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THE POLITICAL ECONOMY OF
SOVIET AID TO THE THIRD WORLD

BY

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THESIS

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CHAPTER 1

INTRODUCTION

The last two decades have witnessed a dramatic change, from almost total isolation to rapidly expanding involvement, in the Soviet Union's policy toward the newly independent nations of the third world. Soviet economic aid extensions to the third world, over these two decades, reached an estimated sum of \$8.7 billion. Less than half of this sum (\$4.3 billion) has to-date, however, actually been delivered to the lesser developed countries. With estimated repayments running close to \$1.7 billion, the net flow of Soviet aid and grants to the lesser developed countries have thus far not exceeded the modest sum of \$2.5 billion.¹

Over the same period, in spite of the parsimony of the Soviet aid program, the annual trade with the lesser developed countries has more than dectupled.² The increased economic activity is indicative of major changes in the Soviet policy toward the developing nations, and of the desire to project the Soviet Union as a major aid and trade partner of the lesser developed countries. The promises of economic assistance have been used, on the other hand, as a major tool to penetrate foreign

¹U.S. Department of State, Bureau of Intelligence and Research, Communist States and Developing Countries: Aid and Trade in 1973, Research Study RS20 (Washington D.C.: Government Printing Office, October 10, 1972), Table 5.

²Roger E. Kanet, Soviet Union and the Developing Nations (Baltimore: Johns Hopkins University Press, 1974), p. 1.

markets and to gain a political foothold in the third world.³ Through these programs the Soviets have succeeded in reducing the Western influence and in augmenting their own.

Much has been written about Soviet economic aid by both the Soviet and the Western experts. Most of the published literature is devoted to qualitative evaluation of various aid forms (e.g., loans, grants, technical assistance, and project aid), and of economic advantages and disadvantages to both the donor and the recipient countries. However, only a few studies have attempted a quantitative analysis. Most of the quantitative studies⁴ carry out a cross-sectional data analysis which is based on three basic assumptions. First, the analysis assumes that the countries are homogeneous. The pursuance of heterogeneous political, social, and economic philosophies by the recipient countries strongly questions the homogeneity assumption. Second, the analysis assumes that the relationship identified in the past will persist in the future.⁵ By assuming that the present policy resembles the past one and the future policy will resemble the present one, the analysis fails to account for changes in the Soviet aid policy. Third, the cross-sectional analysis assumes that a large sample size is available. The paucity of data makes it enormously difficult to meet this assumption.

³Robert S. Walters, American and Soviet Aid: A Comparative Analysis (Pittsburgh: University of Pittsburgh Press, 1970), pp. 26-28.

⁴Satish K. Raichur, "Determinants of United States and Soviet Economic Aid to the Third World" (Ph.D. dissertation, University of Pittsburgh, 1972); W. J. Klages and F. A. Raffa, "A Note On the Soviet Economic Aid to the Lesser Developed Countries," Rivista Internazionale (November 1974): 1065-1070.

⁵Samuel B. Richmond, Statistical Analysis (New York: Ronald Press Company, 1964), p. 339.

The time-series analysis, on the other hand, does not require the countries to be homogeneous, does not assume that the past relationships will necessarily persist in the future, and overcomes the requirement of a large sample size. It should be emphasized that the time-series analysis, in contrast to cross-sectional analysis, assumes the invariance of patterns of change rather than of relationships. It is, therefore, well suited to explain time-varying relationships. On the basis of these considerations a time-series analysis was deemed to be more appropriate for a statistical forecasting of Soviet aid patterns.

In this study, an attempt is made to determine the political rationale of the Soviet economic aid to the lesser developed countries. The motivations, nature, and terms of the Soviet economic aid are analysed. This analysis will be confined, primarily due to computational difficulties associated with non-linear models, to the development of a linear model. The dependent variable, "Soviet economic aid" is regressed against five independent variables which are: Soviet exports to an LDC, Soviet imports from the LDC, repayments by the LDC, foreign reserve position of the LDC, and per capita GNP of the LDC. The countries included in the study are chosen on the basis of data availability. Conscious efforts were made to include major recipients of the Soviet aid. The term 'aid' is defined as the world market value, less repayments, of Soviet aid deliveries consisting of equipments, materials and technical services that are financed through long term credits or grants. It excludes the aid commitments on the ground that they are mere promises.

Most of the data is obtained from the Monthly Bulletin of Statistics, The U.N. Statistical Year Book, and The International Financial Statistics. The aid delivery data are obtained from the Category 16 of official Soviet trade statistics. This category consists of equipments and materials for complete plants, and represents the value of technical services as well as material goods supplied by the USSR to aid receiving countries.⁶ It is assumed that the exports of Category 16 goods to lesser developed countries flow under Soviet credits. A ratio of \$1.05=1 Ruble was used to get the approximate aid figures.

The commonly perceived meanings of aid in general and of the Soviet aid in particular are given in Chapter II. This exposition is followed by a detail discussion of nature, terms, and motivations of the Soviet aid. The development of the mathematical model, and the regression analysis technique used to derive the model are presented in Chapter III. To account for the influence of qualitative variables such as political philosophy, geographical location, and social conditions, dummy variables, also known as binary variables, are employed. The results of the study are summarized in Chapter IV.

⁶Marshall I. Goldman, Soviet Foreign Aid (New York: Praeger, 1967), p. 27.

CHAPTER II

NATURE, TERMS, AND MOTIVATIONS OF THE SOVIET AID

Foreign aid is an ambiguous concept that covers a variety of transactions between the developed and the developing countries. The ambiguity arises from the plurality and complexity of the donor's motivations and the recipient's economic constraints.¹ Often the motivations underlying the aid are implicit and disguised. Apart from the political advantages that may be extracted, the donor derives economic benefits which partially or fully compensate for the cost of the aid. The benefits are derived through the economic strings attached to the aid. Though the strings may not be favorable to the recipient country, domestic economic constraints frequently force the recipient to accept the terms of aid agreement.²

In spite of the ambiguity, an attempt is made to examine the commonly perceived meaning of aid in general and of the Soviet aid in particular. This examination is followed by a discussion of the growth of the Soviet aid program. Since its inception, two decades ago, Soviet aid has assumed many forms. The variety of the forms of aid and the underlying motivations constitute the subject matter of this chapter.

¹James R. Carter, The Net Cost of Soviet Foreign Aid (New York: Praeger, 1971), p. 5.

²Ibid.

As mentioned before, the term 'aid' does not have a precise definition. Generically, "it refers to government sponsored flows of resources, made available on concessional terms to foreign governments either directly (on a bilateral basis) or indirectly (via multilateral organizations)."³ John Pincus, however, has attempted to measure and quantify aid in terms of the cost to the donor country.⁴ Though I.M.D. Little, and J.M. Clifford consider 'aid' to be an ambiguous concept, they define it as the value of subsidy (grant element) implicit in the flow of resources.⁵ Thus, grants of convertible currency are certainly aid to their full face value. Loans on the other hand contain only an insignificant element of aid. Several other scholars viewed aid to the third world nations in a different way. According to them, aid conjures up an ambivalent vision of extended colonialism, patronization, consciously cultered dependence on the donor, humanitarianism, and faint stirrings of internationalism.⁶ It is also viewed as an effort on the part of the donor to nurture, preserve and spread the values and rules which have evolved within their own national and cultural boundaries.⁷

³David Walls, The Charity of the Nations (New York: Basic Books, Inc., 1973), p. 3.

⁴John A. Pincus, "The Cost of Foreign Aid," Review of Economics and Statistics, 14 (November 1963): pp. 360-367.

⁵James R. Carter, The Net Cost of Soviet Foreign Aid (New York: Praeger, 1971), p. 22.

⁶Satish K. Raichur, "Determinants of United States and Soviet Economic Aid to the Third World" (Ph.D. dissertation, University of Pittsburgh, 1972), p. 1.

⁷Ibid.

This study will restrict itself to an analysis of Soviet aid flows to eleven lesser developed countries.⁸ Here, Soviet economic aid will be defined as the world market value, less repayments, of Soviet aid deliveries consisting of the equipments, materials and technical services that are financed through long term credits or grants. The term repayment will be understood as the world market value of goods and services returned to the USSR.

Inception of the Soviet Aid Program

Until Stalin's death in 1953, the Soviet Union had isolated itself from the rest of the world both physically and ideologically. Her foreign policy was primarily a means of obtaining the capital goods which the Soviet economy could not produce.⁹ After Stalin's death, there was a dramatic change in the Soviet's foreign policy toward the lesser developed countries. The policy was fashioned to appeal to the three major aspirations of the lesser developed countries: economic development, national independence and a peaceful world in which these new nations can grow and prosper. The policy took the concrete shape in the form of trade and economic aid agreements.

