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Dear Mr Smith:

In accordance with your letter of September 15, 1969, and as agreed with you and Congressman Bob Casey at a meeting on December 18, 1969, the General Accounting Office has made an analysis of the costs that would be incurred by the Federal Government and an educational institution under the loan, interest subsidy, and grant methods of financing the construction of educational and related facilities, giving consideration to two different methods in calculating costs.

The bases used in our analysis and the results are summarized below, and details are presented in enclosure I.

BASES AND ASSUMPTIONS USED IN GAO ANALYSIS

Under one program administered by the Department of Health, Education, and Welfare (HEW) to assist institutions of higher education in the construction of educational facilities, an institution can receive financial assistance in the form of a grant equal to 50 percent of the development cost of a facility, a 3-percent loan equal to 75 percent of the development cost of a facility; an interest subsidy equal to the interest in excess of 3 percent paid by an institution for a non-Federal loan for 90 percent of the development cost of a facility; or a combination of a grant and loan. Under another HEW program, vocational institutions may receive grants or interest subsidies for the construction of residential schools.

Also, under a program administered by the Department of Housing and Urban Development (HUD), institutions of higher education can obtain assistance in financing the construction or the purchase of dormitories and related facilities in the form of 3-percent loans and/or interest subsidies equal to the interest in excess of 3 percent paid by an institution for a non-Federal loan.

Background information on the HEW and the HUD programs for the construction of educational and related facilities is presented in enclosure II.

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For purposes of our computations, we have assumed that an educational institution receives \$1 million of capital from either a 3-percent loan or a grant from the Government, or obtains \$1 million from a private lender with interest costs in excess of 3 percent borne by the Government in the form of annual interest subsidy payments. The estimated costs to the Government and an educational institution were computed on the basis of the net cash flow of funds, using two different methods of calculating costs applicable to the financing alternatives--the accumulated interest method and the present value method. Both methods are used to determine values for fund flows as of a given point of time.

Under the accumulated interest method, the value of fund flows is calculated by applying an interest rate to outlays and receipts over a specific period of time. Under the present value method, the current value of fund flows over a specific period of time is calculated by use of a discount rate.

In calculating interest on the outlays and receipts under the accumulated interest method, we have assumed that the Government pays 7 percent interest on its borrowings. We have assumed also that a public institution, issuing tax-exempt securities, pays 7 percent interest on its borrowings; and that a private institution, issuing taxable securities, pays 9 percent interest on its borrowings. To show the effect that a lower or a higher Government interest rate can have on estimated costs, we have made two additional calculations using assumed interest rates of 5 and 9 percent.

In calculating costs under the present value method, we have used discount rates of 5, 7, and 9 percent, which are equal to the Government borrowing rates used in the accumulated interest method.

Under both methods, consideration was given to Federal income taxes recovered on interest income earned by private lenders--the source of Government and educational institution borrowings. Also, our analysis includes illustrations of the effect that differences in the borrowing costs of private and public educational institutions have on the Government's costs.

RESULTS OF ANALYSIS AND CONCLUSIONS

On the basis of the assumptions used in our analysis, we found that the conclusions reached under the accumulated interest and the present value methods are the same when the rate used for Government borrowings in the accumulated interest method is also assumed to be the appropriate rate for discounting in the present value method.

Our analysis showed that the grant alternative is the least favorable to the Government because the large initial outlay of funds is not repaid by the institution, as is done in the case of a loan, and Government interest costs associated with the grant are much greater than those costs associated with interest subsidy payments. The grant, on the other hand, is the most favorable alternative to an educational institution.

Our analysis showed that conclusions as to whether a loan or interest subsidy is the most economical method of financing to the Government will vary in accordance with the borrowing rate assumed for the Government and the relationship of this rate to the interest rate assumed to be paid by an educational institution on its non-Federal borrowings. Also, the conclusions reached can be affected by whether or not an institution borrows funds by issuing tax-exempt securities.

The Government's cost of providing financial assistance to an educational institution is identical for both the loan and the interest subsidy alternatives before consideration of Federal income tax recoveries, when the Government's borrowing rate is equal to the institution's non-Federal borrowing rate. If the Government's borrowing rate is less than the institution's borrowing rate, then the loan alternative would be the most favorable method of financing to the Government whether or not Federal income tax recoveries are considered. If the Government's borrowing rate is higher than the institution's borrowing rate and Federal income tax recoveries are not considered, then the interest subsidy becomes the most favorable method of financing to the Government.

