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THE ROLE OF FOREIGN AID AND HUMAN CAPITAL IN THE ECONOMIC GROWTH OF DEVELOPING COUNTRIES

By

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The Role of Foreign Aid and Human Capital

in the Economic Growth of Developing Countries

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Abstract

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Mohamed Ismail El-Kaissy

The primary objective of this research is to analyze the impact of foreign aid and human capital on the economic growth of developing countries. Other sources of economic growth such as raw labor, export sector growth, and the degree of political and civil liberties (PCL) have also been considered. Using recent modern economic growth theories as a guide, the study is conducted on a sample of 80 developing countries. The data are averaged for one of three separate time periods: 1971-1980, 1981-1990, or the total period spanning 1971-1990.

The analysis shows that foreign aid is positively associated with economic growth in developing countries for the periods under study. The findings are consistent with the economic theory of foreign aid which asserts that overseas development assistance accelerates economic growth by supplementing the domestic capital formation. The study also finds that

foreign aid significantly contributes to investment which lends support to the notion that most foreign aid which is intended for capital formation may indeed be used for that purpose.

Although foreign aid has played an important role in developing counties, gross domestic savings remains crucial for economic growth in developing countries because it serves as an important source of the investment. Moreover, the export sector growth is found to have a consistent and substantial positive effect on economic growth. The results also support the view that export promotion policies will have significant effects on growth in developing countries.

Furthermore, the inclusion of human capital into the growth equation reveals that it has a statistically significant positive effect on economic growth. These results suggest that government policies that augment human capital can have high returns. Human capital also positively contributes to investment which implies that it serves as an agent in attracting physical capital. In addition, the study demonstrates that political and civil liberties have had a direct effect on economic growth. The analysis, however, shows that the impact of political and civil liberties on economic growth is not significantly different from zero over the observation period (1971-1990).

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Chapter I:

Introduction

During the last four decades, the developing countries have made considerable progress in reducing poverty. Developing countries are those which are making economic progress with respect to capital investment, education and training, productivity, and general standard of living (Gilpin, 1970). Since 1950, the income per capita in the developing countries has doubled (Meier, 1989). This progress can also be seen in other social welfare measures such as life expectancy, child mortality, and education attainment. For example, the literacy rate has increased from 30 percent to more than 50 percent over the past three decades. Average life expectancy has risen nine years in the middle-income developing countries (those with a per capita income of more than $600, but less than $6000) and by more than 15 years in low-income countries (those with a per capita income of less than $600) in the last three decades. The infant mortality rates has fallen substantially since 1950 from two hundred eighty per thousand to one hundred per thousand

(World Development Report, 1992).

The economic growth of developing countries in the decades prior to 1980 has been quite favorable compared to high income industrialized countries (those with a per capita income of more than $6000). The average annual growth of GNP for the low and middle income countries exceeded that of the high income countries in both the period of 1965-1973 and 1973-1980.

During the last decade, however, the middle income countries showed sharp decline in the rate of growth compared to the high growth rates prior to 1980 when some middle-income countries experienced rates of growth in income which exceeded 5 percent annually. In the mean time, both low-and middle income countries showed slow growth in the 1990's (Poulson, 1994).

Development Paradigm Shift :

During the 1950's and 1960's, capital formation was viewed as the key for the economic growth of the developing countries. Consequently, rapid accumulation of capital became the ultimate goal of nations. The lack of physical capital was viewed to be the critical constraint on economic growth and development. This view was well supported by major development institutions (the United Nations and its agencies, the World Bank, and several

bilateral aid agencies) with a substantial flow of foreign assistance that developing countries would need to finance investment.

During the 1970's, the emphasis shifted to industrialization and investment in human capital. Import-substitution was viewed as a tool to allow domestic industries to grow by eliminating foreign competition and reducing dependency. Several policy instruments such as tariffs, quotas, subsidies, and the exchange rate changes were all used to protect the domestic market from foreign competition. The high rates of protection for industrialization created a bias against the export industries which made exports less competitive in the international market. This resulted in a fall in the shares of exports of many LDCs (Ghatak, 1995). Meier (1989) argued that these losses of income due to the high cost of protection estimated to be between 6-7 percent of gross national product of several developing countries. These policies have also resulted in a monopoly in various sectors of import substituting industries which provided little incentive to improve productivity giving rise to low product quality and the retardation of economic growth.