Prior to 1955, economic assistance programs were a monopoly of the Western powers in general and of the U.S. in particular.¹⁰ In 1955, the communist block countries began a conscious effort to break the

⁸ Eleven LDCs included in this study are: Afghanistan, Ceylon, Egypt, India, Iran, Iraq, Mali, Pakistan, Syria, Tunisia, and Turkey. The period covered is 1963 to 1972.

⁹ James R. Carter, The Net Cost of Soviet Foreign Aid (New York: Praeger, 1971), p. 4.

¹⁰ Ibid., p. 9.

Western monopoly on economic assistance to the lesser developed countries. Among the communist countries the USSR became by far the foremost supplier of aid.¹¹ Over the years, the Soviets have expanded both the size and geographic scope of their foreign aid program. For the period 1955 to 1973, Soviet aid extensions to the lesser developed countries amounted to be \$8.7 billion. This sum includes aid deliveries of \$4.2 billion and estimated repayments of \$1.7 billion. The net flow of aid and grants was, however, only \$2.5 billion (29%).¹² The Soviet aid deliveries to the eleven lesser developed countries, as mentioned previously, are presented in Table 1. The total aid to these countries was worth a meager \$61.65 million in 1960, whereas it increased to a sizable sum of \$606.62 million in 1973, see Table 1.

Nature and Terms of the Soviet Aid

The Soviet aid program is essentially an extension of normal commercial activity. Its main objectives are: the trading of surplus goods and services for much needed raw materials, and the creation of new markets for future trade extensions.¹³ The Soviet Union has thus shown a special interest in medium and long term credits for projects such as heavy industries and power plants. The loans granted for these

¹¹James R. Carter, The Net Cost of Soviet Foreign Aid (New York: Praeger, 1971), p. 9.

¹²U.S. Department of State, Bureau of Intelligence and Research, Communist States and Developing Countries: Aid and Trade in 1973, Research Study RS20 (Washington D.C.: Government Printing Office, Oct 10, 1972), p. 5.

¹³James R. Carter, The Net Cost of Soviet Foreign Aid (New York: Praeger, 1971), p. 15.

TABLE 1
SOVIET AID DELIVERIES IN U.S. MILLION DOLLARS

Countries	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
AFGA	17.3	18.4	19.1	23.7	27.6	29.7	44.6	28.3	23.86	19.35	12.30	25.71	25.0	21.7
CEYLON	0.1	0.15	0.9	2.9	7.0	4.2	0.9	1.1	0.44	0.88	0.4	0.7	0.76	2.6
EGYPT	15.7	34.9	41.9	47.9	61.3	83.3	84.6	79.9	63.2	50.3	70.8	161.7	136.0	162.0
INDIA	17.9	39.2	64.1	80.5	128.4	99.9	63.7	89.7	106.9	93.8	65.3	63.95	82.7	80.0
IRAN	0.1	0.1	0.53	0.68	0.75	0.96	4.7	22.7	34.64	98.3	114.8	113.26	78.1	115.1
IRAQ	4.2	15.7	29.5	25.6	18.2	5.3	4.3	4.5	4.5	21.38	35.4	60.59	62.9	74.8
MALI	0.2	0.1	2.6	3.3	4.1	2.5	3.7	5.2	3.6	2.0	0.8	0.91	0.94	1.96
PAK	0.55	0.2	3.5	4.3	3.0	3.3	3.2	4.2	5.3	7.2	10.0	18.27	17.3	8.5
SYRIA	2.0	8.5	2.2	1.7	1.0	4.3	5.8	20.8	22.5	21.4	19.9	43.3	49.7	58.33
TNSY	0.0	0.0	0.1	2.5	3.7	1.0	0.4	0.4	0.6	0.2	3.0	0.63	0.42	0.55
TRKY	3.6	1.4	0.2	0.1	0.1	0.1	0.1	3.3	23.1	22.1	33.4	60.7	101.7	81.05

Source Ministerstvo Vneshnei Torgovli, Vneshnyaya Turgovlya V 1956-67 godakh (Moscow: Vneshtorgizdat, 1957-1968).

thoroughly examine the feasibility of proposed projects and usually explore the local availability of the human and natural resources that are required for a particular project. It must be noted that these projects pertain to such goods and services that are not locally available, and are financed through Soviet surplus resources. Such a pecuniary scheme is, in effect, equivalent to an exchange of machinery, equipments and technical skill for raw materials and other products which the Soviet economy badly needs. Though the surplus equipments and technical skills could be employed to further their own economic development, the Soviets find the utilization of the surplus capacity for the foreign aid more profitable than the retooling of resources for the domestic needs. Clearly, the role of aid is to create, through trade, new demand for the surplus resources which would have remained otherwise unused in absence of the trade.¹⁴

The Soviet aid program is characterized by the aid commitments predominantly on the credit basis, by the bilateral agreements and by the hard terms of trade. Most of the aid is in forms of 12-year loans at 2.5 percent rate of interest, and is repayable either in local currencies or in specified commodities at fixed prices.¹⁵ The repayments start one year after the completion of the project for which the money was loaned. Eschewing the multilaterization and grant element of the Western aid, the Soviets committed virtually all aid bilaterally. Only 4 percent of the aid commitments, during the period 1955 to 1968, were

¹⁴James R. Carter, The Net Cost of Soviet Foreign Aid (New York: Praeger, 1971), p. 15.

¹⁵Ibid., p. 27.

in the form of grants.¹⁶ Almost all of the grant aid has been used to finance gifts such as a radio station in Conakry, hospitals in Cambodia, Nepal and Lebanon, equipments for a technical institute in India, and for a technical school in Ethiopia.¹⁷ These gift agreements, mostly small and often reciprocal, are more like interest free loans or alternatively like bilateral trade. The reasons for the small ratio of grant to the total aid are not very well known. However, it is speculated that the objective of the Soviet aid is to maintain permanent relations with the recipient country.¹⁸ If the aid were to be advanced in the forms of grant this objective would not be accomplished. The contacts generated through the grant aid, in contrast to credit aid, would last only the period of the implementation of that particular project. Moreover, the credit aid is less expensive than the grant aid.

Financial terms of the Soviet aid program to the third world countries are quite uniform. The program continues to carry relatively hard terms of aid. Most credits are concentrated on supplying capital equipments for relatively large projects in a selected few countries, are tied to the purchase of Soviet goods, and are attached with comparatively stringent conditions to their credit agreements. We shall describe some of these conditions briefly. The prices of the Soviet exports are not fixed in general agreements but are negotiated in

¹⁶James R. Carter, The Net Cost of Soviet Foreign Aid (New York: Praeger, 1971), p. 25.

¹⁷E. Glovinsky, "Soviet Economic Expensions in Developing Countries," Studies on the Soviet Union 1 (November 1961): 189.

¹⁸Robert L. Allen, Middle Eastern Economic Relations with the Soviet Union, Eastern Europe, and Main-Land China (Charlottesville: University of Virginia Press, 1958), p. 10.

subsequent codicils. The prices are determined according to prevalent "world prices", in spite of the fact that Soviet goods are qualitatively inferior, and are negotiated separately for each and every project and aid category.¹⁹ The credits are completely tied to Soviet exports, the recipient is forced to buy equipments in future from the USSR. The Soviet supplied equipments cannot be replaced by the equipments manufactured elsewhere. The Soviet credit covers only the foreign exchange cost of the project financed by the Soviet aid program. The recipient must meet all accompanying domestic costs. However, on several occasions Soviets helped Afghanistan to defray local cost of the aid projects. The Soviet aid is provided in the form of rubles, which, not being a convertible currency, are good only for the purchase in the USSR. As a normal practice, the purchases of the recipient country from the USSR are handled by the monopolistic Soviet "trade corporations" which act as intermediary between Soviet enterprises and the Soviet aid recipients. Consequently, the recipient has a little choice in his selection of suppliers for the desired products.²⁰

The Soviet aid program, in many respects, resembles trade. If Myint's²¹ argument for "Vent for Surplus" is applicable to the Soviet foreign aid program, it follows that aid is not provided for the

¹⁹ Kurt Muller, The Foreign Aid Programs of the Soviet Block and Communist China: An Analysis (New York: Walker, 1967), p. 230.

²⁰ Robert S. Walters, American and Soviet Aid: A Comparative Analysis (Pittsburgh: University of Pittsburgh Press, 1970), p. 166.

²¹ R. E. Caves, "Vent for Surplus: Models of Trade and Growth," in Economics of Trade and Development, ed. James D. Theberge (New York: Wiley, 1968), pp. 211-229.

humanitarian reasons. The aid is then a means of trading surplus goods for much needed imports, e.g., raw materials at advantageous terms. Although the USSR has attached some stringent financial strings to her aid program, on the whole, they are fewer than that of the Western economic aid program. The strings seem to be designed primarily to minimize the burden of aid giving and to continue contacts with the countries of the third world.

