THE STRUCTURE, CONDUCT, AND PERFORMANCE OF THE CCC EXPORT CREDIT SALES PROGRAM WITH A CASE STUDY OF THE ADDITIONALITY EFFECT OF CCC FINANCED COTTON EXPORTS TO KOREA

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ABSTRACT

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The CCC Export Credit Sales Program was the most important export credit program ever offered by the USDA. The program provided financing for US agricultural exports on credit terms for as long as three years. The program was administered by the Office of the General Sales Manager (OGSM) within the USDA. This research attempts to evaluate and measure, when possible, the performance of the program with respect to it's objectives.

This research adapted the structure, conduct, and performance model of industrial organization theory, and applied it to the problem of assessing the program's performance. The analysis of the program's structure begins with a description of the program's values, goals, and objectives, identifies the program's participants, outlines the problems associated with overlapping administrative jurisdiction, and discusses the role of the program in overall agricultural export policy. This research explains the rationale for export credit programs with regard to of the current structure of international agricultural markets.

This research describes the administrative functions of the OGSM. This research found that relations with other USDA

departments and other federal agencies could influence program performance. Generally, the interest rate charged by the OGSM was below comparable market rates, and constituted an implicit price subsidy.

Previous attempts to measure the performance of export credit programs have suffered from a variety of shortcomings. Other export credit studies are discussed, and an alternative methodology is proposed. Performance must be measured against its explicit goal of increasing exports. However, this research also addresses the question of performance with respect to secondary political and economic effects.

The ability of an export credit program to increase foreign sales is called additionality. This research attempts to measure the additionality of export credits for cotton sales to the Republic of Korea. A theoretical model is developed to describe the influence of CCC credits on a Korean textile firm's cotton purchasing behavior. This research uses a pre-existing model of the Korean economy to simulate the effects of a change in export credits. Changes in cotton imports, other agricultural trade, and all trade are documented. The cumulative increase in all Korean imports due to the export credits was 3.5 times the amount of the credits.

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CHAPTER I

INTRODUCTION

The Commodity Credit Corporation's Export Credit Sales Program provided financing for U.S. agricultural exports on credit terms for as long as three years. The Program established lines of credit for specific countries for the purchase of specific commodities. U.S. exporters (or foreign importers) could draw upon these lines of credit when exporting (importing) U.S. commodities. First established in 1956 and expanded in 1966, the Program had two objectives: 1) to maintain and develop markets; and 2) to increase commercial sales of U.S. agricultural commodities which were in need of export assistance. The Program was designed to do this while attempting to minimize the displacement of cash sales and commercial financing.

The Export Credit Sales Program began on February 7, 1956. The initial emphasis was to allow the Department of Agriculture to dispose of government-owned stocks by financing export sales on a short term basis. Countries benefitting from the credit then were primarily Western European nations and Japan. In 1966, the Program was expanded and privately held stocks were made eligible for export financing. At the same time, the focus of the Program shifted from the disposal of surplus commodities to the purposeful development of overseas markets. With the restoration of the Japanese and European economies, the Program directed credit away from these cash markets towards

the emerging markets of Eastern Europe, North Africa, Latin America, and other areas.

Budget allocations for the Program rose dramatically in the 1970's (see Table I) and, concurrent with the increase in its funding, the Program came under the increased scrutiny of other government agencies and Congressional authorities. A report released by the General Accounting Office in the Fall of 1979 raised some fundamental questions about the Program's structure, conduct and performance.[1] The GAO's investigators cited studies which indicated that the gain in exports due to the Program were significantly less than the amount of CCC credit granted.[2] Congressional critics also questioned the effectiveness of the Program and charged that greater efforts were needed to objectively evaluate Program performance.[3]

In FY 1980, the Program was discontinued and all credits ended on September 30, 1980. At the same time, the CCC moved to the sole use of credit guarantees as their primary tool for commercial export promotion. The termination of the Program may, however, prove to be temporary. Section 1201 of the Agriculture and Food Act of 1981 authorized the CCC to establish an Agriculture Export Revolving Fund. At present, funding has been approved for some export promotion effort but the exact form the effort will take has not yet been announced.

TABLE I

VALUE OF U.S. AGRICULTURAL EXPORTS FINANCED FY THE CCC
(1,000 dollars)

Year[a]	Total Exports[b]	Exports to Korea[c]	Total Cotton Exports[d]	Cotton Exports to Korea[e]
1956	1,406	-	-	-
1957	4,567	-	361	-
1958	11,873	-	-	-
1959	38,756	-	-	-
1960	794	-	-	-
1961	18,450	-	-	-
1962	32,808	-	-	-
1963	76,590	-	-	-
1964	118,443	3,590	39,770	1,134
1965	94,484	40	28,030	40
1966	216,768	447	16,168	476
1967	334,779	4,818	39,906	3,018
1968	144,929	6,250	51,759	5,708
1969	115,943	45,460	46,251	10,095
1970	211,346	36,986	48,222	22,186
1971	390,796	62,797	58,667	30,410
1972	371,612	65,175	79,003	40,011
1973	1,028,540	109,245	117,767	64,941
1974	297,900	48,400	63,400	48,397
1975	248,600	60,200	97,400	59,495
1976	618,500	204,300	244,400	103,851
1977	755,300	128,400	98,500	78,117
1978	1,582,600	432,300	229,600	200,625
1979	-	-	-	272,657

[a] Fiscal Year, 1959-1963
Fiscal Year, 1963-1976 July 1 - June 30
Fiscal Year, 1977-.... October 1 - September 30
Sources:

[b] ERS, U.S. Agricultural Exports Under Public Law 480, ERS-Foreign 395., October 1974, p. 238. & FAS, "Commercial Financing Under the CCC Credit Sales Program Reaches Record $1.6 Billion in Fiscal 1978," FATUS, January 1979, pp. 50-53.

[c] ERS, Ibid., p. 250. & FAS, Ibid.

[d] ERS, Ibid., p. 233. & FAS, Ibid.

[e] OGSM, Printout of Country-Commodity tables (Korea-Raw Cotton), Computer printout using OGSM data base, Washington, D.C.: OGSM, USDA, May 31, 1980, pp. 49-53. Since the definition of fiscal years overlap for the nine month period October 1, 1976 to June 30, 1977 approximately 44,719 thousand dollars worth of CCC financed cotton exports to Korea are counted twice, once for fiscal year 1976 (July 1, 1976 - June 30, 1977) and once for fiscal year 1977 (October 1, 1976 - September 30, 1977).

Objectives

The primary objective of this study is to describe the Export Credit Sales Program's structure, conduct and performance. Emphasis will be placed on assessing Program performance and, in particular, evaluating the Program's export enhancing effects. The description of the Program's structure and conduct will be broad in scope but the analysis of performance will be more specific and will concentrate on measuring one aspect of performance in one unique case, CCC financed cotton exports to Korea.

This study is an extension of the work done under a research grant funded by the Office of the General Sales Manager (OGSM) which administered the Program. This research addressed the theoretical and methodological problems associated with quantifying the export enhancing effects of the Program. These effects had been described by other researchers as the "additionality" effect and was defined as the increase in exports due to the export financing. The OGSM funded research analyzed the additionality effect in the context of a single country and a single commodity. At the request of the OGSM, the case study was cotton exports to the Republic of South Korea.[4]

The importance of the Program in promoting cotton exports to Korea was confirmed by the President of the American Cotton Shippers Association:[5]

> "I was first struck, and forcibly so, with the importance of the CCC Credit in the preservation

> of our 95-98% share of the Korean market when I went to Korea as a trade team leader in 1974. Nothing that has happened in the ensuing years has changed my belief in the great importance of CCC Credit in preserving this market for U.S. cotton. Representatives from the Spinners and Weavers Association of Korea, in emphasizing the importance of CCC Credit ... stated that numerous cotton producing countries have approached Korea in an effort to obtain an increased share of their market. In our opinion, without CCC Credit, it would only be a short time before the United States would end up with only 30-40% of the Korean market, just as we have roughly one-third of the Taiwan, Hong Kong and Japanese markets."

The selection of Korea and cotton as a case study to assess the Program's additionality effect is an obvious choice for reasons other than just the Program's influence on relative market share. Over the nine years, 1970-78, Korea received a total of 1,207 million dollars of CCC credit and it ranked first among countries receiving credit during that period. Of these credits, 792 million dollars, approximately 66 percent, went for financing cotton exports.[6] Over the five years, 1974-78, Korea was the United State's first or second largest market for cotton. Of the 733 million dollars of cotton exports financed by the CCC, 635 million (87 percent) went to Korea.[7] During this five year period, 44 percent of all U.S. cotton exports to Korea were CCC financed.[8]

During the course of the OGSM study, it became clear that this single measure of performance could not be fully evaluated unless it was linked with an understanding of the other dimensions of performance and an appreciation of the structural and behavioral factors which determined that performance. Were there other returns to the Program other

than just the increase in commodity exports? What aspects of Program administration seemed to impact favorably or unfavorably on performance? What kind of institutional constraints was the Program forced to operate under? These and other issues needed to be addressed and ordered before it was possible to put the Program's additionality effect in its proper perspective. Consequently, the specific objectives of this study are as follows:

1. Describe the institutional environment in which the CCC Export Credit Sales Program operated. This study will describe the linkages between the specific measures of the Program's performance with its structure and conduct.

2. Develop a theoretical framework to evaluate the economic returns to the credit sales. Specific emphasis will be placed on credit sales of cotton to Korea but the general applicability of the analysis will be demonstrated.

3. Describe and measure the increase in U.S. exports to Korea that can be attributed to CCC export credits for cotton.

Procedures

The research procedures employed in this study can be described as follows:

1. Develop an institutional model of the Program's structure, conduct and performance. The model will employ the appropriate neoclassical, institutional and organizational theories.

2. Review the Federal laws and administrative regulations which governed the Program and its operations. Survey the Congressional testimony of Program administrators and other qualified witnesses over the last five years, and review the published and unpublished reports and studies on the Program and similar export promotion programs (i.e. the Eximbank).

3. Interview officials and administrators of the OGSM, the Foreign Agriculture Service (FAS), the Economic Research Service (ERS), the Treasury Department, the

Eximbank, the World Bank, the Congressional Budget Office, and the Central Bank for Cooperatives.

4. Review the literature relevant to the theoretical and applied aspects of the economic theory of export promotion programs and their influence on international trade.

5. Develop a model to describe the influence of export credit sales on the importing country's purchasing behavior.

6. Using an existing simulation model of the Korean economy, estimate the increase in all exports to Korea attributed to CCC financed cotton exports to Korea from 1971 thru 1975.

Organization

Chapter II of this study introduces the Structure, Conduct and Performance paradigm (SCP) and provides the rationale for applying the model to the Export Credit Sales Program. Following this is an analysis of the structural dimensions of the Program's institutional environment.

Chapter III continues the SCP analysis with an overview of the three major aspects of the Program's conduct: 1) the administrative behavior of the Office of the General Sales Manager; and 2) uncertainty and its influence on administrative decision making.

Chapter IV concludes the SCP model with a discussion of the theoretical and empirical basis for evaluating the many dimensions of the Program's performance. Several methodologies which have been used in the past to measure export additionality will be reviewed and critiqued.

Chapter V presents a model to describe the impact that export credits have on the purchasing behavior of an

importing country. An alternative definition of export additionality is introduced and a methodology is developed and applied to the case of CCC financed cotton exports to Korea. A simulation model of the Korean economy is "shocked" in an appropriate manner to simulate the changes in economic activity wrought by an elimination of CCC cotton credits during the years 1971 thru 1975.

Chapter VI summarizes the study, evaluates the possible role a similar program may have in the 1980's, and offers recommendations as to changes of Program structure and conduct which may lead to improved performance.

CHAPTER I ENDNOTES

[1]U.S., General Accounting Office, Stronger Emphasis on Market Development Needed in Agriculture's Export Credit Sales Program, ID-80-01 (October 26, 1979).

[2]Ibid., pp. 3-4.

[3]U.S., Congress, Senate, Committee on Banking, Housing and Urban Affairs, Trends in Export Markets and Competitiveness, Hearings before the Subcommittee on International Finance, 95th Cong., 2nd Session, 1978, p. 38.

[4]William Tierney and Donald Mitchell, A Theoretical and Methodological Analysis of the Performance of the CCC's Export Credit Sales Program: A Case Study of Cotton Exports to Korea, Michigan State University, East Lansing, Michigan, May 1981.

[5]Walton Scott, Jr., President American Cotton Shippers Association, to George Shanklin, Assistant Sales Manager, U.S. Department of Agriculture, December 5, 1979, Federal Files, Washington, D.C.

[6]See Table I.

[7]U.S. Department of Agriculture, Office of the General Sales Manager, A Report on U.S. Exports for Four Marketing Years, 1974-75 thru 1977-78, (November 1980), by R. L. Rudy, p. 107.

[8]U.S. Department of Agriculture, Foreign Agriculture Service, U.S. Exports of Reported Agricultural Commodities for 1974-74 thru 1978-79 Marketing Years, (1980), p. 191; and Office of the General Sales Manager, "Printout of Country-Commodity Table for Republic of Korea-Raw Cotton," (1980), pp. 49-53.

CHAPTER II

THE STRUCTURE OF THE COMMODITY CREDIT CORPORATION'S EXPORT CREDIT SALES PROGRAM

The Origin of the Structure, Conduct, and Performance Paradigm

The Credit Sales Program has both explicit and implicit objectives. Furthermore, the Program is itself part of a larger strategy of the Department of Agriculture to achieve agricultural price stability and to promote equitable returns to agriculture. In the past, considerable confusion and debate has ensued when the Program's performance was evaluated. This was due, in part, to a lack of appreciation for the complexity of the institutional environment in which the Program operates. Our understanding of the Program would improve if we were to analyze it using the Structure-Conduct-Performance paradigm (SCP).

Scherer, in his book Industrial Market Structure and Economic Performance, presents a hierarchial scheme of cause and effect relationships between the structure of a market (number of buyers and sellers, degree of vertical integration, etc.), the conduct of market participants (pricing behavior, advertising, etc.), and the performance of the market (productive and allocative efficiency, progress, etc.) (see Figure 1).[1]

The SCP paradigm was first applied by investigators in the field of industrial organization but the model has found application in other areas of economic research. Specifically, J. D. Shaffer and A. A. Schmid have modified

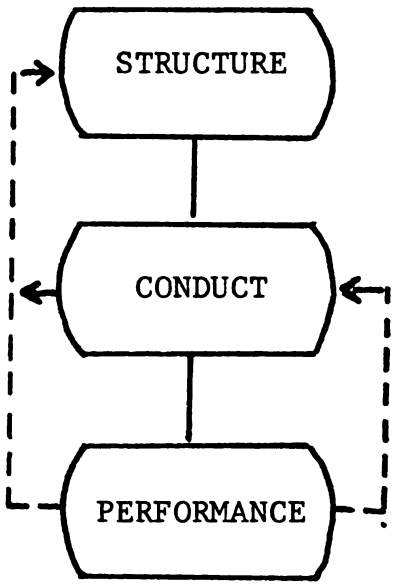


Figure 1
An illustration of SCP Relations

Scherer's paradigm and used it in their studies of institutions and the consequences of institutional change. Their concern was with the relationships among the structure of the institution's environment, the conduct or behavior of members of society who are influenced by the institution, and the performance of these members which follows from this conduct. To paraphrase their paradigm, this study will use the following set of definitions:

Structure. The predetermined characteristics of the institutional environment which constrain the choices and defines the opportunity set of society's members.

Conduct. The choices, decisions, or strategies that society's members actually adopted given their constrained opportunity set.

Performance. The consequences following the choices, decisions or strategies that were adopted. Performance is the matrix of all benefits and costs resulting from conduct.[2]

The interaction of these three parameters is held to be dynamic in nature and subject to probability distributions. Institutions can adapt or evolve over time due to changes in their structural determinants and in response to feedback with regard to their conduct and performance.

The Need for an Institutional Analysis

Previous studies of the Program measured the returns to the Program simply as the increase in exports of the commodity for which export credits were granted. Political

and military returns have been ignored. Returns to groups outside the United States are not measured. No mention has been made of the relative efficiency with which the Program achieves its objectives. Finally, Program costs have not been addressed.

All of these areas need to be explored before the economic returns of the Program can be placed in their proper perspective. This chapter (and the following three chapters) will identify and briefly describe the key relationships which determine the Program's performance. Much of the content of these chapters should be regarded as preliminary research hypotheses. This study does not intend to test these hypotheses. It is useful to state them at this time and thereby provide a starting point for developing further research on these topics.

The organization of topics which follows owes much to the Shaffer and Schmid rendition of the SCP paradigm. This study will follow their outline but will interject other paradigms where they are appropriate.

Structure

Values, Goals, and Objectives

The first element of structure is the values, goals and objectives which presumably guide the Program's operations. Values, goals and objectives are related to one another in a hierarchial manner. To clarify terminology this study will employ the following set of definitions:

A value is a meaning which we assign to our concepts of reality; specifically, a value concerns the sense of

'goodness' or 'badness' which we attach to a particular person, thing, or condition.

A goal is a condition, not yet established or obtained, which some individual or group is trying to obtain by taking appropriate action.

An objective is an action deemed appropriate in attaining a goal.

Objectives

The current Program objectives are "to maintain and develop markets and to increase U.S. commercial sales of Agricultural commodities which are in need of export assistance."[3] Consideration must also be given to whether the financing will:

1. permit U.S. exporters to meet foreign competition;
2. substitute commercial sales for PL 480 or other concessional programs; and
3. introduce a new use of the commodity to expand its consumption in the importing country.

Goals

The Program is itself part of a broader strategy that the USDA pursues in promoting exports. What this strategy is and how the Program fits in will be dealt with later. Suffice it to say that "one of the major goals of the Department of Agriculture has been to maintain or increase U.S. exports of Agricultural commodities and so to continue

to improve farm income and to maintain the economic health of agriculturally dependent enterprises and communities ....Associated with this goal is the purpose of helping the development of poor countries...."[4]

Values

The values which provide the ethic behind the Program are believed to be the same as those which guide all agricultural policy. These values have often been aggregated under the rubric of 'rural fundamentalism.'

Participants

The second aspect of structure to be addressed is the identification of participants. Participants are those parties that either directly or indirectly effect or are effected by the Program.

Domestic Farmers

Since the Program's inception in 1956 until 1979, a total of 31 different commodities have been financed. However, three of these have collectively accounted for nearly 73 percent of all credits (wheat - 32%, corn - 22%, and cotton - 19%) while the top ten commodities have absorbed 97% of total Program credits.[5]

Production of these three major commodities can be characterized as being dispersed with individual producers having no market power. However, if organizations

representing these producers' interests have any influence at all on Program administrators, then they may be able to effect a transfer of income from the general public to the commodity producers. Those producers with the greatest stake in influencing the allocation of Program credits would be those that received the most in past periods (wheat, corn and cotton producers). Benefits, once granted and maintained over a period of time, are often perceived by the beneficiaries as an implicit property right. Producers of other commodities which have received no assistance or only small amounts of credit are probably unaware of the potential benefits which could be captured if they also were to coordinate their lobbying efforts.

Foreign Farmers

If the Program does not distort the relative prices of agricultural commodities, then no negative consequences for other commodity exporting countries would be expected. However, foreign producers of commodities which receive credits may receive lower prices for their own exports. In addition, farmers of the importing countries (mostly LDC's) may also face depressed prices for their commodities that are either identical or close substitutes for the CCC financed imports. Such an effect has been documented by researchers evaluating some of the early PL 480 programs.[6]

To the extent that foreign producers are aware of their losses and to the degree that they can articulate their

dissatisfaction, they could petition their governments to intervene on their behalf and file a protest with the Program's administrators. Note the recent problems arising from the Sino-American trade agreement. The agreement included provisions for CCC credits. These credits, as well as other aspects of the arrangement, have provoked strong protests by both the Canadian and Australian governments.

Domestic Consumers

Although their interests are directly affected, it is unlikely that a unique consumer oriented voice is interjected into the Program's policy deliberations. Any program which subsidizes the export of commodities will decrease the supply available to domestic consumers and increase the prices they must pay. If the interests of consumers are represented at all, it is probably reflected in the lobbying efforts of those producers which use the exported commodities as intermediate goods. In the case of feed grains (wheat and corn) and oilseeds (soybeans) it is the livestock producers (beef, pork and poultry) who are in the best position to assess their losses (and indirectly, the losses that will be suffered by the consumer).

Foreign Consumers

Whereas domestic consumers may lose welfare, foreign consumers probably gain from the Program. In several cases investigated by the GAO, there is some question as to

whether or not cost savings are passed on to the final consumer in the recipient countries.[7] When the importing agency is subject to strict import and foreign exchange controls or is itself a government agency, then the opportunity exists for that government to siphon off benefits and use the revenue to support their domestic budget or to relieve a balance of payments deficit.

If the credit savings is passed on to the end users, then the consumer, not the government, is the primary beneficiary of the Program. In those cases when the financed import is an intermediate input for a product with substantial export sales, then the beneficiaries may include consumers in other nations as well. In the case of cotton exports to Korea, over 60 percent of all cotton textile production is exported. Much of these exports is in the form of yarns and fabrics which are sold for further processing by firms in Hong Kong and Japan. So, if the cost savings are not interdicted by some Korean government authority, then those foreign consumers which benefit from the program may be a very large and heterogeneous group.

Domestic Exporters

The CCC purchases, for cash after delivery, U.S. exporter's accounts receivable arising from the export sale of eligible commodities to eligible countries. U.S. exporters can negotiate contracts with foreign buyer's contingent upon the availability of export credits.[8]

The decision as to commodity eligibility is determined by the USDA and announced monthly; however, the exporter can request that a line of credit be established for a particular country. While it is true that OGSM will respond to credit requests from foreign governments, foreign importers and from Agricultural Attaches; the GAO has found that many requests seemed to be initiated by domestic exporters.

Exporters use the CCC credits as a sales incentive in their contract negotiations. In some cases, exporters have closed deals based on cash or commercial financing and then have applied and been approved for CCC credits. In at least one case, exporters would have lost large contracts due to cancellation if CCC credits had not been made available ex post.[8.5] At that time, nearly $143 million in cotton sales to Korea were financed after the fact, when adverse market conditions threatened to precipitate a wave of contract cancellations.[9]

The Program certainly has the potential to increase the exporters' total sales volume and possibly even increase their unit profit margins. If exporters had intimate knowledge of their competitors' prices and financing terms (if any), then it's possible that they could charge higher per unit prices for CCC financed contracts. In other words, the present value of a CCC financed contract, even at higher unit prices, might still be less than paying cash at competitive per unit prices. Sales volume would still be

larger than under cash terms (assuming a downward sloping demand curve in relation to cash and/or present value prices) and per unit profits would be greater. The exporter escapes all future financing costs by being able to sell his accounts receivable to the OGSM at the higher per unit prices and, thereby, may be able to extract some of the Program's benefits.

Foreign Importers

Whether importing for their own use or acting as a wholesaler, foreign importers obtain significant benefits from the Program. As previously noted, it is possible for an importer to make requests directly to the OGSM. Apparently, this is not usually done. Perhaps this is due to insufficient information, high transactions cost, past negative responses on the part of the OGSM or because they prefer to delegate the initiative to the exporter who then will act on their behalf. Even if the importer is a relatively passive party in the process of obtaining credit, they still stand to gain. Importers will finance imports as long as the net present value of financing costs is less than the present value of costs if cash were paid.

Domestic Banks

Domestic banks either issue bank obligations themselves or must confirm and advise on obligations issued by foreign banks. If the obligation is issued by a foreign bank, then

the advising U.S. bank must confirm at least 10 percent pro rate of the obligation. The bank obligations are in the form of irrevocable letters of credit. They are legally binding documents which certify the credit worthiness of the importers and serve as guarantees of payment should the importer default. In the event of default, the CCC will hold the issuing bank liable for payment without regard to risks. If the domestic bank advises on a foreign bank's letter, then their liability is reduced to 10 percent and is subject to commercial but not noncommercial risks (inability of a foreign bank to pay due to war, hostilities, etc.).[10]

When OGSM employees were questioned regarding the attitude of domestic banks toward the Program, they indicated that a protest was lodged only once. In most cases, they stated, domestic banks felt the Program was good for business and did not perceive it to be a competitor which displaces them.[11]

Foreign Banks

Foreign banks may issue bank obligations but these must be confirmed by a U.S. bank or its overseas branch. Importers have an incentive to arrange for letters of credit with U.S. banks since a higher interest rate is charged on those loans guarantees by foreign banks. Usually the rate charged when foreign bank obligations are presented is one percentage point higher than the rate charged when a U.S. bank confirms the loan.[12]

The United States Government

The Program has both domestic and international economic and political effects. The domestic economic effects on the farmer and consumer have already been mentioned. The international economic effect on foreign producers and consumers has also been discussed. The international political effect, however, does need further development. Considerable criticism has been leveled at the Program by GAO investigators who claimed that credits were granted for reasons other than market development. Most recently, the decision to grant credits to Korea, Poland, and China have been the subject of formal bilateral government-to-government negotiations (something the CCC has consistently tried to avoid).[13] The problem with such negotiations is that broad foreign policy and defense considerations begin to influence the allocation of credits.

Foreign Governments

Direct government involvement in the Program is unavoidable in countries with either state trading or with strict import and exchange controls. In those cases where direct governmental negotiations are undertaken, the impact of governmental influence is even greater. Some of the benefits accrued by foreign governments have already been noted. The following is meant to augment the list: (1) participation in the Program results from a desire for closer ties with the U.S. (CCC credits is only part of a

package defining the relationship between the two governments); (2) government officials are looking for an additional source of revenue to support their budget or to relieve pressure on their balance of payments; (3) a desire to capture significant savings for domestic consumers (particularly if an important part of domestic policy is subsidized, low-cost food); and (4) use the credits as a lever in negotiating with other power blocks or other commodity exporters.

Of course, the Program has an indirect impact on the governments of those countries that are not receiving credits. The governments of those other exporting countries whose agricultural trade is being adversely effected may lodge a formal protest or initiate credit programs of their own to match the CCC Program.

Other Participants

Every commodity grown in the United States is a real or potential export. The Program's budget is fixed and disbursed each year to various commodities and countries as determined by CCC policy makers. Every dollar of credit committed to a commodity or country is one dollar less for all other commodities or countries. This is a crucial fact that must be kept in mind when determining the true 'cost' of the Program. In a very restricted sense, the cost of the Program is not the dollars which are disbursed but rather the return that is lost from not financing alternative

commodities or countries. In a broader sense it is the return which is foregone from not using the money to finance any other government loan program--for instance, the Small Business or Federal Housing loan programs.

Policy Makers

The third dimension of structure is the identification of Program policy makers. Policy makers are those groups within the United States government who either legislate, monitor, advise or administer the Program.

The Program operates under two legislative mandates (the Commodity Credit Corporation Charter Act and the Food for Peace Act of 1966).[14] Its policies and regulations are outlined in two documents ("Financial Arrangements Required by CCC Under its Export Credit Sales Program," and "Regulations Covering Export Financing of Sales of Agricultural Commodities Under the Commodity Credit Corporation Export Credit Sales Program, GSM-5"). These regulations give the authority to designate eligible commodities to the President of the CCC (who is the Assistant Secretary for International Affairs and Commodity Programs) and a Vice-President of the CCC (who is the General Sales Manager). Other departments within the USDA advise them in this process. Determining country eligibility and the amounts of specific country lines of credit is the responsibility of the CCC with the assistance of the Office of the General Sales Manager (OGSM).

Figure 2 is an organizational flow chart that sketches the chain of command and the relationships (vertical and horizontal) that exists among the various groups which influence the Program. The upper half of the chart illustrates the legislative mandates of the Program and the annual budgetary process. The bottom half depicts the nuts-and-bolts interactions between the groups when determining commodity and country eligibility.

Jurisdictional Boundaries

The fourth dimension of structure is the delineation of jurisdictional boundaries. Conflicts between the various policy making groups may arise either from the Program's external effects or because of potential economies of scale in administering the Program.

External Effects

"An external effect is a consequence of an act which currently is negligibly relevant to the...organization making the decision, given the existing jurisdictional boundaries."[15] Although the Program's objectives are primarily economic, its potential effects have inspired other agencies within the government to try to bend the Program to suit their purposes. The OGSM and other Agriculture officials have resisted the intrusion of secondary economic and political objectives in the Program's policy making. While there are no statutory prohibitions

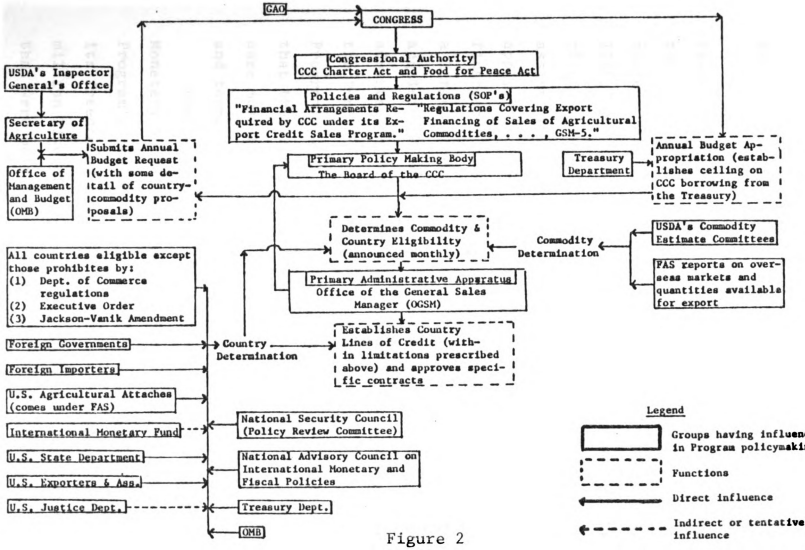


Figure 2

Organizational Flow Chart
of the CCC Credit Sales Program

against such intrusions, the Program lacks any mandate other than to undertake market development and maintenance activities.

What is at issue is not just a matter of bureaucratic territoriality. Should secondary considerations dominate the allocation of credits then the Program may become subject to the provisions of the Cargo Preference Act. A 1965 Justice Department opinion implied that "if the terms of sale are utilized...for the purpose of aiding or assisting a foreign nation or its economy the...Act would apply."[16] The Act requires that at least 50 percent of the financed commodities must be shipped in U.S. bottoms. Such a large increase in shipping costs (and therefore in total acquisition costs to the buyer) may wipe out any competitive advantage afforded by the financing. One other aspect of the Program is vulnerable to provisions of the Act. The Program's administrators must maintain the interest rate that they charge above the cost of money to the CCC. Great care must be taken to avoid the suggestion that the rates and terms are concessional and not 'commercial.'