With the debt crises and global recession of the 1980's, many developing countries, especially in Latin-American and Sub-Saharan Africa

struggled to adjust their economy. The Word Bank and the international monetary fund (IMF) urged these countries to adopt several fundamental structural adjustments designed to strengthen the role of private markets and improve the efficiency of government. The structural adjustments included policies that promote market efficiency, infrastructure, and trade liberalization. Expanding trade was seen to be the key for developing countries to pay their debt service obligation and attract new flows of capital for investments. The developing countries were encourage to adopt trade policies that are characterized as outward-oriented industrialization (World Development Report, 1987). In the mean time, complementary policies such as maintaining realistic exchange rates and fewer investment regulations which would help reduce barriers to entry and encourage foreign direct investments were also suggested.

The outcome of the structural adjustments were mixed. In the newly industrialized countries (NIC) in Asia and middle income countries, outward-oriented trade policy significantly contributed to rapid economic growth. In low income African and Latin American countries, economic growth and development were not sustainable because of the decline in the demand and the fall of international prices for primary goods in which they had a

comparative advantage. High unemployment and underemployment, poverty and inequality in income distribution continued.

Historically, the theory of growth has its roots back to Smith, Malthus, and Ricardo. They believed that economic growth resulted from an accumulation of capital. The theory assumes that given a certain level of production, the wages will be paid to the worker according to the level of subsistence and any surplus will be accumulated by the capitalists. The capital accumulated will increase the demand for labor which raises wages above the subsistence level. As wages increase, population will increase according to Malthusian theory of population which in return will increase labor supply and reduce wages back to the subsistence level. The process of growth will continue until the law of diminishing returns sets in and wages will equal to the subsistence level leaving no surplus for accumulation. At that stage, the economy will reach the stationary state and the growth process will cease. This theory was criticized for neglecting the possibility of technological progress in increasing productivity even though land is limited (Ghatak, 1995). The Malthusian theory of population that food production grows at an arithmetic rate while population grows at a geometric rate has not held true. Moreover, the experience of many countries showed that when

wages are above the level of subsistence, people consume more commodities rather than increasing the family size (Ghatak, 1995).

Following this period, the experience of the industrial revolution which fueled rapid growth in Europe resulted in complacency in growth policies until the Great Depression of the 1930's . Proactive government policy to obtain full employment with price stability took the center stage based on the Keynesian theory of income determination.

Based on the Keynesian tradition, Harrod (1939) and Domar (1946) built their growth model with investment as the main engine of economic growth. Their theory links capital investments and economic growth through the concept of the incremental capital output ratio (ICOR), defined as the change in the capital stock divided by the change in output which indicates the unit value of capital needed to produce one unit of output in a single period. Since investment at an equilibrium level is determined by the propensity to save, the Harrod-Domar model defines economic growth as a function of the propensity to save and the incremental capital / output ratio which is assumed to be stable within individual countries. This assumption would imply that an increase in capital investment would contribute directly to economic growth (Browne, 1990). The model was criticized for not

making provisions for the effect of technological changes, the possibility of substituting labor for capital, and instability problems.

Rostow (1956) applied the Harrod-Domar model in his stages of economic growth theory. He outlined five stages of economic growth according to which countries may be classified. These are: the traditional society, the precondition for take-off, take-off, maturity, and high mass consumption. The take-off stage is the most important phase of economic growth. For developing countries to achieve the take-off stage, Rostow identified three necessary conditions that must be met: 1) a rise in the rate of investment from 5 percent to 10 percent of national income; 2) the development of one or more manufacturing sectors with a high rate of growth; 3) the existence of social, political, and institutional framework. For the first condition, Rostow used the Harrod-Domar ICOR mechanism to determine the required investments. He suggested that the investment rate of the developing countries can be raised by the injection of the foreign aid which would augment domestic savings without reducing the level of domestic consumption. According to Rostow, foreign aid is only needed in the period prior to take-off which will last between ten to fifteen years (Riddell, 1987). Thus, the Rostow stages of economic growth provides some explanation for

the role of foreign aid in the process of economic growth and development. However, the details of the theoretical justification of the foreign aid is mainly given by Chenery-Strout (1966).