Motivations of the Soviet Aid Program

Since financial assistance is a complex phenomenon, the motivations of aid are numerous. Aid may be provided for political, economic, or humanitarian reasons, neither two of which are mutually exclusive. A donor country may seek political and economic advantages from the recipient country. Some specific examples of economic advantages derived by the donor are: dumping the surplus manufactured goods, selling the obsolete technology, purchasing raw materials at a price lower than the prevailing world market price.

Historically, different aid motivations have been predominant at different times. During the seventeenth and eighteenth centuries, subsidies were used to manipulate the balance of power.²² Colonization saw the use of aid as a prop to support the power positions both politically and militarily. The development of the recipient country was considered to be neither a necessary nor a sufficient criterion for aid. In the post-colonization period, most of the emerging countries

²²I.M.D. Little and J.M. Clifford, International Aid (Chicago: Aldine, 1965), p. 22.

of the third world had an intolerable level of economic development. The emergence of these countries emphasized the disparities in the distribution of wealth between the Western and the Afro-Asian countries. The striking economic disparities provided the foundation for the political demand to extract economic aid from the U.S.A., USSR, and the other advanced countries. During the late 1950's, the political demand lead to the acceptance of economic development as a paramount motivation for aid. Within a decade, the aid program helped to evolve the concepts of international community and of welfare beyond the borders of the nation state.²³

The political and military climate which prevailed in the international arena since the World War II, made economic aid attractive to both the donor and to the recipient as an instrument of furthering their national interests. The two prominent donors, the U.S.A. and the USSR, recognized that the dollar and the ruble and not the display of military prowess would enhance their influence in the lesser developed countries.²⁴ Soon the aid programs grew visibly like mushrooms without definite directions.

We shall analyze the motivations of the Soviet aid from the standpoint of these views. It has been felt that the motivations, both economic and non-economic, of the Soviet aid are far more complex and numerous than that of the Western aid. In addition, the paucity of the

²³Satish K. Raichur, "Determinants of United States and Soviet Economic Aid to the Third World" (Ph.D dissertation, University of Pittsburgh, 1972), p. 3.

²⁴Robert S. Walters, American and Soviet Aid: A Comparative Analysis (Pittsburgh: University of Pittsburgh Press, 1970), p. 5.

reliable information severely hampers a thorough analysis of the motivations. Nevertheless, the principle traits such as expansion of the commercial trade, conquest of the foreign markets, and moulding of the third world economies can be deduced from the manner in which the Soviet aid is implemented.

Political Motivations

The combination of aid and trade is employed to gain political influence in and over the lesser developed countries with whom the USSR had no relations previously. Prior to 1955, the diplomatic relations between the Soviet Union and the lesser developed countries were virtually non-existent, and the Soviet political influence was almost absent.²⁵ The combination of aid and trade had proved itself to be quite powerful for establishing her political influence in these countries. Once the influence is gained, the Russians try to create goodwill through their aid extensions. To enhance their political influence through the aid programs, the Soviets create a feeling in the recipient country that the aid agreements are advantageous to both the recipient and the USSR. They demonstrate that the Soviet intentions are honorable, the equipments are sophisticated, and the technology is most advanced. The USSR convinces through these agreements that the recipient country can enter into the regularized relations without the fear of compromising her newly gained independence in the process. The ultimate motive is to present herself as a first rate power rivaling the U.S. economically,

²⁵Ibid., p. 31

technically and militarily. Like the U.S., the Soviet Union hoped to be perceived by the lesser developed countries as a champion of their aspirations for economic development and independence.²⁶

The second visible political motivation is to exert short-term political influence on the domestic policies of the lesser developed countries. To accomplish this goal, aid is provided in a form which moulds the public opinion in favor of communism. A specific example is the concentration of the aid in the state sector to strengthen the role of government in national economic and political development.²⁷

The desire to see these lesser developed countries adopting a neutralist foreign policy constitutes third political motivation. The USSR unreservedly supports the espousals of neutralism, anti-colonialism, and anti-Westernism. An overwhelming proportion of the total Soviet assistance flows to the neutralist states. This fact is convincing evidence of the Soviet desire to encourage them in their adherence to neutralist foreign policy. The unreserved political support and the overwhelming aid strengthen the bargaining power of the neutralist states and enables them to exercise their newly gained independence. These nations view the Soviet Union as an emancipator who gave them long cherished national prestige. Such an obligatory feeling generates tremendous goodwill, in the masses, for the Soviet Union.²⁸

²⁶Ibid., p. 32

²⁷Ibid., p. 33

²⁸Ibid.

Anti-Westernism and Soviet Security

In the Soviet assistance programs, anti-Westernism plays a role very similar to the one played by anti-communism in the American aid programs. The aid and trade have always been regarded as effective weapons to impair the influence of the West and to enhance her own influence. Every Soviet aid agreement is a deliberate attempt to brand U.S. aid programs as exploitative and anti-developmental in nature, and dangerous to the recipient country. Since projects financed through the American aid programs are small in scale, non-industrial in nature, and carry a higher rate of interest, they are portrayed as exploitative and non-developmental.²⁹ The portrayal is sharpened by providing the aid at a comparatively lower rate of interest and for the large scale manufacturing industries. On several occasions, when the Western powers refused to provide capital for agricultural or heavy industrial projects, the Russians quickly and eagerly agreed to finance these projects.³⁰ The Bokaro Steel Mill in India and the Aswan dam in Egypt are two of many such instances.

To establish her own influence and to lessen the Western influence, the USSR has stepped in to relieve serious problems faced by the certain lesser developed countries. When the products manufactured by these countries remained unsold either because of boycott by the major buyers or because of excessiveness in the world market, Soviets were quick to rescue them by buying their products and in return won their goodwill.

²⁹ Ibid., p. 34

³⁰ Marshall I. Goldman, Soviet Foreign Aid (New York: Praeger, 1967), pp. 78-79.

Soviets' purchase of Iceland's fish boycotted by Britain, and of Cuban sugar boycotted by the U.S. are two specific examples. These favors enhanced the Soviet influence and reduced the Western influence. The quest for the world influence continues to spur economic relations with the lesser developed countries. This is best illustrated by President Anwar Sadat's charge that "The USSR has used the supply of weapons and ammunitions to his country as an instrument of policy leverage".³¹

The concern for the military security translates into encouragement of neutralism in the third world and into extension of aid to the U.S. allies bordering the Eastern European countries. The encouragement of neutralism tends to preclude effectively the formation of an alliance between a lesser developed country and the West. The policy is designed to convince Western oriented countries that the USSR does not constitute a threat to their independence and projects herself as non-interventionist.³²

Humanitarian Motive

Though humanitarian considerations may play a part in the determination of aid allocations, their importance relative to economic or security considerations is unclear. The Soviets manifest that it is the duty of a socialist country to help a lesser developed country who has suffered at the hands of colonialism. The aid program is primarily based on the principals of anti-Westernism, and anti-colonialism. The USSR advances aid on comparatively lower rates of interest and in the

³¹The New York Times, 22 June 1974.

³²Robert S. Walters, American and Soviet Aid: A Comparative Analysis (Pittsburgh: University of Pittsburgh Press, 1970), p. 36.

industrial sectors of the recipient country.³³ However, it is aimed to serve her political interests. The humanitarian considerations are of secondary importance.

Economic Benefits

The economic benefits derived from the aid provide a lucrative motivation for aid and trade with the lesser developed countries. The aid extensions caused tremendous increase in the volume of trade with the lesser developed countries. The Soviet trade with these countries grew on an annual average of 9 percent during 1967 to 1971, 41 percent in 1972, and 54 percent in 1973, see Table 8 and 9 of Appendix. This growth reflects the rising aid deliveries to the lesser developed countries and growing repayments to the USSR by these countries.

The primary economic motivation behind trade through aid programs is to import raw materials and agricultural goods, and to export industrial and capital goods. In conjunction with the cost phenomenon, discussed later on, this type of trade heavily favors the USSR. Due to the structure of Soviet economic investment and development, the relative cost of production in the USSR is higher in the non-industrial sector than it is in the industrial sector, particularly in heavy industry.³⁴ This factor suggests that the Soviet Union can enlarge her total product by exporting increased quantities of manufactured goods

³³V. Rimalov, "Soviet Assistance to Underdeveloped Countries," International Affairs 9 (1959): 24.

³⁴Robert L. Allen, "Economic Motives in Soviet Foreign Trade Policy," Southern Economic Journal 25 (October 1958): 193-196.

and by importing greater quantities of raw materials and agricultural products. In addition, the USSR is able to sell her manufactured goods which are markedly inferior to comparable Western goods, available in the world market.³⁵ This apparent falacy is explained by the incapacity of the lesser developed countries to pay for the superior goods manufactured by the Western powers. This state of helplessness is decisively exploited by the USSR to create markets for her products. The aid extensions on easy terms serve as inducement to switch to inferior Soviet products.