Besides the Justice Department, the International Monetary Fund (IMF), while not directly impinging upon the Program's jurisdiction, has nevertheless placed limits on its freedom of action. In 1978, the OGSM extended a $50 million line of credit to the Phillipines on repayment terms that were only 5 days short of a year (360 days). These odd terms were imposed in order to avoid violating a recent IMF

restriction on the Phillipines incurring any new 1 to 5 year debts.[17]

Agencies and departments outside of Agriculture have had some success in influencing credit allocations on at least two occasions (Korea in 1978 and Poland in 1978).[18] On these occasions, the OGSM lost much of its independence when CCC credits were made part of formal bilateral negotiations between the governments of these recipient countries and the U.S. Recently, CCC credits were made part of the recent four year Sino-American grains agreement. While the market development potential represented by such an agreement is clearly evident, some observers claim that the agreement (and any CCC credits that may be part of it) was intended to defuse domestic criticism arising from the earlier imposition of a Russian grain embargo. Others have argued that the agreement (and possibly the credits) were unnecessary and merely served to formalize a trend on the part of the Chinese to import more U.S. grains.[19]

Economies of Scale

Other conflicts arising from the Program's jurisdictional boundaries concerns the possibility of attaining economies of scale in administering the Program. Certain agencies which 'cooperate' with the OGSM have research staffs or expertise that could facilitate the allocation of credits. Significant economies of scale are

possible if greater coordination between complementary agencies could be achieved.

The General Sales Manager, the Foreign Agricultural Service (FAS), the Economics Statistics and Cooperative Service (now the ERS) and the Treasury have all agreed that the Program needs greater strategic planning. However, such planning efforts requires a staff which is far in excess of that which is available within the OGSM. In its report, the GAO made a strong recommendation that the OGSM work with the FAS and ERS in order that the OGSM could take advantage of the specialized research capabilities of these agencies.[20]

Recently, the OGSM has been made a part of the FAS and while cooperation between these two has been close in the past, it must now be closer still.[21] It is unlikely, however, that the degree of cooperation envisioned by the GAO for the FAS-OGSM and ERS will ever be achieved.

A 1977 GAO study attributed the lack of cooperation between the FAS and the ERS to philosophical and technical differences.[22] Philosophical barriers seemed to arise from differences in the two agencies research orientations. The FAS emphasizing the collection and analysis of current data while the ERS studies structural relationships and concentrated on getting the 'big picture.' Technical problems grew out of the FAS's responsibility to provide agribusiness with timely export forecasts. For this, they require immediate and direct market intelligence and an understanding of and good rapport with the agricultural

sector. The ERS, on the other hand, is reputed to have a more 'academic' orientation; is believed to be operating under less of a time constraint than the FAS; and is said to disparage the FAS's analytical capabilities.[23]

Preference Articulation

The fifth aspect of structure to be addressed is the process by which preferences are articulated and communicated to Program policy makers. It must be kept in mind that the Program provides a service and that it is trying to maximize the welfare of its clients. How does the Program find out what its clients want when the service is neither bid for nor sold at market clearing prices?

The OGSM believes they should respond to actual requests as they develop.[24] This policy serves two purposes. First, it permits greater flexibility in responding to changes in market conditions. And second, it is a major preference articulation mechanism whereby the preferences of a select group of clients (voter-consumers) is transmitted to Program policy makers.[25]

The GAO, which strongly recommends the development of master market plans, seems to be advancing a philosophy that client preferences should be discovered analytically and that it is inappropriate to simply react passively to requests.[26] However, if the purpose of the Program is to expand and maintain markets, who would have better or more timely information than the exporters who make their living

from reading and reacting to market developments? Furthermore, if it's the commodity exporters (and the producers) who are meant to benefit from the Program, then what better way to assure that they receive those benefits than to allocate credits in response to their requests? The alternative is to allocate credits according to some predetermined distribution rule.

The Program's effects on domestic consumers has already been described. There is no known formal mechanism for determining the domestic price (inflation) consequences of the Program. The creation of a consumer's affairs department within the USDA by the Carter administration was a step in the direction towards giving consumers a voice in all departmental policy making. What relations, if any, this office had with the OGSM is not known.[27]

The Program's Information and Feedback Systems

The sixth dimension is that set of linkages which collects data needed for Program analysis. The feedback system is those mechanisms instituted to monitor Program performance. Occasionally, the official feedback system existing within the OGSM is augmented by evaluations that are unsolicited by the OGSM.

The Information System

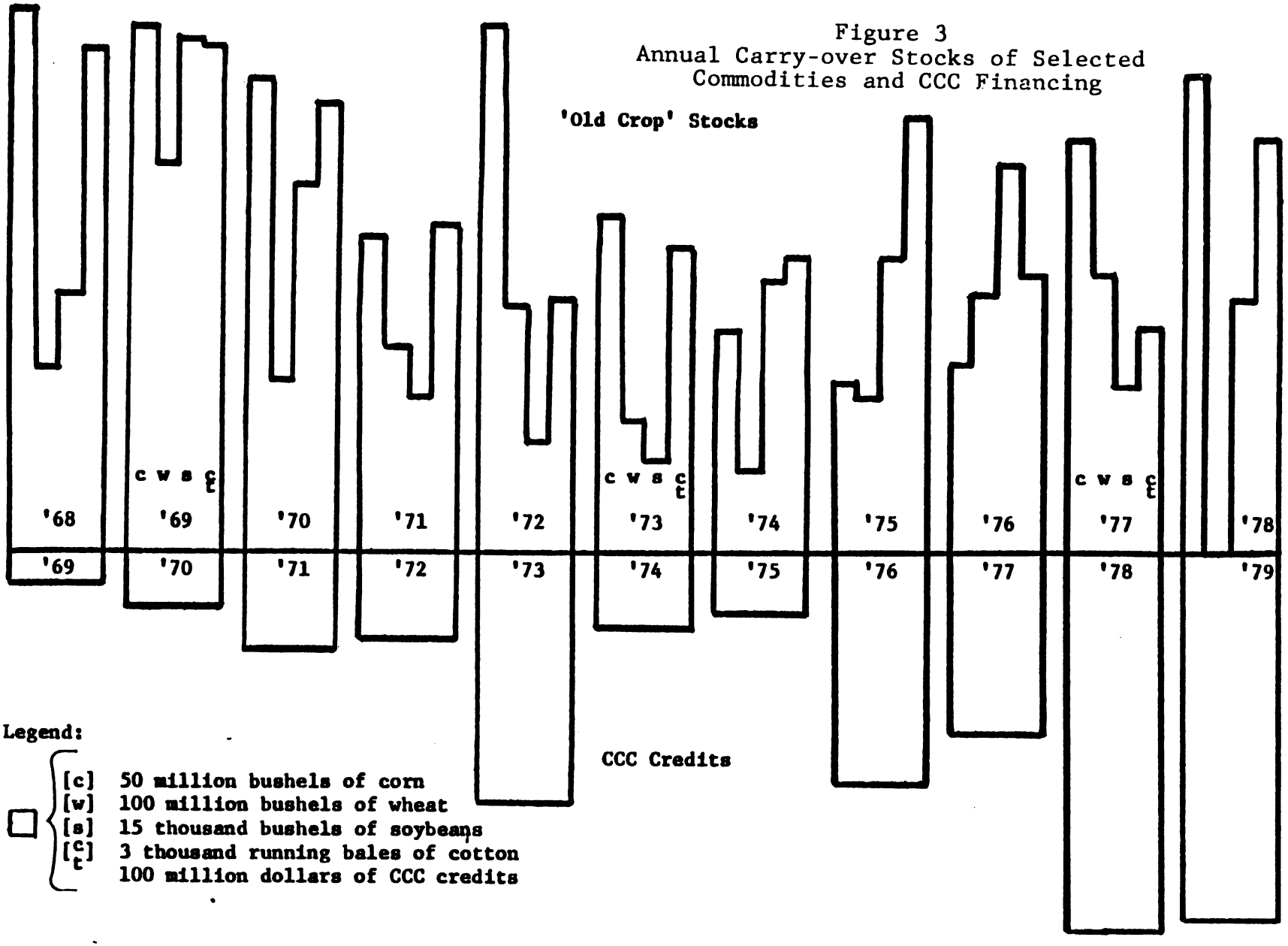
Essentially, the data collected concerns three subjects. They are: (1) how much credit can be extended;

(2) what commodities are eligible; and (3) what countries are eligible. A secondary set of data is used to answer the question as to how much credit should be allocated to each commodity, to each country and/or to what countries for what commodities.

Data used in determining commodity eligibility comes primarily from within the USDA. Eligible commodities are those deemed to be available in sufficient quantity for export and/or in need of export assistance. It is now known exactly what criteria are used when classifying commodities, however, carry-over stocks seem to be a significant factor (see Figure 3).[28] A review draft of a USDA study, done in 1977, listed several criteria that they believed should be used to determine eligible commodities.[29] The criteria are:

1. Commodities that are in ample supply as indicated by growing stocks.
2. Commodities not in serious surplus but for which someone in the U.S. is trying to create a foreign market (i.e., breeding stock or soy protein concentrates).
3. Commodities for which prior commitments have been made even though the original surplus condition has ceased.
4. Commodities for which traditional U.S. or foreign sources of credit will not finance (i.e. live cattle).
5. Commodities facing competition in foreign markets in which the Program's credits have an advantage over alternative credit sources.

Figure 3
Annual Carry-over Stocks of Selected Commodities and CCC Financing



The origin of data used in determining country eligibility is not known. This is the weakest link in the Program's information system and it is one for which the GAO took the OGSM to task. The GAO inferred that the OGSM did not know if the credits were needed or that the OGSM permitted credits to be issued for secondary economic and political objectives.[30]

They attributed this situation to several factors, one of which was what they perceived to be an inadequate information system. Some of the recommendations the GAO made, such as closer cooperation between the FAS-OGSM and the ERS and the use of market plans, have already been discussed. Other recommendations were: (1) collect better information from Agricultural Attaches on a systematic basis; and (2) collect information on competitor's credit terms.

Returning to the 1977 USDA study, it was found that they listed criteria for determining both country eligibility and need for financing.[31] The criteria they recommend be applied in surveying a country's market development potential are:

1. Increased demand for eligible commodities supported by growth in the country's internal and external purchasing purchasing power and by suitable consumer and import policies.
2. Slow growth in domestic production of the targeted commodity even with domestic price incentives.

3. Sufficient capabilities for domestic processing and distribution of the targeted commodity.
4. The existence of a U.S. comparative advantage (one in which only the additional weight of CCC credit is needed to make the U.S. a clearly superior source of supply).
5. The existence of competition from other suppliers who offer preferential price or credit terms that could be offset by CCC credit.

The criteria, suggested by the study, for determining a country's need for financing are:

1. Low per capital incomes.
2. The country's external financial situation as determined by its credit branch with the IMF, drawings under special IMF credit facilities, its import coverage ratio, and recent changes or lack of change in its exchange rate.
3. Ability to repay (the trend of its exports in the next few years).
4. The country's debt service ratio.
5. Political stability and government economic policies.

The Feedback System

The Program's feedback system includes both formal and informal components. The formal components are those arrangements made by the OGSM to check its own compliance with the regulations and to evaluate its performance with

respect to the Program's objectives. Overall, the GAO found that existing administrative procedures seemed sufficient to monitor the technical performance of the OGSM (in-house checks on compliance with regulations).[32] However, when it came to self-assessment of the Program's effectiveness as an export promotion tool, the GAO found the OGSM performance inadequate.[33] The 1977 USDA study, mentioned earlier, found that the Program's ability to generate additional exports or to achieve other objectives had never been evaluated. This oversight was attributed to conceptual, methodological and data problems as well as "limited demand...from policy officials."[34]

The informal components of the Program's feedback system are those reports and evaluations which originate outside the OGSM. These include: (1) reports by the GAO; (2) hearings before Congressional bodies; (3) task force studies either within the USDA or multi-departmental; and (4) formal presentations made by exporters or by their organizations. The relative importance that the OGSM gives to these informal feedback mechanisms is hard to measure. It should be noted, however, that this research itself springs largely out of a desire of the OGSM to answer questions which were raised in the most recent GAO report.

The CCC Program in the Context of Overall Agricultural Export Policy

The seventh dimension of structure to be described is the relationship of the Export Credit Sales Program

vis-a-vis the other export programs which together comprise the total package of export policy mechanisms. The Program is only one of six major components making up the USDA's current export strategy.[35] The other five components are as follows:

1. Trade Negotiations carried on at both bilateral and multilateral levels. Bilateral agreements are generally used to capture a specific market for U.S. commodities. Multilateral agreements have the broader objective of attaining an improved trade climate.
2. Foreign Market Intelligence includes all the activities within USDA that provide foreign market information to decision makers in both the government and private sectors.
3. Market Development encompasses a wide variety of activities ranging from general trade servicing to point of sale promotion. Many of these programs are cooperative and they enable U.S. producers and interested domestic and foreign businessmen to work with the USDA in jointly developing foreign markets.
4. Public Law 4800, when enacted in 1954, was designed primarily to reduce domestic surpluses and to expand export markets. Beginning in 1966 and continuing into following years, the program has been amended to include humanitarian considerations, long-term agricultural and economic development in recipient countries, and the use of food aid as an instrument

of foreign policy. PL 480 shipments include grants and concessional sales and at one time, barter agreements (suspended in 1973).

5. Intermediate Credit and Non-Commercial Risk Assurance are two programs which directly complement the CCC Export Credit Sales Program. These three, as well as PL 480, all come under the purview of the CCC. The Intermediate Credit Program (enacted in 1978) authorizes the extension of credits for 3 to 10 years to finance: (1) the establishment of foreign commodity reserves; (2) the export of breeding animals; (3) the building of market infrastructure in importing countries; and (4) to meet credit competition.[36] The Non-Commercial Risk Assurance Program is an insurance program whereby the government underwrites commercial loans for the export of commodities against the risk of default due to the imposition of currency inconvertibility, government decree, war, etc.[37]

A program similar to the Non-Commercial Risk Assurance Program was proposed in June 1980. This program protects U.S. banks from defaults of private foreign banks against both non-commercial and commercial risks. "The new program was developed as an improvement over the [other] Program which tended to encourage participation by foreign-owned banks. By providing for commercial risks coverage, more private foreign banks will be able to participate in the

proposed program thus allowing a wider range of foreign buyers to participate in the program."[38]

Complementarity Among Programs

There is a definite complementarity between the Export Credit Sales Program and the PL 480, Intermediate Credit and Non-Commercial Risk Assurance programs. Markets are developed first with one program, strengthened with another, then placed on a cash basis (or commercial financing) with other programs. Immediately following World War II and reaching a peak in 1948-49, nearly 60 percent of all U.S. agricultural exports were financed under a variety of aid programs. By 1953, agricultural production in Japan and most European countries had recovered. However, import demand in these countries and in the merging LDC's remained high but was curtailed by a shortage of foreign exchange. PL 480, as originally enacted, permitted continued food aid but reduced the grant aspect and authorized recipient countries to pay for a portion of their food imports with their own nonconvertible currencies. With the continued growth of their economies and the restoration of convertibility, these countries were gradually weaned from PL 480.[39] However, many still suffered from severe balance of payments problems or else evidenced weak commercial demand for agricultural imports.

The Export Credit Sales Program was conceived as a transitional device which would help re-establish Japan and

Western Europe as prime commercial markets.[40] Since then, the Program is applied most often to those countries which are commercial markets both which have balance of payments difficulties or when there is aggressive (but containable) competition from other suppliers. PL 480 is reserved for countries with more severe payment problems and serious food shortages.

The complementary nature of these programs is exemplified in the history of U.S. cotton exports to Korea (see Table II). Mutual Security funds were the primary source of financing from 1950 to 1960; PL 480 from 1960 to 1970; and CCC credits from 1970 to the present. It's too early to tell how the Intermediate Credit Program will be used in relation to the Export Credit Sales Program. However, we do have some indication of how the OGSM would like to use the Non-Commercial Risk Assurance Program. On at least two occasions, in which the OGSM participated in formal bilateral negotiations, the Risk Assurance Program was offered along with CCC credits as a package deal. In both cases, the CCC credits were less than what the countries originally requested and the risk assurances were offered as the next best substitute for credits.[41]

These programs are not the only source of grants, credits or risk assurances for agricultural exports. The Export-Import bank, and independent agency of the government (established in 1934), also extends credits. Since 1963, the bank has also provided loan guarantees to private banks

TABLE II

U.S. EXPORTS OF COTTON TO THE REPUBLIC OF KOREA
(COMMERCIAL AND UNDER VARIOUS GOVERNMENT PROGRAMS)
(1,000 Running Bales)

Fiscal Year	Mutual Security	PL 480	CCC	Commercial
54/55	168	-	-	6
55/56	61	56	-	-
56/57	200	(1)	-	-
57/58	202	3	-	-
58/59	216	-	-	9
59/60	198	70	-	1
60/61	104	86	-	-
61/62	1	234	-	15
62/63	-	267	-	14
63/64	-	229	10	16
64/65	-	243	(1)	31
65/66	-	235	3	28
66/67	-	260	28	22
67/68	-	290	48	2
68/69	-	368	89	4
69/70	-	244	188	-
70/71	-	163	230	-
71/72	-	82	246	62
72/73	-	175	293	54
73/74	-	7	270	464
74/75	-	-	200	341
75/76	-	55	808	216
76/77	-	28	217	439
77/78	-	-	684	581

SOURCE: U.S., Department of Agriculture, Foreign Agricultural Service, The Market for U.S. Cotton in the Republic of Korea, by R. B. Evans, FAS M-291 (1980), p. 5.

[1]Less than 500 bales.

against commercial and non-commercial risk. While Ex-Im loans primarily finance capital goods, over $1.4 billion of loans and guarantees were made for agricultural exports from 1955-1973.[42] Nearly 88 percent of these loans went for cotton exports.

The Credit Sales Program's Impact in Other Policy Areas

The Program has an impact on the government's international financial policy and its importance was recognized by the Treasury Department in a letter addressed to the GAO in August, 1979. A similar letter from the State Department also acknowledged the economic and political contributions that the Program has made to the pursuit of foreign policy objectives.[43]

Although the Program incurs no cost over the life span of its loans, the burden on the domestic budget can be substantial in any one year. New loans made for more than a year contribute to outlays and do not generate revenue until later years.[44] Of course, the Program fits into our overall trade policy and in that regard it has implications for our balance of payments, domestic unemployment and inflation.

Market Structure

The eighth and final dimension of institutional structure concerns the structure of commodity markets. Mention has been made of market structure in earlier portions of this paper but this study has not yet discussed

the full implications which market structure has for the Credit Sales Program. The subject is divided into three parts: (1) the structure of international commodity markets in general; (2) the structure of domestic commodity markets; and (3) the structure of commodity markets in specific foreign countries.

The Structure of International Commodity Markets

Many of the world's commodity markets are dominated by either a few large sellers or by a few large buyers.[45] The nature and degree of concentration in commodity markets has important consequences for the Credit Sales Program. One of the objectives of the Program is to help U.S. agriculture meet foreign competition, specifically credit competition. It is feared that if export credits are used improperly, the Program could actually stimulate international credit competition.

In oligopolistic markets, competition, in any form, often inspires retaliation. Competing suppliers are usually sensitive to the marketing tactics of others.[46] If one of the suppliers initiates an aggressive marketing strategy, it is likely that the others will follow suit. Thus, any temporary gain in trade for the first supplier would later be lost.[47] In addition, each supplier would not be saddled with higher marketing costs.[48] When the Intermediate Credit program was authorized in 1978, the law specifically warned

that "Intermediate credit financing...may not be used to encourage (international) credit competition."[49]

The problem is that the OGSM, in general, doesn't know what the credit terms offered by its competitors are. In 1978, the CCC authorized credits for 25 countries. Foreign credit information was available for only 8 of these countries. Of these, only 5 had data on interest rates and repayment terms.[51]

The History of Credit Subsidy Agreements

GATT does not presently deal with export subsidization through low interest, government provided credits. However, there have been gentlemen's agreements in the field. In 1934, the Berne Union was established to work "for the rational development of credit insurance in the international field."[52] In 1953, members of this group reached a set of understandings governing terms of trade loans. In 1960, the EEC proposed similar guidelines for its members. Among other principles, the 1953 Berne agreement introduced the rule of credit parity. Referred to as the 'matching principle,' it proposes that if any member offers more liberal terms than the rest of the other members may follow suit.[53] This rule, while it may be politically expedient and needed to prevent an international credit race, is nevertheless theoretically unsound.

Robert Baldwin notes that "The rule discriminates against capital abundant countries--like the United

States--that generally have lower domestic interest rates than capital-scarce countries..."[54] Although capital funds are extremely fungible across international borders, interest differentials are not totally eliminated. Requiring the harmonization of interest rates for export credits would be the equivalent of "permitting countries to vary their export subsidies according to the degree that their wage rates exceed the [global] average."[55]

In 1963, the OECD established a permanent Trade Committee Group on Export Credit and Credit Guarantees. This agency serves as an information clearing house which reports on each country's handling of export credit and terms they offer.[56] The OECD Group also provides a forum for international negotiations to regulate various aspects of members' credit programs. The most recent agreement concluded under the auspices of the OECD Group occurred in February 1978. The International Arrangement on Officially Supported Export Credits established needed definitions and detailed provisions for notifying members of unilateral derogations from the new Arrangement. The Arrangement is a slight advance, at best, over the previous Consensus on Export Credits (itself a very weak agreement).[57] With regard to these agreements' impact on the CCC Program, they <u>do not</u> apply to agricultural commodities, as well as to aircraft and nuclear plants.[58]

The Structure of Domestic Commodity Markets

At the producer level the market structure for most eligible commodities is demonstrably competitive. However, as the commodities move from the farm gate to the docks the market structure of handlers and exporters becomes increasingly concentrated.[59]

The question which should be raised is whether and to what extent such concentration effects the Export Credit Sales Program? An answer to this question could only be made if the following areas were investigated:

1. What benefits has the OGSM earmarked for exporters and what benefits were meant to be distributed to producers?
2. How much of a price effect is transmitted down to the farm level from CCC financed exports and how long does it take?
3. What is the ownership of commodity stocks exported under the CCC Program (exporters', cooperatives' or stocks sold on commission for other parties)?
4. Is there a consistent pattern of CCC financing being managed by the same exporters year after year?
5. Are there systematic differences in the terms of contracts negotiated with and without CCC financing and how do the terms of CCC financed exports compare with exports financed under other government programs (i.e. CCC cotton vs. Ex-Im cotton)?

6. Are there significant variations in the export marketing margins for those commodities whose exporting industries is less concentrated (i.e. exporters of breeding livestock and high protein concentrates vs. grain exporters)?

The Structure of Foreign Commodity Markets

The 1977 Agriculture study reported that less than 5 percent of all CCC credits are extended to private importing firms (the OGSM disputes this figure).[60] The rest of the credits went to government agencies or importers that were subject to strict import and foreign exchange regulations. The OGSM agrees that substantial credits are allocated to government importing agencies or to importers under government control.

The critical target in the OGSM's marketing strategy is the foreign purchasing agent. Whether the agent is government controlled or private, the OGSM extends financing in the hope of influencing that agent to purchase United States commodities instead of our competitor's.[61] The GAO contested the wisdom of this strategy on the following grounds:

1. The market development effect of the credits would be greater if the benefits were passed down to the ultimate end-user.

2. If the credits were not passed on but 'siphoned off' to support the government's budget, the Program would then become subject to the Cargo Preference Act.

Market Development in Countries with Government Importing Agencies

Figure 4 provides a basis which can be used to analyze the GAO's objection. As illustrated, it is proposed that the effect of the credits in the short run would be both a shift in the demand curve from d to d' and a shift in the supply curve from S to S_{sub}. Imports would increase from Q_1 to Q_3 if all financing benefits were passed on the end-user. Consumer surplus would increase by the area of lightly shaded region (ACEHDB).

If only the benefit of increased credit availability were passed to the end-user (but not the subsidized interest rate) then imports would increase to only Q_2 and consumer surplus by the area ABDC. Sales revenue to the exporter would decrease by the area Q_2Q_3HG. Given this set of demand and supply curves there, there would be a net loss of sales revenue and unless demand was perfectly inelastic there would always be an unequivocal loss in sales (by quantity). The area EHDC would be the reduction in consumer surplus. Of this loss, the area EGDC would be 'siphoned off' by the government. The remainder, the area GHD, is the familiar 'trade loss triangle' associated with import barriers.

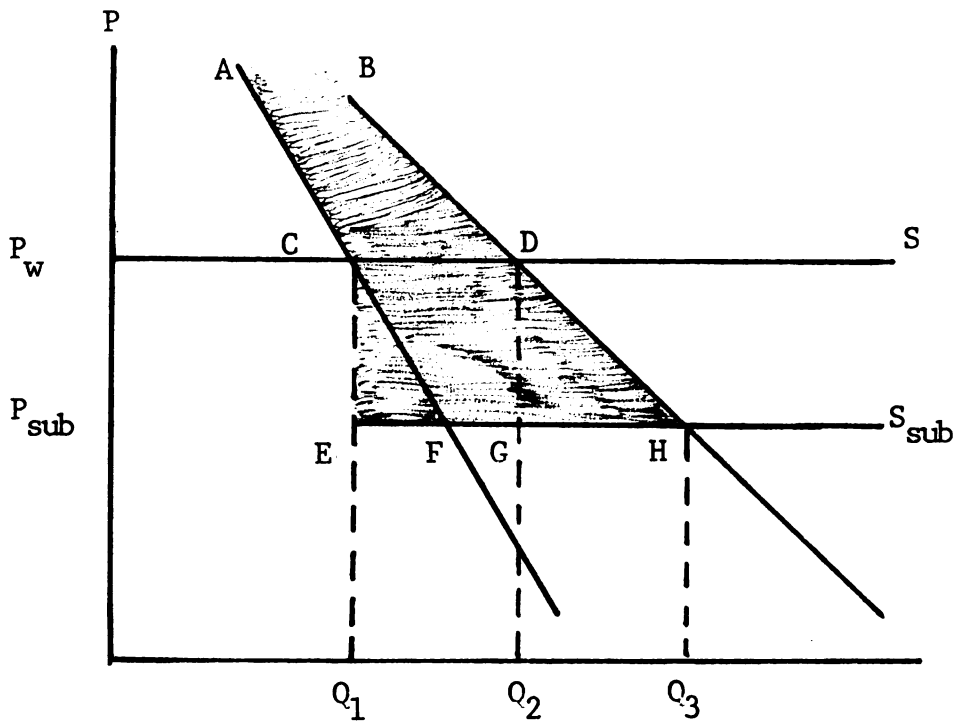


Figure 4

Graphical Analysis of Limited Market Development with Government Importing Agencies.

This analysis seems to support the GAO's objections. It appears that market development seems to be hampered when the full benefits of CCC financing are not passed on to the end-user.

The Cargo Preference Act and Countries with Government Importing Agencies

As is often the case in legal matters, every law, judgement, or opinion is subject to conflicting interpretations. The GAO reported that "the intrusion of economic support or political considerations into the CCC program decision process may jeopardize the program's exemption from the Cargo Preference Act."[62] The State Department challenged this statement, declaring that the 'commercial' nature of the credits distinguishes the Program from concessional assistance.[63] This debate focused on an obscure opinion rendered by the Attorney General over 15 years before. For some reason, neither the OGSM, the GAO, nor the State Department sought further clarification from the Justice Department. Evidently, this issue cannot be resolved unless such clarification is obtained.

Conclusion

The structure of the Program defines the environment in which the Program must operate. Performance can only be as good as is possible given the Program's structural constraints. It has been shown that the Program has both explicit and implicit goals, and that the operational objectives guiding the Program's administration are only tenuously linked to these goals. Perhaps the most important structural feature responsible for this weak link is the process by which, and for whom credit allocations are made. Given the examples of influence exercised by the State Department and the National Security Council, it seems that while these bodies have the power to effect the allocation process, they do not have to contribute to the Program's budget, nor must they bear responsibility for its shortcomings. Political and economic returns other than the increase in agricultural exports are captured by the Program. However, the enabling legislation makes no mention of these returns when defining the Program's mission. Consequently, the Program is shortchanged when evaluated solely on the basis of export promotion and market development.

Justification for the Program's existence relies most heavily on the argument that the US would be at a

disadvantage if it abandoned such export incentives. While there seems to be some support for this line of reasoning, there is no guarantee that escalating retaliation by competitors would not eliminate all benefits. A framework for eliminating subsidized export credits for industrial goods is already in place. A serious effort should be made to duplicate this framework in the area of agricultural export credits. Multilateral movement away from highly subsidized credits would help move trade flows towards the ideal determined by comparative advantage. This would have the added benefit of reducing the participating countries' budget outlays and removing one more source of trade tension.

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[14]Ibid., p. 1.

[15]James D. Shaffer and A. Allen Schmid, "Community Economics," p. 9.

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[19]See "Chinese Grain Deal Isn't a Big Hit," Farm Journal, December 1980, p. 27; Dean Clark, "China Grain Deal?: USDA, Get Lost!," Grain and Feed Journals, 15 December 1980, pp. 22-23; "Four Year Grains Agreement with China...," Washington Farm letter, 24 October 1980, p. 1; and R. Fraedrich, "Big China Deal Won't Make Farmers Rich," Farm Futures, December 1980, p. 42.

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[22]U.S. General Accounting Office, Issues Surrounding the Management of Agricultural Exports, vol. 1, ID-76-87 (May 2, 1977), pp. 79-82.

[23]Ibid.

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[27]Carol Foreman, in charge of this department during the Carter Administration, was a member of the CCC Board.

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[43]General Accounting Office, Emphasis on Market Development in Export Credit Program, pp. 86-91.

[44]Department of Agriculture, "CCC Credit and Market Development," p. 35.

[45]See, C.M. Alaouze, A.S. Watson, and W.H. Sturgess, "Oligopoly Pricing in Wheat," American Journal of Agricultural Economics, April 1978, pp. 173-185; Department of Agriculture, "CCC Credit and Market Development," p. 8;

U.S. Congress, Senate, Committee on Agriculture, Nutrition and Forestry, Hearings on S. 2385, 2504, 2405, 2968, 3011, Hearings before the subcommittee on Foreign Agricultural Policy, 95th Cong., 2nd sess., 1978, p. 46; General Accounting Office, Management of Agricultural Exports, p. 94.

[46]Department of Agriculture, "CCC Credit and Market Development," p. 8.

[47]Senate Committee on Agriculture, Nutrition, and Forestry, Hearings on S. 2385, 2405, 2504, 2968, 3011, p. 46.

[48]Department of Agriculture, "CCC Credit and Market Development," p. 8.

[49]General Accounting Office, Emphasis on Market Development in Export Credit Program, p. 44.

[50]Ibid., pp. 19-20.

[51]Telephone conversation with personnel of the Office of the General Sales Manager.

[52]Robert Baldwin, Nontariff Distortions, p. 52.

[53]Ibid., p. 53.

[54]Ibid., pp. 53-54.

[55]Ibid.

[56]Organization for Economic Cooperation and Development, Trade Committee's Group on Export Credits and Credit Guarantees, The Credit Financing Systems in OECD Member Countries (1976), p. 5.

[57]U.S. Congress, Senate Committee on Banking, Housing, and Urban Affairs, Export Policy, Part 3, Foreign Government Policies and Programs to Support Exports, 95th Cong., 2nd sess., 1978, p. 29.

[58]Department of Agriculture, "CCC Credit and Market Development," p. 53.

[59]General Accounting Office, Emphasis on Market Development in Export Credit Program, p. 5, and Idem., Management of Agricultural Exports, p. 95.

[60]Department of Agriculture, "CCC Credit and Market Development," p. 40.