B- 164031(1)

For example, if the Government's borrowing rate is assumed to be 7 percent and if a private institution's borrowing rate is assumed to be 9 percent, the loan alternative is the most favorable method of financing to the Government whether or not Federal income tax recoveries are considered. Since the Government's borrowing rate usually has been lower than the private institution's borrowing rate, the loan alternative would have been the most economical method of financing to the Government. If, however, the Government's borrowing rate should exceed the private institution's borrowing rate, an analysis would show the interest subsidy alternative as being more economical than the loan alternative.

In the case of a public institution which borrows funds by issuing tax-exempt securities, the interest subsidy alternative becomes the Government's least costly method of financing when an institution's borrowing rate is substantially lower than the Government's borrowing rate. For example, if the Government's borrowing rate is assumed to be 7 percent and consideration is given to the recovery of Federal income taxes, the interest subsidy alternative becomes the Government's least costly method of financing when a public institution's borrowing rate is about 4-3/4 percent or lower.

With respect to an educational institution, its costs, calculated either by the accumulated interest or present value method, are the same for both the loan and interest subsidy alternatives because the institution must pay, either to the Government or a private lender, the borrowed funds and interest at the rate of 3 percent.

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As indicated above and in accordance with your and Congressman Casey's request, we have considered in our analysis the costs to the Government and to an educational institution. We did not use in our analysis a concept often referred to as the opportunity cost concept, which is sometimes used to determine the cost to the national economy

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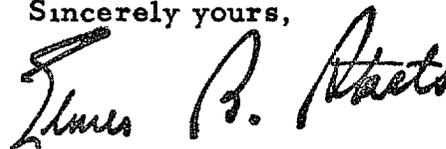
if labor, materials, etc. (resources) are withdrawn from the private sector of the economy to undertake a particular Government program. This cost is assumed to be the rate of return that the resources used by the Government would have earned if they had been allowed to remain in the private sector of the economy. The private sector rate of return has been estimated by economists to be in the range of 10 to 15 percent.

We do not believe, however, that the use of an opportunity cost rate is appropriate in this particular case because the facility which would be constructed under either the loan or the interest subsidy alternative would involve the use of the same resources. This view is supported by economists with whom we discussed this matter. They believe that the two alternatives, from the standpoint of the national economy, involve the same cost and there is no advantage of one alternative over the other.

This report is also being sent to Congressman Casey.

We plan to make no further distribution of this report unless copies are specifically requested, and then we will make distribution only after your or Congressman Casey's agreement has been obtained or public announcement has been made by you or Congressman Casey concerning the contents of this report.

Sincerely yours,

A handwritten signature in black ink, appearing to read "James B. Stewart". The signature is written in a cursive style with a large initial "J".

Comptroller General  
of the United States

Enclosures - 2

The Honorable Neal Smith  
House of Representatives

GENERAL ACCOUNTING OFFICE  
ANALYSIS OF COSTS TO THE GOVERNMENT AND AN INSTITUTION  
FOR CONSTRUCTION OF FACILITIES UNDER LOAN, INTEREST  
SUBSIDY, AND GRANT METHODS OF  
GOVERNMENT FINANCING

BASES USED IN ANALYSIS

In determining the costs related to the loan, interest subsidy, and grant methods of financing, we have computed the net cash flow of funds for the Government and an educational institution using two different methods--accumulated interest and present value. Both methods are used to determine values for fund flows as of a given point of time.

Accumulated interest method

Under this method, the value of fund flows is calculated by applying an interest rate to outlays and receipts over a specific period of time.

With respect to interest on Government borrowings, it is our belief that interest is a cost which is related to all Government expenditures, regardless of whether an agency has revenue sufficient for it to be self-supporting or receives income by way of special taxes. This belief is based on the fact that the Government's expenditures are made from a single pool of funds in the Treasury. All Government disbursements are made from this pool and all funds received by the Government from whatever source--taxes, sale of securities, postal receipts, trust fund receipts--are deposited in the pool.