In summary, the nature and motivations are far more complex and numerous than they are believed to be. However, there are certain definite traits which can be immediately discerned. The aid program is eclectic and pragmatic in nature and is essentially a political tool. The USSR may simply be attempting to establish a foothold in the third world through the association with development aspirations of lesser developed countries.

³⁵Carole A. Sawyer, Communist Trade With Developing Countries 1955-65 (New York: Praeger, 1966), p. 42.

CHAPTER III

AN ANALYSIS OF THE POLITICAL ECONOMY OF THE USER

The Soviet Union has proffered aid to a large number of countries. Geographically, these aid-receiving countries are located in every region of the third world - Africa, Asia, Latin America, and the Mediterranean. But the economic, humanitarian, the political factors on which the aid is based are not self-evident. The contention is that the Soviet aid is an extension of normal commercial trade. This contention is supported by the fact that only 4% of the total aid is in the form of grants.¹ It is further contended that only a negligible fraction of aid is provided on humanitarian grounds, and that low per capita income is not a criterion for the allocation of aid, and that non-economic factors, e.g. political, social, and geographical, heavily influence aid-giving.

To support these contentions the Soviet aid shall be analyzed first on the premise that the aid is essentially a function of economic and humanitarian considerations. Second, an analysis will be presented based on the hypothesis that non-economic factors, in addition to economic and humanitarian, exert substantial influence on aid-giving. If the first part of the analysis fails to reveal the existence of a uniform Soviet political economy toward the lesser developed countries,

¹James R. Carter, The Net Cost of Soviet Foreign Aid (New York: Praeger, 1971), p. 25.

we shall attempt to group the various aid-receiving countries. Each of the groups will be uniquely identifiable by a common Soviet economic and/or humanitarian policy adopted toward them. The second part of the analysis will then be used to discern, by regrouping the countries and by comparing the regrouping with previous grouping, the extent of the influence of the non-economic factors on aid giving.

The first part of the analysis concerns the construction of a linear model which will explain the dependence of aid, the dependent variable in our model, on exports, imports and repayments, the economic variables, and on foreign reserve position and per capita GNP, the humanitarian variables. Since stepwise regression analysis permits us to construct the model recursively, and to include independent variables, in the model, in order of their importance, this regression procedure was used to develop the first model. To determine the dependence of aid on non-economic factors, a second model is developed. Since "non-economic factors" is a qualitative variable, it is introduced in Model 2 through dummy variables, also called binary variables because each of these variables is either unity or zero. The use of dummy variables to measure the effect of these factors, and the actual procedure for inclusion are explained later in this Chapter. Once the model is formulated, stepwise regression analysis is used to retain only those variables, in the model, which are statistically significant.

Formulation of Model 1

Mathematically, the linear relationship of Soviet aid with economic and humanitarian variables is characterized by the model:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + U, \quad (1)$$

where

Y denotes the Soviet aid deliveries in millions of U.S. dollars,

X_1 denotes Soviet net exports to an LDC,

X_2 denotes Soviet net imports from the LDC,

X_3 denotes repayments to the USSR from the LDC,

X_4 denotes foreign reserve position of the LDC,

X_5 denotes per capita GNP of the LDC, and

U denotes the error term.

Explanation of the Variables

We have included three economic variables in Model 1. These variables are recognized indicators of a country's economic development and progress. The best estimate of Soviet aid deliveries to the lesser developed countries is found in the category 16 of the official trade statistics.² This category consists of equipment and material for complete plants, and represents the value of technical services as well as material goods supplied by the USSR to aid-receiving countries.³ This type of export is a unique indicator of the Soviet aid deliveries to the lesser developed countries, because unlike exports of machinery and food stuffs these deliveries are financed through Soviet credit. This category does not include the equipment and material supplied under aid agreements. Consequently, category 16 does not represent the

²Marshall I. Goldman, Soviet Foreign Aid (New York: Frederick A. Praeger, 1967), p. 27.

³Ibid.

total aid deliveries. However, these data give us the most reliable estimate of the Soviet aid deliveries to the lesser developed countries.⁴

Soviet net exports to the lesser developed countries are computed by subtracting the commercial exports of the USSR from the aid delivery data of category 16. The commercial exports data were obtained from two sources.⁵ Most of the Soviet exports to the lesser developed countries are of the capital equipments for the construction of new buildings. Since the USSR is a heavily industrialized country, it appears that these exports constitute the means of dumping their surplus industrial capacity, and of obtaining much needed raw materials. We, therefore, expect a positive relationship between Soviet aid deliveries and Soviet net exports. Soviet net imports to the lesser developed countries are computed by subtracting repayments from the flow of imports. Imports data were obtained from the same two sources which were used for export data. Soviet imports from the lesser developed countries are mainly in the form of raw materials consisting of natural rubber, wool, spun cotton, citrus fruit, coca, hides and skins, and iron and other ores.⁶ We, therefore, expect a positive relationship between aid and Soviet net imports. The USSR prefers to receive raw

⁴Robert S. Walters, American and Soviet Aid: A Comparative Analysis (Pittsburgh: University of Pittsburgh Press, 1970), p. 257.

⁵U.S. Department of State. Bureau of Intelligence and Research, Communist States and Developing Countries: Aid and Trade in 1968-1972, Research Study (Washington D.C.: Government Printing Office); Vassil Vassilev, Policy in the Soviet Block on Aid to Developing Countries (Paris: OECD, 1969), pp. 96-99.

⁶Ibid., pp. 48-49.

materials rather than repayments in convertible currencies. The repayments usually start one year after the completion of the project for which aid drawings were made, and are spread over a period of 12 years. The repayments are calculated on the basis of an annual interest rate of 2.5% and of 12 equal installments.

The foreign reserve position of the lesser developed countries and the per capita GNP are included as the two humanitarian variables. The inclusion of foreign reserve position can be justified on the grounds that the more backward a country is the poorer is its foreign reserve position. If the USSR is providing aid on humanitarian grounds, the poorer the foreign reserve position of a country is, the higher should be deliveries of aid. Therefore, an inverse relationship between these two variables is expected. The foreign reserve position will be measured as the dollar value of gold holdings, foreign exchange, special drawing rights (SDR), and reserve position in International Monetary Fund (IMF). The data were gathered from U.N. Monthly Bulletin of Statistics. The per capita gross national product (GNP) is used as a measure of poverty. Humanitarian consideration, therefore, dictates that aid should be based on per capita GNP and need. Explicitly, the lower the per capita GNP of a country, the higher the aid deliveries should be. Per capita GNP data were obtained from the World Trade Expenditures and Arms Trade.⁷

⁷U.S. Department of State, U.S. Arms Control and Disarmament Agency, World Military Expenditures and Arms Trade 1963-73 (Washington D.C.: Government Printing Office, 1974), pp. 20-60.

The summary of the expected relationships between the criterion and each of the five explanatory variables is given in Table 2.

TABLE 2
EXPECTED RELATIONSHIPS

Dependent Variable	Independent Variables	Sign for Expected Relationships
Soviet Aid Deliveries to the LDC's Y	Soviet Net Exports X_1	+
Soviet Aid Deliveries to the LDC's Y	Soviet Net Imports X_2	+
Soviet Aid Deliveries to the LDC's Y	Repayments to the USSR X_3	+
Soviet Aid Deliveries to the LDC's Y	Foreign Reserve Position X_4	+
Soviet Aid Deliveries to the LDC's Y	Per capita GNP X_5	+

Methodology

The theory of quantitative prediction of economic relationships and of statistical analysis and inference is based on the development of a dynamic model under uncertainty. The parameters of the model are estimated from the empirical observations of the values of economic variables in the model. The dynamic nature of the Model 1 and the prediction of Soviet aid policy toward the lesser developed countries makes it imperative that the economic variables are observed over some time interval. In other words, a time-series analysis is a must for the development of a dynamic model. In addition, the time-series

analysis involves the study of one or at the best only a few countries.⁸ Since we also are interested in analyzing Soviet political economy for only a few lesser developed countries, time-series analysis is deemed to be appropriate. The reasons for the rejection of cross-sectional analysis were stated previously in Chapter 1.

The first step in model development is the selection of a procedure which would permit the inclusion of only statistically significant variables. Combined with the lack of a clear a priori model of Soviet aid behavior, the above consideration suggests the use of stepwise regression analysis method. This method allows the ranking of explanatory variables according to their relative contributions to the regression sum-of-squares. Essentially, this method computes a sequence of regression equations, at each step adding or deleting an independent variable. The criterion for adding or deleting an independent variable can be stated eventually in terms of error sum-of-squares, coefficients of partial correlations, or 'F' statistics. Given a set of independent variables X_1, X_2, \dots, X_n , the stepwise algorithm includes in the model first that independent variable, X_i , which is most correlated with the dependent variable Y . This variable X_i accounts for the largest proportion in the variation of Y . The regression sum-of-squares (SSR) is, of course, independent of the order in which the dependent variables are introduced.

