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THE EXPORT IMPORT BANK OF THE UNITED STATES:
A COST --- BENEFIT (?) ANALYSIS

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I. Introduction

There is a growing interest in U.S. Government direct loan and loan-guarantee programs, which have become a significant feature of our financial system [2,22]. This study examines one such direct lending program, that of the Export Import Bank of the United States (Ex-Im). Ex-Im lending is singled out for analysis because it is one of the largest programs, and because it has been the center of continuing debate in Congress and elsewhere.^{1/} Also, unlike most official lending operations, these funds go to foreign firms or governments. Thus, if Ex-Im loans are subsidized, all or part of the subsidy goes to the foreign sector and is not captured by U.S. firms or consumers.

Ex-Im has long maintained that it is self-sustaining, operates at a profit, and (by implication) is costless to the taxpayer. That argument is simply incorrect. Employing a standard benefit-cost framework, I conclude that in each year studied, 1976-1980, the direct costs of Ex-Im lending exceeded the direct benefits, resulting in a subsidy. Over that period the average subsidy is estimated to be between \$168 million and \$248 million per year. The subsidy increased substantially over the sample period and by 1980 is estimated to be between \$521 million and \$653 million.

Next, I consider the "externalities" or indirect social benefits that have sometimes been attributed to Ex-Im lending. These fall into three general categories. It has been alleged that the Export Import Bank:

- stimulates U.S. export demand, and thus domestic employment,
- helps correct market failure in export financing, and,
- is an important strategic tool in executing U.S. foreign policy.

I analyze these arguments and conclude that each of the supposed benefits is difficult to quantify, but probably trivial or nonexistent.

Admittedly, a rigorous investigation of the strategic value of Ex-Im is beyond the scope and expertise of this study. If my analysis is basically correct, however, and the social cost of Ex-Im lending exceeds the direct and indirect benefits by a substantial margin, policy implications are obvious.

II. The Ex-Im Direct Loan Program

A Congressional staff report [14] summarized Ex-Im's mandate as follows:

Exim has four separate charges from Congress. First, Exim is mandated to "aid in financing and to facilitate exports and imports and the exchange of commodities between the United States ... and any foreign country or the agencies or nationals thereof." Second, the bank is required to achieve this goal on terms that are competitive with export financing in other countries, while at the same time endeavoring to "minimize competition in government supported export financing."

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Third, Exim is charged with supplementing and encouraging private capital financing of exports. It must not compete with private capital. The fourth charge of the Bank is to show net earnings.

Operationally, the primary function of the Export Import Bank is to encourage the export of U.S. goods and services by providing loans, loan guarantees and insurance. In the direct lending program, with which we are concerned, it borrows through the Federal Financing Bank, usually at five to ten year maturities, and then lends to importers of U.S. goods or services. Most typically financed are long-lived capital exports such as aircraft and electrical generating equipment. Ex-Im direct loans are often packaged with private export financing in an arrangement wherein the private institution

(usually a commercial bank) gets its principal back first, and then principal payments go to Ex-Im. The net effect is to give a short maturity loan to the private sector and a long maturity loan to the agency. In recent years, the average maturity of new Ex-Im loans has been around seven years [23].

In many ways, Ex-Im is similar to a commercial bank. It borrows in one market and lends in another, it is exposed to risk of default and risk due to interest rate fluctuations, and it usually earns an accounting profit. Like a private corporation, Ex-Im is financed partly with debt and partly with equity, the equity being composed of a \$1 billion investment by the Treasury, and retained earnings of \$2.19 billion.

In other ways, Ex-Im is different than a commercial bank. It has a highly specialized loan portfolio composed exclusively of export credits, and virtually all its borrowing and lending is at fixed rates of interest. It has a large insurance and guarantee program, with approximately \$6 billion of policies in force as of September, 1980. Moreover, Ex-Im is different than a private bank by virtue of the special advantages given to it by the Congress. It borrows at the risk free (government) rate of interest, and pays no taxes. Its equity is held by the government sector and is not required to earn a market rate of return. Over the period 1976 - 1980, for example, Ex-Im's average rate of return on equity was about four and one-half percent, well below the risk free rate of interest.

III. The Benefit-Cost Framework

In the benefit-cost framework used here, cost per period, C_t , is represented by the dollar amount of new direct loans granted by the Export Import Bank in year t . Loans are treated as a form of direct government

investment; that is, a resource-using expenditure like the building of a subway system or a dam. Benefit is represented by the future stream of principal and interest payments attributable to the year's lending activity. Thus, in year t , cost C_t produces the benefit stream $B_t = b_{t+1}, b_{t+2}, \dots, b_{t+n}$, where b is principal plus interest and n is maturity in years. The present value of benefits, Γ_t is:

$$\Gamma_t = \sum_{i=t+1}^{t+n} b_i / (1+m_t^*)^i, \quad (1)$$

where m_t^* is a discount rate for futurity, and following the usual convention, net benefit, N_t , is:

$$N_t = \Gamma_t - C_t. \quad (2)$$

To compute the present value of benefits, a risk-adjusted private market rate, m_t^* , is employed in this study. There has been a continuing debate as to whether the government should use a private market rate or some other rate in assessing the value of public investments [3,8,21]. In general, though, it has been shown that disparity between the private rate and the appropriate (welfare maximizing) government discount rate depends on two factors. Either there must be imperfections in private capital markets, or the government investment must be in a risk class that is not available in the private sector [8].

Now market imperfections are a matter of degree, and no real world market is perfect in the sense of Arrow-Debreu. However, scores of empirical tests have indicated that the U.S. capital market is extremely efficient, that all publicly available information is reflected in prices, and that few arbitrage opportunities exist.^{2/} It therefore seems reasonable to assume, at least as an empirical approximation, that the private market is competitive.