In managing the Government's fund requirements, the Treasury does not earmark funds either by source or by use; it is concerned with how much in total it must have available to meet demands. When receipts are insufficient to meet demands, the difference is obtained through borrowing; when receipts are in excess of demands, previous borrowings can be repaid. Thus, funds expended for any purpose, if not so used, could be used to repay debts or could result in reduced borrowings and thereby save interest costs on those funds.

For purposes of calculating costs, we have used a Government borrowing rate of 7 percent per year. However, the costs will vary significantly depending on the Treasury interest rate considered to be the most appropriate measure of the borrowing cost associated with a particular program or activity. For example, on December 31, 1969, the average yield on outstanding long-term Treasury bonds was 6.8 percent whereas the average interest rate on the public debt was 5.4 percent; on Treasury bills, 7.7 percent; and on Treasury notes, 5.9 percent. To show the effect that use of a lower or higher Government interest rate can have on estimated costs, we have made two additional calculations using assumed Government borrowing rates of 5 and 9 percent.

#### Present value method

Under this method, the current values of fund flows over a specific period of time are calculated by use of a discount rate. The theory underlying this technique is that costs which must be incurred in the near future loom larger than costs that will be incurred in the more distant future. The discounting of future costs makes them comparable to present costs, i.e., to the present values of costs. The procedure for carrying out this analysis is to (1) determine the net flows in each future period (month, quarter, year, etc.) for each method of financing; (2) use a discount rate to determine the present value of the flows in each future period for each method of financing; (3) sum the present values of the flows for each method of financing; and (4) compare the present value sums to find which method of financing has the lowest present value--the least cost in terms of the current value of future outlays.

For purposes of calculating present values, we have used discount rates of 5, 7, and 9 percent which are equal to the Government borrowing rates used in accumulated interest calculations.

#### ASSUMPTIONS USED IN ANALYSIS

For the purposes of our calculations, we have assumed that the Government borrows a fixed sum (\$1 million) from a private lender and uses the proceeds to make either a loan or a grant to an educational institution. We have assumed also

that an educational institution borrows a fixed sum (\$1 million) of capital from a private lender with interest costs partly borne by the Government. We have assumed further that the institution repays the Government loan over a period of 30 years with interest at the rate of 3 percent per year and that the Government makes interest subsidy payments for a period of 30 years on the institution's borrowings from private sources in an amount equal to the difference between the actual amount of interest paid by the institution and the amount that would be paid if the interest rate was 3 percent per year.

Also, we have assumed that the administrative costs of the Government and an educational institution related to each of the financing alternatives are relatively minor in comparison with the capital investment and interest costs, and we have excluded them from the calculations.

In addition, the following assumptions apply to the calculations:

1. The interest rate applicable to Government borrowings is, alternatively, 5, 7, or 9 percent; the rate applicable to borrowings by a public educational institution, issuing tax-exempt securities, is 7 percent; and the rate applicable to borrowings by a private educational institution, issuing taxable securities, is 9 percent.

2. Federal income taxes are paid by purchasers of Government and private educational institution securities in amounts equal to 35 percent of the interest income earned. Also, these taxes are paid in equal annual amounts over the life of the securities and are used by the Government to reduce its borrowings and related interest costs.

3. The discount rate is, alternatively, 5, 7, or 9 percent.

We recognize that alternatives other than those described by our assumptions could be considered, such as different interest rates on borrowings of educational institutions and different rates for Federal income taxes paid by purchasers of Government and private institution securities.

## RESULTS OF ANALYSIS AND CONCLUSIONS

On the basis of the assumptions used in our analysis, we found that the conclusions reached under the accumulated interest and present value methods are the same when the rate used for Government borrowings in the accumulated interest method is also assumed to be the appropriate rate for discounting in the present value method.

Our analysis showed that the grant alternative is the least favorable alternative to the Government because the large initial outlay of funds is not repaid by the educational institution, as in the case of a loan, and the interest costs associated with the grant are much greater than the interest costs associated with interest subsidy payments. The grant, on the other hand, is the most favorable alternative to an educational institution.