[61]General Accounting Office, Emphasis on Market Development in Export Credit Program, pp. 46-47.

[62]Ibid., p. 58.

[63]Ibid., p. 89.

CHAPTER III

THE CONDUCT OF THE PROGRAM'S POLICY MAKERS

Conduct is the second component of the institutional model. Conduct is the link between an institution's structure and its performance.

This discussion of conduct begins with a description of the behavior of the OGSM in its administration of the Export Credit Sales Program. Other observations will be made concerning the problem of decision making in uncertain situations.

The Behavior of the OGSM

The determination of country and commodity eligibility is the responsibility of the CCC Board with the assistance of the OGSM. A description of the process by which commodities and countries are designated was provided in the structural discussion of policymakers. Also outlined was the CCC's budget cycle and some of the behavior of the CCC vis-a-vis other policymaking groups when establishing country lines of credit (Jurisdictional Boundaries). The remaining topics dealing with the CCC-OGSM's behavior will focus on the inter-departmental relations of the CCC-OGSM, the determination of interest rates, and the technical aspects of the sales registration, confirmation and disbursement process.

Inter-Departmental Relations

The CCC-OGSM has formal and informal relations with a variety of Executive departments, Congressional bodies and international or private organizations. While a closer look is needed at all these relationships, I would like to concentrate on the CCC-OGSM's relationships with the State Department and the Treasury Department.

CCC-OGSM Relations With the State Department

In its 1979 report, the GAO charged that the allocation of CCC credits were being influenced by secondary economic and political objectives. The inferred that the source of much of this influence was the State Department with some additional pressure brought to bear by other administration officials working through the National Advisory Council on International Monetary and Financial Policies (NAC).[1] Representatives of the State and Treasury Departments, as well as members from the Office of Management and Budget (OMB), are authorized by law to "review" all of the CCC's export sales financing agreements.[2]

Dr. Harrison, the General Sales Manager during the Carter Administration, reiterated in Congressional testimony the independent stance of the CCC. "Historically," he said, "the Department of Agriculture has done its own analysis and evaluation of the market impact of the credit program, and then has proposed to the National Advisory Council credit

programs." Furthermore, insisted Dr. Harrison, "The authority for determining and deciding what credits would, in fact, benefit or maximize exports has rested with Agriculture and will continue to rest with them."[3]

Seven months prior to Dr. Harrison's Congressional testimony, the State Department claimed that it had exercised, what was in essence, a 'veto' over the allocation of CCC credits in two separate cases. Richard Arellano, the Deputy Assistant Secretary of State for Latin American Economic Affairs, in a prepared statement on human rights and export promotion, stated that "Exports of agricultural goods under Commodity Credit Corporation loans have been less affected by human rights considerations relative to Ex-Im loans , since these loans are made on a commercial basis and are primarily to support U.S. farm sales. CCC credits have been denied on human rights grounds in two cases in the hemisphere (on wheat to Chile--$10 million in November 1977, $25 million in June 1978)."[4]

The issue of CCC credits and the human rights situation in Chile was broached by Senator Boren during the same hearings in which Dr. Harrison had testified. Senator Boren's questions were directed to Dr. Harrison's superior, Dr. Hathaway, then Assistant Secretary of Agriculture for International Affairs and Commodity Programs.

> Senator BOREN. I am trying to determine the real problem--I would appreciate it, as much as you can, if you would answer this question with a yes or not. Is it completely a lack of funds for the extension of credit that is causing us not to extend credit?
> Dr. HATHAWAY. No, it is also a matter of judgement

as to whether the credit there would result in additional sales.

Senator BOREN. Your answer is then that the human rights question has absolutely nothing whatsoever to do with the decisions on extending credit to Chile? Our Government is making decisions purely on economic grounds, and not at all, in any way, on political grounds, is that the answer?

Dr. HATHAWAY. That is my basic position. We have been watching that market very carefully, but it was not evident at the time that we were making our decisions that it was necessary to use credit. The human rights provision, in fact, under law does not apply to the use of CCC credit, if I understand the law correctly.

Senator BOREN. I understand. So it is no way impacting on the decisions? They are being made on the basis of markets?

Dr. HATHAWAY. Market --

Senator BOREN. Market forces?

Dr. HATHAWAY. Market forces.[5]

Obviously, there is a great difference of opinion between the CCC-OGSM and the State Department as to why credits were not granted to Chile.

CCC-OGSM Relations with the Treasury Department

Relations between the CCC-OGSM and Treasury occur at several levels: (1) within the NAC; (2) during the annual budgetary process; and (3) in consultation concerning the credit worthiness and external financial position of prospective borrowing countries. However, it is the lack of other relations (or coordination) between these two groups that we would like to address.

Specifically, the Eximbank and the CCC both extend credits for the export of agricultural commodities but there is no evidence of any coordination concerning their respective programs. Recently, there have been calls in Congress for a consolidation of all agricultural export credit programs

(under Agriculture) and assurances have been made by Exim officials to do so, but certain Exim developments seem to indicate otherwise.

Senator Adali Stevenson, Jr. (Chairman of the Senate Subcommittee on International Finance, Committee of Banking, Housing and Urban Affairs) pointed out the inconsistency of having two agencies conducting separate agricultural export credit programs. "I suppose," he said, "with the same logic that has been suggested, Export-Import should support the export of agricultural commodities, it could be argued that the CCC should support the export of non-agricultural commodities."[6]

Senator Stevenson put the matter to the President and Chairman of the Eximbank, Mr. John Moore, who replied, "I believe that, to the extent the United States should engage in direct loans in support of agricultural commodities exports, they should be handled through other programs of the government...designed by the Department of Agriculture."[7]

While willing to concede to the CCC-OGSM agricultural credits, the Eximbank nevertheless expanded its operations to include other agricultural export activities. In 1978, Eximbank announced a new insurance program "allowing U.S. commercial banks to obtain short-term comprehensive insurance coverage to support bulk agricultural commodity exports sold on irrevocable letters of credit issued by foreign banks with repayment terms under one year...."[8]

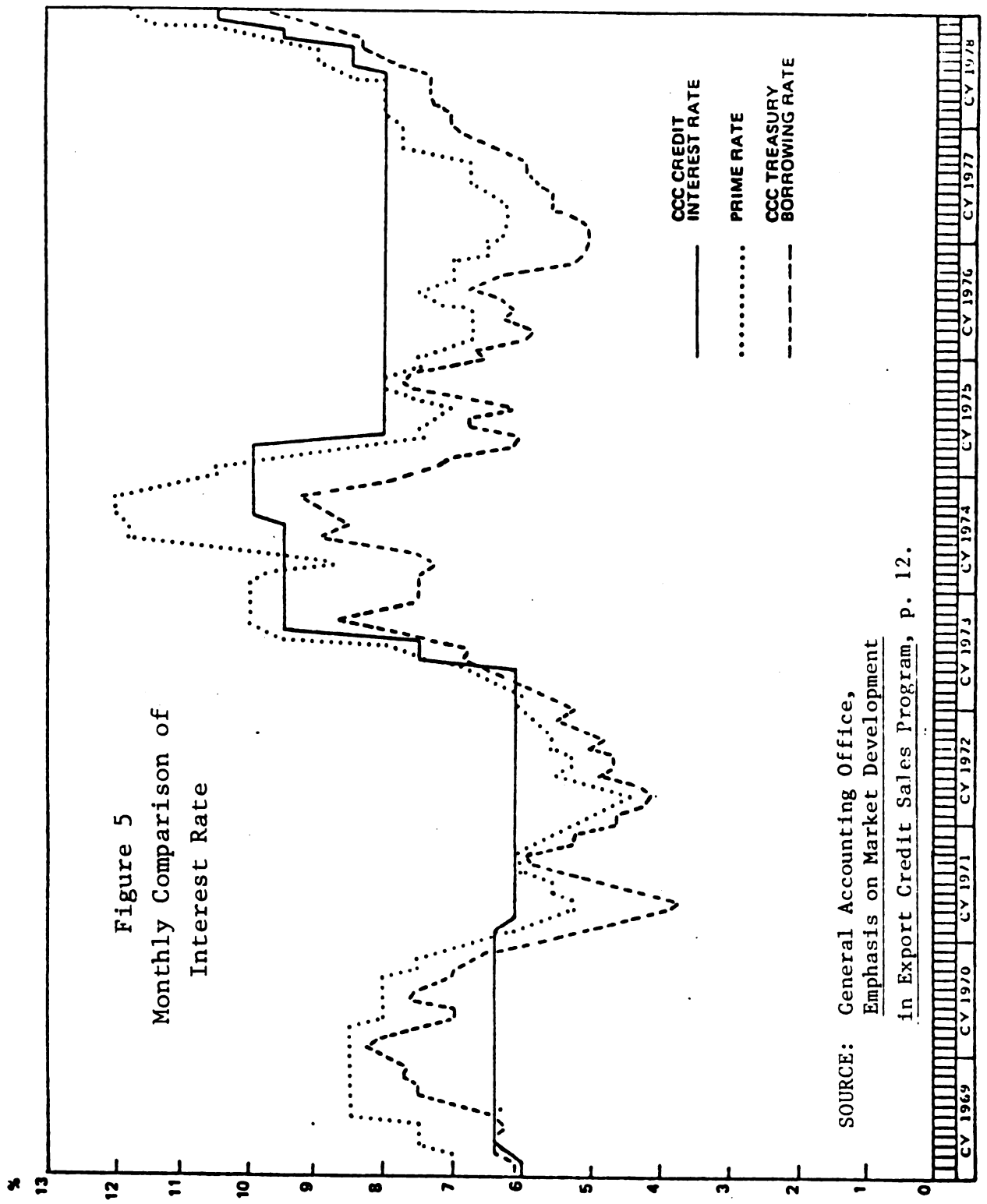


Figure 5
Monthly Comparison of
Interest Rate

SOURCE: General Accounting Office, Emphasis on Market Development in Export Credit Sales Program, p. 12.

With the introduction by the CCC of its own Non-Commercial Risk Assurance and its new Export Guarantee Programs, there is no longer any rationale for maintaining similar programs within the Exim structure.

Determining Interest Rates and Repayment Periods

Interest rates are determined monthly by the General Sales Manager in consultation with the CCC's Controller. Although the CCC has been charged with meeting foreign credit competition while minimizing its displacement of commercially financed or cash sales, neither of these factors have been the principle criteria in setting interest rates.

Instead, the major concern of the OGSM is to maintain a 'commercial' rate and escape the provisions of the Cargo Preference Act (CPA).[9] Loan maturities vary from 6 to 36 months, but 77 percent of the fiscal year 1978 credits were for the full 36 months.[10]

In recent years, the policy of the OGSM has been to set its loan rate at the midpoint between its borrowing rate and the U.S. prime rate (see Figure 5). While this formula may technically remove the program from the purview of the CPA, it was, nevertheless, a 'subsidized' rate that must invariably displace some commercial financing.[11]

The Subsidy Effect

To determine the extent of the subsidy effect, one needs the relevant commercial interest rates and terms of repayment.

Any comparison of the CCC rate with the prime would be, at best inaccurate, and at worst, grossly misleading.

It is doubtful whether the credit ratings on most CCC borrowers is of equal standing with the firms who are quoted the prime rate when borrowing from major United States banks. A more appropriate measure of the degree of subsidy would be to compare the CCC rate with the Eurodollar rates quoted to less-developed, semi-industrialized, and Eastern Bloc countries when they borrow in the Western capital markets.

The Prime Rate

The prime rate, as usually reported in financial publications, is the rate charged by leading New York banks to large borrowers of very high credit standings. The prime is usually the lowest possible cost of using short-term unsecured bank credit. A short-term loan is one in which the borrower has agreed to repay all interest and principal within a 12 month period. Unsecured means that there is no specific pledge of an asset in connection with the loan. Only the debtor's general promise to repay is offered to the creditor in the credit transaction.

Current or short-term financing is often easier to obtain and available with less advance negotiations than other types of financing. Since payment to the creditor is due in a shorter period of time, the risk of lending is generally thought to be less for short-term loans than for loans of later maturity. Other factors being equal, higher interest must be charged for long-term than short-term maturities. The

OGSM implicitly recognizes this principle when it charges incrementally higher rates for loans with progressively longer maturities (in 1978, 7.75%: 6-12 months; 8.5%: over 12 months; and 9.42%: 36 months, see Table III).

Eurocurrency Rates

A 1977 Agriculture study stated that "Private U.S. and foreign bank loans for commodities are seldom longer than 180 days and the rates tend to approach the Eurodollar rate in international banking."[12] An FAS internal study noted that "the maximum repayment period under the CCC program is 36 months. This is a longer repayment period than is generally available from commercial sources for comparable loans."[13]

Both studies are half right. Loans are seldom made at a fixed rate of interest for longer than 180 days but they can be turned over continuously for terms longer than three years. Treasury and World Bank officials confirmed that the Eurocurrency rates were indeed the best barometer of rates that were commercially available for the 'typical' CCC borrower.[14]

The Eurodollar interest rate is determined among major banks in London.[15] The London Interbank Offered Rate (LIBOR) has tended to follow the prime rate in the United States. This tendency was strengthened in January 1974 following the lifting of balance-of-payments restrictions by the United States. Variations between the two rates (prime and LIBOR) are due mainly to: (1) seasonal factors; (2) fluctuations in the dollar exchange rate; and (3) global events.[16]

TABLE III
INTEREST RATES
(Simple Averages of Calendar Years 1963 - 1979)

	Year	FRD Discount Rate	CCC Interest Rate on Treasury Borrowings	CCC Lending Rates by Monthly Terms 6-12	Over 12	13-24	25-36	6-36	Prime Rate
	1963	-	-	3.7	4.2	-	-	-	-
	1964	-	-	4.04	4.54	-	-	-	-
	1965	-	-	4.5	5.0	-	-	-	-
-	1966 a/	-	5.104	-	-	-	-	5.38	5.65
+	1967	-	4.792	-	-	-	-	5.66	5.58
-	1968	-	5.604	-	-	-	-	6.00	6.27
-	1969	-	6.927	-	-	-	-	6.32	7.93
-	1970	5.917	7.177	-	-	-	-	6.38	7.85
+	1971	4.833	4.875	-	-	-	-	6.15	5.65
+	1972	4.500	4.792	-	-	-	-	6.13	5.19
-	1973	6.560	7.094	-	-	-	-	7.69	8.18
-	1974 b/	7.833	8.260	9.85	10.42	-	-	-	10.73
+	1975	6.302	6.854	8.50	9.50	-	-	-	7.97
+	1976 c/	5.542	6.010	8.00	8.83	-	-	-	6.87
+	1977 d/	5.490	5.896	7.10	-	7.83	8.50	-	6.81
+	1978 e/	7.448	8.021	7.75	8.50	-	-	9.42	9.08
+	1979 f/	10.271	10.510	-	-	-	-	12.82	12.64

Source: Xerox copies of tables provided by Tom Pomeroy, Agricultural Marketing Specialist, Commercial Export Credits Branch, FAS, USDA. CCC's rates shown are those charged on U.S. bank obligations - rates charged on foreign bank obligations are one percent higher.

a/ Rates charged until February 17, 1966 were based on length of credit period.

b/ Effective as of August 20, 1973 the CCC tables begin reporting rates for 12-month and 3-year loans

c/ Effective as of September 23, 1976 the CCC tables begin reporting rates for 6 month, 1 year and 3 year loans.

d/ Effective as of December 15, 1977 the CCC tables begin reporting rates for 6-12 month and over 12 months loans.

e/ Effective as of March 24, 1978 the CCC tables begin reporting rates for 6-36 months loans.

f/ Effective as of September 19, 1979 the CCC instituted a new policy of tying their rates to the prime lending rate (usually between .5 to 1.5 percentage points higher than the prime).

\+ Years in which the CCC lending rate is higher than the prime.

\- Years in which the CCC lending rate is lower than the prime.

Just as the prime may be a very poor measure of domestic borrowing costs, so too is the LIBOR an inaccurate measure of international borrowing costs. Since June 1974 and the failure of several banks who were heavily engaged in Eurocurrency operations, the LIBOR has become a multi-tiered arrangement with less favored third- and fourth-tiered borrowers paying premiums of as much as 2 percent over LIBOR.[17]

The greatest activity by volume in the Eurocurrency market is in short-term loans (many loans having maturities of less than a month). The market also serves as an interbank market (which probably explains the heavy traffic of these short-term borrowings). Other Eurocurrency markets exist in: (1) Euro-Commercial Paper to finance trade; (2) a Eurobond market providing the longest maturities available and at fixed rates (supported by a well developed secondary market for trading bond issues); and (3) a Eurocredit market for medium-term financing with maturities of more than 1 but less than 15 years (with most falling between 3 to 12 depending on the liquidity of the market).[18] It is the latter that is the relevant commercial alternative source of financing available to most CCC customers.

Medium-term credit agreements essentially are a transformation of the short-term capital market into a market of longer maturities. A formula in the loan agreements specifies the loan roll-over dates (at 3, 6 or 12 month intervals) and the lender refinances the loan at the

prevailing short-term market rates. Fixed-rate, medium-term loans are unusual.[19]

As previously stated, the short-term rate often quoted is the LIBOR. However, there is no uniform LIBOR and the parties of the loan agreement specify a formula that usually averages the rates offered by several 'reference' banks. In the past, there have been times when wide disparities existed in the rates offered by the more commonly used 'reference' banks.[20]

In addition to the base LIBOR (which can be unique for each loan), the lender affixes an agreed percentage margin or 'spread' for risk, overhead, and profit. Here again, the degree of 'spread' varies widely depending on characteristics of the borrower and the liquidity of the market (a first-tier borrower in a liquid market could pay less than a .5 percent spread while a fourth-tier borrower in a tight market could pay more than a 2.5 percent spread).[21]

There is a paucity of data on the terms and size of the medium-term Eurocredit market. In 1976-77, over 95 percent of the publicized medium term credit commitments were in United States dollars.[22] The base LIBOR for most of these credits paralleled short-term interest rates in the United States. The 'spread' for first-tier borrowers ranged from 1.53 percent in 1976 to 1.13 percent in 1977. In a few cases, some credits were negotiated with only a .5 percent spread.[23]

Sales Registration, Confirmation, and Disbursement

The standard operating procedures of the Export Credit Program (commonly referred to as the GSM-5 regulations) specify the procedures governing the processing of all credit applications. Figure 6 illustrates the procedural flow of an application from the initial request to the final receipt of the loan.

The GAO found that the compliance with these regulations was generally good.[24] However, some recommendations and changes in administrative practices were proposed. The GAO's recommendations concerned: (1) the verification of export shipment and destination arrival; and (2) a general tightening of management with regard to permitting exporter-initiated amendments of financing agreements.[25]

The OGSM's reply to the first recommendation was that it was unnecessary (there had been no evidence of the diversion of CCC financed shipments in the Program's history) and that additional verification procedures would only impose more red tape on the exporter.[26] The OGSM's reply to the second recommendation was that requests for amendments in the past had not been granted without examination (and had been denied in some cases). Furthermore, they argued, the world trading environment was fraught with uncertainty and exporters' petitions for amendments were often due to factors beyond the exporters' control.[27]

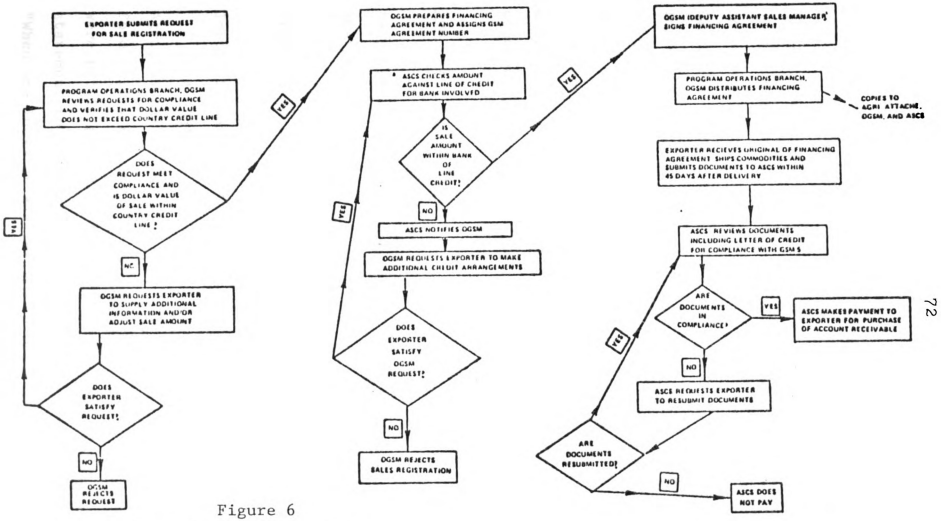


Figure 6

Export Credit Sales Program

Processing of Sales from Registration to Payment

SOURCE: General Accounting Office, Emphasis on Market in Export Credit Sales Program, p. 10.

Uncertainty and its Influence on Program Decisionmaking

Neoclassical economic theory proposes that decision making takes place in an environment of perfect information. Consequently managers (whether in business or government) need only to specify their decision rule and objective function (maximize profits/maximize consumer welfare or minimize losses/minimize social costs) and then execute the optimizing solution. In the 'real' world (the one in which the CCC-OGSM policymakers and decisionmakers must function) very little is known with certainty. The strategies which these managers adopt in dealing with uncertainty will have significant consequences for the Program's performance.

Sources of Uncertainty

There are two primary sources of uncertainty opposing the Program's administrators. One source is the domestic institutional environment in which the Program operates. The other source is the economic environment in which agricultural trade takes place.

Institutional Uncertainty

The Chairman of the Senate Subcommittee on Foreign Agricultural Policy recognized the unavoidable confusion in food policy ensuing from the plethora of agencies (26) which were participating in the policy process. In his opening statement to hearings conducted in January 1976, he said, "When one looks at all the agencies...involved in food and

agricultural policy, it is understandable that decisions are made which are seemingly at cross purposes. If the Secretaries of State, Treasury, Agriculture, and Labor say conflicting things, one can only wonder who is in charge. And, obviously this will have an important impact on decisions by our foreign buyers."[28]

In March 1976, the agricultural policy process was reorganized with Agriculture as the titular head of the Agricultural Policy Committee. In reality, claims the GAO, the President's Economic Policy Board remained in effective control (at least until the end of the Ford administration). Apparently the situation had not improved so that in May 1977 the GAO concluded that "Uncertainty continues to exist regarding how and when major policy options should be implemented."[29] The confusion over the denial of CCC credits to Chile seems to indicate that the delegation of policy making authority continues to be a problem.

Economic Uncertainty

Economic uncertainty emanates from a variety of sources. The most fundamental uncertainty concerns the trend of world agricultural prices (particularly in the 1980's). Another source of economic uncertainty concerns the other imponderables often associated with international trade. These include: (1) foreign government's commercial policy and the degree to which they are enforced; (2) fluctuating exchange rates; (3) foreign government's balance of payments

position; (4) the credit worthiness of foreign banks; (5) domestic inflation; and (6) international political developments (and the United States' response to these developments) all add to the daily headaches of CCC-OGSM administrators and policy makers.

Flexibility as a Strategy for Dealing with Uncertainty

The CCC Program's administrators seem to use flexibility as their primary strategy for coping with uncertainty. 'Passivity' and lack of rigid adherence to mandatory country and commodity priorities appear as failings to GAO investigators. However, the OGSM considers this a virtue since it permits them some degree of flexibility in responding to changing market conditions.[30]

Another administrative adaptation to uncertainty is the occasional practice of permitting the registration of 'old' sales, either to prevent the cancellation of contracts or to encourage customers to buy ahead during seasonal periods of depressed prices (usually prior to the shipping season).[31] Still another adaptation is the practice of accepting amendments to loan agreements.

Again, flexibility imposes a cost. In this case, the failure to develop or adhere to marketing plans makes it difficult to judge the Program's performance along objective criteria. Also, without a specific plan to guide allocations, the Program becomes more vulnerable to manipulation for secondary economic and political considerations.

Another method of maintaining the required flexibility is to avoid binding statements of the Program's policy objectives. There is, however, a danger that the operational results of the Program would be at variance with the intent of policy responsibility to operating officials (but it would also reduce their accountability).[32]

The 1977 Agriculture study implicitly justified this and other strategies when it noted that "The transfer of policy responsibility to operations staff is not necessarily bad. It is often appropriate in situations where there is a high degree of uncertainty and where conditions for potential program effectiveness are highly variable and difficult to specify with much lead time."[33]

Conclusion

The conduct of the Program's administrators is strongly influenced by the Program's structural characteristics. Structure defines the limits of the administrators' powers and responsibilities. While the administrators have a large degree of independence in developing the Program and in evaluating credit requests, other agencies appear to have been able to use the Program to meet their particular objectives. Even the Program's mission, promoting agricultural exports through export financing, must be shared with another agency. It has been established that the Eximbank had also financed agricultural exports and has developed export credit insurance programs very similar to those offered by the CCC.

One critical aspect of the administrators' conduct is the process by which interest rates are set. Because of the Cargo Preference Act, the Program has to charge a "commercial" rate of interest. However, the rates charged by the CCC, while strictly covering their own borrowing costs, are not comparable to the true commercial rates which would be charged to foreign importers. The comparable rate would be that charged by the Eurocurrency market. It will be demonstrated in Chapter V that it is the implicit subsidy embodied in the CCC interest rates which is responsible for much of the Program's "additionality" effect.

Program conduct is also influenced by the uncertainty with which its administrators must deal. The Program's administrators have adopted a strategy of flexibility and rely

on broad statements of the Program's objectives. Because institutional and economic conditions are highly variable, a lack of specificity in Program goals allows administrators a greater degree of latitude in responding to unexpected developments.

CHAPTER III ENDNOTES

[1]The Council, consisting of representatives of Treasury, State, Commerce, Export-Import Bank, and Federal Reserve System, was established by Executive Order 11269 on February 14, 1966, and is responsible for coordinating U.S. Government foreign lending.

[2]U.S. Congress, Senate Committee on Agriculture, Nutrition, and Forestry, Implementation of the Agricultural Export Trade Expansion Act of 1978, Hearing before the Subcommittee on Foreign Agricultural Policy, 96th Cong., 1st sess., 1979, p. 21.

[3]Ibid.

[4]U.S. Congress, House and Senate, Joint Economic Committee Congress of the United States, Exports: Time for a National Policy, Hearings before the Subcommittee on International Economics, 95th Cong., 2nd sess., 1978, p. 62.

[5]U.S. Congress, Implementation of the Agricultural Export Trade Expansion Act, p. 28.

[6]U.S. Congress, Senate Committee on Banking, Housing, and Urban Affairs, Export Policy, Hearing before the Subcommittee on International Finance, Part 2, Trends in Export Markets and Competitiveness, 95th Cong., 2nd sess., p. 24.

[7]Idem., Part 4, Export-Import Bank Authorization and Related Issues, p. 25.

[8]Idem., Part 5, Agricultural Export Policies, p. 52.

[9]For a review of the Cargo Preference Act refer to an earlier portion of this paper titled: External Effects.

[10]General Accounting Office, Emphasis on Market Development in Export Credit Program, p. 11.

[11]As of September, 1979, the CCC has set their lending rates at .5 to 1.5 percentage points higher than the prime.

[12]Department of Agriculture, "CCC Credit and Market Development," p. 42.

[13]Idem., Foreign Agricultural Service, "New Orientation to FAS Activities," pp. 6-7.

[14]From telephone conversations with Rodney Bent, U.S. Treasury Department, 4 February 1981; Sue Whitsitt,

Export-Import Bank and Mrs. Fullerton, Financial Policy and Analysis, World Bank, 6 February 1981.

[15]The primary currency supporting Eurocurrency transactions is the U.S. dollar. Other currencies include the euro-DM, euro-Swiss franc, euro-sterling, and euro-franc(France). The market is not restricted to London but has expanded to include financial markets in Zurich, Paris, Bonn, Singapore, Nassau, and Panama.

[16]P. A. Wellons, Borrowing by Developing Countries on the Euro-Currency Market (Paris: Development Centre of the OECD, 1977), p. 23.

[17]International Monetary Fund, "Report on International Lending," IMF Survey, 31 July 1978, p. 233. The banks which failed were the Herstatt Bankhaus in Europe and the Franklin National Bank in the United States.

[18]Wellons, Borrowing by LDC's on the Euro-Currency Market, p. 25.

[19]Ibid., p. 27.

[20]Ibid., p. 26.

[21]Ibid.

[22]IMF, "International Lending," p. 233.

[23]Ibid.

[24]General Accounting Office, Emphasis on Market Development in Export Credit Program, p. 50.

[25]Ibid.

[26]The OGSM cited a Presidential Executive Order requesting that all Federal programs keep their paperwork to a minimum, thereby reducing the burden on users.

[27]See Ibid., pp. 68-69.

[28]General Accounting Office, Management of Agricultural Exports, p. 96.

[29]General Accounting Office, Management of Agricultural Exports, p. iii.

[30]Department of Agriculture, "CCC Credit and Market Development," p. 4.

[31]General Accounting Office, Emphasis on Market Development in Export Program, pp. 64-66.

[32]Department of Agriculture, "CCC Credit and Market Development," p. 54.

[33]Ibid.

CHAPTER IV

THE PERFORMANCE OF THE PROGRAM

Performance is the third and final component of the institutional model. Performance is "the flow of consequences from a particular structure, given the conduct of the participants in a system."[1] When evaluating performance, it is counter-productive "to judge performance on the basis of an ideal which may be attainable or on the basis of some absolute criteria [such as maximizing a single argument objective function [which][would] ignore...the multiple dimensions of performance and the necessity [of] mak[ing] trade-offs."[2]

The Importance of Retaining a Pragamatic Perspective

Analysis of performance must be done from a pragmatic perspective. To accomplish this, current Program performance must be compared to the performance that would have resulted had the Program been organized according to a realistic, next-best set of structure and conduct arrangements. Such a comparison is difficult if there are no existing alternative models against which to make a comparison. In the case of the CCC Program, a comparison with the Treasury's Eximbank is possible. The Eximbank has nearly the same programs as the CCC and in the past has financed some of the same products. Both programs are designed to be self-sufficient, follow approximately the

same procedures, and have many of the same problems. While a strict one-to-one comparison of the two Programs would be misleading, it is useful where appropriate, to make some comparisons.

Impact Indicators

Institutional performance is often evaluated along broad categories such as equity, fairness, productivity, progressiveness, etc. While these concepts are useful, they are too general to serve the purpose to which we would put them. Rather, what is needed are more specific categories with which to document the Program's performance. This study will employ something like the impact indicators used by program budgeting evaluation systems (PBES).[3] Impact indicators are specific, measurable indices of the consequences of a particular public program. To the degree that each program is unique, so too will be its set of impact indicators.

The impact indicators of the Export Credit Sales Program are its performance with respect to its objectives (increasing exports and maintaining/developing markets) and its goals (increasing farm income and maintaining the economic health of agribusinesses and farming communities). In addition to these explicit objectives and goals it is appropriate to examine and discuss the performance of the Program with regard to its secondary economic and political impacts. Finally, there will be some discussion on ways to

measure the degree of efficiency with which the Program has been administered.