The particular type of government investment considered here, dollar denominated export loans, is routinely held by private financial intermediaries, particularly commercial banks, and these financial intermediaries issue debt and equity claims that are publicly traded. Thus, there is reason to believe that Ex-Im's investments are in a risk class available to the private sector. It follows that a private market rate should be appropriate for discounting benefits.

IV. Estimating the Risk-Adjusted Discount Rate

In principle, one could empirically estimate the correct interest rate to use in discounting Ex-Im benefits by finding private assets in the same risk class, and observing their rate of return. Operationally, however, this is difficult since export loans are rarely traded, and are typically held to maturity by the lender, a commercial bank. Published data on loan rates are of little value for this purpose either, since the effective cost of a bank loan may depend on commitment fees, compensating balances, collateral requirements and a host of other terms not publicly disclosed.

An alternative approach, the one which is adopted here, is to estimate the marginal cost of capital which would confront Ex-Im, if it were a private financial intermediary. In that case, it would be obliged to pay taxes, borrow without a government guarantee, and earn a market rate of return on equity. Moreover, if Ex-Im attempted to maximize its market value in the manner of other private corporations, it would do so by equating the marginal cost of capital with the marginal rate of return on assets. That relationship is briefly described below.

Define V = the total market value of a private firm which is financed partly with debt, L and partly with equity, E . Both debt and equity are risky, and r_l and r_e are the expected rates of return which investors require, respectively, on these claims. Further defining \bar{I} = expected interest payments and $\bar{\pi}$ = expected profits,

$$V = L + E = \bar{I}/r_l + \bar{\pi}/r_e. \quad (3)$$

If \bar{r}_a = the expected rate of return on the firm's assets, before taxes, A = total assets and t = the corporate tax rate, assumed constant:

$$\bar{\pi} = (\bar{r}_a A - r_l L) (1-t). \quad (4)$$

I assume that the firm's assets are in a given risk class known to investors, and abstract from the question of optimal capital structure by assuming that if one exists, the firm is at it with,

$$L/V = K, \text{ a constant.} \quad (5)$$

Product or factor markets may be imperfect so that:

$$\partial \bar{r}_a / \partial A < 0. \quad (6)$$

the firm's objective is to maximize its market value, V , net of the cost of acquiring assets, A , or,

$$\text{Max: } (V-A), \quad (7)$$

A

subject to 3), 4), 5) and 6).

After rearrangement, the necessary condition which satisfies (7) is,

$$\bar{r}_a + A \bar{r}_a' = r_e (1-K)(1/1-t) + r_l K. \quad (8)$$

The lhs. of (8) is the equilibrium marginal rate of return on the firm's assets, which is what we want to estimate. Let us call this m^* . In value-maximizing equilibrium, m^* is set equal to a weighted average of the expected rates of return on debt and equity. The weights, $K = L/V$, and $1 - K = E/V$, are in market values and must sum to one. Finally, the required rate of return on equity is adjusted by the factor $1/(1-t)$, reflecting the fact that returns to equity are taxable at the corporate level, whereas returns to debt are not.^{3/}

Empirical Estimates: Components of the Cost of Capital

The next step is to obtain empirical estimates of the parameters r_l , r_e , K and t which would have been faced by the Export Import Bank, had it been private. To that end, a sample of commercial banks is selected, having operating characteristics as similar as possible to those of Ex-Im.^{4/} As shown in Table 1, the sample banks share three important characteristics: they are extremely large, they emphasize corporate as opposed to consumer or mortgage lending, and a substantial proportion of their loans is to foreign corporations or governments. The idea is, had Ex-Im been a private bank, it would have been similar to those in the sample. Historical sample averages are used to estimate the values of r_e , K and t that Ex-Im would have faced over the period 1976-1980. As explained below, r_l is differently estimated. In what follows, a hat denotes an estimated value, a title denotes a random variable.

Table 1

Sample Banks, December 1980

Name	Total Assets (\$Billion)	Total Loans* Total Assets (%)	Commercial and	
			Industrial Loans Total Loans (%)	Foreign Loans Total Loans (%)
Chase Manhattan Corp.	76.2	62	61	57
Citicorp	114.9	61	78	53
First National Boston Corp.	16.0	55	73	39
First Chicago Corp.	28.7	59	45	39
J.P. Morgan & Co.	52.0	51	78 **	55
Export Import Bank	14.1	98	N.A.	~100

*Loans and lease financing

**Estimated

The Tax Rate, t

Fx-Im's tax bracket is estimated as the arithmetic average tax rate for the sample banks, \hat{t} , and for simplicity, it is assumed that marginal and average tax rates are equal. As indicated in Table 2, there was considerable variability in the individual tax rates, both cross-sectionally and over time. Tax rates were particularly volatile for First Chicago Corporation which experienced substantial income swings during the sample period. However, the sample average rate was quite stable over time at about 37 percent.

The Cost of Equity, r_e

The capital asset pricing model has frequently been employed to estimate the cost of equity for private firms.^{5/} In practice r_e is usually estimated as the risk free rate of interest plus a risk premium. That is the procedure employed here. Under the appropriate assumptions [11] it can be shown that in market equilibrium:

$$r_e = r_f + \beta [E(\tilde{r}_m) - r_f], \quad (9)$$

where,

r_f = the risk free rate of interest,

$E(\tilde{r}_m)$ = the expected rate of return on the market portfolio of all assets,

$\beta = \text{cov}(\tilde{r}_e, \tilde{r}_m) / \text{var}(\tilde{r}_m)$,

\tilde{r}_m = the realized rate of return on the market portfolio, and

\tilde{r}_e = the realized rate of return on a given common stock.