The rigidities of the Harrod-Domar model has prompted the neoclassical economists to search for a new theory that allows more flexibility. One of the first economists to work in this area was Solow (1957). In addition to accepting all the Harrod-Domar assumptions, except that of fixed capital-output ratio, he assumed perfect substitution between the factors of production of labor and capital. In the model, the inputs are paid their marginal products, namely capital and labor (Mankiw, Romer, and Weil, 1991). Solow specified the growth model based on the Cobb-Douglas production function in which output is expressed as a function of capital, labor, and autonomous technological changes.

Solow assumed that the production function displays constant return to scale with respect to all the factors of production taken together. For example, a one percent increase in inputs would lead to a one percent increase in output. However, the production function displays law of diminishing marginal returns with respect to a single input. In other words, if we hold one input (capital) constant, doubling labor will yield less than

doubling the amount of output (Herrick and Kindleberger, 1983).

One of the major problems with neoclassical growth theory lies in its failure to provide a satisfactory explanation of the role of technological changes in economic growth. In the Solow (1957) model, technological changes in growth known as the residual, is the part that is not explained by the growth of labor and capital inputs. This residual was found to be very significant, especially in developed countries. It has been argued by Schumpeter (1950) that technological progress takes place because innovators find it profitable to introduce new methods of production. In the late 1980's, several economists tried to understand the nature and the role of the Solow "residual" in the growth theories by endogenizing it (Ghatak, 1995). The new economic growth theory is referred to as the endogenous growth theory. It introduced human capital accumulation as an important complementary input to physical capital. The new production function expresses output as a function of physical capital, labor, and human capital.

The Solow "residual" can be explained by introducing the human capital input into the neoclassical model. Investment in human capital include education, on-the-job training, investment in health and nutrition. Denison (1974) found that education represented about 14 percent of growth

in GNP between 1929-1969 for the United States. Kendrick (1976) estimated that over half of U.S. capital stock in 1969 was human capital. Lucas (1990) suggested that physical capital fails to flow to poor countries because of their relatively poor endowments of complementary human capital. Barro (1991) suggested that the main barrier to growth convergence in the LDCs resulted from the inadequate investment in human capital.

One of the major problems of most developing countries is the lack of capital because the majority of the population are very poor and have only limited ability to save. As a result, most of these countries can not finance the investment which is a prerequisite for economic growth. Many economists argue that foreign aid can fill this gap and augment domestic savings (Chenery and Strout, 1966; Papanek, 1972,1973; Cassen , 1994) . For many low-income developing countries, foreign aid is considered to be the main source of capital. In the 1960's and 1970's, foreign capital financed between 10 to 20 percent of total investments in many developing countries (World Development Report, 1981). In 1991, foreign aid represented more than 69 percent of Mozambique's GNP, 43 percent of Nicaragua's GNP, 22 percent of Jordan's GNP, and 7 percent of total GNP of low-income countries. The total value of official aid from all sources to developing

countries reached $57 billions in 1991. Almost 70 percent of all aid went to low-income countries, particularly Asia and Sub-Saharan Africa (Cassen, 1994).

Foreign aid or the official development assistance (ODA) is defined by the World Bank as all sources of loans and grants made on concessional financial terms by bilateral and multilateral agencies to promote economic development and welfare. This definition does not include loans or credit for military purposes (Cassen 1994). For the aid to qualify as ODA, it must meet three criteria: 1) it must be given by official agencies; 2) it has to be given for promotion of economic development and welfare as the main goal; and 3) it has to have a grant element of 25 percent or more (Cassen, 1994).

The Research Problem:

The main purpose of this dissertation is to revisit the critical role that foreign aid presently plays in the economic growth of the LDC's and to examine the nature of its utilization in those countries that heavily rely on foreign aid. Based on the results, the study will offer some recommendations which may enable aid recipients to be on a self sustaining growth path. Other sources of economic growth such as capital (physical and human capital), raw labor, technological changes, and the degree of political and civil liberties will also be considered in the dissertation using cross-sectional data for 80 countries for the period of 1971-1990 (see, appendix A).

The theoretical literature and the empirical studies will be reviewed in chapter two. Chapter three will present the theoretical model and the methodological approach. The empirical results and the statistical analysis will be discussed in chapter four. Finally, chapter five will provide a summary of the study and some policy recommendations.