Performance with Respect to the Program's Explicit Objectives

Chapter I introduced and discussed the concept of additionality. Additionality has been the primary criteria used in evaluating the performance of export credit programs. Additionality refers to the increase in exports due to the effects of a specific program. As it applies to the CCC Program, additionality is the additional United States exports which occur because of the granting of credits. Additionality can extend over several years and it can also extend to commodities which are not directly included in the credit program.

A number of studies have attempted to measure the additionality of various programs designed to increase exports. These will be reviewed and used as a basis for developing the methodology introduced in the following chapter.

Previous Additionality Studies

Four separate methodologies have been identified to measure additionality. The subject of these additionality studies was not always the CCC Program. Most of the studies uncovered evaluated the additionality of the Eximbank Program. Some of these methodologies have been employed for both the CCC and the Exim Programs. The four methodologies

are: (1) the elasticity approach; (2) the probability approach; (3) case studies; and (4) the simple correlation approach.

The Elasticity Approach

Exim and Treasury officials stated that several additionality studies have been done using the elasticity approach.[4] However, only one study was available so we can only infer that the others used similar methodologies. The single available study is one that was done in 1978 by the Congressional Research Service (CRS).[5] The method is briefly described by the author as follows:

> The Eximbank program provides loans at discount rates which are lower than loans which could be obtained in the marketplace. If one assumes that at some interest rate these loans could be obtained, then the direct loan program would be perceived by foreign purchasers as the equivalent of a price reduction, as long as the seller does not capture any of the initial subsidy.
>
> From the point of view of the U.S. sellers of export products, the effect is as if the demand for these Eximbank subsidized exports had shifted upward. Therefore, if supply and demand elasticities are known and the percentage price reduction can be determined, conventional application of elasticities will yield a new value of exports.[6]

The subsidy value of Exim loans was estimated as the present value of the difference between the Exim interest rate and an alternative commercial rate. This interest rate differential was further refined by weighting according to the maturities of the loan. The additional exports due to this subsidy were estimated using the following formula:

$$\text{Percentage Change in Exports} = \frac{E_d(1 + E_s)\ P^*}{E_d + E_s}$$

where

E_d = Price elasticity of import demand.

E_s = Price elasticity of export supply.

P^* = Subsidy value expressed as a percentage reduction in price.

Exports were not disaggregated and the formula was applied using aggregate price elasticities obtained from an earlier and similar study done by the Domestic International Sales Corporation (DISC).[7] The additional exports attributed to the subsidy value of the Exim loans was approximately 14 percent of the value of all Exim loans made during FY 1976.[8]

If any of the subsidy is captured by the exporter, the additionality effect is weakened. Also, under a regime of floating exchange rates, the effect may be overestimated if the Exim credits cause the dollar to appreciate in value. On the other hand, if the credits "involve the equivalent of addition to the U.S. investment position abroad resulting in an increase in outpayments from the Balance on Current Account and Long-Term Capital " causing the dollar to depreciate, then the effect would be underestimated.[9]

Treasury and Exim officials disparaged the elasticity approach for its reliance on questionable estimates of the elasticities. One Treasury official reported that the econometric techniques used in the past failed to produce reliable estimates of import demand elasticities.[10] They

indicated that the estimates were consistently overwhelmed by income and exchange rate effects. There is also the problem of determining the size of the subsidy and discovering how much of the subsidy reaches the foreign purchaser. This approach does not consider any cross commodity effects and it assumes all effects occur within a single year.

The Probability Approach

The probability method of calculating additionality has been employed by at least three studies: (1) an unspecified 1970 Agriculture study (cited in the 1979 GAO report on the CCC Program); (2) a 1978 Treasury study; and (3) a 1980 Treasury study.[11] The latter two studies estimated additionality effects of 64 percent (of FY 1976 Exim loans) and 72 percent (of FY 1978 Exim loans) respectively. The first study estimated the additionality effect of CCC credits to be "about 50 percent of FY 1971 sales under the Program."[12]

The two Treasury studies defined additionality as "the probability that Eximbank programs have in fact fostered U.S. exports.... Additionality defined in this way is not meant to measure Eximbank's total impact either on overall U.S. trade balance.... The stud ies only attempt to calculate export sales booked as a result of the Eximbank presence."[13]

These two studies rest on "certain probability assumptions as to the likelihood that various loan characteristics are associated with additional exports."[14] These factors are: (1) the amount of the loan; (2) the duration of the loan; and (3) characteristics of the obligor country, particularly its access to capital. The 1978 study "deliberately excluded [foreign official export credit competition] as a factor [on the grounds that] while more advantageous credit terms may reduce U.S. exports, such foreign [competition] does not influence the relationship between capital market imperfections and U.S. trade."[15] For some unexplained reasons, the 1980 study, while identical in nearly all respects with the 1978 study, decided to include foreign credit competition as a fourth factor contributing to additionality.

If these factors contributing to additionality were a readily observable phenomena, the separate effect of each factor might be identified by econometric methods. However, as both studies indicate, "past studies had great difficulty in attempting to identify the independent influence of these factors ."[16] Therefore, these more recent studies generated <u>subjective probability distributions</u> for each factor. They then assigned a partial probability coefficient "associated with the intensity of each factor."[17]

Each and every loan made in a particular year was then examined and the total additionality probability of the loan

was calculated as the "simple weighted average" of the partial, subjective, factor probabilities.[18] The additionality probability of the entire program was the sum of the individual loan probabilities weighted by the amount of each loan (see Table IV).

There is a large disparity between the additionality estimates of the probability studies (64 and 72 percent) with the estimate of the elasticity study (14 percent). This discrepancy was commented on by the author of the latter study.[19]

> The major reason for the difference is that the Treasury studies are based on determining 'additionality' factors. These additionality factors assume that a specified percentage of exports are additional given characteristics. In fact, it appears that a very large portion of the additionality associated with direct credits is due to the assumption that loans with certain characteristics (such as long maturities) mean that the sale would not have been made at all without such a characteristic.
>
> The Treasury studies indicated that the basis for their additionality factors is popular assumptions. Given such a qualitative basis for these estimates, it is of course difficult to assess such an estimate.

Case Studies

At least one case study of Exim loans was done in the early 1960's.[20] The study employed the buyer-interview method. The purpose of these interviews was to investigate and "determine whether certain features of Exim loans might have precluded private financing, or...severely limited the supply of private funds at a reasonable price."[21]

TABLE IV

HYPOTHETICAL ADDITIONALITY CALCULATIONS
USING PROBABILITY APPROACH

Characteristic	Probability Associated with Obligor Country Characteristics	Probability Associated with Loan Size	Probability Associated with Loan Duration	Probability Associated with Foreign Competition	Total 'Partial' Probability	Weighted by Loan
Algeria ($5 mil., 2 yrs. Textile Machinery)	.6*(.25) = .15	0.0*(.25) = 0.0	0.0*(.25) = 0.0	.15*(.25) = .038	.1875	.1875*5/75 = .0125
Brazil ($40 mil., 7 yrs. Aircraft)	.2*(.25) = .05	.5*(.25) = .125	1.0*(.25) = 1.0[1]	.4*(.25) = .1	1.0[1]	1.0*40/75 = .5333
New Zealand ($30 mil., 5 yrs. Tractors)	0.0*(.25) = 0.0	.25*(.25) = .063	.25*(.25) = .063	.2*(.25) = .05	.175	.175*30/75 = .07
						+
Total Additionality Probability						.62

[1]When a single factor for a given loan on a value of 1.0, Treasury assumed that the export value of the loan was entirely additional. By assigning the Total Partial Probability for that loan a value of 1.0 avoids the downward bias by reducing that factor's impact by giving it only a one-quarter weight.

The GAO employed a somewhat similar approach in its recent evaluation of the CCC Program. The focus of their interviews (and survey) was not the foreign buyer but the domestic exporter.[22] Regardless of the subject under investigation, the technique suffers from several drawbacks:

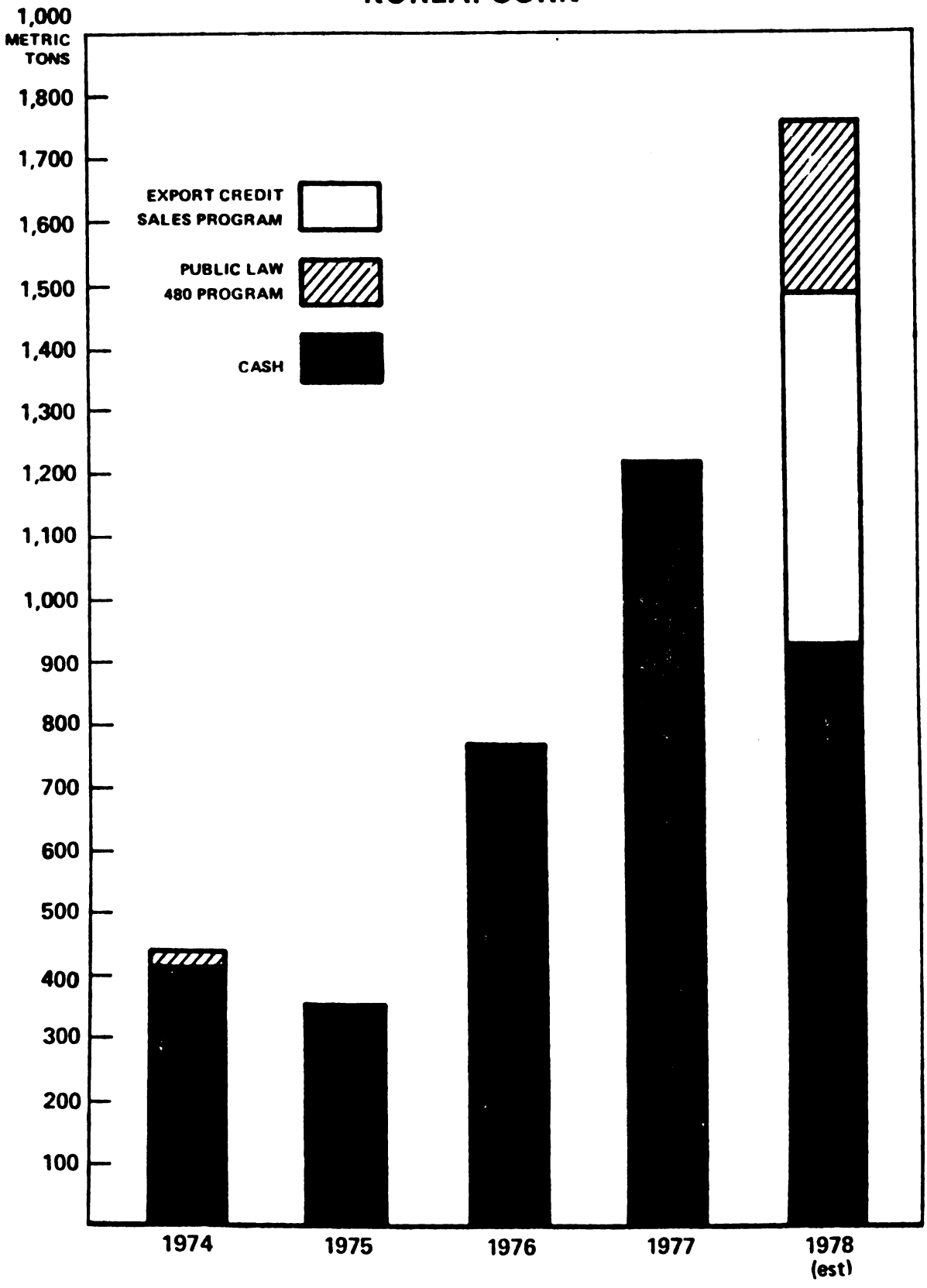
1. A large number of responses can be solicited through a formal questionnaire but the information may be superficial and the results may be biased by low response rates.
2. Better quality information may be obtained using the direct interview approach but that increases the cost of the study and this usually limits the number of interviews. Whoever is interviewed, it is possible that the answers given will be biased. The GAO recognized this problem when it cautioned the OGSM not to put too much credence in the opinion of the American Cotton Shippers Council as to whether CCC cotton shipments to Korea were necessary. "We question," they wrote, "whether for Korea the Shippers Council could be considered completely objective...."[23]
3. Most interview and survey studies are less-than-perfect research methods due to problems in design, sampling technique, interview interaction effects, etc.[24]

The Simple Correlation Approach

GAO investigators "analyzed export sales of major commodities to selected countries over a period of 5 years."

They then drew a set of graphs breaking down the composition of these exports by the amounts financed by CCC, exported under PL 480, or sold for cash (see Figures 7, 8, and 9). From these graphs, they inferred that "the need for some credits is questionable and they may not be contributing to the overall expansion of U.S. agricultural exports."[25]

The conclusions drawn by the GAO can be challenged on two points. First, a statistical correlation does not prove causation. With regard to CCC financed exports, did increased CCC credits displace cash sales as the GAO claims or did declining cash sales required increase CCC financing? Second, even assuming a cause-and-effect relationship between two variables, regardless of direction, may be inappropriate. It is possible that the variation in the composition of a country's imports are not caused by each other. The relative share of exports financed by the CCC, shipped under PL 480, or sold for cash could be related to other factors. For example, what if the importing country were experiencing balance of payments difficulties but demand was still high; it would make sense to finance a greater portion of the exports using CCC credits. And if the competition from foreign exporters was higher in some years than in others; would an increase in CCC financing be an appropriate response to this challenge. There are many more scenarios that could explain the graphs with equal plausibility.



SOURCE: General Accounting Office, Emphasis on Market Development in Export Credit Sales Program, pp. 30-31.

Figure 7

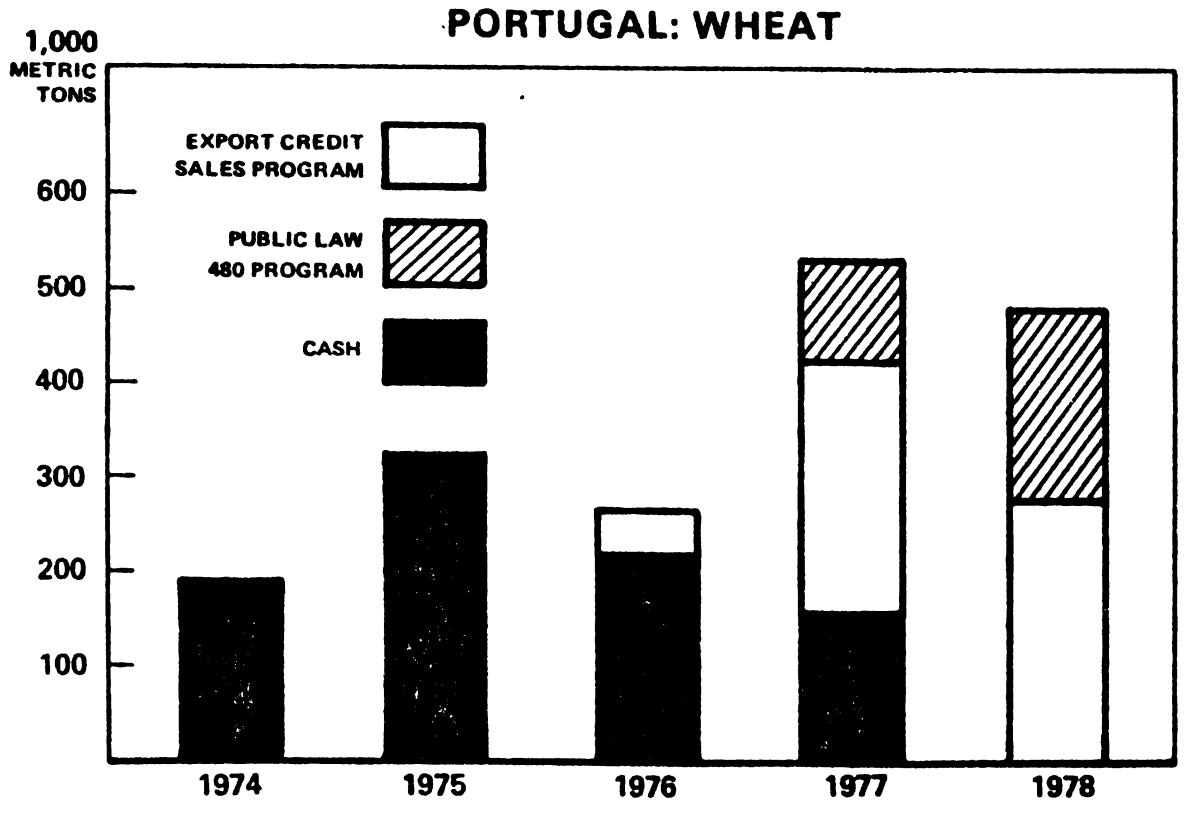


Figure 8

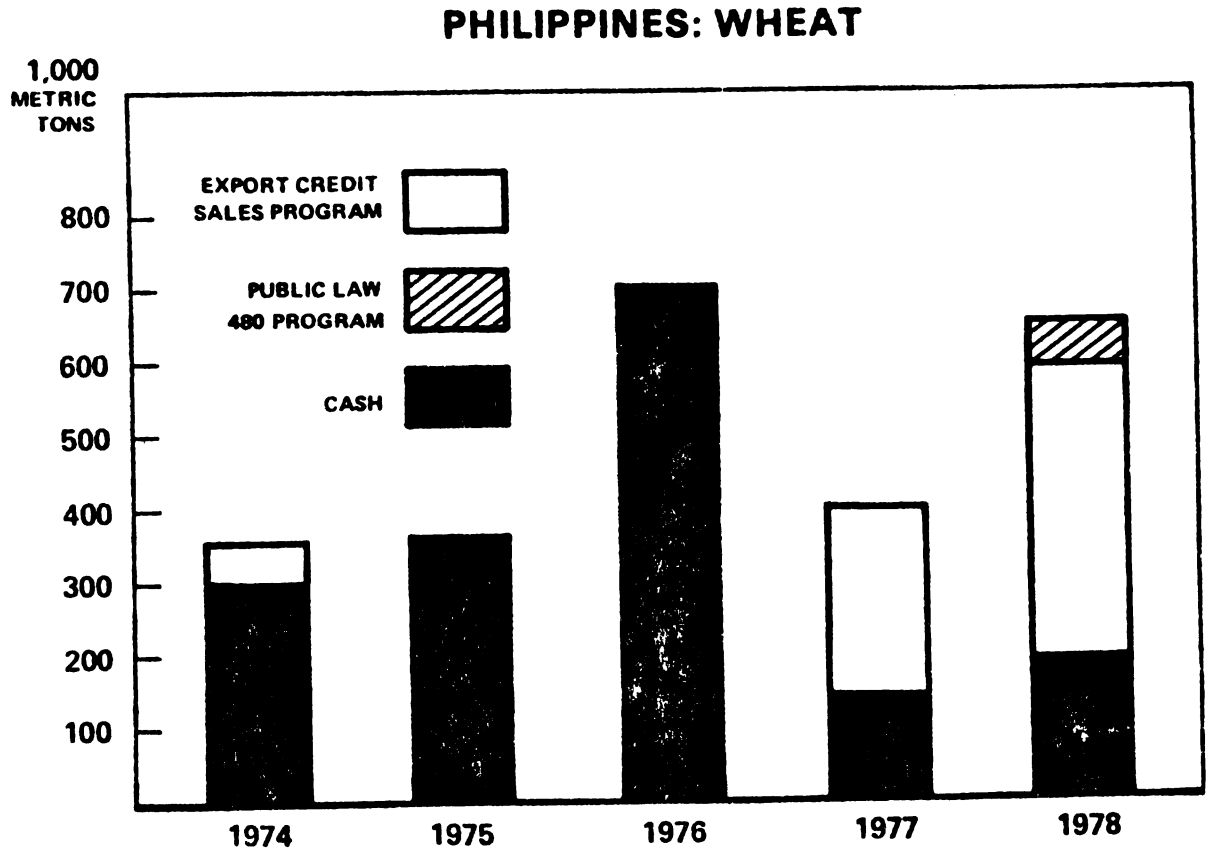


Figure 9

An Alternative Methodology

All of the methods used to measure it have had serious theoretical or procedural weaknesses. When looking at a single country and a single commodity I believe that using a dynamic input-output modeling technique would help capture the complex set of interactions resulting from the provision of import credits. However, constructing an input-output model for each actual or potential recipient of CCC credit does not seem to be a realistic approach to measuring the overall additionality effect of the Program.

One alternative which could be employed would be to to use a set of dynamic country models, each possessing three components: (1) a sectoral demand function for the imported commodity; (2) sectoral investment function based on profits; and (3) a GNP expansion multiplier that links sectoral growth to overall growth in national income. The demand function would reflect the effect of credit availability as well as the price effect of obtaining credit at less than the opportunity cost of capital. The investment function is needed to capture the "induced investment" effect which carries the credits' import-expanding influence into future time periods. Finally, if there are country income import elasticities available, then the sectoral GNP expansion multiplier would reflect how credit could effect imports of other commodities.

Performance with Respect to the Program's Explicit Goals

While the difficulties of assessing additionality may seem formidable, they are minor compared to the problems associated with determining the Program's impact on farm income and the distribution of Program benefits. Future research on these issues could include the following topics: (1) measuring the degree of subsidy (if any) embodied in a CCC loan; (2) determining benefit incidence of the subsidy; and (3) a critique of the Program when viewed from the new 'supply-side' economics.

Benefit Incidence - Exporter or Importer

Conventional economic wisdom has identified the importer as the beneficiary of any subsidized export credits. This is not true if our competitor's price for the exported commodity is below our domestic price and the subsidy just offsets this price disadvantage. 'Price' here is used to define the total set of purchase costs: list price, transport, financing (if any), insurance, losses, etc. While the United States enjoys a dominant position in the world market for many commodities, its market share, at the prevailing 'world' price, can be undercut by other exporters who offer importing countries a variety of transport and financing cost savings. In that sense, it is possible that for some commodities, during some years, the 'world' price at which the U.S. markets its products may exceed the subsidized price charged by our competitors.

A Perfectly Compensating Subsidy

If, for example, the domestic (or 'world' price) for wheat in the United States is $4.00 a bushel, but a competing exporters' price is $3.75, then United States wheat will sell only after the competing exporter has sold all he wants, reducing the U.S. to the role of being the residual source of supply. However, if the subsidy effect of the CCC Program is equivalent to a 25 cent price reduction, the United States wheat will be competitive with foreign supplies.

Under these conditions, does the importer receive the 25 cent per bushel subsidy? From the perspective of the importer (assuming price is the sole determinant of purchasing behavior) he is indifferent between purchasing wheat from the United State or from the other supplier. He has gotten nothing out of the transaction that he could not have obtained from the other supplier.

Who then received the subsidy? Without a doubt, a subsidy was paid by American taxpayers, but who received it? In this case, the exporter received the subsidy. Even if the exporter is selling his $4.00 wheat at break-even price and the subsidy produces no additional revenue, the political economy has still been transformed in a manner which makes foreign sales possible when they were not possible before.

To be fair to the exporter (which in this case is assumed to be the farmer with no middle man), the economic

structure of American agriculture received the subsidy and, indirectly, so did the entire society. It is the socio-politico-economic environment which establishes the 'rules' or 'givens' for agriculture--such as minimum wages, input prices, interest rates, taxes, environmental regulations, etc. It is in this mileau, bounded by the constraints of our political economy, that American agriculture must operate. If the 'natural' comparative advantage of American agriculture is swamped by domestic price distortions (ignoring for the moment importers' trade barriers and competitors' subsidies) then it may be in the nation's interests to provide an export subsidy as compensation.

An Overly Compensating Subsidy

Let us return to our original example but now change the competing exporter's price of wheat to $3.85 (from $3.75). For the United States to end its role as residual supplier to the world market it must provide at least a 15 cent per bushel subsidy. What would happen if we kept the subsidy at the previous level of 25 cents?

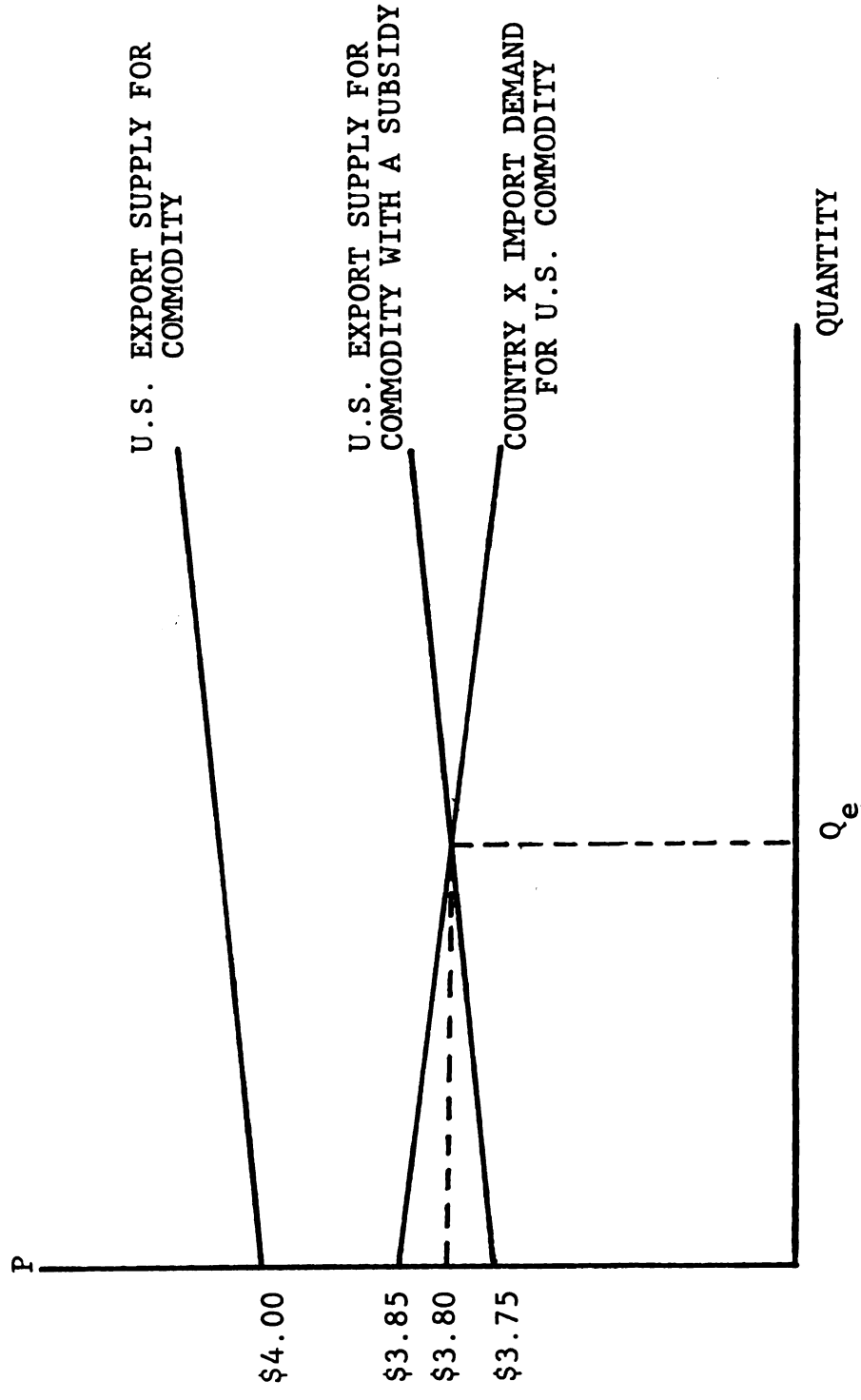
In this case, the remaining 10 cents of the subsidy is a surplus which is split by the exporter and the importer. The relative shares of the split are determined by the price elasticities and market power of each participant in the transaction.

The simplest way to illustrate this would be to assume a perfectly competitive domestic exporting sector facing an

elastic world import demand curve (see Figure 10). The analysis is similar to that employed when determining the incidence of an excise tax, except now it is the incidence of subsidy we are trying to trace.[26] Prior to the subsidy, no exports were being made and would not be made unless the price fell to the world price of $3.85. The effect of a 25 cent per bushel subsidy would be to shift the supply curve down by that amount. Now Q_e exports are shipped and the equilibrium price is $3.80. The entire domestic agricultural sector has been subsidized by 15 cents a bushel. Individual exporters capture an additional 5 cent subsidy while the importers receive a similar 5 cent benefit. The incidence of the benefit would be the same regardless of whether we shift the demand curve or the supply curve.

An Unnecessary Subsidy

If the competing exporter's price is no lower than the domestic price, only a small incentive (perhaps a few cents per bushel) would be needed to swing the sale to the United States. If the subsidy exceeds this minimum sales threshold level then "Insofar as [the exporters] are able to charge a higher price because they can also offer such low-cost credit, they could capture a part of the subsidy."[27] Here again, some of the subsidy may be passed on to the importer depending on the price elasticities and the distribution of market power.



U.S. Export Market

Figure 10

Effect of an overly compensating export subsidy

Benefits versus Costs--The View from the "New Supply-Side Economics"

The CCC Export Credit Sales Program is frequently justified on the grounds that it is necessary to help improve our balance of payments. According to Arthur Laffer, this is an irrelevancy. Any increase in exports, states Laffer, would be matched, dollar for dollar, by an expansion of imports.[28] Laffer also discounts the arguments that we must meet foreign credit competition or that export subsidy programs have an aggregate employment effect. Finding no real benefits, Laffer concludes that the loss to taxpayers from the government lending funds at below-market rates makes such programs unwarranted on economic grounds.

In 1978, these views of Dr. Laffer's were not heeded by the Senate subcommittee that listened to his testimony on the Eximbank. Today, Laffer and other spokesmen of the 'New Supply-Side Economics' have the ear of both the administration and influential members of Congress.

Performance with Respect to Secondary Economic and Political Impacts

The list of the Program's possible secondary impacts is long and this study will not discuss all of them. However, it will address those that have often been cited in various

reports and studies. These will be discussed separately under the headings of domestic then international secondary impacts.

Secondary Domestic Impacts

Some of the Program's secondary domestic impacts may derive from the Program's relative effectiveness in moving our nation's agricultural trade closer to the pattern dictated by the principle of comparative advantage. Other impacts concern the Program's influence on the domestic price level and on the domestic distribution of income.

Comparative Advantage

One of the more durable theories explaining the pattern of international trade is the principle of comparative advantage. A country produces for export those products in which it has a cost advantage to other countries. Even in a two-country case where one country has an absolute advantage in the production of all products, there is still a basis for trade if there is a discrepancy in the two countries' domestic relative price ratios.

If countries engage in unimpeded trade, then each country will specialize its production and export those products in which it has comparative advantage and it will reduce its domestic production of and import more of those products in which it does not. Total global product must increase as the world's resources will be used more

efficiently. Depending on the degree of bargaining power of each country, there will be an unequivical increase in the welfare of at least one country and no decline in the welfare of the others.

If the CCC Program pushes American agricultural exports towards the pattern of trade that would prevail if all international trade were organized along lines of comparative advantage, then two distinct benefits could be captured.