Our analysis showed that the conclusions reached with respect to whether a loan or an interest subsidy is the most economical method of financing to the Government will vary in accordance with the borrowing rate assumed for the Government and the relationship of this rate with the interest rate assumed to be paid by an educational institution on its borrowings. Also, the conclusions reached can be affected by whether or not an institution borrows funds by issuing tax-exempt securities.

### Accumulated interest method

The costs to the Government for the loan and interest subsidy alternatives at the assumed interest rates of 5, 7, and 9 percent applicable to Government borrowings, are as follows:

	Loan to private or public institution	Interest subsidy	
		Private institution borrowings at 9 percent	Public institution borrowings at 7 percent
----- (000 omitted) -----			
Government borrowings at 5 percent:			
Costs before tax recoveries	\$ 932	\$3,077	\$1,964
Costs after tax recoveries	195	1,589	1,964
Government borrowings at 7 percent			
Costs before tax recoveries	2,793	4,375	2,793
Costs after tax recoveries	1,231	2,260	2,793
Government borrowings at 9 percent.			
Costs before tax recoveries	6,313	6,313	4,030
Costs after tax recoveries	3,260	3,260	4,030

The Government's cost of providing financial assistance to an educational institution is identical for the loan and the interest subsidy alternatives, before consideration of Federal income tax recoveries, when the Government's borrowing rate is equal to the institution's borrowing rate under the interest subsidy alternative. If the Government's borrowing rate is less than the institution's borrowing rate under the interest subsidy, then the loan alternative is the most favorable method of financing whether or not Federal income tax recoveries are considered. If the Government's borrowing rate is higher than the institution's borrowing rate and Federal income tax recoveries are not considered, then the interest subsidy becomes the most favorable method of financing.

If the Government's borrowing rate is assumed to be 7 percent and a private institution's borrowing rate is assumed to be 9 percent, then the loan alternative, as shown in the above table, is the most favorable method of financing to the Government whether or not Federal income tax recoveries from the Government's and the private institution's borrowings are considered. Since the Government's borrowing rate usually has been lower than the private institution's borrowing rate, the loan would have been the most economical method of financing to the Government.

However, in the case of a public institution which borrows funds by issuing tax-exempt securities, the interest subsidy becomes the Government's least costly method of

financing when the institution's borrowing rate is substantially lower than the Government's borrowing rate. For example, if the Government's borrowing rate is assumed to be 7 percent and consideration is given to the recovery of Federal income taxes, the interest subsidy alternative becomes the Government's least costly method of financing when the public institution's borrowing rate is about 4-3/4 percent or lower.

For purposes of illustrating the accumulated interest method of calculating the Government's costs for the loan and the interest subsidy alternatives, an example of the calculation using a Government borrowing rate of 7 percent is shown on page 9 of this enclosure.

Present value method

The present values of Government costs for the loan and the interest subsidy alternatives at the assumed discount rates of 5, 7, and 9 percent, which are equal to the Government borrowing rates used in the accumulated interest calculation, are as follows:

	Loan to private or public institution	Interest subsidy	
		Private institution borrowings at 9 percent	Public institution borrowings at 7 percent
(000 omitted)			
Discount rate of 5 percent:			
Present value of costs before tax recoveries	\$216	\$712	\$455
Present value of costs after tax recoveries	45	368	455
Discount rate of 7 percent:			
Present value of costs before tax recoveries	367	575	367
Present value of costs after tax recoveries	162	297	367
Discount rate of 9 percent:			
Present value of costs before tax recoveries	476	476	304
Present value of costs after tax recoveries	246	246	304

The conclusions reached under the present value method are the same as those reached under the accumulated interest method, when the rate used for discounting is assumed to be the same as the interest rate used for Government borrowings.

The Government's cost of providing financial assistance to an educational institution is identical for the loan and the interest subsidy alternatives, before consideration of Federal income tax recoveries, when the discount rate used in

the computation is equal to the institution's borrowing rate under the interest subsidy alternative. If the discount rate is less than the institution's borrowing rate under the interest subsidy, then the loan alternative is the most favorable method of financing whether or not Federal income tax recoveries are considered. If the discount rate is higher than the institution's borrowing rate and Federal income tax recoveries are not considered, then the interest subsidy becomes the most favorable method of financing.