⁸Satish K. Raichur, "Determinants of United States and Soviet Economic Aid to the Third World" (Ph.D. dissertation, University of Pittsburgh, 1972), p. 79.

Estimates of Model 1 Parameters

For each of the eleven countries the parameters of the Model 1 were computed by implementing the multiple regression program on IBM 360/65 computer. The parameter values, taken from the computer output, are given in Table 3. The tabular form was preferred to avoid cluttering up our discussion with eleven regression equations, and to facilitate comparison of various parameters. Table 3 also contains values of 'F' statistics, the standard error of each estimate (STE), and coefficient of determination R^2 . The rankings of the independent variables are shown in Table 4.

On the basis of the tabulated values of parameter estimates and the 'F' statistics, we can make several important observations. Some of these observations are conclusive while others need further corroboration. Except for India and Mali, the rest of the nine models are statistically significant. However, the number of significant explanatory variables varies from one for U.A.R. to three for Iran and Pakistan. The order in which these variables appear in different models is not the same for all models (refer to Table 4). The lack of a consistent ranking suggests that there is no single factor which can be considered as the criterion for Soviet aid-giving. It then appears that the Soviet Union does not have a uniform and consistent policy for aid-giving.

The dependence of Soviet aid on Soviet net exports is insignificant in cases of Afghanistan, Ceylon, Egypt, and Mali. By looking at the 'F' ratios, we can see that this variable is the most significant in Iraq's model and the least significant in the equation of Syria.

TABLE 3

REGRESSION RESULTS

Soviet Aid Deliveries To: Y	Intercept b_0	Soviet Net Exports To:		STE		F		Soviet Net Imports From:		STE		F	
		b_1		b_1		b_1		b_2		b_2		b_2	
Afghanistan	926.31002	--	--	--	--	--	--	-0.94618		.38538		6.028	
Ceylon	0.01238	--	--	--	--	--	--	0.23826		.20847		1.306*	
Egypt	-788.75046	--	--	--	--	--	--	--		--		--	
India	-149.70342	-0.34161		.48293		.500*		0.33734		.25664		1.728*	
Iran	88.90370	2.02201		.78856		6.575		-2.57163		1.04707		6.032	
Iraq	-90.09919	-2.00298		.60103		11.106		-0.56692		.28831		3.867*	
Mali	9.07127	--		--		--		-1.03961		.93513		1.236*	
Pakistan	31.77612	-0.12800		.04509		8.059		0.11705		.07089		2.727*	
Syria	-3.84851	0.16732		.32050		.273*		-0.47200		.22456		4.383*	
Tunisia	2.98367	-0.30895		.09560		10.443		-0.38347		.19107		4.028*	
Turkey	-59.10035	-0.40339		.17846		5.110*		0.35275		.51943		.461*	

*The traditionally accepted 5% level of significance was used to determine the statistically significant coefficients. The * denotes the coefficients which are not significant at this level.

TABLE 3 (CONTINUED)

Soviet Aid Deliveries To: Y	Repayments From: b ₃	STE b ₃	F b ₃	Foreign Reserve Position of: b ₄	STE b ₄	F b ₄
Afghanistan	--	--	--	1.09490	.34897	9.844
Ceylon	-1.29615	1.44541	.804*	--	--	--
Egypt	--	--	--	-0.88042	1.36742	.415*
India	--	--	--	-0.15511	.06675	5.399
Iran	4.75677	1.07979	19.406	0.15757	.12464	1.598*
Iraq	--	--	--	0.24484	.05100	23.051
Mali	-2.65144	1.49436	3.148*	-0.37880	.36669	1.067*
Pakistan	4.35271	.66058	43.418	0.00144	.00794	.033*
Syria	1.79788	.76487	5.525	0.38225	.10800	12.528
Tunisia	0.69132	1.25519	.303*	--	--	--
Turkey	4.07890	3.19118	1.634*	0.01914	.02603	.541*

TABLE 3 (CONTINUED)

Soviet Aid Deliveries To: Y	Percapita GNP Of: b ₅	STE b ₅	F b ₅	F Entire Equation	R ² Entire Equation
Afghanistan	-16684764.64361	4170945.57180	16.002	5.96808	.74900
Ceylon	--	--	--	8.02155	.69622
Egypt	4392519.89579	1884955.51343	5.430	5.14357	.59507
India	3477216.18106	3012289.65277	1.333*	1.90967*	.60439
Iran	-394074.60270	343622.11901	1.315*	37.45945	.97909
Iraq	227190.64075	246334.42515	.851*	11.64596	.90307
Mali	--	--	--	3.04233*	.60336
Pakistan	-435394.64704	92848.86608	21.989	35.59671	.97802
Syria	-10808.20154	24581.53260	.193*	27.27997	.97151
Tunisia	--	--	--	7.12306	.78073
Turkey	177937.40913	203777.40779	.762*	102.51715	.99226

Soviet aid has a negative relationship with net exports for India, Iraq, Pakistan, Tunisia, and Turkey. The negative relationship predicts that Soviet exports are not increasing as the aid deliveries are increasing. If the 'Vent for Surplus' hypothesis were true, the relationship would have been positive. It then appears that the Soviets are not advancing aid to dump their surplus capacity. Only for Iran and Syria this relationship is positive. Moreover, the contribution of this variable is very small in the case of Syria.

Soviet net imports from the lesser developed countries have been deleted from the model of Egypt. There is a negative relationship between Soviet aid deliveries and Soviet net imports for Afghanistan, Iran, Iraq, Mali, Syria, and Tunisia. The negative relationship indicates that Soviet net imports are not increasing as Soviet aid deliveries are increasing, and that Soviet aid deliveries are not aimed to obtain raw materials. Though this relationship is positive for Ceylon, India, Pakistan, and Turkey, the contribution of net imports in explaining the aid dependence is insignificant. Consequently, it can not be concluded that the Soviets are delivering aid to obtain raw materials.

One possible explanation of our failure to arrive at a conclusion lies in the fact that the Soviets prefer repayments in the form of raw materials rather than in hard currencies. Since repayment are a definite form of imports, it would be revealing to consider the relationship between aid and repayments. It follows from Table 3 that there is a significant positive relationship between Soviet aid deliveries and repayments for Iran, Pakistan, Syria, Tunisia, and Turkey.

TABLE 4
RANKING OF EXPLANATORY VARIABLES

Countries	First	Second	Third
Afghanistan	b ₅	b ₄	b ₂
Ceylon	b ₂	b ₃	
Egypt	b ₅	b ₄	
India	b ₄	b ₂	b ₅
Iran	b ₃	b ₁	b ₂
Iraq	b ₄	b ₁	b ₂
Mali	b ₃	b ₂	b ₄
Pakistan	b ₃	b ₅	b ₁
Syria	b ₄	b ₃	b ₂
Tunisia	b ₁	b ₂	b ₃
Turkey	b ₁	b ₃	b ₅

The positive relationship implies that as aid deliveries are increasing, repayments are also increasing. Though a negative relationship does exist between aid and repayments for Mali and Ceylon, it is statistically insignificant. The predominance of the positive relationships points out that Soviets are importing raw materials in the disguised form of repayments, and that these imports increase in direct proportion to an increase in aid deliveries.

The relationship between the foreign reserve position and the aid is positive for Afghanistan, Iran, Iraq, Syria, and Turkey. The positive relationship implies that the better the foreign reserve position of a country is, the higher is the aid inflow; and that, the aid is advanced neither on the humanitarian ground nor on a "sincere desire" to assist the poverty ridden lesser developed countries. However, this contention is not confirmed by the evenly distributed relationship between per capita GNP, a humanitarian variable, and the Soviet aid deliveries. If aid were committed on humanitarian considerations, the relationship between Soviet aid, and the humanitarian variable, per capita GNP, would have been negative.⁹

Estimates of Model 2 Parameters

The derivation of Model 1 was based on the assumption that the variables included in the model are real, continuous and quantitative. Qualitative variables such as political influence and regional proximity were excluded on the assumption that these variables do not

⁹It should be noted that the value of the coefficient b_5 is large because a small valued variable, per capita GNP, is regressed on a large valued dependent variable - aid, and that this large value should not be misinterpreted to mean that aid is based on humanitarian considerations.

influence Soviet aid. To test the validity of the latter assumption, aid will be modeled as a function of economic, humanitarian and non-economic variables. Being qualitative in nature, the last variables' influence cannot be measured in numbers. In absence of measurement the best one can do is to include a qualitative variable as a classifactory, and therefore discrete, variable. A classifactory variable is also called an indicator, or a dummy variable. Usually, a qualitative variable takes only two values - zero and one. For this reason, it is also known as binary variable.