Increased Efficiency. In 1970, about one-fourth of all United States crop production (harvested acres) was exported. By 1978, this figure had risen to nearly one-third.[29] Obviously, exports are a large part of the total demand for the agricultural sector as a whole and is the dominant source in some of the major crops. Over the Program's life, the increased demand of the magnitude represented by exports may have had an effect on agriculture's unit production costs. The degree to which increased exports reduce unit production costs depends on the extent to which "economies of scale are relevant in production and their relationship to the size of the potential market."[30] A decrease in unit production costs would have a twofold effect: (1) agricultural products would become even more competitive than before, leading to a secondary round of exports; and (2) domestic consumers are able to obtain the products at a lower price.

The Export Multiplier. A USDA input-output analysis found that $21 billion of additional business activity was generated from the $22 billion of agricultural exports shipped in 1974.[31] Consequently, each dollar of agricultural exports stimulated a further 96 cents of domestic output--a multiplier effect of almost two. The labor of nearly half a million farm workers (or 14 percent of the United States' farm labor force) was required to produce the 1974 exports. Another 650,000 non-farm workers were needed to assemble, process, and distribute these products prior to export.[32]

Domestic Price Effects

The CCC Export Credit Sales Program can effect the domestic price level through three channels: (1) increase in the government budget for any particular year; (2) increase in food prices; and (3) increased support for the dollar.

Increase in the Federal Budget. Although the Program has incurred no cost over the life span of its loans, the burden on the domestic budget can be substantial in any one year. New loans made for more than a year (and 77 percent are for 36 months) contribute to outlays and do not generate revenues until later years.[33] To the extent that this budget outlay increases the aggregate level of government borrowing in any one year, there may be two separate consequences: (1) an increase in inflationary pressures

depending on how the borrowing is financed (whether or not the Federal Reserve purchases the Treasury Notes); and (2) a 'crowding out' effect. The latter occurs as interest rates rise due to increased government borrowings. Some private sector investment opportunities must be foregone and the increased cost of borrowing contributes to the increased cost of doing business which may further fuel inflation.

Increase in Food Prices. Any increase in agricultural exports decreases the supply available for domestic use and consequently increases domestic food prices. In 1974, the GAO, at the request of Congress, published a study on the Impact of Soybean Exports on Domestic Supplies and Prices.[34] While the GAO did not deny that changes in the level of exports effected domestic prices neither they nor Agriculture had "analyzed in detail the impact of increased soybean exports on domestic prices." Furthermore, they could not "explain the exact relationship between exports and increased domestic prices...."[35] It should be clear, however, that any short-run increase in prices, either due to increased exports or through government borrowing, must be weighed against the long-run returns to trade which are accrued comparative advantage.

Increased Support of the Dollar. Another benefit of the Program, which may ameliorate any inflationary impact, is that increased exports must translate into increased demand for dollars to pay for those exports. While this is an undeniable return for the Program, its relative

importance is diluted because of the kinds of countries which generally receive credits (LDC's and Eastern European countries).

If the Program's credits were allocated to our largest agricultural export markets (Japan and Western Europe) and this resulted in a substantial increase in their agricultural imports, then the dollar should appreciate relative to their currencies. A very large share of our current account deficit is with Japan and the countries of Western Europe. An appreciating dollar would contribute to a reduction in this deficit. This would also have an anti-inflationary effect on domestic prices.

Henry C. Wallich, a member of the Board of Governors of the Federal Reserve System, outlined for Congress the principal arguments in support of this proposition.

> ...we have learned that exchange rate depreciation contributes significantly to inflation. This has been the lesson of the devaluation of 1971 and subsequent exchange rate movements. Prior to that, it had been widely thought that the small size of our foreign sector meant that the dollar rate had almost no influence o the domestic price level. Experience has shown that depreciation influences prices beyond the export and import sectors. Domestic prices are influenced also through the mechanism of competition. A depreciation of the dollar reduces competition for a wide range of domestically sold goods. Moreover, since 1971, the foreign sector of the U.S. economy has increased from 6 percent of GNP to 10 percent. The American economy has become more open. Thus, the immediate impact of exchange rates on domestic prices has also increased.[36]

Unfortunately, most of the countries receiving credits are not countries with which we have a current account deficit but rather a surplus. The appreciation of our

currency relative to theirs does little to help restore our balance of trade with Western Europe and Japan.

Income Distribution

Eximbank directives require that, prior to the approval of loans, the Bank must take into account "any serious adverse impact of loans and guarantees on U.S. industry and employment....in the United States."[37] No similar requirement applies to the operation of the CCC program. In an attempt to counterbalance the disproportionate amount of Exim credits extended to just 200 firms, the Bank's management has instituted a variety of programs aimed at increasing the participation of small business in the export market.

The allocation of CCC credits is less concentrated than the Eximbank's. A GAO survey of American agricultural exporters found that 195 private firms engaged in export activities in 1973 and 1974.[38] However, just 7 of these firms (or 5 percent of the 148 who reported sales) accounted for 62 percent of the total exports.[39] In 1978, the GAO reports, 75 percent of the CCC credits were allocated to 45 exporters. Assuming that the number of exporter firms had not changed, that would be approximately 23 percent of all 1974 firms. It is not known what was the exact distribution of credits among these 45 firms. Furthermore, many of the companies to which the Eximbank had extended credit were primarily manufacturers who handled their own exporting

operations. As has been shown in the prior discussion of the structure of the United States' domestic exporting sector, it cannot be claimed that producer and exporter are the same or that increased exports will significantly benefit producers.

The Program's benefits that filter down to the producer level are unevenly distributed. Between the Program's inception in 1956 to 1978, only three commodities accounted for nearly 73 percent of all credits (wheat, corn, and cotton). Johnson and Quance have proposed that at least part of the persistent surplus in these and other crops was due to the overinvestment in productive capacity.[40] In one sense, the Program has subsidized these producers' management errors and weakened the market signals indicating that adjustments were needed.

Secondary International Impacts

Much has already been said about the alleged influence of secondary economic and political objectives (see the sections on Participants, External Effects, the Structure of Foreign Commodity Markets, and CCC-OGSM Relations with the State Department). Only a summary of that material will be repeated here along with additional discussion on other matters. The presentation will be divided under two headings: (1) international political impacts; and (2) international economic impacts.

International Political Impacts

The history of the Program's relationship with two countries may help to highlight some of the more prevalent political impacts which the Program may have had or will have in the future.

The Soviet Union. The third largest historical participant in the Program, as of 1978, was the Soviet Union.[41] During the two years 1973-1974, the USSR remained one of our major export markets. Undoubtedly the Soviets would have continued to be a major recipient of CCC credits given their continued pattern of grain purchases. That the USSR has not received additional credits can be attributed solely to political reasons.

China. The recent four year grains agreement "accomplishes two major objectives--promoting the sale of U.S. grain to a large and growing market and furthering the process of building a long-term structure for U.S.-China relations."[42] In addition to formally announcing the intended levels of future trade the "Agreement provided for...the extension of U.S. export credits for Chinese imports of certain U.S. farm products...."[43]

Human Rights. Eximbank loans have been formally reviewed and on occasion denied on the grounds that the recipient government's domestic policies violated its citizens' human rights.[44] We have already reviewed the debate over whether CCC credits were denied to Chile on

similar grounds. There is no question that credits have been denied to the Soviet Union for the same reasons.

The Risk of a Deterioration in the International Trade Climate. It's possible that an expanding Export Credit Sales Program, though theoretically justified by the existence of our competitors' credit programs (about which we have little information), may not immediately improve the international trade climate. It might help, in the long run, if the United States government pursued an announced strategy of either matching or reducing its credit subsidies in response to our competitors' programs (a carrot and stick approach).

As it is, the CCC-OGSM is operating in an uncertain environment and may be exceeding or matching our competitor's terms. If we are exceeding their terms, this may only serve to encourage them to further intensify their own credit subsidy efforts, thereby increasing the costs for all and wiping out any benefits.

International Economic Impacts

The 1977 Agriculture study estimated that as much as 95 percent of all CCC credits were extended to importing firms that were either owned or strictly controlled by their governments.[45] Depending on the presence and extent of the subsidy embodied in the credit terms, it is likely that some of the subsidy is passed either to the foreign governments or to their citizens.

Export Credits as Aid

Mr. Fred Bergsten, an Assistant Secretary of the Treasury during the Carter Administration, addressed the question of the efficacy of using export credit programs for foreign aid objectives. He considered this an inappropriate use of the programs, and he offered several arguments in support of his position.

> First, an export credit program should be viewed as a commercial program designed to facilitate exports....Export credit programs should not be seen as a substitute for genuine aid. If countries wish to increase the aid they give LDCs, they should do it through programs that directly benefit the LDCs rather than their own exporters.
>
> Second, often the main beneficiaries of official export credits are the richer LDC's such as Korea and Mexico, and the intermediate category countries such as the nations of Eastern Europe. These nations do not require aid nearly as much as countries that have low per capita incomes, if they need it at all....Finally, the World Bank, the regional development banks, the International Monetary Fund and bilateral assistance agencies are far more efficient and effective in addressing development and balance of payments problems than are official export credit agencies. The purposes of the two sets of agencies should not be confused.[46]

Uneven Effects on LDCs

Programs which assist one segment of an importing country are not always beneficial or acceptable to other segments within that society. For example, Korea, prior to the Korean War, produced significant quantities of cotton. Since the mid-1950's and the onset of P.L. 480 and CCC financed cotton imports, domestic production has steadily fallen.

In response, it may be argued that Korea lacked comparative advantage in the production of cotton textile goods. What CCC credits achieved was to move agricultural resources out of cotton (into higher value commodities) while at the same time promoting the development of a major manufacturing sector.

It may be a little more difficult to determine the Program's negative effects on the earnings of competing LDC exporters. In the last decade "Numerous LDCs have become important new suppliers of raw cotton on the world market... these include the Ivory Coast, Chad, Columbia, Turkey, Iran, and Afghanistan...."[47] Some of these countries have been or are recipients of CCC credits, P.L. 480 shipments, and perhaps even AID funds designed to develop the same commodities for export while the CCC finances American exports. In some cases, it may not be clear as to which country has comparative advantage and it is difficult to assess the harm done by the Program to the agricultural and economic development of these countries.

Performance with Respect to the Technical Efficiency of Program Administration

Some aspects of administrative performance have been discussed in the Conduct chapter (see Determining Interest Rates and Payment Periods, and Sales Registration, Confirmation, and Disbursement). There are several additional subjects in this category which require treatment. These include: (1) defaults and debt

rescheduling; (2) attempts to be self-sustaining; (3) and aspects of administrative performance.

Defaults and Debt Rescheduling

The Export Credit Program has, in the GAO's opinion, "an excellent record of repayments [although] it has had to reschedule payments for some countries."[48] The OGSM proudly claimed that there have been no losses in the Program's entire history. There is, however, one claim pending against the Intra-Bank of Beruit which "is being handled in accordance with terms agreed to by the CCC and the Government of Lebanon...."[49]

Compare this exemplary performance with that of the Eximbank. In February 1980, Senator Adlai Stevenson, Jr., Chairman of the Senate Sub-committee on International Finance, drew attention to the shaky financial position of the Eximbank. "Many of the Bank's borrowers" he stated, "are facing chronic payments deficits. Some have already had to reschedule debts and now political events raise some new questions about certain of the Bank's outstanding loans."[50] Mr. Frank Conahan, of the General Accounting Office, also reported on the Bank's financial situation.

> We noted the delinquencies that were rising during that year [1978] and we especially were concerned with the decreasing ratio between Eximbank's exposure and its reserves. That ratio has further decreased over the last year [1979] and although we don't know of any particularly magic ratio that should exist, it's clear that particularly now when contributions to reserves are declining in proportion to total exposure by virtue of the difference in their borrowing and lending rates, it would

seem there is some rather serious cause for concern.[51]

A strict comparison of these two programs is unfair to the Eximbank. Comparisons are misleading because Exim loans are for considerably longer time periods than the CCC's (5-7 years versus a maximum of 3 years). Nevertheless, both Programs lend funds to many of the same clients, are meant to meet foreign credit competition, and both are charged with operating in a self-sustaining manner.

Attempts to be Self-Sustaining

The Eximbank places far greater emphasis on meeting foreign credit competition than does the OGSM (perhaps because the Eximbank has access to better information on its competition through the international agreement on credit). However, the drive to meet foreign credit competition must not "jeopardize the Bank's longstanding tradition of being a self-sustaining institution."[52] The recent rise in the Bank's borrowing costs has not been matched by an increase in its lending rate primarily to retain competitive parity with foreign credit programs. The OMB "estimates that this negative spread between Eximbank's borrowing and its lending rates costs the Bank over $125 million annually in lost income and addition to reserves."[53] If this trend continues, the Eximbank could be operating at an annual $65 million loss by 1988 or as early as 1982 if domestic interest rates remain at their recent high levels.[54]

The CCC Export Credit Program is also intended to be a self-sustaining program. Although meeting foreign credit competition is one of the Program's objectives, the OGSM emphasizes the Program's 'commercial' character. "The normal guidelines for setting the CCC interest rate is the midpoint between the CCC borrowing rate and the U.S. prime rate... furthermore, unlike the Eximbank the CCC's interest rates have usually exceeded its cost of money...."[55] It is interesting to note that the Eximbank estimates that "To remain self-sustaining...it must charge about one-quarter to one-half a percentage point more than its marginal cost of money."[56] Would the CCC Program still retain its 'commercial' character if it too followed a similar policy and concerned itself only with just covering its costs?

Other Aspects of Administrative Performance

Two administrative aspects deserving comment are the Program's policy with respect to interest rate adjustment and the interest differentials it charges on letters of credit.

Interest Rate Adjustment

The GAO reported that the CCC interest rates are reviewed and announced monthly. The principal of 'maintaining a commercial rate' would dictate that these rates always be above the CCC borrowing rate but below the prime. An examination of Figure 5 (on page 64) would seem

to indicate that this rule has not always been followed. During the periods 1971-1972 and 1975-1978 the CCC lending rates were actually above the prime. Over the period 1969-1978, the OGSM seemed to be more responsive to increases in its borrowing costs and less responsive to decreases, behaving almost as if a 'ratchet' effect were in operation.

Interest Differentials on Letters of Credit

Bank letters of credit, issued by banks on behalf of the importer, protect the CCC in the event of importer default. The Program offers a one point interest reduction on those loans which are backed by a letter drawn on an American bank. This is done either because these banks are less risky guarantors or because the CCC wants to direct the business to those banks instead of foreign banks. The 1977 Agriculture study reported that "The one percentage point interest advantage of U.S. letters of credit has not been sufficient to induce its extensive use."[57]

Conclusion

The performance of the CCC Program should be evaluated on a broader set of criteria than just the additionality effect. Specific impact indicators should be used when assessing the Program's overall performance. Impact indicators such as additionality measure performance with respect to the Program's explicit objectives of export promotion, but other indicators need to be developed to assess performance with respect to the Program's goals. Measures should be developed which determine the domestic incidence of Program benefits, and what distribution rules, if any, are used in allocating these benefits.

Program performance should also be evaluated by assessing the Program's secondary economic and political impacts. These impacts include domestic effects such as generating additional income and employment. Counterbalancing these possible favorable effects is the danger that the Program increases inflationary pressures by contributing to increased food prices, and by adding to the Federal deficit. The Program's foreign policy impacts appear to be very important to other government agencies. Given the history of interdepartmental conflict over the foreign policy impacts of the Program, it seems that if they are that important, then they should be formally recognized and evaluated when assessing performance.

It is not the purpose of this study to measure performance in any area other than additionality. Nevertheless, these other impacts are legitimate aspects of performance and need to be researched and quantified if possible. Ideally, the importance of the Program's other performance measures will be recognized and incorporated in a revised credit allocation process. Dealing with multiple measures of performance would, however, require an explicit tradeoff matrix which would provide the Program's administrators with guidelines as to the relative weights to assign to each performance measure. Such a matrix could not be developed without first a recognition of the Program's multiple impacts and second an interdepartmental effort to cooperate in ordering and weighting these impacts.

CHAPTER IV ENDNOTES

[1]James D. Shaffer and A. Allan Schmid, "Community Economics," p. 19.

[2]Ibid., p. 20.

[3]Ibid., p. 21.

[4]From telephone conversations with Treasury and Eximbank personnel.

[5]U.S., The Library of Congress, Congressional Research Service, "Impact of Eximbank on U.S. Exports" (April 25, 1978), by Jane Gravelle.

[6]Ibid., p. 1, emphasis added.

[7]U.S. Department of the Treasury, The Operation and Effect of the Domestic International Sales Corporation. 1975 Annual Report (April, 1977).

[8]Congressional Research Service, "Impact of Eximbank," p. 3.

[9]Ibid., p. 5.

[10]From telephone conversations with Treasury and Eximbank personnel.

[11]In order: General Accounting Office, Emphasis on Market Development in Export Credit Program, p. 24; U.S., Congress, Committee on Banking, Housing, and Urban Affairs, Export Policy Part 4, Export-Import Bank Authorization and Related Issues, Hearings before the Subcommittee on International Finance, 95th Cong., 2nd session, 1978, pp. 58-76; and Idem., Export-Import Bank Programs and Budget Hearings before the Subcommittee on International Finance, 96th Cong., 2nd session, 1980, pp. 90-106.

[12]General Accounting Office, Emphasis on Market Development in Export Credit Protram, p. 25.

[13]Senate, Committee on Banking, Housing and Urban Affairs, Export-Import Bank Programs and Budget, p. 90.

[14]Ibid., p. 91.

[15]Idem., Part 4, Export-Import Bank Authorization and Related Issues, p. 60.

[16]Idem., Export-Import Bank Programs and Budget, p. 91.

[17]Idem., Part 4, Export-Import Bank Authorization and Related Issues, p. 59.

[18]Idem., Export-Import Bank Programs and Budget, p. 93.

[19]Susan E. Whitsitt, Deputy Vice President, Policy Analysis, Export-Import Bank of the United States, to William Tierney, February 9, 1981, personal files of William Tierney.

[20]Senate, Committee on Banking, Housing, and Urban Affairs, Part 4, Export-Import Bank Authorizations and Related Issues, p. 58.

[21]General Accounting Office, Emphasis on Market Development in Export Credit Program, p. 5. A similar study in the United Kingdom attempted to measure the gains from their government's export promotion programs. The researchers recognized that a quick, low-cost methodology was needed to provide an unambiguous, quantitative measure of utility. Their pilot study placed the onus for evaluation of the benefits of export services on the user firm themselves. They determined that business firms have the ability to make meaningful estimates of the gains from government programs (see Tom Pointon, "Measuring the Gains from Government Export Promotion," European Journal of Marketing, 1978, 12(6), pp. 451-462.

[22]General Accounting Office, Emphasis on Market Development in Export Credit Program, p. 23.

[23]Ibid., p. 35.

[24]For a discussion of some of the problems associated with surveys and questionnaires see, A. Birch and A. A. Schmid, "Public Opinion Surveys as Guides to Public Policy and Spending," Social Indicators Research, 7(1980), pp. 299-311.

[25]General Accounting Office, Emphasis on Market Development in Export Credit Program, p. 29.

[26]Richard H. Leftwich, The Price System and Resource Allocation (Hinsdale, Illinois: The Dryden Press, 1979) 7th edition, pp. 71-73.

[27]Gunter Duffy, "Financing East-West Business," Columbia Journal of World Business, Spring 1973 IX(1), pp. 37-41.

[28]From a prepared statement given by Prof. Arthur Laffer before the Senate, Committee on Banking, Housing, and Urban Affairs, Part 4, Export-Import Bank Authorization and Related Issues, p. 444.

[29]U.S. Department of Agriculture, 1980 Handbook of Agricultural Charts, Agricultural Handbook No. 574 (Washington, D.C.: Government Printing Office, October 1980), p. 64.

[30]Vernon Sorenson, International Trade Policy: Agriculture and Development (East Lansing: Division of Research, Graduate School of Business Administration, Michigan State University, 1975), p. 221.

[31]Senate, Committee on Banking, Housing, and Urban Affairs, Part 5, Agricultural Export Policies, p. 3.

[32]Idem., Part 2, Trends in Export Markets and Competitiveness, p. 5.

[33]Department of Agriculture, "CCC Credit and Market Development," p. 35.

[34]U.S. General Accounting Office, Impact of Soybean Exports on Domestic Supplies and Prices, B-178753 (February 12, 1974).

[35]Ibid., p. 11.

[36]Senate, Committee on Banking, Housing, and Urban Affairs, Part 1, Oversight on the Effect of Floating Exchange Rates on U.S. Exports, p. 36.

[37]Senate, Committee on Banking, Housing, and Urban Affairs, Part 4, Export-Import Bank Authorization and Related Issues, p. 17.

[38]General Accounting Office, Management of Agricultural Exports, pp. 39-41.

[39]Ibid.

[40]See Glenn Johnson and Leroy Quance, Eds. The Overproduction Trap in U.S. Agriculture (Baltimore: John Hopkins University Press, 1972).

[41]General Accounting Office, Emphasis on Market Development in Export Credit Program, p. 3.

[42]Foreign Agricultural Service, "China No. 4 Spot Among U.S. Farm Markets, Grain Agreement Points to a Bright Future," Foreign Agriculture (December 1980), p. 7.

[43]Ibid.

[44]Senate, Committee on Banking, Housing, and Urban Affairs, Competitive Export Financing, pp. 95-96.

[45]General Accounting Office, Emphasis on Market Development in Export Credit Program, p. 38, this figure was challenged by the OGSM but they were unable to offer a substitute figure.

[46]Senate, Committee on Banking, Housing, and Urban Affairs, Competitive Export Financing, pp. 152-153.

[47]Senate, Committee on Agriculture, Nutrition, and Forestry, Export Promotion, p. 164.

[48]General Accounting Office, Emphasis on Market Development in Export Credit Program, p. 13.

[49]Ibid.

[50]Senate, Committee on Banking, Housing, and Urban Affairs, Export-Import Bank Programs and Budget, p. 66.

[51]Ibid.

[52]Ibid., p. 7.

[53]Ibid.

[54]Ibid., p. 133.

[55]General Accounting Office, Emphasis on Market Development in Export Credit Program, p. 11.

[56]Senate, Committee on Banking, Housing, and Urban Affairs, Export-Import Bank Programs and Budget, p. 7.

[57]Department of Agriculture, CCC Credit and Market Development," p. 45.

CHAPTER V

THE ADDITIONALITY EFFECT OF CCC CREDITS FOR COTTON EXPORTS TO KOREA

Over the nine years, 1970-78, Korea received a total of 1,207 million dollars of CCC credit and it ranked first among countries receiving credits during that time. Of these credits, 792 million dollars, approximately 66 percent, went for cotton exports.[1] Because of the long period over which cotton credits were extended and the size of these credits relative to the total Program budget, cotton credits to Korea should present a good case study of the Program's additionality effect.

This chapter begins with a presentation of an economic model of the effects of export credits on the cotton imports of a Korean textile firm. The model is specific in that it deals with the demand for an imported input rather than a product consumed directly. The model is presented in both graphical and mathematical form. The model has general applicability in that it deals with the behavior of an importing firm or agency, it assumes that the importer faces a credit constraint, and that the import demand is a derived demand and not a final demand. Most CCC financed commodities (wheat, corn, and cotton) are all raw materials that are used in the production of a final product (flour, livestock products, and textiles).

Following the presentation of the economic model, this study will estimate the additionality effect of CCC cotton credits over the period 1971-75. An intersectoral model of

the Korean economy will be used to simulate the effect of a cutoff of CCC credits. The model will detail the immediate and long term effects of an elimination of cotton credits on the imports of cotton and on the imports of other commodities as well.

The Influence of CCC Credit on a Korean Textile Firm's Import Purchasing Behavior

A Graphical Analysis

The economic effects of the CCC Credit Sales Program on the Korean cotton textile sector and the Korean economy has two components. First, is the immediate effect of the Program which influences the total level of Korean imports and the U.S. market share. Second, is the long run effect which influences the cotton textile sector and the general economy.

Short-Run Effects

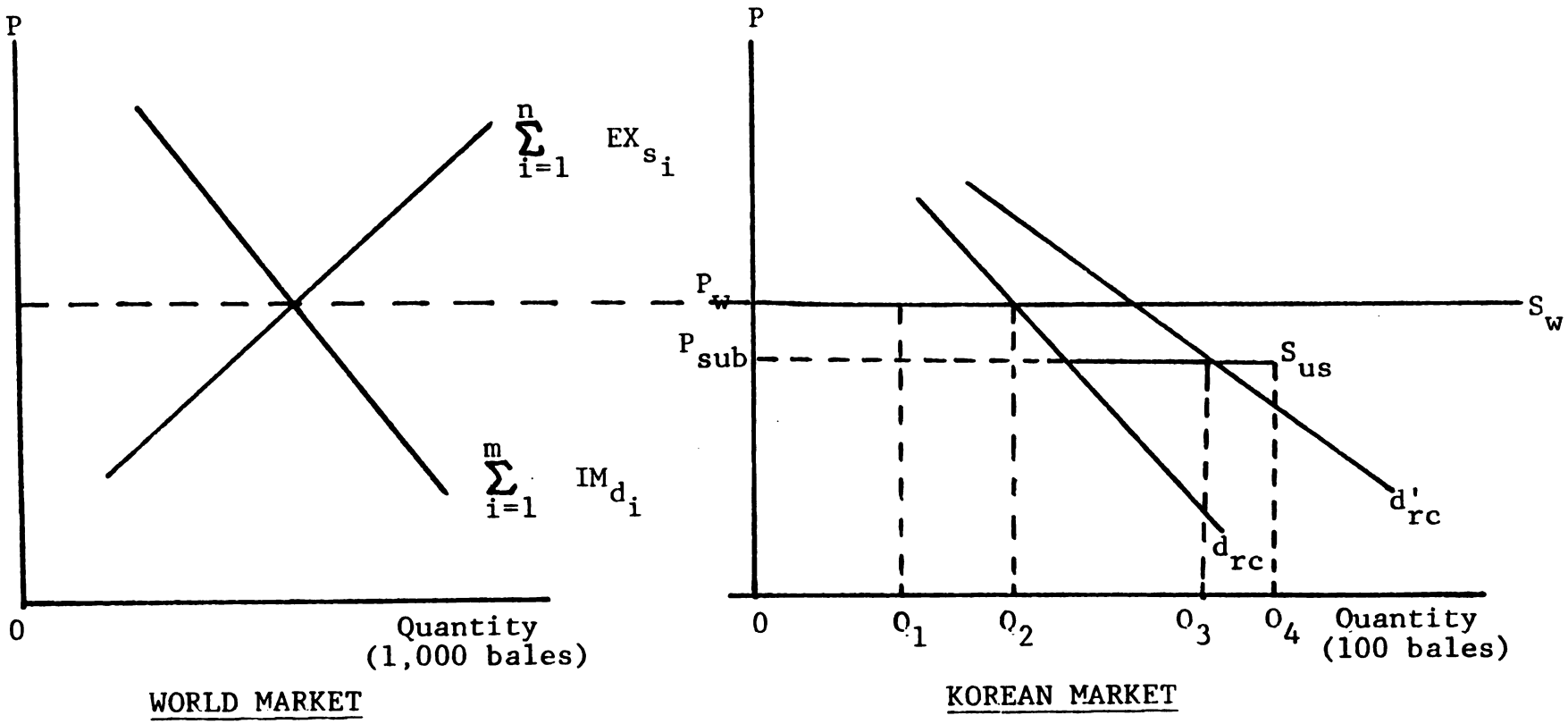
In the short run, the extension of credit has two effects:

1. It shifts the demand curve.
2. It introduces a second supply curve which is both quantitatively and temporarily discontinuous.

If the derived demand for an input is constrained by a credit limit, then the provision of credit will shift the demand curve from d_{rc} to d_{rc}' (see Figure 11). Note that d_{rc}' may be more price elastic than d_{rc}. This hypothesis is suggested by recent research on interfirm trade credit. Robert Schwartz treated trade credit as an integral part of

Figure 11

THE SHORT RUN EFFECTS OF THE CCC PROGRAM



the seller's pricing policy.[1.5] He developed a model to specify the seller's optimum quantity, price and credit terms. Two implications of his work are of relevance to our research. They are:

1. Present value demand functions are systematically more elastic than list price demand functions.
2. Creditor firms with easy access to money markets indirectly provide these monetary resources to smaller debtor firms that may have productive investment opportunities but are restricted in their ability to obtain funds. Thus, interfirm trade credit enables established firms to help finance the growth of their smaller customers.

Shifting the demand curve represents the change in demand due to the availability of credit at below market interest rates. The interest charged by the CCC has, in the past, been below commercial rates. In addition, the maturity of the loans (6 to 36 months) often exceed the short terms (at fixed rates) allowed by commercial banks for commodity loans.

The subsidized nature of the CCC loan, in effect, introduces a second supply curve (labeled S_{us}) representing supply from the United States. Two assumptions are possible when determining the price elasticity of U.S. supply:

1. U.S. supply is upward sloping and, therefore, the Koreans must behave as an oligopsonist and equate marginal factor cost (mfc) with the value of marginal product (vmp).

2. U.S. supply is perfectly elastic since U.S. cotton exports to Korea represent only 22 percent of all U.S. cotton exports and CCC financed cotton exports to Korea represent only 10 percent of all U.S. cotton exports.

The latter assumption appears most appropriate and simplifies the analysis so I have chosen to depict U.S. supply as perfectly elastic.

U.S. supply is discontinuous at Q_2 and Q_4 because lines of credit are announced for only a specified total amount of financing for cotton exports to Korea. The supply curve is also temporally discontinuous. One of the constraints placed on the Program is that it must minimize its displacement of commercial cash sales or conventionally financed sales.[2] This implies that the OGSM would be required to withhold financing until all commercial sales had been contracted (in other words, act in a price discriminating manner).

Referring to Figure 11, total commercial exports by the world to Korea are OQ_2 of which the U.S. has some specified market share OQ_1. If we assume that conventional financing is unavailable, then the incremental sales due to the Program are Q_2Q_3 (as drawn in Figure 11 somewhat less than if the full amount of credits were used by Korean importers). The sales revenue accruing to U.S. exporters is the sum of the two areas ($OP_w * OQ_1$) and ($OP_{Sub}\ Q_2Q_3$). Assuming that demand is currently price elastic (where S_{us} intersects d_{rc}') and if the objective of the OGSM were to

maximize the total sales revenue of U.S. cotton exporters (without regard to the opportunity cost of credit funds) then the OGSM should provide sufficient credits at an interest rate low enough to shift S_{us} so that it just intersects d_{rc}' at the point of unitary price elasticity.

Long-Run Effects

In the long run, the extension of CCC credit has four effects:

1. Market Development - it increases Korea's market share of the world's cotton textile exports.
2. Induced Investment - the program accelerates the industry's schedule of plant expansion.
3. Conservation of Foreign Exchange - scarce foreign exchange can now be used for other purposes in promoting the development of the textile sector or the economy as a whole.
4. Forward and Backward Linkages - growth in market share, expanded investment in the textile sector, increased employment in the textile sector and in ancillary industries all contribute to growth in employment and per capita income.

If, over a period of years, the Program provides a consistent and reliable stream of credit services, it could develop the market further through an induced investment effect. Referring back to Figure 11, we see that the program was responsible for additional U.S. exports (Q_2Q_3).

Because additional inputs were acquired at lower cost, the Korean textile supply curve shifts to the right (see Figure 12). This shift occurs simultaneously with the shift of the supply curve from S_w to S_{us} in Figure 11).