Tax Rates of Sample Banks*

<u>Firm</u>		<u>1980</u>	<u>1979</u>	<u>1978</u>	<u>1977</u>	<u>1976</u>
Chase	:	.330	.435	.459	.367	.291
Citicorp	:	.399	.375	.417	.336	.356
First Boston	:	.380	.433	.462	.450	.400
First Chicago	:	(.218)	.200	.228	.255	.316
Morgan	:	.382	.342	.364	.394	.461
<hr/>						
Average [\hat{t}_t]	:	.373**	.357	.386	.360	.365

*The tax rate is defined as Tax Liability/Income Before Taxes and Securities Gains and Losses.

**First Chicago is excluded from the 1980 average.

For present purposes, r_f is represented by the 91-day Treasury Bill rate and estimates of β are taken from Value Line.

Measuring $E(\tilde{r}_m)$ is problematic since this is a market expectation, and over considerable periods of time, realized rates of return may be different than expected. However, Ibbotson and Sinquefeld, [9] found that over a very long period of time, 1926-1978, the average risk premium on the S&P 500 market index was 6.2 percent. In my estimates, it is assumed that this relationship is maintained, or that $E(\tilde{r}_m) - r_f = .062$. Expected equity returns, computed on this basis, are presented in Table 3. The expected rate of return on Ex-Im equity, \hat{r}_e^h , is estimated as the arithmetic average of returns for sample banks, and is shown in the last row. The superscript h indicates that these are "high" estimates and distinguishes them from "low" estimates, obtained by a different method and discussed next.

Another common way to estimate the expected rate of return on equity is by capitalizing an expected stream of future dividends. If, for example, expected growth in dividends per share is $E(\tilde{g})$ ad infinitum, current dividends and current price per share are D_0 and P_0 respectively:

$$r_e = D_0/P_0 + E(\tilde{g}). \quad (10)$$

In equilibrium, P_0 will be set so that r_e just equals the market's required rate of return, given the perceived risk of the stock.

D_0 and P_0 are easily measured, but $E(\tilde{g})$ is another expectations variable which cannot be observed directly. The time path of dividends depends on a firm's payout policy and on the rate of return it earns on retained earnings. If, for example, earnings grow continuously from period 0 to period t, and 1-p percent of earnings are retained and reinvested at a constant rate ρ :

Table 3

Estimates of the Expected Rate of
Return on Equity,* \hat{r}_e

<u>Firm</u>	<u>1980</u>	<u>1979</u>	<u>1978</u>	<u>1977</u>	<u>1976</u>
Chase :	.176	.163	.134	.115	.112
Citicorp :	.183	.169	.140	.121	.118
First Boston :	.164	.150	.122	.102	.099
First Chicago :	.179	.166	.137	.118	.115
Morgan :	.173	.160	.131	.112	.109
<hr/>					
Average [\hat{r}_e^h, t] :	.175	.162	.132	.114	.111

*Estimated according to equation (9).

$$D_t = D_o e^{\rho(1-p)t}. \quad (11)$$

$\rho(1-p)$ is thus the growth rate in dividends.

Table 4 shows annual values of ρ and p for the sample banks. Again, these exhibited considerable variation, both cross-sectionally and over time. However, the sample averages, $\bar{\rho}$ and \bar{p} , were relatively stable over the five year period, and the 1980 averages were quite similar to the five year averages.^{6/} Thus, it is reasonable to use the five year historical average values, denoted $\bar{\rho}$ and \bar{p} , to estimate the expected future growth rate of dividends as of 1980, $E(\hat{g})_{1980}$.

$$E(\hat{g})_{1980} = \bar{\rho}(1-\bar{p}) = .121(1-.388) = .074. \quad (12)$$

$\left(\frac{\hat{D}_o}{P_o}\right)_{1980}$ was defined as the arithmetic average of dividend/price ratios for the five sample banks, as of the end of 1980.^{7/} Substituting in (10):

$$\hat{r}_{e,1980} = \left(\frac{\hat{D}_o}{P_o}\right)_{1980} + E(\hat{g})_{1980} = .136. \quad (13)$$

This estimate of the expected return on equity is considerably lower than that obtained using the capital asset pricing model, (.136 versus .175) and implies an average risk premium of only about .022 as opposed to .061. The reason for the discrepancy is unclear, since both methods are based on expectations variables which must be proxied. It is possible that I have incorrectly estimated the expected growth in dividends, the market risk premium, the banks' betas, or some combination of all three. Therefore, in following computations I use two separate estimates of the cost equity: a "high" estimate assuming a risk premium of .061, and a "low" estimate assuming a risk premium of .022.^{8/} These are denoted \hat{r}_e^h and \hat{r}_e^l , respectively.

Table 4

		<u>Return on Book Equity, ρ_t, and Payout Ratio, p_t, [in brackets], In Percent*</u>				
		<u>1980</u>	<u>1979</u>	<u>1978</u>	<u>1977</u>	<u>1976</u>
Chase		15.8 [27.6]	14.9 [27.2]	10.7 [39.8]	7.4 [57.4]	7.0 [60.6]
Citicorp		12.8 [35.3]	15.0 [29.3]	14.8 [30.1]	13.1 [34.8]	15.1 [29.3]
First Boston		14.0 [27.7]	12.9 [30.7]	10.7 [37.9]	8.4 [49.3]	8.2 [52.4]
First Chicago		5.2 [75.5]	9.4 [40.6]	11.6 [31.9]	11.1 [34.0]	11.1 [36.0]
Morgan		15.7 [34.6]	14.8 [36.5]	14.6 [36.1]	13.6 [38.5]	14.0 [36.7]
<hr/>						
<u>Average:</u>	$\frac{\bar{\rho}_t}{\bar{p}_t}$	12.7 [40.1]	13.4 [32.9]	12.5 [35.2]	10.7 [42.8]	11.1 [43.0]

*Return on book equity is defined as net income after taxes divided by common shareholders' equity. The payout ratio [in brackets] is defined as cash dividends divided by net income after taxes.