If the ensuing analysis reveals that the countries can be divided into groups, i.e., the differential coefficients are statistically significant, we shall conclude that non-economic considerations do influence aid-giving and that a uniform policy does not exist. On the other hand, if the differential coefficients are statistically insignificant, we shall infer that Soviet Union does have a uniform policy for all countries.

To facilitate the mathematical formulation of the model each country, with the sole exception of Egypt, which is numbered zero, is assigned an index number alphabetically. Explicitly, Afghanistan is country number one and Turkey is number ten. Using the above indexing scheme Model 2 can be stated as:

$$\begin{aligned}
Y = & b_{0,0} + b_{0,1} + b_{0,2} + b_{0,3} + b_{0,4} \\
& + b_{0,5} + b_{0,6} + b_{0,7} + b_{0,8} + b_{0,9} + b_{0,10} \\
& + \{ b_{1,0} + b_{1,1}^D D_1 + b_{1,2}^D D_2 + b_{1,3}^D D_3 + b_{1,4}^D D_4 + \\
& \quad b_{1,5}^D D_5 + b_{1,6}^D D_6 + b_{1,7}^D D_7 + b_{1,8}^D D_8 + \\
& \quad b_{1,9}^D D_9 + b_{1,10}^D D_{10} \} X_1 \\
& + \{ b_{2,0} + b_{2,1}^D D_1 + b_{2,2}^D D_2 + b_{2,3}^D D_3 + \\
& \quad b_{2,4}^D D_4 + b_{2,5}^D D_5 + b_{2,6}^D D_6 + b_{2,7}^D D_7 + \\
& \quad b_{2,8}^D D_8 + b_{2,9}^D D_9 + b_{2,10}^D D_{10} \} X_2 \\
& + \{ b_{3,0} + b_{3,1}^D D_1 + b_{3,2}^D D_2 + b_{3,3}^D D_3 + \\
& \quad b_{3,4}^D D_4 + b_{3,5}^D D_5 + b_{3,6}^D D_6 + b_{3,7}^D D_7 + \\
& \quad b_{3,8}^D D_8 + b_{3,9}^D D_9 + b_{3,10}^D D_{10} \} X_3 \\
& + \{ b_{4,0} + b_{4,1}^D D_1 + b_{4,2}^D D_2 + b_{4,3}^D D_3 + \\
& \quad b_{4,4}^D D_4 + b_{4,5}^D D_5 + b_{4,6}^D D_6 + b_{4,7}^D D_7 + \\
& \quad b_{4,8}^D D_8 + b_{4,9}^D D_9 + b_{4,10}^D D_{10} \} X_4 + U
\end{aligned} \tag{2}$$

In the above equation, the first subscript refers to an independent variable and the second refers to the number assigned to a country. Accordingly, $b_{0,0}$, $b_{1,0}$, $b_{2,0}$, $b_{3,0}$, $b_{4,0}$ are the intercept and slope coefficients of respective X_i 's for Egypt; $b_{0,1}$, $b_{0,2}$, ..., $b_{0,10}$ are the differential intercepts for various countries; $b_{1,1}$, $b_{1,2}$, ..., $b_{1,10}$ are the slope coefficients of X_1 ; $b_{2,1}$, $b_{2,2}$, ..., $b_{2,10}$ are the slope coefficients of X_2 ; $b_{3,1}$, $b_{3,2}$, ..., $b_{3,10}$ are the

differential slope coefficients of X_3 ; and $b_{4,1}, b_{4,2}, \dots, b_{4,10}$ are the differential slope coefficients of X_4 .

The various D 's are defined as:

$$D_1 = \begin{cases} 1, & \text{if the observation belongs to Afghanistan} \\ 0, & \text{otherwise.} \end{cases}$$

$$D_2 = \begin{cases} 1, & \text{if the observation belongs to Ceylon,} \\ 0, & \text{otherwise.} \end{cases}$$

$$D_3 = \begin{cases} 1, & \text{if the observation belongs to India,} \\ 0, & \text{otherwise.} \end{cases}$$

$$D_4 = \begin{cases} 1, & \text{if the observation belongs to Iran,} \\ 0, & \text{otherwise.} \end{cases}$$

$$D_5 = \begin{cases} 1, & \text{if the observation belongs to Iraq,} \\ 0, & \text{otherwise.} \end{cases}$$

$$D_6 = \begin{cases} 1, & \text{if the observation belongs to Mali,} \\ 0, & \text{otherwise.} \end{cases}$$

$$D_7 = \begin{cases} 1, & \text{if the observation belongs to Pakistan,} \\ 0, & \text{otherwise.} \end{cases}$$

$$D_8 = \begin{cases} 1, & \text{if the observation belongs to Syria,} \\ 0, & \text{otherwise.} \end{cases}$$

$$D_9 = \begin{cases} 1, & \text{if the observation belongs to Tunisia,} \\ 0, & \text{otherwise.} \end{cases}$$

$$D_{10} = \begin{cases} 1, & \text{if the observation belongs to Turkey,} \\ 0, & \text{otherwise.} \end{cases}$$

Equation (2) can be written compactly as:

$$Y = \sum_{i=0}^4 \sum_{j=0}^{10} b_{i,j} D_j X_i + U \quad (3)$$

where $D_0=1$ and $X_0=1$. The index i denotes the number of independent variable whereas j refers to the number by which a country is identified. The independent variables X_i 's were defined earlier on page 23. The coefficients $b_{0,0}, b_{1,0}, \dots, b_{4,0}$ denote the intercept and the slope coefficients of X_i 's for Egypt, respectively. The coefficients $b_{i,j}$'s, $j \neq 0$, denote the differential intercepts and differential slope coefficients¹⁰ ($i \neq 0$) of X_i 's for the rest of the ten countries. The binary-valued variables D_j , $j=1,2,3, \dots, 10$ are defined as follows:

$$D_j = \begin{cases} 1, & \text{if observation belongs to country } j, \\ 0, & \text{otherwise.} \end{cases} \quad (4)$$

To compute the estimates of $b_{i,j}$, the aid data given in Table 7 of Appendix were used. The Soviet aid deliveries were regressed on net exports, net imports, repayments, and foreign reserve position. Following Gujarati's¹¹ approach a regression program was implemented

¹⁰Damodar, Gujarati, "Use of Dummy Variables in Testing for Equality Between Sets of Coefficients in Linear Regressions: A Generalization," The American Statistician (December 1970): 18-22.

¹¹Ibid.

on the computer. The computer output consisting of all intercepts and slope coefficients is reproduced below:

$$\begin{aligned}
 Y = & 44.25423 - .25X_1 + .40X_2 + .49X_3 \\
 & + [-9.46D_1^* -49.5D_2 + 168.92D_3 +41.9D_4 \\
 & -73.74D_5 -41.27D_6 -38.81D_7 -51.91D_8 \\
 & -41.62D_9 -50.34D_{10}] \\
 & + \{ .3D_2 - .54D_3 + 1.34D_4 -1.42D_5 \\
 & -.03D_7^* + .38D_8 - .17D_{10} \} X_1 \\
 & + \{ -2.17D_1 - .09D_3 -1.68D_4 \\
 & -1.02D_5 - .69D_8^* - .66D_9 + .31D_{10} \} X_2 \\
 & + \{ -0.76D_1 - .88D_3 + 3.09D_4 \\
 & + .7D_8 + 6.41D_{10} \} X_3 \\
 & + \{ .81D_1 - .12D_3 + .24D_5 + .4D_8 \} X_4
 \end{aligned} \tag{5}$$

The first four coefficients on the right hand side of (5) are the intercept and the three slope coefficients of the Model. The differential intercepts are enclosed in square brackets whereas the differential slope coefficients for X_i 's are enclosed in curly brackets. The asterisk* identifies the differential coefficients which are not statistically significant at 5% level of significance.

Since statistically significant differential intercepts and slope coefficients are present in (5), the individual regression equations differ from country to country. The absence of a common regression equation for all eleven countries points out that non-economic

motivations exercise substantial influence on the relationship of aid with economic and humanitarian motives. This evidence confirms our earlier contention that non-economic factors such as political considerations, regional proximity, and social conditions are important determinants of Soviet aid.

The order in which the X_i 's enter an individual regression equation is shown in Table 5. It emerges from this table that X_3 , repayments, is the second most important explanatory variable for all countries. To aid our interpretation, we have tabulated the individual regression equations for all countries. These equations are given in Table 6. The tabulated coefficient values, for each country, were obtained by adding the appropriate differential intercept and slope coefficients to intercept and slope coefficients, respectively. For example, the intercept $b_{0,1}=34.78956$ for Afghanistan is calculated by adding the differential intercept value -9.46464 to the common intercept $b_{0,0}=44.25423$.