If the discount rate is assumed to be 7 percent and the borrowing rate for a private institution is assumed to be 9 percent, a loan, as shown in the above table, is the most economical method of financing to the Government, whether or not Federal income tax recoveries from the Government's and institution's borrowings are considered. The loan is also the most economical method of financing to the Government in the case of a public institution which borrows funds at 7 percent by issuing tax-exempt securities, if Federal income tax recoveries from the Government's borrowings are considered.

The interest subsidy becomes the Government's least costly method of financing in the case of a public institution which borrows funds by issuing tax-exempt securities, when the institution's borrowing rate is substantially lower than the discount rate. For example, if the discount rate is assumed to be 9 percent, and consideration is given to the recovery of Federal income taxes, the interest subsidy alternative becomes the Government's least costly method of financing when the public institution's borrowing rate is about 6-1/4 percent or lower.

For purposes of illustrating the present value method of calculating the Government's costs for the loan and the interest subsidy alternatives, an example of the calculation using a discount rate of 7 percent is shown on page 10 of this enclosure.

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With respect to an educational institution, its costs, calculated either by the accumulated interest or present value method, are the same for both the loan and the interest

subsidy alternatives because the institution must pay, either to the Government or a private lender, the borrowed funds (\$1 million) and interest at the rate of 3 percent (\$530,600) over 30 years.

Accumulated Interest Method of  
Calculating Government Costs

	Loan to private or public <u>institution</u>	<u>Interest subsidy</u>	
		<u>Private institution borrowings at 9 percent</u>	<u>Public institution borrowings at 7 percent</u>
Government borrowing at 7 percent:			
Payments by Government to repay borrowed funds and interest	\$2,417,600		
Loan and interest payments by institution to Government	<u>-1,530,600</u>		
Net cash flow	887,000		
Interest on net cash flow	1,905,900		
Subsidy payments	-	\$1,389,500	\$ 887,000
Interest on subsidy payments	<u>-</u>	<u>2,985,600</u>	<u>1,905,900</u>
Government costs before recovery of Federal income taxes	2,792,900	4,375,100	2,792,900
Federal income taxes recovered and related reduction of interest costs	<u>-1,562,200</u>	<u>-2,114,900</u>	<u>-</u>
Government costs after recovery of Federal income taxes	<u>\$1,230,700</u>	<u>\$2,260,200</u>	<u>\$2,792,900</u>

Present Value Method of  
Calculating Government Costs

	Loan to private or public <u>institution</u>	<u>Interest subsidy</u>	
		<u>Private institution borrowings at 9 percent</u>	<u>Public institution borrowings at 7 percent</u>
Discount rate of 7 percent:			
Present value of Government payments on borrowed funds	\$1,000,000		
Present value of loan repayments to Government by institution	-633,100		
Present value of Government subsidy payments	<u>-</u>	<u>\$574,800</u>	<u>\$366,900</u>
Present value of Government costs before recovery of Federal income taxes	366,900	574,800	366,900
Present value of Federal income taxes recovered	<u>-205,200</u>	<u>-278,000</u>	<u>-</u>
Present value of Government costs after recovery of Federal income taxes	<u>\$ 161,700</u>	<u>\$296,800</u>	<u>\$366,900</u>

GENERAL ACCOUNTING OFFICE  
BACKGROUND INFORMATION REGARDING  
HEW AND HUD PROGRAMS  
FOR CONSTRUCTION OF  
ACADEMIC AND RELATED FACILITIES

In HEW, two programs have been authorized to assist educational institutions in financing the construction of educational and related facilities. One program covers academic facilities for institutions of higher education, and the other covers residential schools and dormitories for the vocational education of youths. Also, HUD administers a college housing program under which Federal assistance is provided to educational institutions for the construction or the purchase of dormitories and related facilities.

HEW PROGRAMS

The Higher Education Facilities Act of 1963 (20 U.S.C. 701) established a program which authorized the Commissioner of Education, HEW, to make grants to institutions of higher education to assist in the financing of the construction of undergraduate and graduate academic facilities. Under the provisions of the act, the grant may not exceed 50 percent of the development cost of a facility. As of June 30, 1969, approximately \$1.8 billion in construction grants had been awarded.