Chapter II :

Review of Literature

Foreign aid can be traced back to the nineteenth century when it was a common practice for the colonial governments to transfer money on concessional terms to their subjects. The governments of Britain, France, Germany, and the United States all gave "infant colony subsidies" before 1914 on a temporary basis without any connection to development, or moral obligation (Mosley, 1987). Over 75 percent of all overseas assets were held in North and South America, Europe, and Oceania (Mosley, 1987; World Bank, 1985.)

With the establishment of the United Nations in 1942, foreign aid as we know it today was primarily considered to be a post World War II phenomenon. The United Nations Relief and Rehabilitation Administration (UNRRA) was created by 44 countries as the first modern aid organization. Its main task was to help over six million people who were victims of World

War II. The UNRRA gave major humanitarian relief aid to several European countries. By 1946, two organizations were established in Washington including the International Monetary Fund (IMF) and the capital source of the International Bank for Reconstruction and Development (IBRD). The major objective of these organizations was to provide financial resources for the reconstruction of the European economy and other emerging economies. The Soviet Union never joined the IMF and the IBRD because of its major political differences (Browne, 1990).

By 1948, the United States provided Europe with a substantial financial assistance through its well known program, the Marshall Plan which made available over $12 billion (with more than 90 percent of which was in grant form) for the reconstruction of the European economy including Germany. The plan was very successful, especially in Western Europe which had the human resources and skills, but was short in capital. The American assistance was well compensated later by the increase in the demand for American exports by most European countries (Browne, 1990). In the 1950's the U.S. aid was provided under the Mutual Security Act (MSA) of 1953-1961. The MSA specified that financial assistance be provided only if it strengthened the security of the United States. During the 1950's, the U.S.

aid to Asian countries totaled $1.3 billion which represented 75 percent of its total aid. In the second half of the 1950's, the Soviet Union became a major donor of aid running an annual average of $450 million a year (Mosley, 1987). Military aid was a major component of both the U.S. and USSR's total aid. In 1954, the United States supplemented its economic assistance programs with a food aid program known as Public Law 480 which provided surplus domestic food production to developing countries on concessional terms. At the same time, Western European countries were also establishing their own foreign aid programs through the Organization for European Economic Cooperation (OEEC). The French aid programs were mainly connected to the French colonies which received a substantial financial assistance prior to and after their independence. Similarly, the British financial assistance in the 1950's was only limited to the British colonies (Browne, 1990).

During the 1960's, significant developments occurred. First, the International Development Assistance (IDA) was established within the World Bank. Its major objective is to provide the poor developing countries with long term interest-free loans. Second, the Development Assistance Committee (DAC) was formed in 1961. The committee consisted of eleven

countries including the United States, France, the United Kingdom, Netherlands, Belgium, Portugal, West Germany, Japan, Italy, Canada, and Sweden. The members of DAC accepted as a goal to provide at least ODA of each equal 0.7 percent of their GNP. Only five countries Sweden, Norway, Denmark, the Netherlands, and France today have reached that goal (Hagen, 1986). The DAC became the major source for western bilateral aid and acted as a research center and the primary monitor of aid trends (Browne, 1990). By the beginning of the 1970's, the United States accounted for over half of all the aid from the DAC member countries.

During the 1970's, several major events occurred which affected both the demand for and the supply of foreign aid. Most of the developing countries gained their independence in the early 1960's. At same time, severe drought affected Africa and India and the need for economic assistance has largely increased. The oil crises of the 1970's has forced the developed countries' economy into recession and resulted in changes in donors' aid policies. Several donors began to tie their aid to the purchase of goods and services of the donors countries. In 1972, a conference in Stockholm drew the attention of the DAC to the importance of the human environment in the developing countries. The conference recommended using

indicators of human well-being (such as infant mortality, life expectancy, literacy, and employment level) rather than the macroeconomic indicators as a measurement of the development progress. By the 1975, the Organization of Petroleum Exporting Countries (OPEC) became an important source of official aid. Much of the OPEC aid was in the form of grants and was mainly distributed to Arabs and the Islamic countries.

During the early 1980's, the food crises in Africa, the debt crises in Latin America, and the declining rate of growth in world trade all increased the demand for foreign aid. The demand for aid continued to grow in the second half of the 1980's and reached its highest peak in 1989/1990 with a total of $55 billion. Despite its continued use, the role of aid in economic growth has always been a controversial issue.