The induced investment effect could occur if the Program is able to influence the expectations of Korean textile managers, since management's long run planning horizon (LAC) is strongly influenced by expectations of future product prices and input costs. Figure 13-a shows the "normal" growth curve of the "typical" Korean textile firm (we assume that the firm is experiencing increasing returns to scale and is, therefore, on the downward sloping portion of the long run average cost curve (LAC).

Referring to Figure 13-a, we see that the firm is currently on SAC_1 and is producing OQ_1 units of output. Management is rational and knows that it can produce the present output at a lower average cost if it were to expand its plant scale and shift to SAC_2. Production would increase to OQ_2 units of output. If, for any given plant scale, say SAC_1 in Figure 13-b, the firm were to enjoy a windfall cost savings (a lower purchase price for cotton), then the firm would find itself operating on the new cost curve SAC'_1 for the duration of that production cycle. If management considers this cost savings to be temporary, then they will not adjust their long run plans and the next stage of plant expansion will be unaffected by the Program (they will stay on LAC). But, if management believes that the

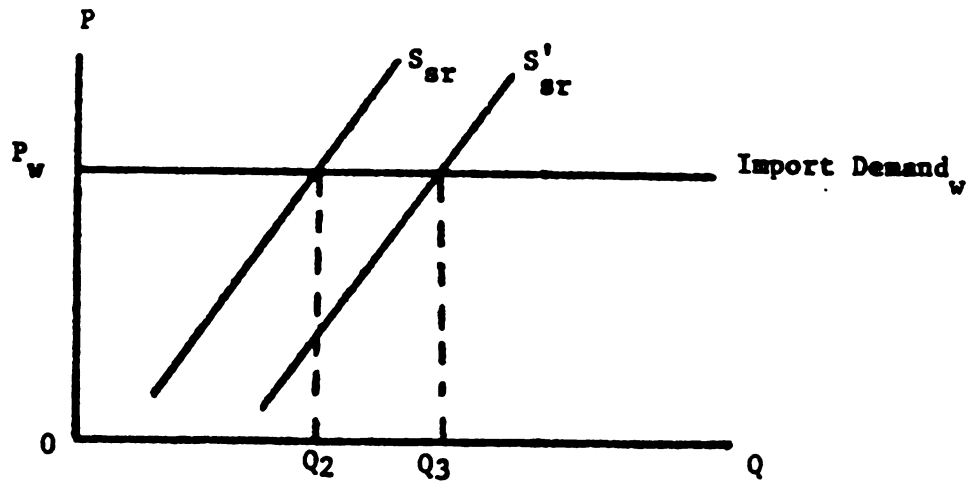


Figure 12

THE LONG RUN EFFECTS OF THE CCC PROGRAM

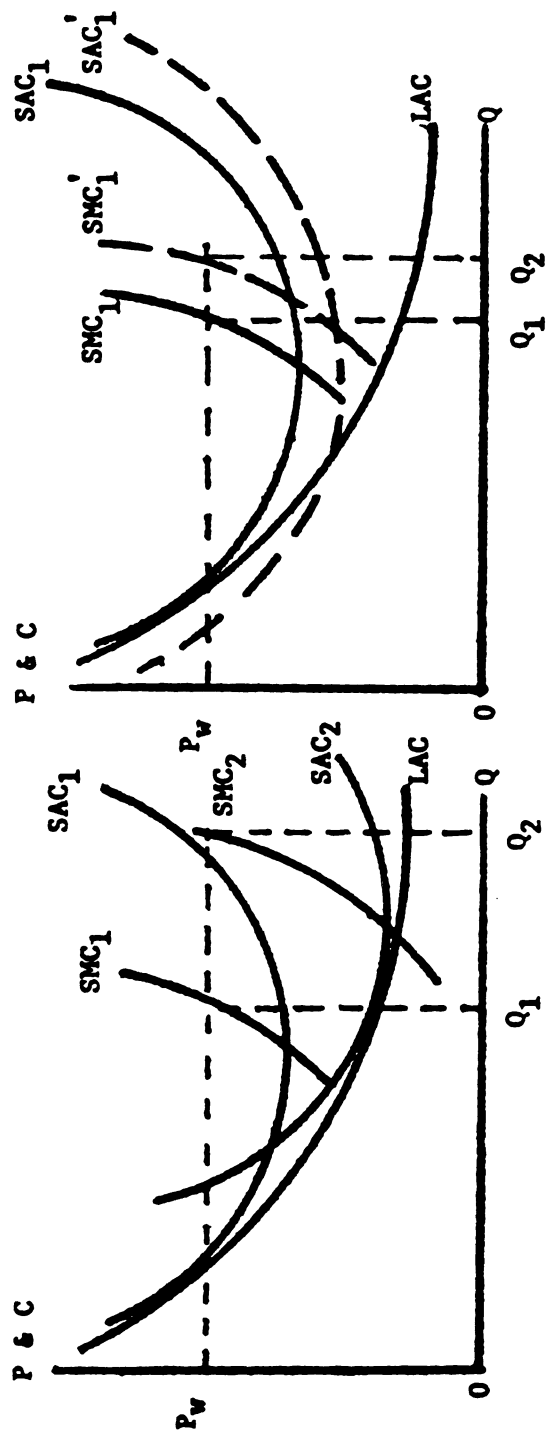


Figure 13-a

Figure 13-b

SHIFTS ALONG THE FIRM'S LONG RUN COST CURVE

cost savings is of a long term nature, then they will adjust their capital investment plans and expand along a new curve LAC'. The next round of firm growth will be larger than what it would have been without long term cost savings (see Figure 14).

General forward and backward linkage effects are distributed over time and diffuse in their impact.[3] Korean employment and income is enhanced via the market development, foreign exchange and induced investment effects. The program not only induces additional cotton sales, but also creates additional demand for other U.S. exports via Korea's marginal propensities to import for U.S. products. The return to the U.S. from these long run effects can only be measured by taking into account the changes in the levels of Korean imports of all U.S. products (both manufactured goods as well as agricultural commodities).

A Static, Neoclassical Model of the Influence of the CCC Credit on an Importing Firm's Purchasing Behavior

The demand for cotton is derived from the underlying demand for the outputs produced by the Korean cotton spinning and weaving industry (primarily yarns and fabrics). Because of the variety of products using cotton as an input, an appropriate model of firm behavior would be the neoclassical theory of the multi-product firm.

An interesting difference of opinion arises in the literature regarding the consequences to factor demand if the multi-product firm is able to switch fixed factors from

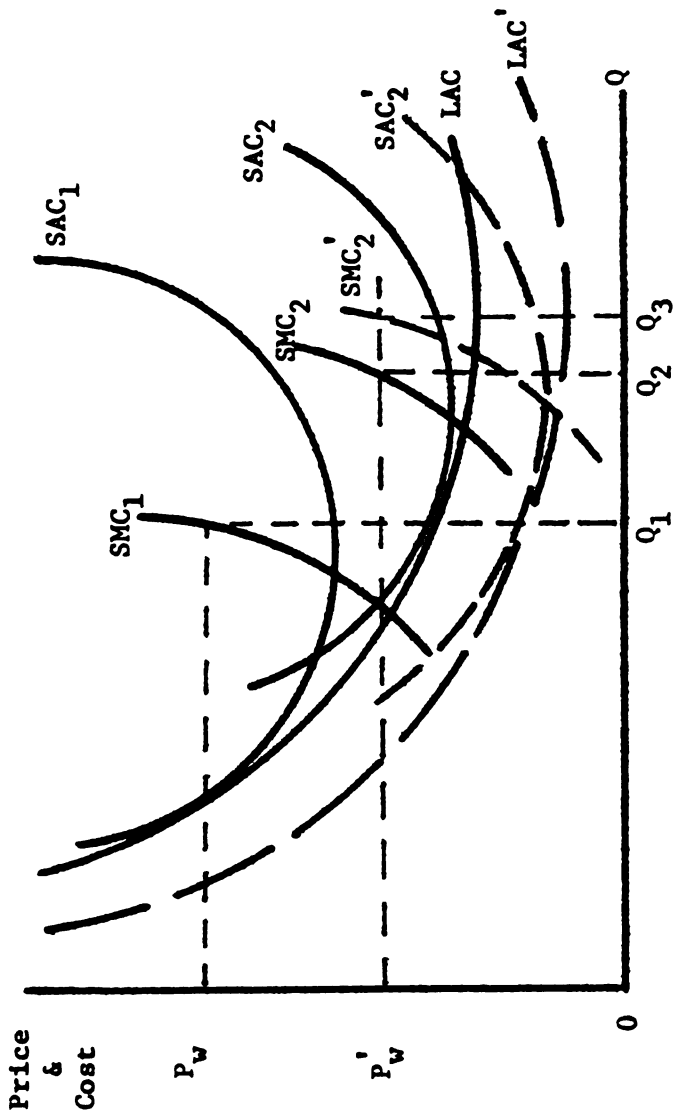


Figure 14

Shift of the Firm's Long Run Cost Curve

one product line to another. Ferguson contends that the theory of the multi-product firm is entirely analogous to that of the single product firm requiring only minor modifications in its mathematical expression.[4] Pfouts (1961), Naylor (1965) and most recently, Hughes (1978) hold that if the multi-product firm must ration its fixed factors among many product lines, then the equilibrium conditions for cost minimization must be re-examined.[5]

While it may be of theoretical interest to note the existence of this debate, the practical implications for this research are minor. Whether, or to what degree, fixed factors are mobile between product lines is unknown. Furthermore, the arguments presented by the latter group affect only the determinancy of factor demand for a single product line not the firm's aggregate demand for a factor.

Profit Maximization in a Multi-Product Firm

Assume that the objective of the typical Korean cotton textile firm is profit maximization. Such a firm would adjust inputs and outputs until the profit maximizing output(s) is attained. This hypothetical firm produces (n) products in quantities (q_1) using (m) variable inputs (x_j) and (r) fixed inputs (y_k). The production function for any i'th product can be expressed as:

$$(1) \quad q_1 = f_i(x_{1i}, \ldots, x_{mi} \,/\, y_{1i}, \ldots, y_{ri}) \qquad (i = 1, \ldots, n).$$

Each variable input can either be purchased for cash or financed by inter-firm trade credit offered by the

supplier.[6] Consequently, every input (x_j) can be designated as being acquired for cash ($x_j^{\$}$) or financed with credit (x_j^{c}). While these inputs are perfect technical substitutes ($x_j^{\$} + x_j^{c} = x_j$ total) the distinction is critical in determining production costs.

Production costs can be decomposed into variable costs (V), fixed costs (F) and the costs incurred when a fixed input is "switched" from one product line to another (S). Variable costs are the sum of the wages (w_j) paid to each input (x_j). Inter-firm trade credit (C_j) is available from input suppliers at an interest rate of (I_j) for a period of time (T_j).

The firm can finance a portion of its total purchases up to its credit limit (C_j/w_j). The decision to accept credit imposes on the firm a set of costs separated by time. Interest and a share of the principal $\frac{(w_j x_j^{c})}{T_j}$ must be paid in the current period and in future time periods. If the input being purchased on credit is assumed to be used at the end of the current production period it cannot be called upon to generate a stream of value to support the additional payments required in the future.

Therefore, that share of variable costs consisting of financed purchases must include not only the current period's interest charge but also the present value of all future costs associated with the financed input (PVC). Firms accept inter-firm trade credit because it conserves their working capital which earns an average rate of return

(r) over (T) time periods. The average rate of return (r) can be thought of as the firm's in-firm opportunity cost of working capital. An expression for variable costs which incorporates these elements is:

cost of cash purchases; 1st period's interest and principal costs

$$(2)\quad V = W_j \sum_{j=1}^{m} \sum_{i=1}^{n} \overbrace{x_{ji}^{\$}} + \Bigg[\overbrace{x_{ji}^{c}\left(\left(I_j + \frac{1}{T_j}\right)\right.} +$$

interest on remaining principal; principal

$$\overbrace{\left.\left(\frac{I_j\left(1 - \left(\frac{1}{T_j} * t\right)\right)}{1 + r}\right)\right.} + \overbrace{\frac{1}{T_j}} + \ldots,$$

present value of 2nd period's interest and principal costs

$$\underbrace{\left(\frac{I_j\left(1 - \left(\frac{1}{T_j} * t\right)\right) + \frac{1}{T_j}}{(1 + r)^t}\right)}\Bigg],$$

present value of last period's interest and principal costs

where w_j, T_j, I_j, r are given and $(t = 1, \ldots, T_j)$.

Switching costs (S) are incurred when the firm transfers unspecialized fixed factors from one product line to another. This cost arises from the firm's need to physically move the factor, recalibrate, or change variable components on the fixed factor. This cost is dependent on both the previous use of the factor and its new use. Each fixed factor has an nxn matrix denoting the switching costs

associated with changing the factor from one product line to another. For the sake of simplicity, I have assumed that the switching cost matrix is symmetric. The elements of these matrices can be expressed as:

$$(3)\quad S = S(y_{111}, y_{112}, \cdots, y_{11n}; y_{211}, \cdots, y_{21n}; \; ; \; y_{rn1}, y_{rn2}, \cdots, y_{rnn}).$$

Those costs which are invariant with respect to output during the production period are simply denoted as fixed costs (F).

Total revenue (TR) from the sale of the (q_1) output of the (n) product lines is earned in two markets, a domestic and an international market. The firm is assumed to be a perfect competitor in the world market and earns the world price (p_i^w). It the domestic market is protected from international competition by a tariff (Tf_i) then there is an incentive for domestic producers to form a cartel and exploit the relative advantage that they have in their home market. The profit maximizing solution would require the firm to act in a price discriminating manner and to equate marginal revenue in both markets. If this is the case, the firm produces a total output of (q_1), sells (q_1^d) on the domestic market and exports the remainder ($q_i^x = q_i - q_i^d$). Domestic sales earn a price (p_i^d) which is greater than the world price (p_i^w) but less than the world price plus the tariff ($p_i^w + Tf_i$). An equation describing total revenue is as follows:

$$(4) \qquad TR = \sum_{i=1}^{n} p_i^{w}(q_i^{x}) + p_i^{d}(q_i^{d})$$

where $q_i = q_i^{x} + q_i^{d}$

p_i^{w}, p_i^{d}, Tf_i are given or $p_i^{d} = f(q_i^{d})$,

and $p_i^{w} \leq p_i^{d} \leq p_i^{w} + Tf_i$.

Profit can now be expressed as the difference between total revenue (TR) and total costs (TC)

$$(5) \qquad \P = TR - (V + S + F)$$

$$(6) \qquad \P = \sum_{i=1}^{n} [p_i^{w}(q_i^{x}) + p_i^{d}(q_i^{d})] - \left(\left[w_j \sum_{j=1}^{m} \sum_{i=1}^{n} x_{ji}^{\$} + \left[x_{ji}^{c}((I_j + \frac{1}{T_j}) + , \ldots , \right. \right. \right.$$

$$\left. \left. \left. + \frac{(I_j(1 - (\frac{1}{T_j} * t)) + \frac{1}{T_j})}{(1 + r)^{t}} \right] \right] + S(y_{111}, \ldots , y_{rnn}) + F \right),$$

$(t = 1, \ldots , T_j)$,

$(r = 1, \ldots , k)$.

The firm will maximize Eq.(6) subject to the following set of constraints:

A fixed factor constraint

$$(7)\quad y_k - \sum_{i=1}^{n} y_{ki} \geq 0 \quad (k=1, \ldots, r),$$

and a trade credit constraint

$$(8)\quad \frac{C_j}{w_j} - \sum_{i=1}^{n} x_{ji}{}^{c} \geq 0.$$

The associated Lagrange equation is

$$(9)\quad L(X,Y,\theta,\Omega) \equiv \sum_{i=1}^{n} [p_i{}^{w}(q_i{}^{x}) + p_i{}^{d}(q_i{}^{d})] -$$

$$\left(\left[w_j \sum_{j=1}^{m} \sum_{i=1}^{n} x_{ji}{}^{\$} + \left[x_{ji}{}^{c}((I_j + \frac{1}{T_j}) + , \ldots, \right. \right. \right.$$

$$\left. \left. \left. + \frac{(I_j(1 - (\frac{1}{T_j} * t)) + \frac{1}{T_j})}{(1+r)^{t}} \right] \right] + {}^{s}(y_{111}, \ldots, y_{rnn}) + F \right.$$

$$\left. + \sum_{k=1}^{r} \theta_k [\, y_k - \sum_{i=1}^{n} y_{ki} \,] + \sum_{j=1}^{m} \Omega_j [\frac{C_j}{w_j} - \sum_{i=1}^{n} x_{ji}{}^{c} \right)$$

where

$(t = 1, \ldots, T_j)$,

and

$(r = 1, \ldots, k)$,

$p_i{}^{w}$, $p_i{}^{d}$, w_j, I_j, r, T_j, F, and

$S(y_{111}, \ldots, y_{rnn})$ are given.

The Kuhn-Tucker saddlepoint theorem is required to describe the conditions needed for a maximum. The theorem is a generalization of the theory of constrained extrema and permits the introduction of some unique mathematical forms, such as: (1) inequality constraints; (2) non-negativity assumptions; and (3) non-linear objective functions. The fixed input constraint is expressed as an inequality to more closely approximate the true behavior of a firm. An implied assumption of the analysis is that at the point of profit maximization, all inputs must be positive or zero. Finally, according to Ferguson, "one cannot plausibly assume linear profit functions for a multi-product firm."[7] If you did, then given a set of constraints, one product line would always yield a higher total profit and the firm would produce just that product to the exclusion of others.

For the Kuhn-Tucker saddlepoint theorem to hold, two assumptions must be met: (1) the objective function and the constraints must be differentiable; and (2) the objective function and the constraints must all be concave functions. These assumptions ensure that the conditions which guarantee a saddlepoint also guarantee the existence of a constrained extremum.

Therefore, the necessary and sufficient conditions for a saddlepoint are as follows:

(10) a) $\dfrac{\partial L}{\partial x_{ji}} \leq 0, \qquad (j = 1, \ldots, m), \quad (i = 1, \ldots, n),$

b) $\dfrac{\partial L}{\partial y_{ki}} \leq 0,$

c) $$\frac{\partial L}{\partial \Theta_k} \equiv y_k - \sum_{i=1}^{n} y_{ki} \overset{>}{=} 0, \quad (k = 1, \ldots, r),$$

d) $$\frac{\partial L}{\partial \Omega_j} \equiv \frac{C_j}{w_j} - \sum_{i=1}^{n} x_{ji}{}^{c} \geqq 0,$$

e) $$x_{ji} \geqq 0, \; y_{ki} \geqq 0;$$

(11) a) $$\sum_{j=1}^{m} \sum_{i=1}^{n} \left(\frac{\partial L}{\partial x_{ji}} \right) x_{ji} = 0,$$

b) $$\sum_{j=1}^{m} \sum_{i=1}^{n} \left(\frac{\partial L}{\partial y_{ki}} \right) y_{ki} = 0,$$

c) $$\sum_{k=1}^{r} \left(\frac{\partial L}{\partial \Theta_k} \right) \Theta_k = 0,$$

d) $$\sum_{j=1}^{m} \sum_{i=1}^{n} \left(\frac{\partial L}{\partial \Omega_j} \right) \Omega_j = 0,$$

e) $$\Theta_k \geqq 0, \quad \Omega_j \geqq 0.$$

A Survey of the Korean Cotton Textile Industry

The textile industry is one of the oldest and largest industries in Korea. The contribution of the textile industry to industrial production and employment is greater than that of any other industry. Its share of employment for the manufacturing sector has been steadily rising since, and in 1974 was 31.4 percent.[8]

Cotton and woolen yarns and fabrics have been the traditional mainstays of the textile industry. However, man-made fibers (MMF) have been displacing these traditional textile products. In part, this is due to the increasing demand for synthetic fibers and the emphasis placed by the Five-Year Plans on the construction of synthetic fiber plants.[9]

Modern textile manufacturing began in Korea in 1917 when the country was under Japanese suzerainty. The Korean war destroyed some 70 percent of the industry's plant, but it was rapidly rebuilt after the war, with the help of foreign aid. The four Five-Year Economic Development Plans have had a considerable influence on the composition and growth of the textile industry. At one stage, authorization for the construction of new spinning plants was withheld if the plant scale was below the minimum optimum scale of 50,000 spindles.[10] The current and fourth Five-Year Plan (1977-81) initially implied that less emphasis would be given to textiles. While the Five-Year Plans have

influenced the industry's development, they have not dictated it and apparently, the Plans are flexible enough to respond to strong market signals. For example, during an unusual textile export boom in 1979, it was announced that the prior ceilings on expansion of facilities in the textile industry would be abolished.[11]

The industry has moved rapidly into the world market. Foreign demand now accounts for over 60 percent of total demand. In 1966, textiles earned Korea 26.3 percent of its total export revenues. In 1975, that figure had risen to 34.5 percent.

While the importance of cotton textiles relative to other fibers has declined, cotton textiles have nevertheless continued to expand (see Table V). Most cotton production is destined for overseas markets. In 1979, 86 percent of the cloth and 69 percent of the yarn produced was exported. In recent years, yarn accounted for nearly half of the cotton exports and fabrics accounted for 46 percent. Made-up goods comprised only 5 percent of cotton products exports.[12]

In 1975, cotton textile exports accounted for 6 percent of all export revenues and 17.4 percent of the export revenues earned by the textile sector. Nearly all of the yarn exported goes to Hong Kong and Japan while most of the fabrics go to Western Europe with significant amounts being exported to Hong Kong, Japan and the United States. Most of the fabric exported is a blend of cotton and other fibers.[13]

TABLE V

SUPPLY AND DEMAND FOR COTTON YARN AND CLOTH
(yarn in kg. tons, cloth in km.)

	PRODUCTION		EXPORTS		DOMESTIC DEMAND	
	Yarn	Cloth	Yarn	Cloth	Yarn	Cloth
1961	44,190	183,555	-	3,977	44,190	179,578
1963	62,566	203,938	52	24,930	62,516	179,008
1966	69,799	171,685	837	81,117	68,962	90,568
1970	103,408	212,084	29,779	-	73,628	-
1974	159,015	231,113	95,098	201,056	63,917	30,058
1977	278,743	479,299	199,790	439,782	78,953	39,518
1978	330,164	559,705	229,954	491,097	100,210	68,608
1979	380,071	620,034	260,971	535,829	119,099	84,206

Sources: The Spinners and Weavers Association of Korea & Korea Development Bank (The Korean Reconstruction Bank, 1967), Industry in Korea 1967 (by the KRB) & Industry in Korea 1976 (by the KDB). Seoul, Korea, 1967 & 1976.

Korea is now the world's lowest cost producer of cotton textiles, and it is likely to retain that distinction for at least the next several years.[14] The cotton textile industry has been steadily improving utilization rates and is now working at virtually full capacity (see Table VI). The industry's plants are characterized by large units of new machinery operated by an efficient labor force working at relatively low wages. Although the wage rates have been rising with the increase in other employment opportunities, productivity is also rising as the industry takes full advantage of the economies of large-scale operations.

Production of cotton in Korea is insignificant (only 9 thousand bales in 1977 compared to 1,312 thousand bales imported) and of low quality.[15] Domestically produced

TABLE VI

COTTON SPINNING AND WEAVING
OPERATION RATES

	Spindles		Looms	
	Operation Ratio	Days	Operation Ratio	Days
1970	92.49 %	329	91.87 %	322
1971	93.02	336	83.92	329
1972	94.49	350	84.01	341
1973	95.35	354	79.19	302
1974	88.62	305	70.63	313
1975	89.60	336	84.31	342
1976	95.25	347	92.15	343
1977	96.28	334	95.72	342
1978	97.96	343	94.43	348
1979	96.99	342	94.61	347

Source: Spinners and Weavers Association of Korea.

cotton is used primarily by rural households for their own needs. Since the Korean textile industry depends exclusively on imported cotton, the entire market demand for cotton (not just the excess demand) is the relevant demand for cotton imports.

The international trade of cotton textiles has a long history of protectionism. Much of Korea's cotton exports are subject to bilateral agreements between the importing countries and themselves. These agreements were negotiated under the auspices of the international Multi-Fiber Arrangement (MFA) concluded under the General Agreement on Tariffs and Trade (GATT). One of the current provisions of the MFA is an overall growth rate of textile imports of at least six percent annually.[16] Other limitations to trade include tariffs and exchange restrictions, subsidies to local industry, state trading; and quotas which are imposed

by countries that are not signatories to the MFA. Korea is able to get around some of these trade restrictions by exporting semi-finished cotton goods to Hong Kong. As a free port, Hong Kong places few restrictions on Korean cotton imports. Since Hong Kong has obtained relatively large import quota concessions from the United States and Western European countries, Korea has managed to bypass the small quotas on her products by exporting to Hong Kong who then re-exports Korean yarns and fabrics in a more finished form.[17]

The general upward trend in demand for Korean cotton textiles is due to two factors:

1. Low labor costs, new plant, government assistance and other factors has given Korea comparative advantage relative to other exporters. At the same time, the textile industry has begun to decline in several major importing countries. The importance of the former was recently illustrated when the Korean market share in some Asian yarn and fabric markets suddenly increased in 1978. The increase followed an earlier appreciation of Yen which forced Japanese mills to withdraw from these same markets.[18]
2. Increased textile demand on the world market which is due to the growth in population in some markets and to the rise in per capita income in others.

The scope of future demand for Korean cotton textiles is also dependent on the Korean market shares of world

exports for yarn and fabrics. In 1976, Korea exported only 6 percent of the world's yarn exports and 3 percent of the fabric exports.[19] There is considerable scope for further market expansion if the following conditions hold:

1. The competitive position of their traditional competitors continues to deteriorate.
2. The Koreans are successful in negotiating more generous trade concessions from the major importing countries.
3. A new rival does not challenge their position as low cost producer (the PRC, for instance).

As previously noted, Korea relies entirely on imports to meet its industrial requirements for raw cotton. The U.S., over the last five years (1974-78), has been supplying 95-98 percent of these imports and the CCC has financed 44 percent of this trade. Over the 1976-78 cotton seasons 1 out of every 4.4 cotton bales exported by the U.S. went to Korea. In 1977, Korea was the world's third largest cotton importer accounting for 5.5 percent of the world's trade. In 1978, Korea's share had risen to 7 percent.[20]

The United States' dominance of the Korean cotton import market has been attributed to several factors:

1. The provision of financing under a variety of programs (Mutual Security, PL 480 and CCC). Mutual Security funds were the primary source of financing from 1950 to 1960; PL 480 from 1960 to 1970; and CCC from 1970 to the present.
2. The relative proximity of U.S. sources of supply.

3. The availability of large quantities of the various types of cotton fibers.
4. The trade intangibles such as close relationships between exporters and importers, good coordination of trade and extensive cotton promotion efforts on the part of U.S. suppliers.[21]

An Operational Model for Estimating the Additionality of CCC Cotton Export Credits

In order to capture the short and long run returns to the U.S. (defined as the changes in the level of all exports to Korea), one should employ a dynamic model which will address the following issues:

1. The linkages of the textile sector with the general Korean economy.
2. Changes in the level of all imports resulting from changes in the general economy.
3. The sensitivity of the Korean cotton textile industry to CCC credit in relation to:

   (i) their present and future demand for U.S. raw cotton

   (ii) the growth in the industry's capital investments

Developing such a model would certainly be beyond the capability and resources of a research effort such as this, unless a large portion of the model already existed in an operational form.

The operational model this study will employ is the Korean Agricultural Sector Model (KASM). KASM is actually a system of models which interact with one another as

components of an integrated system. The components can be run separately or in combination for subsector analyses. The five components of KASM are:

1. Population and Migration
2. Crop Technology Change
3. Demand-Price-Foreign Trade
4. Farm Resource Allocation and Production
5. National Economy

Only the latter three components would be employed in an additionality study. The use of these three components allow us to expand our definition of additionality to include changes in the level of all imports and to isolate the effect of just one year's credit on the level of current and future imports. The heart of our proposed methodology is the National Economy Model (NECON). A description of this model and its linkages with the Production and Demand Models is found in Appendix A.

Shocking the Model to Simulate Changes in CCC Credit

One of the 16 sectors of NECON is the textile sector. This sector can be 'shocked' and the effect of a change in CCC credit can be simulated. Three sets of data need to be adjusted to approximate a change in CCC credits. The model is set to run using actual historical data from 1970-75. The model uses the historical price indices for world prices and domestic prices. Export demand for each sector is also set at its historical levels.

If CCC credit had not been available at that time then the world price that cotton importers would have to pay would be higher. Production costs in turn would be higher. Domestic consumers would buy less at higher prices and export demand may fall as well. Per unit profits for the textile sector would decline as would the textile sector's contribution to aggregate employment and income. As GNP would decline, so to would the consumption and import of food and nonfood consumer and investment goods. Assuming constant market shares, the value of U.S. exports to Korea would also decline.

Determining the Interest Subsidy Embodied in CCC Credits

If CCC interest rates are below commercial market rates, then the Program is providing the buyer with an implicit interest subsidy. The alternative commercial interest rate for export financing is best determined by looking at the Eurocurrency market. In order to determine if an interest subsidy existed for CCC cotton credits to Korea, this study compared those rates against the rates charged to Korean firms who obtained financing on the Euromarket.

Estimating the Interest Subsidy

The interest subsidy is the positive difference between the CCC rate and the LIBOR rate charged to Korean firms plus an interest premium. The LIBOR rate is assumed to be a given reference rate that applies to all loans, but the

premium is believed to be dependent on characteristics of the obligor and other factors.

World Bank records of transactions in international capital markets were examined to determine the prevailing commercial interest rate. The data covered loans contracted by Korean firms or government agencies from 1972 to 1980. The data identified the borrower, the type of loan, the loan's purpose, date of the loan, amount, interest rate and terms. The data also distinguished between several classes of firms (utilities, transport, financial institutions, and general industrial firms).

Fixing the base LIBOR rate, the next step in estimating the interest subsidy was to discover the determinants of the premium. Was the interest premium charged the same for all firms or was it determined by the type of the firm, the amount of the loan, the base LIBOR rate or other factors?

The premium was regressed against a variety of structural and functional specifications. A single equation was chosen based on its overall statistical properties and economic logic. This equation was then used to estimate the premium that would have been charged to Korean textile firms had they financed their cotton imports on the Eurocurrency market. This estimated premium plus the base LIBOR rate prevailing at the time of the CCC loan was then compared against the CCC rate to determine the implicit interest subsidy.

The final structural form chosen to estimate the premium and its structural coefficients are:

$$\text{Premium} = \underset{(2.58)}{1.24161} - \underset{(1.78)}{.45364E\text{-}03}(\text{Maturity}) + \underset{(2.12)}{.0162619}$$

$$(1/\text{Amount}) - \underset{(2.53)}{.243584E\text{-}03}(\text{Time}) - \underset{(5.07)}{.845641E\text{-}03}$$

(LIBOR Reference Rate)

Estimation Procedure	- OLSQ
Number of Observations	- 54 months of data
F- Statistic	- 27.42
Durbin-Watson Statistic	- 1.82
R-Squared	- .69
( )	- t-statistic

The independent variables are not self evident and require some explanation. It should be kept in mind that the premium is both a service charge and a discriminatory charge based on the particular risk associated with the loan. Since Eurocurrency loans are roll-over loans, there is no risk to the lender that he will not be able to pass on higher interest costs should they rise during the life of the loan. Risk is associated with the borrower, not the possibility of higher interests rates should the loan be for an extended period of time.