The Cost of Debt, r_ℓ

It was tempting to estimate the marginal cost of borrowing for the sample banks and use this as a proxy for Ex-Im's cost of debt. However, private bank borrowing costs are themselves subsidized to some degree, due to Regulation Q and the prohibition of interest on demand deposits, and for present purposes I wanted a market cost of borrowing, not a subsidized cost. Moreover, private commercial banks borrow primarily at short maturities, whereas Ex-Im borrows at intermediate to long maturities. Alternatively, therefore, it was assumed that Ex-Im borrowed at the long-term corporate bond rate. Since it was unclear as to how its debt would have been received by the market, two different rates were assumed, Moody's AAA and A. These are denoted \hat{r}_ℓ^l and \hat{r}_ℓ^h , respectively.^{9/}

Table 5 shows the AAA and A rates over the sample period and also shows the average rate of interest on new debt issued by Ex-Im. The value of Ex-Im's government guarantee was apparently substantial, reducing interest costs by an average of about 50 basis points vis-a-vis the AAA rate and about 110 basis points vis-a-vis the A rate.

The Market Weight, K

In the equilibrium condition (8) K is defined in terms of market values of L and V. Therefore it is necessary to estimate the market values of debt and equity which would have been observed, had Ex-Im been private. Published balance sheet data are not good proxies for market data in this case, as Ex-Im earned below market rates of return on both debt and equity.

Table 5

Bond Interest Rates (%)

<u>Year</u>	<u>Moody's AAA Corporate*</u>	<u>Moody's A Corporate*</u>	<u>Ex-In Issues**</u>
1980	11.94	12.89	11.20
1979	9.63	10.20	9.39
1978	8.73	9.12	8.34
1977	8.02	8.49	7.33
1976	8.43	9.09	7.88

*Annual Average. (Source, Federal Reserve Bulletin, various issues.)

**Dollar weighted average of new issue rates. (Source, Annual Reports, Export
Import Bank, various years.)

The approach adopted here is to estimate L and E by discounting the relevant cash-flows from the income statement. To estimate the market value of equity, I discount profits, net of predicted taxes, at the market-required rate of return on equity. Thus, if π = total profits reported by Ex-Im, and \hat{E} = the estimated market value of equity,

$$\hat{E} = \pi(1-t)/\hat{r}_e. \quad (14)$$

The market value of debt is estimated in a similar manner. In this case, however, I invoke the simplifying assumption of a flat term-structure, which permits the valuation of Ex-Im debt as if it were consol bonds. That is, I capitalize interest payments only, and ignore the repayment of principal. Over the sample period the yield curve had a positive slope about as often as a negative one, and thus the assumption of a horizontal term structure is reasonable at least on average.^{10/} The market value of Ex-Im debt is therefore estimated:

$$\hat{L} = I/\hat{r}_\ell, \quad (15)$$

where I is total interest expense reported by Ex-Im.

Table 6 shows the estimated market values of debt and equity in each year, as well as the accounting values reported by the Export Import Bank. There are two estimates of each market value, one derived with high cost of capital, the other with the low cost of capital. For consistency, the superscripts h and l refer to the cost of capital used in the estimate, not to the market value of debt or equity. For example, \hat{L}^h is the market value of debt estimated with the high (single A) interest rate, and \hat{L}^l is the market value of debt estimated with the low (AAA) interest rate. Naturally, $\hat{L}^h < \hat{L}^l$.

Table 6

Ex-Im Capitalization: Accounting Data and Market Value Estimates*

Year	Total Debt, L (\$ million)			Total Equity, F (\$ million)			Total Capitalization V, (\$ million)			Leverage (%)**		
	Book	Market	Market	Book	Market	Market	Book	High	Low	Book	High	Low
		\hat{L}^L	\hat{L}^H		\hat{E}^L	\hat{E}^H		Market	Market		Market	Market
1980	10,087	7,116	6,591	3,187	506	393	13,994	7,622	6,984	.772	.934	.944
1979	8,936	7,004	6,613	3,078	830	630	12,014	7,834	7,243	.744	.894	.913
1978	8,709	7,298	6,986	2,954	909	647	11,663	8,207	7,633	.747	.889	.915
1977	8,785	7,773	7,343	2,850	1,172	771	11,635	8,945	8,114	.755	.869	.905
1976	8,169	6,151	5,723	2,719	1,018	660	10,888	7,169	6,383	.750	.858	.897

*The market value of debt is estimated according to (15), the market value of equity according to (14). Two market value estimates are provided. The "high" values in this table are calculated using the "low" discount rate, and vice versa.

**Total debt/total assets.

As expected, estimated market values are consistently lower than accounting values, reflecting a probable bias in the accounting data. On average, the accounting value of debt exceeded market value by 28 percent or 37 percent, depending on which estimate is employed. More striking, the average accounting value of equity was 3.33 times market value according to one estimate, 4.77 times according to the other. Thus, the discrepancy between accounting and market values is relatively greater for equity than for debt. The result is that financial leverage is much greater when computed with market values than it is with accounting data. Or, put another way, Ex-Im is much more highly levered than one would conclude from examination of its balance sheet.^{11/}

Empirical Estimates of Ex-Im's Cost of Capital

We now have all the parameter estimates necessary to compute the risk-adjusted private cost of capital, m^* , defined by (8). These are in Table 7, where again there are two estimates for each period, \hat{m}^{*h} and \hat{m}^{*l} . \hat{m}^{*h} assumes the A bond rate and a 6.1 percent risk premium on equity, whereas \hat{m}^{*l} assumes the AAA bond rate and a 2.2 percent equity risk premium. For purposes of comparison, Table 7 also shows the average rate of return on new Ex-Im loans in each year, the latter being a reasonable approximation of the marginal rate of return on loans, m_t .^{12/} In each year, $m_t < \hat{m}_t^{*l} < \hat{m}_t^{*h}$; in other words, the realized rate of return on lending was always less than the estimated private cost of capital. This, in turn, implies that there was a consistent subsidy component in Ex-Im lending. The next section presents estimates of that subsidy.