The results obtained from the regression analysis show that most of the countries display negative relationship between aid and net exports, and that Soviet exports are decreasing as aid deliveries are increasing. The negative relationship also indicates that Soviet aid is not primarily used as a means of venting surplus industrial capacity. Soviet aid and net imports exhibit both positive and negative relationships. Since the relationships are about evenly divided between the countries, it is not possible to make guaranteed statements about the dependence of aid on imports.

TABLE 5
RANKING OF THE EXPLANATORY VARIABLES

Countries	First	Second	Third
0 Egypt	X_2	X_1	X_3
1 Afghanistan	X_1	X_2, X_3	X_4
2 Ceylon	X_2	X_3	-
3 India	X_4	X_3	X_1
4 Iran	X_1	X_3	X_2
5 Iraq	X_4	X_2	X_1
6 Mali	X_2	X_1	X_3
7 Pakistan	X_2	X_3	-
8 Syria	X_4	X_2	
9 Tunisia	X_1	X_3	
10 Turkey	X_3		

TABLE 6

REGRESSION RESULTS

Soviet Aid Deliveries To:	Intercept b_0	Soviet Net Exports To: b_1	STE of b_1	'F' of b_1	Soviet Net Imports From: b_2	STE of b_2	'F' of b_2
0 Egypt	44.25423	-.25934	.07999	10.513	.40010	.10322	15.025
1 Afghanistan	34.78959	-.25934	.07999	10.513	-1.77646	.69911	6.344
2 Ceylon	5.25244	.04246	.55606	0.295*	.40010	.10322	15.025
3 India	213.1765	-.80394	.33260	2.681	.30847	.19920	.212*
4 Iran	2.34593	1.06899	.25629	26.866	-1.28658	.48074	12.309
5 Iraq	-29.48619	-1.68558	.57619	6.127	-.62135	.35698	8.187
6 Mali	2.98399	-.25934	.07999	10.513	.40010	.10322	15.025
7 Pakistan	5.44235	-.29925	.29558	0.018*	.40010	.10322	15.025
8 Syria	-7.66533	.12773	.72385	0.286*	-.29849	.50307	1.928*
9 Tunisia	2.63012	-.25934	.07999	10.513	-.26935	1.75325	.196*
10 Turkey	-6.09121	-.43252	.43342	.160*	.71472	.56193	.313*

*Denotes the coefficients which are not significant of 5% level of significance.

TABLE 6 (CONTINUED)

Soviet Aid Deliveries To:	Repayment From LDCs	STE of		'F' of		Foreign Reserve Position of LDCs		STE of		'F' of	
		b ₃	b ₃	b ₃	b ₃	b ₄	b ₄	b ₄	b ₄	b ₄	b ₄
0 Egypt	.49976	.27276	3.357	---	---	---	---	---	---	---	---
1 Afghanistan	-1.26112	.69911	6.344	.81966	.63251	1.679 *					
2 Ceylon	.49976	.27276	3.357	---	---	---	---	---	---	---	---
3 India	-.38341	.53226	2.753	-.10627	.04287	6.145					
4 Iran	3.5913	.81908	14.246	---	---	---	---	---	---	---	---
5 Iraq	.49976	.27276	3.357	.24627	.06001	16.843					
6 Mali	.49976	.27276	3.357	---	---	---	---	---	---	---	---
7 Pakistan	.49976	.27276	3.357	---	---	---	---	---	---	---	---
8 Syria	1.20773	1.19470	.175	.40271	.23901	2.839					
9 Tunisia	.49976	.27276	3.357	---	---	---	---	---	---	---	---
10 Turkey	6.91067	.97822	42.950	---	---	---	---	---	---	---	---

Soviet aid shows positive dependence on repayments for all countries except Afghanistan and India. This positive dependence can be interpreted to mean that the Soviet Union is advancing aid to obtain raw materials. The foreign reserve position is statistically significant only for a small minority of the countries. For these countries, foreign reserve position is positively related to aid, supporting the contention that aid is not committed on humanitarian grounds.

In summary, two linear models were developed to explain the extent to which Soviet aid is dependent on economic rather than on humanitarian and other non-economic factors. Specifically, Model 1 establishes a relationship between exports, imports, repayments, foreign reserve position, per capita GNP and aid. The model asserts that Soviet aid is being advanced mainly to obtain raw materials in the disguised form of repayments. The hypothesis that Soviet aid is a means of dumping surplus manufacturing capacity in the third world finds little or no support while the premise that aid is not governed by humanitarian considerations is strongly confirmed. It should be emphasized that this model ignores the dependence of Soviet aid on non-economic factors. To overcome this inadequacy non-economic factors such as political motivations, regional proximity and social conditions were introduced as a qualitative variable in Model 2. The presence of a large number of statistically significant differential coefficients proves that aid is definitely a function of non-economic factors.

CHAPTER IV

CONCLUSIONS

Two linear dynamic econometric models were constructed to predict the functional dependence of Soviet aid on economic, humanitarian, and non-economic, such as political, geographical and social, variables. The first model assumes with complete certainty that there is no relationship between aid and non-economic variables. Though this assumption of perfect knowledge leads to a simple model, in reality this relationship is not known with complete certainty, beforehand. The uncertainty is accounted for in the second model wherein we enter the non-economic considerations as an additional predicant. The qualitative nature of the predicant forced us to include it as a dummy variable rather than as a regular (continuous) variable.

These two models together provide adequate evidence for either acceptance or rejection of most of our hypotheses, stated earlier. One of our hypotheses was that the Soviet aid is not advanced on humanitarian grounds to assist the poor countries of the third world. Model 1 predicts that the relationships between aid and the humanitarian variable, the foreign reserve position (FRP) of a lesser developed country, is positive. The positive direction implies that the poorer a country is, the lesser is the aid given to it. This evidence strongly suggests that aid is, indeed, not extended on humanitarian basis. It was, also, hypothesized that the Soviets are using aid as a vehicle to dump their surplus industrial capacity in the third world markets. The existence

of the statistically significant negative relationship between aid and net exports for a number of countries tends to counter our hypothesis. In fact, the negativity of the relationship suggests that an increase in aid is accompanied by a relative decrease in exports of manufactured goods and equipments. Similarly, the models do not uphold our premise that Soviet aid is designed to obtain much needed raw materials from the lesser developed countries.

Based on Model 1 several other important observations can be made. The absence of a common regression equation points out that the Soviet Union does not have a uniform aid policy for all or any sub-group of countries. The random ranking of explanatory variables (refer to Table 4 page 33) emphasizes that no single factor plays a dominant role in aid-giving. The number of statistically significant variables entering an equation differs from country to country. This fact further underscores the lack of uniform policy. Overall, the model is very effective in explaining the variations in aid.

Finally, we contended that the aid is heavily influenced by non-economic motivations. This contention is strongly supported by Model 2. The presence of a large number of statistically significant differential intercepts and slopes demonstrates unequivocally that aid is governed by non-economic considerations. The non-existence of a common regression equation indicates that the effect of non-economic factors on aid varies from one country to another, and that the Soviet Union does not adhere to a common political economy.

A comparison of the two models reveals that they are identical in their acceptance or rejection of our contentions. Together they

underscore the non-uniform dependence of Soviet aid behavior on non-economic and economic factors. The two models differ in the rankings of explanatory variables (see Tables 4 and 5). Model 1 is noted for the lack of any consistent ranking of predicants. In contrast, 're-payments' appears as the second most important variable in Model 2. However, we cannot explain its significance. It should also be noted that Model 2 has, as expected, a higher 'F' statistics than Model 1. The improvement in 'F' ratio is, of course, attributed to the inclusion of the qualitative variable in Model 2.

Though the linear models were quite adequate for our analysis, it is felt that a more realistic model can be constructed by first eliminating the trend, equivalently, removing the autocorrelation, from the original data and working with the deviations from the trend. Since project aid at any given time is often functionally related to previous project commitments, an autoregressive model will be more suitable for the characterization of Soviet aid. Yet another important modification would be to formulate a nonlinear model - nonlinear in parameters as distinguished from polynomial type models. Some initial efforts were expanded in the development of a nonlinear model. These efforts were later abandoned for some computational difficulties. However, a devoted researcher, given sufficient time, should be able to overcome these difficulties.