Writing the loan, assessing the borrower's credit worthiness, arranging a syndicate to float the loan, etc., are all expenses incurred by the lending institution above and beyond the cost of money (just like closing costs are added on to the cost of financing a mortgage). The cost of writing the loan, however, is not a lump sum charge at the time of closing, but rather is charged as a percent of the principal over the life of the loan. The cost of writing a

loan has a large fixed cost component, independent of whether the loan is large or small, for 1 year or 5 years. The forms, processing, and details that must be worked out are often the same.

On the other hand, certain economies may be captured by the lender if the loan is for a large amount. Assuming that the lending institution has a fixed pool of lendable funds, managing a few large loans may be less expensive than managing many small loans. Premiums should, therefore, be inversely related to the maturity of the loan as well as to the amount of the loan. For example, if 80 percent of the service component of the premium is fixed, that fixed charge as a percent of the principal should be smaller the longer the life of the loan. In addition, the service costs, which are largely invariant with respect to the size of the loan, should be smaller the larger the principal amount becomes. For example, if the fixed cost component of the premium is 1 million dollars over the life of the loan, this would be 10 percent of a 10 million dollar loan but only 1 percent of a 100 million dollar loan.

The premium also reflects the lender's judgement as to the risk associated with a particular loan. At low LIBOR rates, more firms may be encouraged to seek financing and apply for loans, Consequently, the incidence of risk increases as the population of loan applicants increases. At high interest rates, only the most credit-worthy firms apply as only they have internal rates of return high enough

to support the interest payments. A high interest rate acts as an environmental selection device keeping the less credit-worthy firms from applying. Consequently, that component of the premium which is a discriminatory risk charge should go down as the base LIBOR rate goes up.

Premiums may also be influenced by the passage of time. Time may work in two ways. First, as the market develops and more banks do business with Korean firms, the competition for that business may increase over time. Since the base LIBOR is determined by the market, the only room for competition is in the service fees charged by the banks. Also, as time passed and the same firms came back again and again to borrow on the market, their credit history improved and banks may have lowered their risk charges. This hypothesis seems to be supported by the negative sign on the time coefficient.

Measuring the Interest Subsidy

A Korean textile firm importing U.S. cotton could choose to pay cash, finance the purchase at market rates, or finance using CCC credit. The firm would be expected to finance the purchase if the net present cost (NPC) of financing is less than the cash cost. When the firm's opportunity cost of capital exceeds the interest rate, then the firm would finance rather than pay cash.

The subsidy implicit in a CCC loan is realized when the interest charged by the CCC over the life of the loan is

less than the cost of financing at commercial rates. The subsidy (s) is the difference between the NPC of commercial financing (NPC_{cf}) and the NPC of CCC financing (NPC_{ccc}). A subsidy ratio (S) can be calculated as the ratio of the subsidy to the face value of the loan (L).

The formal expression for this ratio is:

$$S = (NPC_{cf} - NPC_{ccc})/L$$

where:

$$NPC_{cf} = L + \sum_{j=1}^{t} \sum_{i=1}^{n} \frac{\left[L - (P*i)\right] \; I_{cf(j)}}{(1 + q_i)^i}$$

$$NPC_{ccc} = L + \sum_{i=1}^{n} \frac{\left[L - (P*i)\right] \; I_{ccc}}{(1 + q_i)^i}$$

$I_{cf(j)}$ = the commercial interest rate in (t)

I_{ccc} = the CCC interest rate (fixed over the life of the loan)

t = commercial loan maturity in roll-over dates

n = the number of times interest and principal payments are made (for commercial loans in each period (t); for CCC loans over the life of the loan)

P = equal principal payments such that P*n = L

q = the firm's opportunity cost of capital (its

discount rate)

This expression has several advantages which make it useful when doing commercial policy analysis.

1. The ratio expresses the subsidy as a percent of the total loan. For example, if the subsidy ratio is .05, the subsidy is 5 cents on each dollar loaned.
2. The partial differentials of S with respect to each argument ($I_{cf(t)}$,I_{ccc},q,i,t) are measures of the sensitivity of the subsidy to changes in these variables.
3. As the subsidy becomes larger or smaller relative to the changes in these variables, it is reasonable to assume that the Program becomes more or less effective as a tool of commercial policy.

Without detailed knowledge of the debtor's profit function, we cannot determine empirically the "true" value for q. However, a surrogate measure can be employed in its place. Past studies of the subsidy effect of EXIM loans used the market rate of interest.[22] Consequently, the interest rate charged by Korean banks was used to approximate textile firms' opportunity cost of capital. Values for I_{cf} and t were obtained from the World Bank data on Euro-credit transactions.

From 1971 to 1975 the CCC financed the purchase of $329,898,000 worth of cotton exports to Korea. The subsidy provided by the CCC relative to commercial terms was

$20,054,000. For the entire 5 year period the subsidy ratio (S) was .061, or 6 percent of the value of the credits.

TABLE VII

CCC SUBSIDY RELATIVE TO COMMERCIAL TERMS
($1,000)

Calendar Year	Amount of CCC Credits	Subsidy ($)	Subsidy Ratio (%)
1971	41,084	3,340	8.1
1972	37,016	6,930	18.7
1973	69,812	6,421	9.2
1974	31,185	0	0.0
1975	150,801	3,375	2.2

The World Bank data showed few loans made for the import of raw materials. In 1972 and 1973 the net present cost of commercial financing exceeded the cash purchase cost. Consequently, one is lead to believe that Korean textile firms did not use commercial financing because: (1) it was too expensive relative to cash; (2) international banks would not agree to provide long-term financing for raw material imports; or (3) the Korean government rationed scarce foreign exchange. If we accept the assumption that commercial financing was not available then the credit subsidy would be the full difference between the net present cost of CCC financing and cash. Given this assumption, cotton imported under CCC financing resulted in a net present cost savings of $36,146,000 and was the equivalent of an 11% reduction in the average bale price.

TABLE VIII

AVERAGE COTTON PRICE: CASH, COMMERCIALLY FINANCED AND CCC FINANCED

Calendar Year	Cash	Commercial	CCC	Cash - CCC Equivalent Price Cut
	($/Bale)			(%)
1971	146	141	129	11.7
1972	178	201	144	18.7
1973	162	164	147	9.2
1974	294	272	272	7.2
1975	302	277	270	10.4

Estimating Own Price and Cross Price Effects

Imports

Imports of raw cotton were regressed against the price of cotton and other variables. The final structural form chosen was:

$$\underset{\text{Imports}}{\text{Cotton}} = \underset{(.81)}{-3081590} + \underset{(.79)}{.590647E+10}(1/\text{Time}) - \underset{(1.61)}{147.161}(\text{Cotton Price}) + \underset{(1.87)}{181.932}(\text{Cotton Yarn Price}) + \underset{(3.08)}{.2387}(\#\ \text{Cotton Spindles in Industry})$$

Estimation Procedure	- OLSQ
Number of Observations	- 21 years of data
F-STatistic	- 94.56
Durbin-Watson Statistic	- 2.2
R-Squared	- .96
( )	- t-statistic

The own-price elasticity is relatively inelastic at -.35. A literature review did not reveal any other published estimates of Korea's cotton price elasticity. The estimate, while it appears reasonable, is weakened due to the

relatively low t-statistic which indicates that the estimate is significant at the .14 level. Other problems associated with the estimate are multicollinarity between cotton and cotton yarn prices as well as the assumption that elasticity is stable through time. From 1970 to 1975 nearly all of the fiber materials used by the Korean textile industry were imported. Synthetic yarn and wool imports supplied the bulk of the fiber requirements for the woolen and synthetic textile industries. Industry studies suggest that there is a high degree of substitutability of one fiber for another[23]. The industry has to be flexible with regard to production processes in order to adapt to abrupt changes in tastes, technology and input costs. In order to capture these substitution effects, wool and synthetic yarn production were regressed against the price of cotton and other variables. The final structural forms chosen were:

Wool Imports = -3475.84 + 3459.49(Wool Yarn Prices) + 24.55(Cotton Price)
(.49) (1.72) (5.90)

Regression Procedure	- OLSQ
Number of Observations	- 16 years of data
F-Statistic	- 17.42
Durbin-Watson Statistic	- 1.43
R-Squared	- .73
( )	- t-statistic

and

Synthetic Yarn = -.173209E+08 - 32.579(Synthetic Fiber Price) + 22.02(Raw Wool Price) + 271.87 Cotton Price) + 8788.54 (Time)
(4.38) (1.45) (1.32) (7.06) (4.36)

Regression Procedure	- OLSQ
Number of Observations	- 16 years of data

F-Statistic	- 264.78
Durbin-Watson Statistic	- 1.79
R-Squared	- .99
( )	- t-statistic

No meaningful structural equations could be fitted to synthetic fiber imports.[24] Consequently, cotton price was regressed against the domestic production of synthetic yarn. An input/output coefficient was estimated for synthetic fiber input/yarn output. Synthetic fiber imports were assumed to change in a proportional manner.

Finished Textile Production and Textile Exports

An increase in the import price of cotton should have several effects. The own-price effect would reduce the quantity of cotton imported. This, in turn, would reduce the quantity of finished cotton textiles produced and exported. Cross-price effects would lead to an increase in the import of wool and synthetic fibers. More woolens and synthetics won't take up all the slack left by a reduction in cotton textile production, total fiber imports would fall and total textile production and exports would decline.

Input/output coefficients were estimated for each of the three textile sectors. The coefficients were assumed to be constant from the period 1970-75. Changes in fiber imports resulted in proportional changes in the output of finished textiles. The average ratio of exports to total production was assumed to remain constant.

Decomposition of KASM Indices

Three indices of KASM were changed to reflect the changes wrought in the textile industry by a lack of CCC financing for cotton imports. The first index changed was the import price index for the textile sector (VPWI-10). KASM's designers originally obtained the index from the Korean Foreign Trade Statistics Yearbook. The index was duplicated using the original data but decomposed into various components. The index was then recalculated to reflect the change in cotton import prices. The value weights for the various fibers were adjusted since the total value of cotton, wool and synthetic fiber imports had also changed.

The second KASM index to be adjusted was the domestic producer price index for the textile sector (P-10). The index was obtained from Korean economic statistical yearbooks and was decomposed into its subsectoral components. Changes in fiber imports required proportional changes in the composition and quantity of finished textile outputs. Detailed knowledge of textile subsector cost functions were not available, consequently constant costs were assumed to prevail over the range of output changes in cotton, woolen, and synthetic textile production. The textile producer price index was modified based solely on the changes in cotton fiber costs, the composition of fiber inputs, and the composition of finished textile products.

The final index to be modified was the absolute level of export demand for the textile sector (VXD-10). As

stated, the ratio of exports to total production was assumed to remain constant under both sets of cotton import prices. In other words, if 50% of cotton yarn production was exported in 1973 given CCC financing, the 50% of the reduced cotton yarn production would be exported even if CCC financing were not available. No changes in world prices were made under the assumption that changes in the level of Korean exports could not effect world prices.

TABLE IX

CHANGES IN KASM DATA BASE
FOR CCC SIMULATION

Item	1970	1971	1972	1973	1974	1975
VPWI-10						
CCC Credit	1.000	.877	.795	.575	.800	.900
No CCC	1.000	.965	.875	.633	.880	.990
VXD-10*						
CCC Credit	341	448	560	1022	1036	1144
No CCC	306	403	504	919	932	1030
P-10						
CCC Credit	1.000	.928	.888	.876	.753	.649
No CCC	1.000	1.021	.977	.964	.828	.714

*Million won/year

Simulation Results

The KASM model was run from 1971 to 1975 under the two scenarios of with and without CCC credit. Although only three components of the model were linked

(Demand-Price-Foreign Trade, Farm Resource Allocation and Production, and National Economy components) considerable economic information was generated. Only that information pertaining to the textile sector, agricultural imports and overall measures of economic performance will be discussed.

Cotton Imports

U.S. cotton exports to Korea decreased due to the direct price effect of CCC credit and due to the induced investment effect. The first effect acts in the current time period and the second acts in preceding time periods and is cumulative in nature. Because of its cumulative nature the latter's total impact on cotton exports exceeded the immediate price effect of the credits.

The Direct Price Effect

Without CCC credits net exports of U.S. cotton to Korea would have decreased $14,359,000 during the five years 1971-1975. Exports declined because the Koreans no longer enjoyed the implicit price discount that was embodied in the credits. The discount was the difference between the net present cost of financing at CCC terms and the cost of paying cash in the current time period. When the "additionality" of the credits is measured as the increase in the value of exports (due to the credits) as a percent of the amount of the credits, the influence of the Program is relatively minor (Table X). The low additionality coefficients of the credits can be attributed to the low price elasticiity of demand for cotton imports (about -.35).

TABLE X

ADDITIONALITY COEFFICIENTS OF THE PRICE EFFECT OF CCC CREDITS

1971	1972	1973	1974	1975	TOTAL
2.52%	4.53%	2.75%	4.30%	5.59%	4.36%

The Induced Investment Effect

The induced investment effect is considerably greater than the price effect. CCC credits reduced the net present cost of cotton imports and this savings represented a transfer of income to the Korean textile industry. From 1971-1975 this transfer amounted to over $36,146,000. From 1972 thru 1975, total textile sector imports increased by more than the amount of the changes in cotton, wool and synthetic fiber imports. The value of those changes is due solely to the direct price effect of the credits. Without those credits the rate of investment in the textile sector fell so that by 1975, gross investment under the no-credit model was 33% less than investment in the with-credit model (see Table XI).

TABLE XI

ADDITIONALITY COEFFICIENTS OF THE INDUCED INVESTMENT EFFECT

1971	1972	1973	1974	1975	Total
0.00%	10.24%	2.25%	45.38%	33.06%	21.03%

The induced investment effect of the income transfer embodied in the credits contributed to the expansion of the textile industry and indirectly increased cotton imports in succeeding years. The total amount of cotton imports attributed to the induced investment effect was $69,364,000. The total effect is probably several times larger due to the cumulative nature of the investment-return process whereby investments made during 1972-1975 influenced output and consequently cotton demand well after 1975. This estimate of the induced investment effect must be qualified. The investment elasticities used by the KASM model were not estimated directly but were loosely derived from a variety of sources. In fact, the KASM documentation describes the source of the investment parameters as "tentative estimates."

Combined, the price and induced investment effects of CCC loans increased U.S. cotton exports by $83,763,000. The total additionality of the credits during the period 1971-75 would therefore be 25.39%. Since the model was set to run from 1971-1975 only, it is not possible to document the induced investment returns after 1975. However, given the geometric expansion of cotton imports it is likely that total additionality (price and investment) is two to three times greater than the base additionality effect of 83.7 million dollars.

TABLE XII

THE VALUE OF COTTON IMPORTS DUE
TO THE INDUCED INVESTMENT EFFECT
($1,000)

1971	1972	1973	1974	1975	Total
0	3,789	1,574	14,152	49,849	69,364

Linkage Effects

Because of the pivotal role that the textile sector played in the Korean economy, any factor increasing textile production would have secondary impacts in other sectors of the economy. No attempt was made to identify which sectors were effected but agricultural imports and total imports were examined. The linkage effects were simulated by KASM using a 1970 input-output model of the Korean economy which was developed by the Bank of Korea. Input demand functions in the trade component of the model were derived by time series regressions.

TABLE XIII

IMPACT OF CCC COTTON CREDITS ON
OTHER AGRICULTURAL IMPORTS
($1,000)

Commodity	1971	1972	1973	1974	1975	Total
Rice	0	-60	-864	-2071	-924	-3,919
Wheat	0	-134	-75	-291	-233	-1,466
Oth. Grains	0	-28	-2	-57	-169	-256
All Imports	0	+822	-6617	-4195	-1920	-11,910

From 1971 thru 1975 Korean agricultural imports declined $11,910,000 when CCC credit was eliminated. Rice was the commodity suffering the largest decline.

Much of the decline in agricultural imports can be attributed to the income elasticity of demand for those commodities. Reduced output of the textile sector alone probably would not have been sufficient to reduce import demands for these commodities. However, as a result of the linkages the textile production resulted in a significant decline in the output of other sectors and the economy as a whole. By 1975, gross domestic product (GDP) in Korea had declined as much as 7.2% relative to the GDP generated with credits (see Table XV). This loss of GDP in turn led to a reduction in per capita incomes, thereby reducing the import and consumption of these food commodities.

Other imports besides food and textile fibers were reduced when CCC credits were eliminated. From 1971 thru 1975 imports other than cotton and agricultural commodities decreased over 1 billion dollars.

TABLE XIV

IMPACT OF CCC CREDITS ON OTHER IMPORTS
($1,000)

1971	1972	1973	1974	1975	Total
0	73,085	105,174	292,659	586,501	1,057,419

The U.S.'s share of these imports was not estimated but whatever the U.S. share is, when combined with the increase in cotton and agricultural imports, would probably be 1 to 3 times the $329,898,000 worth of CCC cotton credits extended. If the probable impacts of the credits after 1975 are taken into account, then the total additionality of the credits could be from 3 to 5 times the value of the credits.

TABLE XV

KASM OUTPUT FOR WITH AND WITHOUT CCC CREDIT

	1971	1972	1973	1974	1975
			(Percent Change)		
Textile Sector					
Output	-4.2	-9.3	-14.5	-24.5	-33.0
Investment	0	-6.8	-16.4	-24.9	-41.4
Capacity Utilization	-4.2	-19.8	-14.8	-24.9	-33.4
Labor Dmnd.	-4.2	-19.7	-14.5	-24.5	-32.9
Import Dmnd.	-3.7	-18.8	-13.6	-23.2	-32.1
Export Dmnd.	-7.8	-18.7	-20.0	-32.1	-37.8
Total Economy					
GDP	-.3	-1.3	-2.1	-3.4	-7.2
Investment	0	-.4	-1.2	-2.8	-6.1
Labor Dmnd.	-.3	-2.2	-2.0	-4.4	-8.6
Import Dmnd.	-.5	-3.1	-3.6	-6.9	-14.3
Export Dmnd.	-1.9	-4.2	-6.4	-11.2	-19.6

Conclusion

Economic theory suggests the CCC Program would increase exports by relieving the importer's credit constraint and by providing an implicit interest subsidy. The provision of export credit combined with an interest subsidy has the same effect as a price discount in that they might reduce the net present cost of the purchase to less than the current cash cost. A comparison of CCC interest rates with Euromarket rates confirms that CCC rates were lower than commercial rates. In addition, it was determined that export financing on the Eurocurrency market was either unavailable or not used for agricultural or raw material imports. Consequently, the direct effect of CCC credits was equal to an 11 percent discount in cotton prices.

An implicit 11 percent price discount had the following effects: 1) it increased cotton imports; 2) it increased textile production and textile exports, and 3) it increased the rate of capital expansion in the textile industry. Over the five year period 1971-1975, the increase in cotton imports due to the induced investment effect of the credits was considerably greater than the own-price effect of the price discount.

The Korean textile industry is an important engine of economic growth and employment. The induced investment effect of the credits on the textile industry were multiplied throughout the economy and promoted additional agricultural imports. Non-agricultural imports increased in

response to these multiplier effects. The cumulative increase in all imports due to the CCC cotton credits was 3.5 times the amount of the credits.

TABLE XVI

SUMMARY OF EFFECTS OF CCC COTTON CREDITS
($1,000)

	1975	1972	1973	1974	1975	Total
Cotton Imports	1,035	5,467	3,497	15,491	58,273	83,763
Other Agricultural Imports	0	-822	6,617	4,195	1,920	11,910
Other Imports	0	73,085	105,174	292,659	586,501	1,057,419

The empirical results of the KASM model simulation must be received with caution as they are subject to an unspecified margin of error. The cotton textile industry, nor the textile industry itself were modeled separately due to a lack of detailed industry data. The textile sector described within the input-output model of the national economy can be "shocked" only by manipulating three aggregate price indices of textile import prices, domestic producer prices, and export demand. Furthermore, the KASM model was designed primarily to evaluate agricultural policies, not to simulate minute changes in the import price of specific textile fibers. In this regard, perhaps the

most serious shortcoming of the model is the "tentative" nature of the investment elasticities used when estimating the induced investment effect of the export credits. It was the investment effect of the credits which proved to be far greater than the immediate price effect and therefore assessing the overall returns to the Program is heavily dependent on the accuracy of those investment elasticities.

CHAPTER V ENDNOTES

[1]See, Robert Schwartz, "An Economic Model of Trade Credit," Journal of Financial and Quantitative Analysis, September 1974, 9(4), pp. 643-657.

[2]U.S., Department of Agriculture, Office of the General Sales Manager, Quarterly Report of the General Sales Manager (January 1979), p. 10.

[3]For a discussion of the measurement of these linkages, see LeRoy P. Jones, "The Measurement of Hirschmanian Linkages," Development Discussion Paper No. 6 (October 1975), Harvard Institute for International Development.

[4]C.E. Ferguson, The Neoclassical Theory of Production and Distribution, (Cambridge, The University Press, 1971), pp. 201-211.

[5]See, Ralph Pfouts, "The Theory of Cost and Production in the Multi-Product Firm," Econometrica, 1961, XXIX, pp. 650-8; Thomas H. Naylor, "A Kuhn-Tucker Model of the Multi-Product, Multi-Output Firm," Southern Economic Journal, April 1965, 31, pp. 324-30, Joseph P. Hughes, "Factor Demand in a Multi-Product Firm," Southern Economic Journal, October 1978, 45, pp. 494-501.

[6]The firm could have access to commercial credit supplied by traditional financial institutions. However, unlike inter-firm trade credit which can only be used to purchase a specific type of input, commercial credit can be used to purchase all inputs to simplify the presentation we have omitted cash and commercial credit as separate constraining factors. If included they would simply add two more Lagranian multipliers to the finan expression of the firm's objective function.

[7]C.E. Ferguson, Theory of Production, pp. 201-211.

[8]The Korea Development Bank, Industry in Korea 1976, (Seoul: The Korea Development Bank, 1976) , p. 239.

[9]Ibid., p. 240.

[10]The Korean Reconstruction Bank, Industry in Korea 1967, (Seoul: The Samhwa Printing Co., Ltd., 1967), p. 111.

[11]U.S. Department of Agriculture, Foreign Agriculture Service, The Market for U.S. Cotton in the Republic of Korea, by R. E. Evans, FAS Marketing Series (1980), FAS M-291, P. 9.

[12]Ibid., pp. 2.

[13]Ibid., p. 1-2.

[14]Ibid, p. 16.

[15]Ibid., p. 3.

[16]U.S.I.T.C., The History and Status of the Multi-Fiber Agreement, USITC Pub. No. 850 (Washington, D.C.: United States Internation TRade Commission, 1979).

[17]Foreign Agricultural Service, Market for U.S. Cotton in Korea, p. 14.

[18]Ibid., p. 9.

[19]Ibid, p. 2.

[20]U.N., Food and Agriculture Organization, Trade Yearbook 1978, (New York: F.A.O., 1979).

[21]Foreign Agricultural Service, Market for U.S. Cotton in Korea, pp. 6-9.

[22]The Library of Congress, Congressional Research Service, "Impact of Eximbank on U.S. Exports" (April 25, 1978), by Jane Gravelle.

[23]Korea Federation of Textile Industry, Textile Industry in Korea, 1979-1980, Korea Federation of Textile Industry (Seoul, Korea, 1980).

[24]The own-price elasticity of cotton imports is estimated to be -.35. The cross-price elasticity of wool imports to cotton price is +.83 and synthetic yarn production's cross-price elasticity is +.92. The price of wool was not included in the wool import equation due to problems of multi-collinearity with the price of cotton. Since the objective of the wool import equation was to measure the cross-price relationship, not wool's own price elasticity, the wool price was delated from the equation in favor of cotton.

CHAPTER VI

SUMMARY AND PROPOSALS FOR CHANGES IN THE PROGRAM'S STRUCTURE AND CONDUCT

The CCC Export Credit Sales Program had, for many years, been an important part of the USDA's strategy to develop overseas markets and to enhance exports. Despite the long history and importance of the Program, very little formal research has been done to assess the performance of the Program. The original focus of this study had been to rectify this situation and to quantify the Program's impact on exports by conducting a case study of CCC financed cotton exports to the Republic of Korea.

During the course of that research it became evident that there were other aspects of Program performance that were not being addressed. Additionality, while a major component of performance, was an incomplete and inadequate way of evaluating the Program. However, it was clear that simply identifying the other measures of Program performance was not enough. How were these various effects related? What were the determinants of performance? Were there any strategies which could be employed that would improve Program performance? How might different strategies influence the various measures of performance?

Additionality and other impact indicators are the end products of the CCC Program's Structure and the Conduct of the Program's participants. This study has attempted to outline the salient features of the Program's Structure, to

describe the Conduct of the Program's administrators, and to identify other valid measures of performance. This study has then described and estimated the influence of CCC credits in the case of CCC financed cotton credits to Korea.

This study suggests that substantial returns were accrued by the U.S. from its extension of cotton export credits to Korea. The contention that similar returns from other export credits are possible is supported by the recent research of a joint USDA-MSU study. Using the MSU AGMODEL, researchers found that a 4 percent subsidy on 10 year export loans could provide an additional 1.028 billion dollars in export earnings during 1982-83.

Although the Program had been discontinued by the Reagan administration, Congress resurrected the Program under the guise of the Agricultural Export Revolving Fund. The Revolving Fund Program has not yet been funded but when it is, this Program will inherit many of problems of the old Export Credit Sales Program. OGSM-USDA administrators have a unique opportunity to take a fresh look at the whole idea of export credit programs. Now is the time to begin an investigation of possible changes in both the Structure and the Conduct of export credit programs that could lead to improved program performance. This chapter offers some concluding observations on the role of export credit programs and suggests some changes to future programs' Structure and Conduct. These proposals are offered as a research menu and are not meant as a final institutional

diagnosis and prescription. Prescriptions cannot be made until these proposals are evaluated with additional data and more precise analysis. The proposals are divided between those that concern program Structure and those that deal with program Conduct.

Structural Proposals

Will the Program Have a Role in the Agricultural Export Markets of the 1980's?

Our existing international agricultural policies were designed to reduce the chronic surpluses of the Post-War era. At that time, exports (even at concessional terms) were considered a more efficient use of agricultural resources than any other competing uses. However, beginning in the early and mid-1970's and continuing on until today, many analysts believe that fundamental changes have transformed international markets and that these changes, in turn require a restructuring of our trade policies and programs.

Domestic and international conditions suggest that our trade must now cope with markets characterized by a trend toward tightening supplies and increasing variability in production (and consequently in prices). Presently, the United States supplies approximately one-half of the world's agricultural trade volume and this represents almost 10 percent of the world's consumption (other than our own). A recent agriculture study estimates that by the end of the eighties "the U.S. share of world trade could rise to

three-fifths, and our exports could constitute as much as 13 percent of the world's food consumption."[1]

Given these conditions one might assume that export promotion programs in general would be unnecessary. This is possible, particularly given the new administration's philosophy of reducing the government's role in the nation's political economy. However, that does not mean that there are no sound economic reasons for maintaining and even expanding the Program.

Reducing Price and Income Instability

If higher prices are to be accompanied by increased variability, then there may be a resultant need for an appropriate policy intervention. Evidence of the trend toward increasing variability was overwhelming during the seventies. The instability in prices led to unstable export revenues and fluctuations in farm incomes (see Figures 15, 16 and 17). With exports comprising an ever-increasing share of total farm income we find that total exposure to market risk is also increasing.

Producer strategies to cope with risk impose additional costs (and losses in output) in that producers must forego some returns arising from use of specialized machinery, single cropping systems, use of debt capital, and the introduction of new technology.[2]

The primary policy response proposed to deal with price instability has been the institution of a global reserve program. While reserve schemes may have comparative

Figure 15

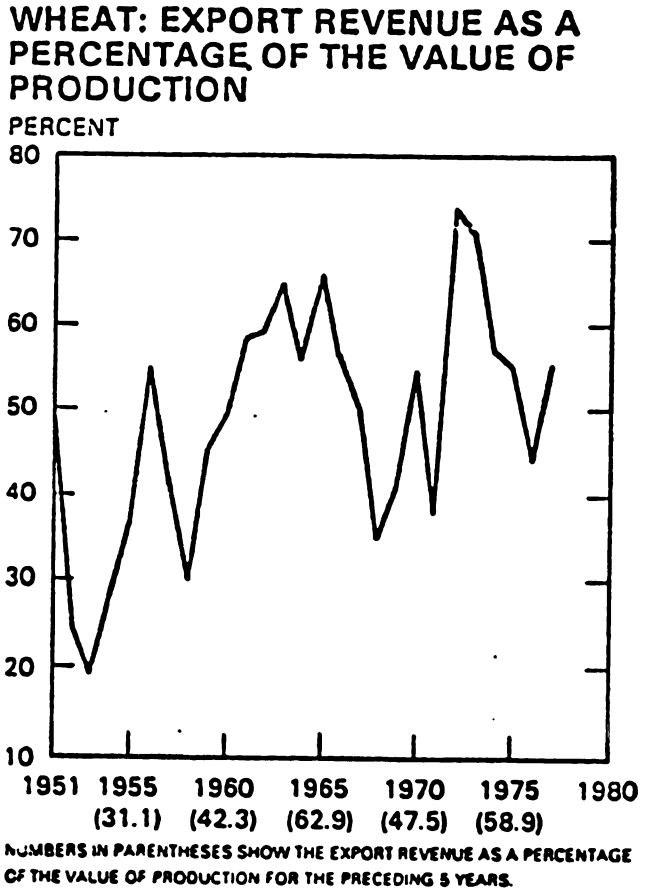
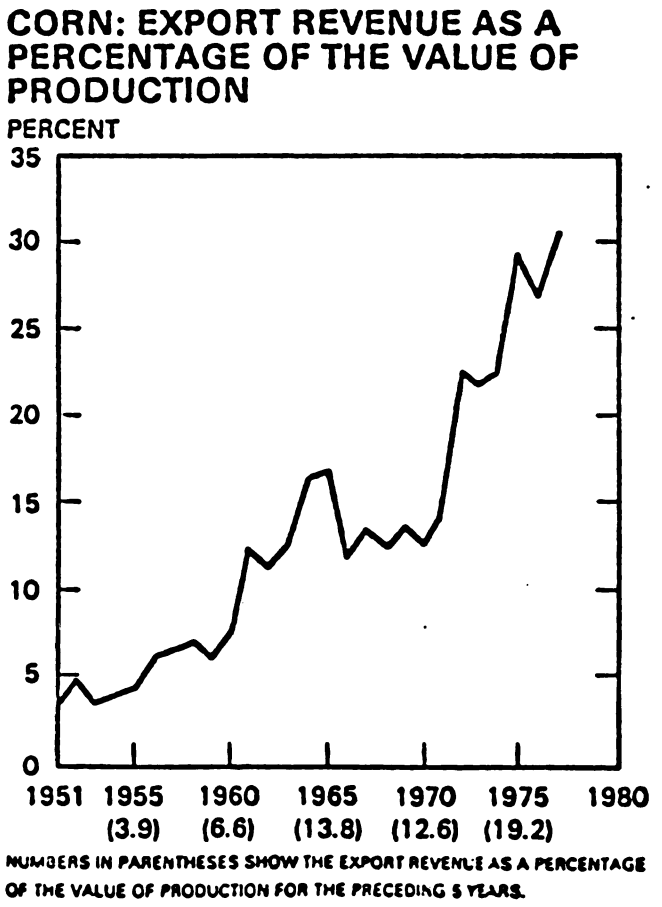
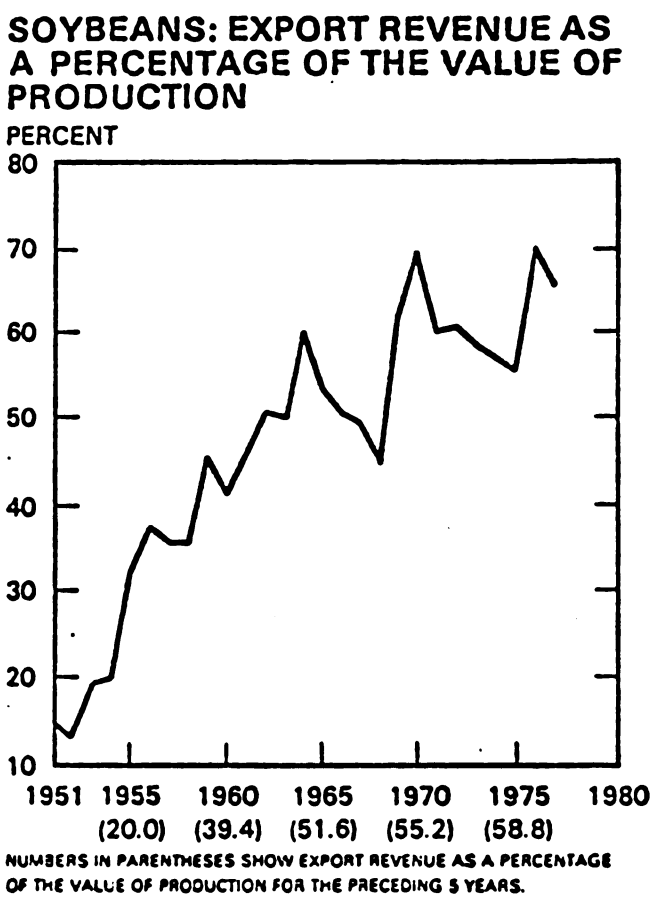


Figure 16



Source: U.S., Department of Agriculture, "Implications of Increased Reliance on International Markets, by Ronald L. Meekhof, ESCS Agriculture Economic Report 438 (November 1979).