Table 7

Estimated Marginal Cost of Capital and
Realized Marginal Rate of Return on
Ex-Im Loans

	Cost of Capital*		Realized Marginal Rate of
	\hat{h}_m	\hat{g}_m	Return on New Loans**
			\bar{m}
1980	.137	.125	.083
1979	.115	.106	.083
1978	.102	.094	.085
1977	.094	.085	.081
1976	.100	.088	.078

*Defined by equation 8.

**Source, Special Analyses, Budget of the United States Government, [23], various dates.

V. Estimating Present Benefits, Γ and Net Present Benefits, N

Table 8 shows the total amount of new direct loans in each year, the average rate of interest on those loans at origination, and their average maturity. These data are necessary to determine the benefit stream, B_t , attributable to total loans C_t in year t . However, the elements of B_t (principal and interest payments) are not constant over time. As mentioned previously, Ex-Im often cooperates with private financial intermediaries in making export loans. In such arrangements, it takes the long maturities on a particular credit and the private lender takes the short maturities. Operationally, the borrower pays a constant amount of interest and principal in each year, but principal payments go first to the private lender, until its portion of the loan is paid off, and then to Ex-Im. The result is that Ex-Im's cash-flows exhibit a discrete increase part way through the life of the loan. In a detailed study of Ex-Im lending practices in 1979-1980, Baron found that the average moratorium on principal repayments to Ex-Im was about 40 percent of the term to maturity [4]. Thus, on a ten year loan, Ex-Im would be to receive principal payments after the fourth year. The estimates of Γ in Table 8 assume a 40 percent moratorium and a semi-annual repayment schedule, the latter being standard operating procedure for the agency. Let Ψ = the moratorium as a percentage of average loan maturity. Then, equation (1), which defines the present value of benefits, becomes:^{13/}

$$\Gamma = \frac{C}{m^*} \left\{ m \left[1 - \frac{1}{\left(1 + \frac{m^*}{2}\right)^{2n}} \right] + \frac{1}{n(1-\psi)} \left[\frac{1}{\left(1 + \frac{m^*}{2}\right)^{2n\psi+1}} - \frac{1}{\left(1 + \frac{m^*}{2}\right)^{2n}} \right] \right\}. \quad (16)$$

Derivation of (16) is straightforward, but tedious, and will not be presented.

Table 8

Benefit Estimates, 1976-1980

Fiscal Year	New Loans* (\$ million) C	Average Maturity** (Years) N	Average Rate of Interest** (%) m	Present Value of Benefits (\$ million)		Net Present Value of Benefits (\$ million)		Subsidy Rate (%)	
				High \hat{r}^l	Low \hat{r}^h	High \hat{N}^l	Low \hat{N}^h	$-\hat{N}^l/C$	$-\hat{N}^h/C$
1980	3,288	7	8.3	2,767	2,635	(521)	(653)	15.8	19.9
1979	1,629	7	8.3	1,483	1,429	(146)	(200)	9.0	12.3
1978	1,260	7	8.5	1,220	1,178	(40)	(82)	3.2	6.5
1977	1,789	6	8.1	1,713	1,658	(76)	(131)	4.2	7.3
1976	2,206	8	7.8	2,148	2,032	(58)	(174)	2.6	7.9

*Source, Export Import Bank, Annual Report, [1], various years.

**Source, Special Analyses, Budget of the United States Government, [23], various years.

Table 8 shows the present value of benefits, computed according to (16), and the net present value of benefits according to (2). The net present value of benefits, N, is negative in every year, whether the low or high estimate is used. In other words, there was a consistent subsidy component in Ex-Im lending which averaged about \$168 million per year according to the low estimate, and about \$248 million according to the high estimate. The subsidy increased substantially during the last two sample years, more than doubling in 1979 and again in 1980, and by 1980 it was somewhere between \$521 million and \$653 million. This was partly due to increased lending, but also due to an increased spread between Ex-Im loan rates and the private cost of capital. The latter factor is reflected in the Subsidy Rate, shown in the last two columns of the table. The Subsidy Rate measures the dollar amount of net subsidy, per dollar of loan. This rate also increased rapidly during the last two sample years, and by 1980 was in the 15-20 percent range.

The results for 1979 and 1980 clearly reflect a major policy shift which began in early 1978 under the Carter Administration. At that time, the Export Import Bank announced an aggressive policy of supporting U.S. exports by lending more, and at lower rates relative to market [6,16]. As indicated by these estimates, the policy was "successful" at least in the sense that it greatly increased the subsidy component in Ex-Im loans.^{14/}

Problems With the Accounting Data

The actual subsidy in Ex-Im direct lending is almost surely greater than is indicated by the estimates in Table 8, which are based on income data reported by the agency. For two reasons, reported Ex-Im income is overstated by some unknown amount.

First, unlike private banks, Ex-Im is not obliged to adhere to generally accepted accounting principles, nor does it. It is not required to make realistic provisions for loan losses or to write off bad loans in a timely manner. In fact, "No loans were written off in fiscal years 1979 and 1980, and only \$8 million in loans has been charged off against income since 1934. For example, no determination of uncollectibility has been made for delinquent loans of \$26.4 million made in 1946 to the then recognized government of China and \$36.3 million made to Cuba before 1961 when a prior government existed." [18, p. 14]

Second, interest income is systematically overstated. Sometimes, loans made by Ex-Im, or for that matter by private banks, are in a sort of questionable status. That is, they are delinquent and yet there remains a reasonable chance that they will ultimately be collected. Private banks ordinarily put such loans on a "nonaccrual basis," which means that interest can be shown as income, but only as it is actually collected. Ex-Im does not follow this procedure. Thus, its reported interest income includes accrued interest which has not actually been collected, and may never be. In recent years, this has become a sizable component of reported income. In 1978, accrued interest on delinquent loans accounted for 7.9 percent of Ex-Im's reported net income. In 1979, it accounted for 15.7 percent and in 1980 for 84.5 percent. [18, p. 17]

VI. Indirect Social Benefits Due to Ex-Im Lending

My estimates of the direct costs and benefits of Ex-Im lending indicate that a net cost was incurred in each year studied. A logical next question then is, "Are there positive externalities or indirect social benefits resulting from export lending which offset these direct costs?"

