$1.0 billion is to be repaid. The minimum repayments are \$10 million a year for the five years beginning in the fiscal year of 1961, \$15 million a year for the next five years, and \$20 million a year thereafter.

6. Payment of interest and principal on bonds takes precedence over payments relating to appropriations. Furthermore, payments on appropriations may be deferred for two years by the TVA Board under certain circumstances.

7. The amendment reaffirms the policy that TVA shall sell power at rates as low as feasible, but defines the costs which are to be covered by the rates. The definition coincides with TVA's long existing policies, but its inclusion has the advantage of assuring bond-holders (and the nation) that these policies will continue.

8. Geographic boundaries are placed on the service area. Previously, the only boundary was that determined by economics and engineering. It is worth noting, however, that because the TVA service area is, in reality, the area served by municipal and cooperative electric systems which distribute TVA power, the boundaries are placed on their areas of activities. Essentially, the service area is frozen as of July 7, 1957, except for a few communities which had long been seeking a supply of TVA power, and with a modest degree of geographic freedom to allow for such obvious expansions as those which arise through natural community growth.

In November 1960, TVA sold \$50 million in bonds by competitive bid to a syndicate of investment dealers. The bonds were awarded the highest ratings offered by *Standard & Poor* and by *Moody's*. The effective interest rate to TVA was 4.44 per cent.

CONCLUSION

Power revenues have been sufficient to meet the current operating and maintenance expenses of TVA's power program and will continue to be so. Earnings

have not been sufficient, nor is it reasonable to expect them to be sufficient, to finance by themselves the cost of building new power facilities to meet load growth. In the past, earnings have been supplemented with appropriations; in the future these sources will be supplemented with bonds. It is generally expected that earnings may provide one third to one half of the system's capital requirements, and that bonds will be required for the remainder. In so far as nonpower activities are concerned, appropriations supplemented with proceeds from the sale of fertilizer and from other sources will continue to finance operating expenses as well as capital expenditures.