APPENDIX

TABLE 7

SOVIET AID DELIVERIES TO LDCs, 1963-72

(Millions of U.S. \$)

Countries	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Afghanistan	23.7	27.6	29.7	44.6	28.3	23.86	19.35	12.3	25.71	25.0
Ceylon	2.9	7.0	4.2	0.9	1.1	0.44	0.88	0.4	0.7	0.76
Egypt	47.9	61.3	83.3	84.6	79.9	63.2	50.3	70.8	161.71	136.0
India	80.5	128.4	99.9	63.7	89.7	106.9	93.8	65.3	63.95	82.7
Iran	0.68	0.75	0.96	4.7	22.7	34.64	98.3	114.8	113.26	78.1
Iraq	25.6	18.2	5.3	4.3	4.5	4.5	21.38	35.4	60.59	62.9
Mali	3.3	4.1	2.5	3.7	5.2	3.6	2.0	0.8	0.91	0.94
Pakistan	4.3	3.0	3.3	3.2	4.2	5.3	7.2	10.0	18.27	17.3
Syria	1.7	1.0	4.3	5.8	20.8	22.5	21.4	19.9	43.3	49.7
Tunisia	2.5	3.7	1.0	0.4	0.4	0.6	0.2	3.0	0.63	0.42
Turkey	0.1	0.1	0.1	0.1	3.3	23.1	22.1	33.4	60.66	101.7

SOURCE: Ministerstvo Vneshnei Torgovli, Vneshnyaya Turgovlva v 1956-67 godakh (Moscow: Vneshtorgizdat, 1957-1968).

TABLE 8

SOVIET EXPORTS TO LDC's, 1963-72
(Millions of U.S. \$)

Countries	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Afghanistan	72.5	47.4	51.6	73.3	56.7	39.7	44.8	40.0	50.3	46.1
Ceylon	22.5	24.4	21.3	21.3	20.2	11.8	8.3	3.6	9.4	3.8
Egypt	250.5	154.8	208.7	198.7	281.3	198.0	238.2	363.2	381.3	322.0
India	199.7	234.8	215.0	193.3	162.3	183.3	171.3	135.9	129.2	167.6
Iran	14.5	21.8	15.3	31.0	63.0	88.1	161.6	187.8	152.8	115.6
Iraq	39.1	31.0	29.6	35.9	36.7	50.8	67.7	66.0	110.1	109.0
Mali	11.0	13.2	9.8	8.6	9.6	9.4	5.1	5.2	2.6	1.3
Pakistan	5.6	11.0	13.2	39.0	39.4	36.8	39.4	35.7	28.7	21.2
Syria	11.8	12.2	12.7	22.7	34.2	42.1	47.8	46.4	57.7	70.9
Tunisia	2.1	3.1	6.6	8.7	6.1	3.3	4.2	3.4	4.0	3.3
Turkey	8.9	9.9	16.7	27.4	28.1	30.8	57.9	62.4	76.0	134.1

SOURCE: Two sources were used to compile Soviet exports data: U.S. Department of State, Bureau of Intelligence and Research, Communist States and Developing Countries: Aid and Trade in 1968, (Same: 1969, 1970, 1971, 1972) Research Study (Washington D.C.: Government Printing Office); Vassil Vassilev, Policy in the Soviet Block on Aid to Developing Countries (Paris: OECD, 1969).

TABLE 9

SOVIET IMPORTS FROM LDCs, 1963-1972

(Millions of U.S. \$)

Countries	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Afghanistan	23.0	22.7	20.2	18.8	21.3	31.0	30.6	34.3	38.3	37.3
Ceylon	20.6	22.9	19.1	17.3	10.7	16.2	14.4	13.3	16.1	12.0
Egypt	111.2	123.6	163.4	150.0	145.1	170.7	228.1	310.6	334.1	299.6
India	140.3	155.9	188.2	199.1	180.8	183.0	221.4	269.6	284.2	378.1
Iran	18.9	21.0	18.1	19.4	30.6	40.1	56.4	69.1	111.2	162.1
Iraq	2.2	2.4	3.7	3.2	5.1	4.1	4.7	4.6	6.1	74.5
Mali	3.3	3.7	2.6	1.6	1.7	1.8	2.0	1.9	2.0	1.4
Pakistan	2.4	2.7	3.9	29.3	27.0	11.1	23.7	31.4	38.9	22.6
Syria	16.0	17.8	18.6	20.3	18.2	20.9	37.3	19.2	29.3	65.0
Tunisia	0.1	2.2	3.6	3.8	4.3	5.4	3.4	2.9	7.0	8.3
Turkey	8.3	9.2	18.9	18.8	27.9	30.0	29.9	30.1	37.3	41.0

SOURCE: Ibid.

TABLE 10

REPAYMENTS TO THE USSR 1963-1972

(Millions of U.S. \$)

Countries	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Afghanistan	5.34	7.65	10.34	13.20	17.55	20.31	22.63	24.52	25.72	28.23
Ceylon	0.03	0.31	0.99	1.40	1.49	1.60	1.64	1.72	1.76	1.83
Egypt	8.98	13.62	19.60	27.92	36.17	43.96	50.12	53.77	60.77	76.44
India	11.82	19.67	32.19	39.43	45.65	54.37	64.79	73.93	89.30	86.53
Iran	0.05	0.12	0.21	0.67	2.83	6.21	15.8	27.0	40.36	51.40
Iraq	4.82	7.32	9.09	9.61	9.51	9.95	10.39	12.47	15.04	20.94
Mali	0.22	0.54	1.18	1.54	2.05	2.40	2.60	2.68	3.19	3.28
Pakistan	0.37	0.79	1.08	1.40	1.91	2.32	2.84	3.54	4.51	6.29
Syria	1.18	1.35	1.45	1.87	2.44	4.47	6.69	8.78	10.68	14.90
Tunisia	0.24	0.60	0.70	0.74	0.78	0.84	0.86	1.15	1.25	1.30
Turkey	0.51	0.52	0.53	0.54	0.55	0.87	3.12	5.27	8.53	14.48

Note: Repayments were computed from aid deliveries.

TABLE 11

FOREIGN RESERVE POSITION OF LDCs 1963-1972

(Millions of U.S. \$)

Countries	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Afghanistan	46.4	44.5	45.3	46.9	38.3	39.1	41.2	47.2	62.9	56.7
Ceylon	75.0	51.0	73.0	43.0	55.0	52.0	40.0	43.0	50.0	58.0
Egypt	216.0	223.0	193.0	156.0	195.0	168.0	145.0	167.0	167.0	153.0
India	607.0	498.0	599.0	608.0	662.0	682.0	926.0	1006.0	1206.0	1180.0
Iran	246.0	199.0	236.0	268.0	324.0	291.0	310.0	208.0	621.0	960.0
Iraq	295.0	251.0	234.0	324.0	368.0	453.0	476.0	462.0	606.0	782.0
Mali	4.0	3.0	3.0	2.0	1.0	2.0	1.0	1.0	3.0	4.0
Pakistan	308.0	244.0	221.0	200.0	164.0	247.0	332.0	190.0	189.0	281.0
Syria	23.0	33.0	45.0	30.0	74.0	67.0	59.0	55.0	88.0	135.0
Tunisia	63.0	32.0	36.0	28.0	40.0	35.0	39.0	60.0	123.0	223.0
Turkey	178.0	141.0	141.0	131.0	119.0	123.0	245.0	431.0	761.0	1401.0

SOURCE: U.N. Monthly Bulletin of Statistics, 24-26 (1970 - 1972).

PER CAPITA GNP OF LDCs 1963-1972

(Millions of U.S. \$)

Countries	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Afghanistan	56.0	56.0	56.0	56.0	56.0	56.0	57.0	57.0	57.0	57.0
Ceylon	88.0	91.0	94.0	94.0	98.0	101.0	105.0	108.0	106.0	106.0
Egypt	201.0	208.0	217.0	113.0	206.0	204.0	212.0	219.0	221.0	227.0
India	93.0	97.0	92.0	90.0	96.0	96.0	100.0	102.0	101.0	97.0
Iran	262.0	279.0	300.0	323.0	349.0	375.0	395.0	425.0	459.0	497.0
Iraq	285.0	306.0	336.0	342.0	320.0	353.0	356.0	355.0	376.0	371.0
Mali	56.0	57.0	62.0	63.0	63.0	64.0	61.0	65.0	65.0	64.0
Pakistan	68.0	72.0	75.0	76.0	76.0	80.0	81.0	86.0	81.0	109.0
Syria	233.0	247.0	245.0	232.0	236.0	240.0	269.0	265.0	291.0	304.0
Tunisia	283.0	287.0	286.0	289.0	279.0	292.0	301.0	315.0	346.0	390.0
Turkey	305.0	301.0	310.0	312.0	340.0	346.0	361.0	370.0	386.0	408.0

SOURCE:

U.S. Arms Control and Disarmament Agency, Washington D.C.

U.S. Department of State, U.S. Arms Control and Disarmament Agency, World Military Expenditures and Arms Trade 1963-1973 (Washington D.C.: Government Printing Office, 1974.).

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