In general, there are only two reasons for government intervention in private markets. These are the existence of externalities not reflected in market prices (market failure), or an undesirable distribution of income across classes of economic agents [5]. Now, Ex-Im lending is difficult to justify in terms of income redistribution, since the recipients of subsidy are foreign firms or governments, and U.S. exporters. Normally, the subsidy is shared between these groups, and the higher the price elasticity of export demand, the larger the share going to the foreign sector. Ex-Im loans are highly concentrated in a few export industries, and to the extent that the subsidy is captured by U.S. firms, most of it goes to a handful of large corporations. In 1980, for example, 27 percent of the bank's loans went to finance Boeing Company exports. Westinghouse, Combustion Engineering, McDonnell Douglas, Western Electric, Lockheed, and General Electric accounted for an additional 40 percent of loans extended [16]. There is no obvious reason to subsidize these large firms, and Ex-Im is not mandated to give foreign aid. Therefore, if there are indirect social benefits due to Ex-Im lending, these must result from market failure.

Export Demand and Employment

It is sometimes argued that, without government intervention, the level of U.S. exports would be less than socially optimal. Various reasons are given for this claim, but the most common is that foreign governments themselves interfere with trade, either by restricting imports or by subsidizing exports [18,19]. Thus, it is reasoned, Ex-Im lending is desirable since it stimulates U.S. export demand, offsetting foreign official intervention. A corollary is that by increasing U.S. exports, Ex-Im lending increases domestic

employment. I examine these arguments in reverse order, first considering the employment effects of export subsidization.

Sector-specific government programs such as Ex-Im may increase labor demand in the industries directly benefited, and in turn, this effect may be measured empirically []. It would be incorrect, however, to conclude from such evidence that aggregate employment has been favorably affected. In other words, such programs may alter the allocation of employment opportunities without increasing the total. There is a continuing debate on this topic, which goes beyond the scope of the present study. Simply stated, however, it is not clear that demand-inducing government policies have had much, if any, sustained effect on aggregate employment [12].

Nor is there reason to believe that subsidized financing stimulates export demand, except in a short run ceteris paribus sense. Over time, exchange rate fluctuations will operate so as to mitigate the effect of export subsidies. Moreover, liberalization of official U.S. credit terms is likely to evoke a policy response by other nations, and vice versa. The more successful a given strategy in stimulating exports, the more likely it is to provoke foreign retaliation in the form of trade barriers, or increased subsidization by other exporting nations. Even the governments involved have recognized this problem, and since 1973 have negotiated to reduce official subsidies to export finance. In 1978 the United States signed the "Agreements on Guidelines for Official Supported Export Credits," which put voluntary limits on interest rates and repayment terms. These are generally viewed as ineffective, since signatory nations seem willing to violate the guidelines at will. And attempts to negotiate further restrictions have had little success [18,24]. Nevertheless, the negotiations themselves evidence official recognition that competitive subsidization of export finance is largely self-defeating.

An Instrument of Foreign Policy

This logically brings us to another social benefit which is sometimes attributed to the Export Import lending program; namely, that it represents an instrument of foreign policy [18,19]. In particular, the argument goes, Ex-Im lending terms can be strategically manipulated so as to influence the outcome of trade negotiations such as those mentioned above.

For the last several years, Ex-Im has been used as a sort of "club" to wield over the heads of other major exporters. For example, the government of France has been viewed as particularly uncooperative in bargaining, and in response Ex-Im offers uniquely favorable terms on export transactions where France is the main competitor. Also, the bank has long threatened to retaliate against foreign subsidization of export finance by offering extremely long maturities which most foreign countries would find difficult to match. Recently, it began making selected loans with maturities up to 20 years, in effect living up to that threat [24].

Now, an analysis of the strategic value of Ex-Im in this capacity is well beyond the scope (and expertise) of the present study. However, I cannot drop the issue without making one passing observation. Over the period studied, 1976-1980, the United States made little if any detectable progress in achieving its objectives via trade-finance negotiations. Thus, if actual results of negotiations are any measure of Ex-Im's strategic value to the U.S., that value was nil.

Market Failure in Export Finance

It is often argued that there is market failure in export financing, and Ex-Im's primary value is to correct that failure [17]. The reason given is that most private financial intermediaries do not have sufficient expertise to assess the risk of export loans, which depends on several unique factors. These include the risk of government expropriation (sovereign risk) and the risk that the borrower will be unable to obtain dollars to repay the loan (convertibility risk). As a result, it is argued, few private intermediaries are willing or able to lend in the export market [17,18]. Thus, without government intervention, there would be an inadequate supply of export financing.

This argument ignores the size composition of the financial intermediary industries, especially commercial banking. While it is true that most private intermediaries have no expertise in cross-border lending, large commercial banks such as those in our sample certainly do. These banks have international staffs as large or larger than that of Ex-Im, and networks of overseas offices and branches not available to the agency. They lend in several hundred countries and, in doing so, routinely assess the above mentioned risks. Although there are a limited number, perhaps 20 or 30, domestic banks which fit this description, the skewed size distribution of the industry results in their holding the majority of U.S. banking assets.