Figure 17


SOYBEANS: EXPORT REVENUE AS A PERCENTAGE OF THE VALUE OF PRODUCTION
PERCENT
80
70
60
50
40
30
20
10
1951
1955
1960
1965
1970
1975
1980
(20.0)
(39.4)
(51.6)
(55.2)
(58.8)
NUMBERS IN PARENTHESES SHOW EXPORT REVENUE AS A PERCENTAGE OF THE VALUE OF PRODUCTION FOR THE PRECEDING 5 YEARS.

advantage in ameliorating price swings there is still a role for the CCC Export Credit Program. The Agricultural Trade Act of 1978, among other things, authorized the CCC to finance the "establish-[ment] in importing countries [facilitates] for...storing...imported agricultural commodities..."[3] In addition to financing foreign storage facilities the CCC could (if authorized) finance the purchase of large commodity stocks. In years when world prices are depressed, the CCC could offer special, low-interest financing to encourage importing countries to 'buy ahead'. These stocks could not be released until a specified time period has passed.

The program would be similar to the domestic reserve program already run by the CCC in that the importer would have the option of abrogating the financing agreement and releasing his stocks prior to the expiration of the storage period buy only at the expense of paying off the loan at some higher rate of interest (a penalty). This program would have the combined effect of strengthening any global reserve program and also increasing demand for U.S. agricultural exports by providing importers with an incentive to purchase in advance during periods of low prices.

Market Penetration for High Value-Added Products

Two contrasting positions have been identified in regard to the 'cost' of producing for the export market. On the one hand we are assured that "U.S. agricultural exports

could be much greater than they are...[and]Vast opportunities exist for expanded production at very nearly constant costs."[4] On the other hand we are warned that exports in the volume likely in the 1980's will have high additional costs with broad social and economic consequences.[5]

If the latter is the true situation, then this may require a shift in the relative emphasis that an export credit program places on the various commodities it finances. For example, the Program might focus more on financing those commodities "that minimize pressure on our resource base and food-price inflation but maximize the value added to the product and the benefits for the farm sector and the general economy."[6]

An internal FAS study suggests that such "high value added" products have not been traditionally exported and that they would benefit the most from increased credit availability.[7] If adopted, this strategy may require credit agreements to finance exports for a period of years rather than on an annual case-by-case basis. The OGSM has recognized the importance of making credit available from one year to the next (though it cannot currently engage in multiyear credit agreements).[8]

Use of the CCC Program for Diplomatic Purposes

In 1977, the Congressional Research Service issued a report on the use of United States food resources for diplomatic purposes.[9] Food, they stated, is a real or

potential source of power which the state can employ in the pursuit of its foreign policy objectives. The requisite conditions to successfully exercise food power based on market control are rather stringent and have not been very successful in the past. However,

> For an exporting country to have food power based of foodaid [and food imports financed by low-interest loans can be considered a form of food aid], it is enough that it have surplus food that it is willing to transfer on concessional terms...

Don Paarlberg, retired Professor of Agricultural Economics at Purdue University, described the relative success that the United States had in at least two cases when it attempted to exercise diplomatic power based on food aid. The offer of food aid, he said, was instrumental in getting the Egyptians to negotiate with the Israelis. However, an attempt by the Johnson administration to pressure India (using food aid) into supporting our Vietnam Policy backfired.[11]

Considerable criticism has been made of the use of food as a tool of foreign policy. Some of this criticism has been based on humanitarian grounds but much of it was based on the efficacy and the cost of using food, rather than other methods, to achieve foreign policy objectives. Most of the objectives were summed up in the aforementioned CRS report:[12]

1. Lack of effective market control.
2. Failure to extract specific policy changes from other countries.

3. Unfavorable impacts on our domestic agriculture.
4. To use food power effectively would require a major restructuring of the role of government in agriculture.

During the course of Congressional hearings on or related to the CCC Export Credit Program, the nearly unanimous opinion of Congressmen and witnesses was that the use of CCC credits for foreign policy purposes was ineffective and expensive. Mr. John W. Curry, President of the National Corn Growers Association, estimated that corn exports alone would expand by 53 percent if CCC credit were provided to all non-market economies.[13] Mr. Robert Kohlmeyer of Cargill Inc., further endorsed this view. He identified the Eastern European countries as being particularly responsive to credit availability and he predicted significant increases in commodity imports if CCC credit were extended.[14]

Negotiating Limits to Foreign Credit Competition

Over the last 20 years, American trade policy has tended to emphasize free trade in agricultural products and the removal of barriers to agricultural trade. In 1979, the Senate Subcommittee on International Finance, reported that "Reductions in foreign import barriers and export subsidies is the major avenue through which U.S. agricultural exports could be increased."[15] The United States, however, runs the risk of escalating the level of export subsidies if its own

Export Credit Program exceeds the 'par' level which has evolved over time for such subsidies.

A 1977 Agriculture study reported that "most export markets are basically oligopolistic."[16] In such a market, competition, in any form, often inspires retaliation. If one supplier initiates an aggressive marketing strategy it is likely that others will follow suit. The expansion of the CCC Program to include intermediate credits (up to 10 years) was strongly opposed by the State Department on these grounds. The State Department argued that the program "would be breaking new ground and that our competitors would almost certainly respond by changing their own credit programs to protect their market shares."[17] Congress seemed to heed the State Department's warning, not by rejecting the program but by including the provision that "intermediate credit financing under this subsection may not be used to encourage intermediate credit competition."[18]

The Nature and Extent of Foreign Credit Competition

Two contrasting positions exist as to the nature and extent of foreign agricultural credit competition. First, there is the State Department.

> While the agricultural export systems of these three countries Canada, Australia, and Argentina differ from ours, they essentially rely upon commercial bank credits with Government guarantees. More important, one of the three countries normally offers credit terms for agricultural commodities of more than 3 years and generally speaking they provide less favorable terms. There have been one or two exceptions to this in recent years but the underlying reason for these exceptions were--appears to have been more political than commercial.[19]

When pressed to document their position the State Department representative that testified before the Senate Subcommittee on Foreign Agricultural Policy waffled a bit and finally admitted that they had "No information in advance and very little information after the fact..."[20] What data they eventually were able to produce was sketchy, outdated, and of little use in determining an appropriate credit strategy of our own.

The opposing view is usually championed by the Department of Agriculture. Representatives of Agriculture reported to the same Subcommittee that--

1. The Canadian wheat board finances its operations with bank credits guaranteed by the government.
2. The Australian wheat board receives credit through the reserve bank of Australia.
3. Individual member countries of the European Community offer long-term credit and low interest rates and financing is also supplied through private banks operating under a government subsidy scheme.
4. Brazil has used an indirect export subsidy by providing funds at preferential interest rates to exporters in proportion to their exports of soybean products. Exporters can then relend the funds on the Brazilian money market at substantially higher rates and use the differential to reduce their export prices.[21]

The United States is the only major exporter that regularly announces the particulars of its credit program

(commodity and country eligibility, amount of the credits, interest rates, and maturities). Even if the Program administrators had nothing buy good intentions and sought only to offer credit at the 'going subsidized rate' it is impossible to find out what that rate is.[22]

A Two-Stage Strategy for Limiting Foreign Credit Competition

Because the CCC-OGSM administrators are operating in the dark they must strive to obtain better information on competitors' credit terms. This information is apparently not forthcoming via the traditional channels. What is needed is an international reporting agreement similar to the one recently concluded governing the reporting of officially supported capital goods export credits. This would be the first step in a two-stage strategy for limiting foreign credit competition.

Once everyone's cards are on the table, so to speak, the necessary conditions for the second stage would have been met. The Department of Agriculture has identified the next stage in its 1977 study when it noted that "No individual competitor dares to withdraw unilaterally from the use of aggressive methods for fear that others will not and so cause him to lose his market share." They concluded correctly that "The only way out is through a collective effort."[23]

The Carrot and Stick Approach to Credit Negotiations. A 1978 OECD study on officially supported export credits for capital goods estimated that these programs were costing

OECD governments $2 billion annually in lost revenues.[24] By 1980, the annual cost of these subsidies rose to between three to five billion (due primarily to the higher interest rates government's had to pay finance their programs.)[25] No similar study of agricultural export credit costs is possible due to the lack of information. However, it is likely that the total subsidy cost to agricultural exporting countries is considerable.[26]

The Eximbank had initiated a 'carrot and stick' approach in its relations with its credit competitors. The 'carrot' is that the United States stands ready to raise the minimum rate that it charges if its competitors are willing to follow its lead. The minimum allowable rates would be determined by a formula which would tie each country's rate to its government's cost of money. This would retain some weighted parity among countries' programs yet reduce the subsidy cost for all. Eventually, the minimum allowable rate would rise through a gradual process until it approximated the prevailing commercial rates.[27]

The 'stick' is that the United States is equally prepared to make "aggressive use of the substantial resources...committed to [the Eximbank] ... [and] to match, on a selective basis, the type of predatory financing [which it believes would lead to an escalation of the international credit 'war']."[28] There are no economic reasons why such a approach could not be employed in achieving a similar

reduction in total world agricultural export credit subsidies.[29]

Conduct Proposals

Planning: Indicative versus Mandatory

Both the 1977 Agriculture study and the 1979 GAO report made strong recommendations for greater planning within the Program and for the establishment of country-commodity export priorities.[30] In 1978 and again in 1979, the General Sales Manager came out in support of the general idea of market planning.[31] In 1978 the beginnings of a planning group was assembled within FAS for just this purpose.[32] However, by the time the GAO report came out only a few country plans had been produced and the GAO attributed this poor showing to several factors--

1. lack of commitment by CCC-OGSM administrators to a "structured approach for establishing...priorities and market share goals...;"[33]
2. insufficient coordination among agriculture agencies (specifically FAS and ESS); and
3. hiring limitations which had kept the FAS planning group at only 60 percent of its authorized strength.

The GAO argued that the 'structured approach' (mandatory) to planning is needed to prevent the Program's effort from "being dispersed to low priority countries with less need for credit than others."[34] Furthermore, the plans would provide a yardstick against which Program performance

could be measured. Finally, the plans could be used by the CCC-OGSM administrators to defend the Program against the unwarranted influence of secondary economic and political considerations.

The OGSM replied to the GAO's planning strategy in January 1980.[35]

> We continue to feel that surveying our worldwide network of Agricultural Attaches, and responding to actual requests for credit will provide a more flexible and effective framework for planning than setting specific market-share targets.

This is not to say that the OGSM has abandoned its formal planning efforts.

> ...country analysis, buttressed with country analyses prepared by AID, ESCS and further supported by Long Range Strategic Marketing Plans being prepared by FAS, will ensure a more exhaustive examination of individual countries and commodities when allocating budgeting funds for CCC credit.

Whatever the degree of sophistication achieved by these plans, the OGSM insists that the plans be of an indicative character and not mandatory schedules that must be followed in all cases.

Mandatory 'Plans' could achieve some of the benefits that the GAO claims for them. Without a doubt the more systematic and extensive one's data and analysis the better one's understanding of market factors. A formal joint planning effort among Agriculture agencies would be more efficient and may capture some economies of scale. Judging from the OGSM's statements there does not seem to be any fundamental disagreements on these points.

The usefulness of making the 'Plan' the primary criterion of performance is quite another matter. Any target identified by the Plan would be dependent upon the assumption of certain values for a multitude of independent variables. Many other variables which effect the targets must be omitted from the analysis either because there is little or no data on them or because their independent influence on the target cannot be determined. What if one of these omitted variables should change during the planned period and the OGSM proceeds with the Plan as ordered but fails to attain its target (it doesn't even come close)? Does this mean that the Program was poorly administered?

If the Plan is used as the yardstick of Program performance one of two things will happen. First, the Plan will be pared down to something that has the maximum possible likelihood of success. No risk will be accepted but the plan will be fulfilled. Or second, the target impact indicators chosen will be those that have a high probability of yielding good scores (lots of smoke but little fire). For example, if volume of sales is the target impact indicator chosen, then the OGSM could up its score by simply lowering the interest rate it charges (nearly give the stuff away at zero interest). If net economic returns is the target impact indicator, then the OGSM may tend to underestimate the Program's cost (bury the subsidy in paperwork or subterfuge) and inflate the Program's benefits

(create a very favorable export multiplier for employment and national income effects).

The remaining benefit of mandatory planning is that the Plan can be used to fend off attempts by others to use the Program for other than strictly commercial purposes. Even if it is possible and proper that the Program should serve only very limited commercial objectives, hiding behind a Plan will not prevent it from being subverted for other purposes. Instead of the day-to-day struggle between the CCC-OGSM and other power cliques all their efforts will be concentrated into capturing the Plan.

Interest Rates--To subsidize or not to Subsidize

Effective as of September 19, 1979, the CCC instituted a new policy of tying their rates to the prime lending rate (usually between .5 to 1.5 percentage points higher than the prime). This was a significant departure from the earlier policy of pegging the rate to the mid-point between the prime and the CCC's cost of money.

The new rates undoubtedly reduced if not eliminated the 'grant' component embodied in the loans (although there may still be some element of a subsidy if the rates are lower than alternative commercial rates charged the 'typical' CCC importer). With the diminishing of the implicit subsidy, the Program's ability to influence importer's purchasing patterns likewise diminished. As the Program's rates and terms approached those prevailing in the commercial

market, there was not only less of a distinction between CCC financing and commercial financing but also less of a justification for maintaining a separate government financing program.

One of the strongest arguments used in support of the Eximbank Program has been that it corrected specific imperfections in the long-term financing market for capital goods exports. The reasoning was that most semi-industrialized and Third World countries required fixed-rate, long-term financing before it could afford to import 'big ticket' capital goods. Furthermore, if this type of financing were not forthcoming, many capital goods imports would not be made. They would not be made even at a reduced scale (and probably at higher rates and shorter terms) since the 'big ticket' imports were indivisible and it would be inefficient to shift to a smaller scale of an imported capital good.[36]

I have been unable to find any reference to a similar argument in support of the CCC Program. While it is true that the CCC offers fixed rates for up to 36 months, no one has claimed that this was needed because there were capital market imperfections; that agricultural imports are indivisible; that significant economies of scale exist as to the value (volume) of commodity shipments; or that importers would cease buying if CCC financing were not available. Consequently if none of these conditions exists and if the CCC continued to operate the Program on a strictly

'commercial' basis, then importers would have perceived the Program as just another source of financing and the United States as merely another source of supply. The Program would have served only to marginally increase the total supply of credit available to finance agricultural exports and I doubt whether this will be sufficient justification to maintain the Program (particularly not during the present administration).

An alternative policy with regard to interest rates would be to set lending rates (whether above or below the CCC's cost of money) at that level which would 'maximize' the returns to the Program. What arguments to include in the Program's objective function are another matter which has been addressed elsewhere in this paper. Suffice it to say that there has been considerable support (particularly from exporters) for the idea of operating the Program solely to increase agricultural exports.

CHAPTER VI ENDNOTES

[1]U.S., Department of Agriculture, "A Time to Choose: Summary Report on the Structure of Agriculture" (January 1981), p. 139.

[2]U.S., Department of Agriculture, "Implications of Increased Reliance on International Markets," by Ronald L. Meekhof, ESCS Agriculture Economic Report 438 (November 1979), pp. 261-262.

[3]General Accounting Office, Emphasis on Market Development in Export Credit Program, p. 44.

[4]U.S., Congress, Senate, Committee on Banking, Housing, and Urban Affairs, U.S. Export Policy, A Report submitted by the Subcommittee on International Finance, 96th Cong., 1st sess., p. 14.

[5]Department of Agriculture, "A Time to Choose," p. 139.

[6]Ibid.

[7]Foreign Agricultural Service, "New Orientation to FAS Market Development Activities," p. 14.

[8]Office of the General Sales Manager, "Statement of Action on GAO Report," pp. 3-4.

[9]Congressional Research Service, Use of Food Resources for Diplomatic Purposes. An Examination of the Issues, a committee print prepared for the Committee on International Relations, U.S. House of Representatives (Washington, D.C.: U.S. Government Printing Office, January 1979).

[10]Ibid.

[11]Bob Tamarkin, "Food - Myth and reality," Forbes (February 2, 1981), p. 52.

[12]Congressional Research Service, Use of Food Resources for Diplomatic Purposes, p. 2.

[13]Senate, Committee on Banking, Housing, and Urban Affairs, Part 5, Agricultural Export Policies, pp. 24-25.

[14]Ibid., p. 52.

[15]Senate, U.S. Export Policy, A Report, p. 16.

[16]Department of Agriculture, "CCC Credit and Market Development," p. 8.

[17]Senate, Committee on Agriculture, Nutrition, and Forestry, Hearings on S. 2385, 2405, 2504, 2968, 3011, p. 47.

[18]General Accounting Office, Emphasis on Market Development in Export Credit Program, p. 44.

[19]Senate, Committee on Agriculture, Nutrition, and Forestry, Hearings on S. 2385, 2504, 2968, 3011, pp. 46-47.

[20]Ibid., p. 47.

[21]Senate, U.S. Export Policy, A Report, pp. 15-16.

[22]OGSM personnel reported in a telephone conversation that the OGSM has gone to considerable expense on cables in attempt to collect information on competito rates, total amounts, eligible commodities-countries, etc. Neither they nor the U.S. Agricultural Attaches had much success.

[23]Department of Agriculture, "CCC Credit and Market Development," p. 8.

[24]Senate, Committee on Banking, Housing, and Urban Affairs, Part 4, Export-Import Bank Authorization and Related Issues, p. 84.

[25]Senate, Committee on Banking, Housing, and Urban Affairs, Competitive Export Financing, p. 147.

[26]For a description of a methodology which could be employed in estimating global cost see Axel Wallen, "Arrangement on Guidelines for Officially Supported Export Credits: Implications for the Arrangement of Operational Alternatives to the Present Matrix (Paris: Trade Directorate, OECD, April 24, 1980).

[27]Senate, Committee on Banking, Housing, and Urban Affairs, Export-Import Bank Programs and Budget, p. 85.

[28]Senate, Committee on Banking, Housing, and Urban Affairs, Competitive Export Financing, p. 180.

[29]That is not to say that there are not political reasons to avoid such an approach. Agricultural trade has a tradition of being the most intractable item on the agenda of every multilateral trade negotiation since the so-called Dillon Round was initiated by GATT in 1961.

[30]General Accounting Office, Emphasis on Market Development in Export Credit Program, p. 14, and see Department of Agriculture, "CCC Credit and Market Development."

[31]General Accounting Office, Emphasis on Market Development in Export Credit Program, p. 18.

[32]Ibid., p. 17.

[33]Ibid., p. 18. For a description of one analytical technique for performing a constant-market-share analysis that decomposes a country's change in exports due to (1) a general increase in world trade, (2(commodity composition, (3) market distribution, and (4) a residual competitive effect see C. Michael Aho and Richard D. Carney's paper presented in Senate, Committee on Banking, Housing, and Urban Affairs, Part 2, Trends in Exports and Competitiveness, pp. 138-151.

[34]General Accounting Office, Emphasis on Market Development in Export Credit Program, p. 14.

[35]Office of the General Sales Manager, "Statement of Action on GAO Report," p. 2.

[36]Senate, Committee on Banking, Housing, and Urban Affairs, Part 4, Export-Import Bank Authorization and Related Issues, pp. 444-445.

APPENDIX

APPENDIX A

NECON Model Description

The National Economy Model is a recursive input-output model of the Korean economy. The model has 16 sectors which are an aggregation of a 52 sector input-output model estimated by the Bank of Korea in 1970. The recursion takes place via the linkages with the demand and production models. These interactions and the model's inputs and outputs are shown in Figure 18.

NECON is an unconstrained production model that is essentially demand driven. For this reason we will describe the derivation of demand in some detail.

Consumption Functions

Both food and nonfood consumption functions were estimated using a Cobb-Douglas equation of the form:

$$(1)\quad PCDM_i(t) = \alpha_i \left[\left(\frac{APCD(t)}{MPC_1(t)}\right)^{EX_i} \left(\frac{GDPP(t)}{MPC_1(t)}\right)^{EG_i} \prod_j \left(\frac{MPC_j(t)}{MPC_1(t)}\right)^{EP_{ij}}\right]^{SN(t)}$$

where:

PCDM = per capita consumption at constant relative consumer prices (won/person-year)

MPC = consumer price index (1970 = 1.00)

APCD = total nonfood consumption expenditures at constant relative consumer prices (won/person-year)

GDPP = per capita gross domestic product (won/person-year)

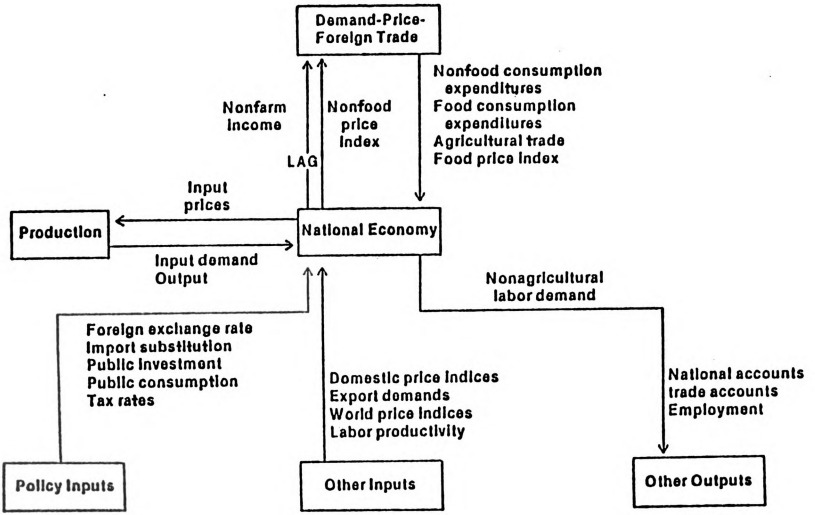


Figure 18

Major linkages between the National Economy Model and selected other models of the Korean Agricultural Sector System of models

SN = elasticity expansion parameter

i, j = index commodities, k, j = 1, 2,..., NNC

NNC = number of commodities

Food consumption is calculated in the demand model while nonfood consumption is generated within NECON. Separate estimates of consumption functions were obtained for farm and nonfarm populations. Total consumption for each commodity group is then the sum of consumption by these two groups

$$(2)\quad CDM_i(t) = MPC_i(t)\ [CDPM_i(t) + \sum_{k=1}^{2} PCDM_{ik}(t)POP_k(t)]$$

where:

CDM = consumption demand at current relative consumer prices (won/year)

MPC = consumer price index

CDPM = public consumption demand at constant relative consumer prices (won/year)

POP = farm and nonfarm population (persons)

i = indexes all sectors, i = 1, 2,..., NS

NS = number of sectors (currently 16)

Consumer goods imports are computed by first deflating CDM to constant relative prices (CDM_i/MPC_i), then determining imports at constant relative prices ($CMC_i CDM_i/MPC_i$), and finally adjusting to current relative world prices with $PWLD_i$.

$$(3)\quad CM_i(t) = PWLD_i(t)CMC_i(t)CDM_i(t)/MPC_i(t)$$

where:

CM = consumer goods imports at current relative world prices (won/year)

PWLD = world price index

CMC = consumer goods import coefficient (proportion)

Domestic consumption demand at current relative producer prices is used in the production component of NECON as part of final domestic demand. It is a function of domestic consumption at current relative consumer prices (CDM_i-CM_i) and trade and transportation margins.

$$(4)\quad DCD_i(t) = \frac{CDM_i(t) - CM_i(t)}{1 + TDMGC_i \frac{P_{12}(t)}{P_i(t)} + TPMGC_i \frac{P_{13}(t)}{P_i(t)}}$$

for $i \neq 12$ or 13, where:

DCD = domestic consumption demand at current relative producer prices (won/year)

TDMGC, TPMCG = consumer goods, trade and transportation margins, respectively, at constant relative producer prices (constant won of margin/constant won of consumption)

P = producer price index (see price component discussion)

The remaining two elements of final demand are government consumption and export demand. Both of these would be set to their historical levels. The latter, export demand, would be subject to adjustment to reflect the effect of changes in CCC credit.

Investment

NECON also computes net and gross investment, demands for investment goods and investment goods imports as required by the production component and for national accounting. The proportional rate of change of private net investment is a function of the proportional rates of change of profits per unit output and capacity utilization.

$$(5)\quad IVPR_i(t) = IVPR_i(t-DT)\left[1 + PEI_i \frac{PPUL_i(t) - PPUL_i(t-DT)}{PPUL_i(t-DT)} + CEI_i \frac{CUL_i(t) - CUL_i(t-DT)}{CUL_i(t-DT)}\right]$$

where:

IVPR = private net investment at constant relative investor prices (won/year)

PPUL = exponential average of recent past profits per unit output (proportion--won of profits/won of output)

PEI = profitability elasticity of investment

CUL = exponential average of recent past capacity utilization rates (proportion/year--won per year of output/won of capital stock)

i = indexes nonagricultural sectors, 1 = 2, 3,...,NS

A matrix BN is used to convert from investment in a sector to demands for investment goods, where BN_{ij} is demand for investment good i per unit investment in sector j. BN is computed in nominal terms based on 1970 incremental

capital-output ratios and current relative producer price indices.

$$(6)\quad BN_{ij}(t) = \frac{ICOR_{ij}P_i(t)}{\sum_{k=1}^{NS} ICOR_{kj}P_k(t)} \qquad \text{for } i, j=1, 2, \ldots, NS$$

where $ICOR_{ij}$ is the incremental capital-output ratio, i.e., demand for investment good i per unit change in output of sector j.

Investment goods demands at current relative investor prices are:

$$(7)\quad ID_i(t) = BN_{i16}(t)\left[GIV_{16}(t) - PIG_{16}(t)RESCON(t)\right] + \sum_{\substack{j=1 \\ j\neq 16}}^{NS} BN_{ij}(t)GIV_j(t)$$

Imports of investment goods at current relative world prices and demand for domestically produced investment goods are computed in a similar fashion as are consumer goods demands.

$$(8)\quad IM_i(t) = IMC_i(t)ID_i(t)PWLD_i(t)/MPI_i(t)$$

$$(9)\quad DID_i(t) = \frac{ID_i(t) - IM_i(t)}{1 + TDMGI_i\frac{p_{12}(t)}{p_i(t)} + TPMGI_i\frac{p_{13}(t)}{p_i(t)}}$$

for $i \neq 12, 13$ and

$$(10)\quad DID_{12}(t) = \sum_{\substack{j=1 \\ j\neq 12}}^{NS} DID_j(t)TDMGI_j\frac{p_{12}(t)}{p_j(t)}$$

$$(11)\quad DID_{13}(t) = \sum_{\substack{j=1 \\ j\neq 13}}^{NS} DID_j(t)TPMGI_j\frac{p_{13}(t)}{p_j(t)}$$

where:

ID = demand for investment goods at current relative investor prices (won/year)

IM = investment goods imports at current relative world prices (won/year)

MPI = market price index for investment goods

IMP = investment goods import coefficients

PWLD = world price index

DID = domestic investment goods demand at current relative producer prices (won/year)

TDMGI, TPMGI = trade and transportation margins, respectively, for investment goods (constant won of margin/constant won of investment goods)

P = producer price index (see price component discussion)

Production

Based on final domestic demand, the production component computes output at current relative producer prices and unit value added for each sector. In matrix notation, out put is

$$(12) \quad OUT(t) = [I - AD(t)]^{-1} FDD(t)$$

where:

OUT = vector of sector outputs at current relative producer of prices (won/year)

FDD = Vector of final domestic demand at current relative producer prices (won/year)

AD = matrix of domestic intermediate input requirements at current relative producer prices (won of input/won of output)

I = identity matrix

Final domestic demand for each sector's output is the sum of domestic consumption, investment goods demand and exogenous projections of export demand. Equation (12) is an unconstrainted production model. Constraints on production--particularly capacity constraints and skilled labor constraints--are not directly considered in the model. However, NECON does address the capacity problem by making private net investment a function of capacity utilization.

NECON assumes the input-output coefficients for the 15 nonagricultural sectors (at constant relative prices) will not change over the time horizon of the model. The high degree of aggregation tends to reduce the errors introduced by this assumption. In addition, NECON does consider the effects in relative prices.

When used in conjunction with the demand and production components this set of models will generate the value of a large category of food imports and the value of consumer and investment goods imports for the 15 nonagricultural sectors. Any change made to either the structure or the inputs of any

sector can be traced to changes in these import levels in the current and future time periods.

This description of NECON is a greatly condensed version of the one which appears in, Michael H. Abkin, National Economy Model of KASM3: Technical Documentation, (East Lansing: Department of Agricultural Economics, Michigan State University, 1977).