The act also authorized the Commissioner of Education to make loans to institutions of higher education when the Commissioner finds that not less than one-fourth of the development cost of a facility will be financed from non-Federal sources, and that the applicant is unable to secure a loan from non-Federal sources upon terms and conditions equally as favorable as the terms and conditions applicable to loans made by the Government. The loans have a maximum repayment period of 50 years (repayment periods have generally been 30 years) and bear an interest rate of 3 percent per year. As of June 30, 1969, loans of approximately \$535 million had been made.

In addition, a combination of a grant and a loan may be provided for the construction of a facility, but such Federal

assistance may not exceed, in total, 75 percent of the cost of the project.

The Higher Education Amendments of 1968 (20 U.S.C. 1001 note), approved October 16, 1968, added section 306 to the Higher Education Facilities Act of 1963 (20 U.S.C. 746), which authorized the Commissioner of Education to make interest subsidy payments to institutions of higher education to assist in reducing the cost of borrowings from non-Federal sources for the construction of academic facilities. The subsidy payments may be made if the Commissioner finds that not less than 10 percent of the development cost of the facility will be financed from non-Federal sources, and that the applicant is unable to secure a loan, with respect to which the interest subsidy is to be made, from non-Federal sources upon terms and conditions equally as favorable as the terms and conditions applicable to loans made by the Government.

The annual subsidy payments may not be in an amount greater than the difference between (1) the average annual debt service which would be required to be paid, during the life of the loan, on the amount borrowed and (2) the average annual debt service which would be required to be paid, during the life of the loan, with respect to such amounts, if the applicable interest rate was 3 percent per year. The interest subsidy payments may be made for a period not exceeding 40 years.

At the time of our review, the provisions of section 306 had not been implemented although funds totaling about \$3.9 million had been appropriated for interest subsidy payments as of June 30, 1969, and HEW had been granted authority to enter into contracts with institutions for subsidy payments totaling about \$25.3 million as of July 1, 1970.

The Vocational Education Act of 1963 (20 U.S.C. 35) established a program which authorized the Commissioner to make grants to State boards, to colleges and universities, and, with the approval of the appropriate State board, to public educational agencies, organizations, or institutions for the construction, equipment, and operation of residential schools to provide vocational education for youths who need full-time study on a residential basis. As of June 30, 1969, no funds had been appropriated.

The Vocational Education Amendments of 1968 (20 U.S.C. 1241 note), approved October 16, 1968, added section 153 to the Vocational Education Act of 1963 (20 U.S.C. 1323), which authorized the Commissioner of Education to make annual interest subsidy payments to reduce an institution's cost of borrowing funds for the construction of residential vocational schools and dormitories.

The annual interest subsidy payments may be made for a period not exceeding 40 years, and are computed on the same basis as the interest subsidy payments made to institutions of higher education. At the time of our review, there had been no activity under the provisions of section 153 although HEW had been granted authority to enter into contracts with institutions for subsidy payments totaling \$10 million. This program does not have a loan counterpart.

#### HUD PROGRAM

In addition to the HEW programs, title IV of the Housing Act of 1950 (12 U.S.C. 1749), authorized the Secretary of HUD to make loans to institutions of higher education for the construction or the purchase of dormitories and other facilities for students and faculty members. The loans may be in an amount equal to the total development cost of the facility, have a maximum repayment period of 50 years (repayment periods have generally been 40 years), and bear an interest rate of 3 percent per year.

The Housing and Urban Development Act of 1968 (12 U.S.C. 1701t note), approved August 1, 1968, amended title IV of the Housing Act of 1950 to provide, separately or in combination with Government loans, interest subsidy payments to institutions of higher education to assist in reducing the cost of borrowings from non-Federal sources for the construction of educational facilities. The subsidy payments may be made for a period not exceeding 40 years in an amount not greater than the difference between (1) the average annual debt service which would be required to be paid, during the life of the loan, on the amount borrowed and (2) the average annual debt service which would be required to be paid, during the life of the loan, with respect to such amounts, if the applicable interest rate was 3 percent per year.

In fiscal year 1969, HUD allocated \$5.5 million for interest subsidy payments to 142 colleges, universities, and teaching hospitals and approved loans of \$69.4 million to 77 institutions. Since the program began in 1950, HUD has made over 3,000 loans totaling about \$3.6 billion.