A corollary to the above argument is that sovereign and convertibility risk apply to entire countries, or even regions of the world, and are not easily diversifiable. Thus, it is argued, the private sector may be unwilling to provide the socially optimal quantity of export finance, or to provide it in the appropriate form. As evidence of such market failure, it is

noted that in recent years, commercial banks have become virtually unwilling to make long term fixed-rate export loans. Therefore, it is reasoned, it is necessary for Ex-Im to "fill the gap" [18].

This argument overlooks the fact that export finance is available from a number of private sources, not just banks. For example, dollar-denominated fixed rate debentures may be sold by foreign importers or U.S. exporters, either in the United States or in the Eurobond market. Private market alternatives are available, at least to firms with sound credit ratings. In this respect, there is little difference between export finance and domestic U.S. finance, since most commercial banks prefer short maturities and/or floating rates on all their lending. If this preference evidences market failure, therefore, it is a general malaise not confined to export lending. Baron makes an interesting observation regarding the incentives of U.S. exporters and foreign importers. "If an importer has an opportunity to obtain subsidized export financing (from Ex-Im) the amount of subsidy will be greater the longer is the maturity. This may explain why importers and exporters claim that long maturities are needed."^{15/}

VII. Summary and Concluding Observations:

An Aside on the Economic Theory of Regulation

My empirical estimates indicate that the Ex-Im direct lending program resulted in a net direct cost in each year studied, and that this net direct cost increased substantially over the sample period. Due to problems with the accounting data released by the agency, it is likely that the true costs were even greater than estimated here.

It is difficult to justify these direct costs in terms of indirect social benefits, since there is little evidence that subsidized export lending contributes to economic efficiency by offsetting market failure. The private market for dollar denominated export financing is large and extremely competitive, except in the area of fixed rate term loans where, quite naturally, Ex-Im dominates.

It is not likely that subsidized lending has had a large effect on the long run equilibrium level of U.S. exports either, once it is recognized that foreign governments' policies must be treated as endogenous; that is, they can and do respond to Ex-Im. Nor can the direct loan program be justified in terms of income redistribution effects, since the primary beneficiaries are foreign firms or governments, and a handful of large U.S. corporations.

The Economic Theory of Regulation

If we assume that these conclusions are basically correct, and assume further that Ex-Im has not been a valuable tool of U.S. foreign policy, then the social cost of Ex-Im direct lending has exceeded the benefit for at least five years. The public policy entailments of this conclusion are obvious. However, a vexing question is then raised. "Why has the program continued to exist in its present form and, in fact, to grow substantially?

One possible explanation is that policymakers have been systematically misguided, overestimating the benefits of the program, underestimating the cost, or both. Yet, Ex-Im has certainly had the time and incentive to carefully investigate the relevant cost-benefit trade-offs, having for years been subjected to periodic criticism from Congress, the GAO, and elsewhere.

Moreover, this theory does not explain certain long-standing Ex-Im policies. Why, for example, does the agency intentionally perpetuate the notion that it is "self financing" and thus costless to the public? Surely, it knows that this rhetoric is misleading. Why does it effectively "cook its own books" using odd accounting procedures which overstate true earnings by some unknown amount?

Prima Facie, such policies may be better explained by the Economic Theory of public agencies, as proposed by Stigler [29], Posner [27] and others. In this, the concluding section, I argue that Ex-Im's policies have been quite consistent with this body of theory and that, in fact, it may be one of the best examples in the literature. I must clearly point out, however, that these observations do not constitute a "proof" of the Economic Theory, or a "proof" that Ex-Im is motivated by the incentive structure it assumes. All I claim is that the agency's behavior has been remarkably consistent with the theory's predictions.

The Economic Theory was originally developed to explain the behavior of regulatory agencies. Briefly, it postulates that regulation may, in appropriate circumstances, be a substitute for private cartelization of an industry; that is, government regulation may increase profits by fixing prices, limiting entry or, in general, by suppressing competition.^{16/} Regulatory cartelization suffers from the same problems as private cartelization, including the free rider problem and the incentive for cartel members to cheat by cutting prices.

The theory further postulates that such regulation is demanded by industries, and that demand will be greatest when cartelization is difficult, for example, because it is highly visible. It is hypothesized that regulation is supplied by the political system in exchange of payment in the form of

votes, campaign contributions, future jobs in private industry, etc. Some industries may be able to influence the political process more cheaply than others, especially if they are able to deliver large blocks of votes.

Posner [27] has pointed out a fundamental problem with the Economic Theory of Regulation, however. In most cases, its predictions are not sufficiently precise to be testable. Quoting Posner,

I used to think that there was one case in which the theory yielded an unequivocal and testable prediction. That is where the number of firms in the industry is small, thereby facilitating organization of the industry for effective political action, but the number of employees in the industry is great. Since the profits from protective regulation can be divided between the employees and the firms through collective bargaining, it should be possible for the firms to induce the employees to "lend" their voting power to obtain such regulation. [27, pp. 347-48]

Such an industry would seemingly exhibit ideal demand and supply conditions which result in a heavily regulated equilibrium. Yet, Posner goes on to point out that even this case is ambiguous. If the number of firms in an industry is small, this tends to reduce the cost of private collusion, which is a substitute for regulation. Moreover, the sort of protective regulation which benefits firms in an industry is likely to conflict with employee objectives. For example, restricted entry may reduce the number of jobs, and artificially high prices will reduce output demand which, in turn, reduces demand for factor inputs including labor.

Interestingly, the Export-Import Bank could be Posner's "missing link;" that is, a government agency with the extreme demand and supply conditions he describes, but absent the complications which conflict with an unambiguous prediction. To see this, however, the theory must be broadened to recognize that government agencies may supply an outright subsidy (as opposed

to cartel-like regulation), and that the subsidy may be demanded by any interest group, not necessarily firms in a particular industry.^{17/}

In Ex-Im's case the relevant interest group is composed of U.S. firms which export long-lived capital assets. The effective price of such goods is importantly dependent on financing costs, so that these firms have the most to gain from subsidized export loans. They tend to be large capital-intensive companies and, as we have already seen, Ex-Im lending is heavily concentrated in a few of them. In 1980, for example, 67 percent of total direct loans went to finance the exports of only seven firms. This sort of concentration is typical year after year, and thus, Posner's small number of firms condition is well satisfied. His large number of employees' condition is well met also, as these seven firms have in excess of one million employees, worldwide. It is not clear how many of these are U.S. citizens, but certainly the substantial majority.

The basic demand and supply conditions for a heavily regulated (or in this case, heavily subsidized) equilibrium are therefore fulfilled. However, those factors which confound an unambiguous prediction are notably absent in this case. Firms in the interest group export many different products and are in different industries which may or may not be cartelized. Thus private cartelization is not a substitute for Ex-Im loans, the latter being a subsidy to the interest group.

Nor is there a conflict of interest between firms and employees in this case. Subsidized financing tends to increase product demand, not reduce it, and this may be expected to result in more jobs as well as higher profits. The coalescing of firm-employee interests is unambiguous. In fact, there exists a lobbying organization entitled the Labor-Industry Coalition for International Trade (LICIT). Its membership includes the major exporters

and the Industrial Union Department of the AFL-CIO. Not surprisingly, one of LICIT's primary missions is to lobby Ex-Im for more and cheaper export loans.

In all respects, the theory would seem to predict a highly subsidized equilibrium and that, according to my estimates, is what we observe. Finally, Ex-Im's confusing rhetoric and accounting procedures are easily explained in this framework.

The use of language that, if the economic theory of regulation is correct, is utterly uninformative and indeed misleading is not costless; presumably it is employed because there are offsetting benefits. These benefits must have to do with increasing the costs to members of the public of obtaining accurate information about the effect of the actions of their legislative representatives on their welfare. [27, p. 355]

Footnotes

1/In fiscal 1980, the largest direct loan programs had loan obligations or commitments as follows: Agricultural Credit and Insurance, \$7.5; Rural Housing Insurance fund, \$6.8; Export Import Bank, \$5.5; Agricultural Price Supports, \$4.9; F.H.A., \$3.0. (Billions of dollars, [23]).

2/For an excellent review of empirical tests of capital market efficiency see Dyckman, Downes and Magee, [7].

3/In general, $V > A$ when (8) holds. In the special case of perfect competition in the product and factor markets, (8) simplifies to, $m^* = \bar{r}_a = r_e (1-K) (1/1-t) + r_k K$. Scale is indeterminate and in this case $V = A$.

4/The sample firms are actually bank holding companies. Most large commercial banks have the holding company form of organization, and in almost all cases it is holding company shares that are traded in the equity market.

5/See Litzenberger, Ramaswamy and Sosin [11] for a discussion of such applications in the public utilities industry.

6/If the 1980 average values of ρ and p are substituted in (12), $E(\hat{g}) = .076$. The actual compound growth in total dividends paid by the five banks over the sample period was .075.

7/Nearby dates were checked to be sure the dividend/price ratios as of the end of 1980 were not "abnormal". They did not appear to be.

8/Ibbotson and Sinquefeld [9] estimated the market risk premium to be .062. The average risk premium for the sample banks is slightly lower, .061, since the average beta is less than 1.

9/All five sample banks have term debt outstanding and all are rated AAA or AA. Therefore, the assumption of an A rate for Ex-Im is intentionally conservative.

^{10/}With publicly available data, it is not possible to determine the maturity structure of all Ex-Im debt outstanding during the sample period. According to the Office of Management and the Budget, however, the average maturity of newly issued Ex-Im debt has consistently been about 7 years. Invoking the heroic assumption that all debt issues had a 7 year original maturity, the average maturity of outstandings was approximately 3-1/2 years.

I estimated the market value of Export Import debt assuming a 3-1/2 year maturity, and these estimates were quite similar to those based on the assumption of an infinite maturity. This reflects the fact that the yield curve is generally quite flat beyond a few years maturity.

^{11/}Ex-Im has long maintained that it is well capitalized vis-a-vis the largest private banks [18, pp. 13-14], and that is true if one compares accounting data. In 1980, for example, the average accounting ratio of debt/total assets for sample banks was .960, compared with a value of .772 for Ex-Im.

If debt/total assets is computed with market values, however, the 1980 sample bank average was .973, compared to a value between .934 and .944 for Ex-Im. Although Ex-Im still looks better, it's "advantage" over the private commercial banks is greatly reduced when capitalization is measured in market value terms.

^{12/}As explained in footnote 13, however, it is only an approximation.

^{13/}For simplicity, time subscripts are omitted in (16). m is the effective rate of interest paid by the borrower. The rate earned by Ex-Im is actually somewhat lower due to the moratorium on principal repayments.

^{14/}The policy also produced some problems for Ex-Im, particularly in satisfying the Congressional mandate that it be self-sustaining; e.g., show an

accounting profit. Reported profits declined by about 50 percent in 1980 and losses are projected for 1981, 1982, and possible beyond. A recent GAO study was extremely critical of the bank, questioning the adequacy of its loss reserves and its ability to survive without appropriated funds [18].

^{15/}Baron, [4, p. 7], italics added.

^{16/}Commercial banking is an excellent example of such an industry. Regulation limits entry, sets ceilings on deposit interest rates and prohibits interstate (spatial) competition. (See Boyd and Kwast [26]).

^{17/}This sort of generalization is not new, for political scientists have long studied the role of interest groups in public policy formation [28]. Typically, however, they have not employed an economic (supply and demand) framework.

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