The proponents of foreign aid claim that overseas capital inflow is necessary and sufficient for economic growth in the less developed countries (Riddell, 1987). They argue that there is a positive relationship between aid and economic growth because it supplements domestic savings and helps to close the foreign exchange gap (Chenery and Strout, 1966; Papanek, 1973; Gulati, 1975; Gupta ,1975; Over, 1975; Levy, 1987,1988; Islam, 1992; and Snyder, 1993). These conclusions are confirmed with the experience of

individual countries such as Bangladesh and India where foreign aid appears to have played an important role in the development process. For instance, 100 percent of Bangladesh's developmental budget depends on aid which has made a significant contribution to the reconstruction of the economy. In India, foreign aid has financed over 8 percent of the domestic investments and about 15 percent of imports (Cassen, 1994) .

To this date, the most comprehensive theoretical justification for the inflow of foreign aid to the less developing countries was provided by Chenery and Strout (1966) and White (1992). In their model, they established three phases that developing countries pass through in the transition from backwardness to self-reliance status. The first phase requires a rise in the investment rates with two major constraints: shortage of capital and low level of skills. In this phase, capital inflow is required to close the gap between investment and domestic savings. At this stage, the planned investment is greater than savings by the amount of capital inflow.

$$S + FR = I$$

where : S = savings, FR = capital inflow, and I = investments

In the second phase, the investment rate is still above the savings rate and

capital inflow will still be needed. At this stage, the developing economy will be in need of capital goods that the domestic productive sector has limited capacity to meet. The capital inflow would be needed since export earnings would not be adequate to finance imports. Furthermore, a foreign exchange gap may also exist as follows:

$$M = X + FR$$

where: M = imports and X = exports

Finally, the investment and savings gaps may disappear, but aid will be still needed to close the foreign exchange gap at the third stage. The country will achieve its self sustaining goal and the foreign aid may not be needed any more at the end of this phase. Chenery and Strout (1966) also argued that the time needed for each phase will depend on domestic policies. Many studies followed the Chenery-Strout model mainly to test the theoretical validity of their foreign aid thesis.

Papanek (1973) applied cross-country regression analysis to 34 LDCs in the 1950's and 54 for the 1960's, respectively. By treating foreign aid, foreign investment, other inflows, and domestic savings as explanatory variables, he found that savings and foreign aid explain about one third of the

variation in GDP growth. His results suggested no support to the case that savings respond inversely to foreign aid. Aid was found to have a coefficient nearly twice that of the other independent variables. He explained some of the negative relation that might exist between foreign aid and savings could be related to factors as war or major political disturbance, declining terms of trade, or weather. Papanek concluded that foreign aid which disproportionately went to countries with low savings rate had a more significant effect on growth than savings, or other forms of foreign resource inflows.

Reviewing the existing literature on the aid, savings, and growth relationships, Mosely (1980) suggested that foreign aid might have different effects in different less developed countries. Furthermore, the models that were used in most literature to explain the relationship between aid and growth were estimated as a single equation model using ordinary least squares. He stated that this technique is inappropriate because the right-hand side of the equation contains an endogenous variable, namely aid which influences and is being influenced by the recipient country's GDP. Mosely (1980) further argued that the data used in the previous studies need to be tested for their current validity.

Having in mind all the problems of the previous studies, he tested the effect of aid, savings, and other financial flows on economic growth using data from 83 developing countries. Mosley (1980) found that about 25 percent of the growth in LDCs in the 1970's was explained by domestic savings and capital flow from abroad.

He then divided the sample data into two groups. The first group consisted of the 30 poorest countries and the second group consisted of 53 middle-income countries. In the poorest country group, aid was found to be positively related with growth using 5-year lag period. Aid and economic growth were negatively related for middle-income countries.

Levy (1987) tested the effect of foreign aid on capital formation using cross-sectional data for 46 low income countries. He utilized the OLS and the two-stage least squares equation methods to deal with the simultaneity problem. He found that on the average, the aid flows were used for fixed capital formation. Levy (1987) concluded that a sustained increase in the aid ratio caused an equal increase in the investment ratio. In a another study, Levy (1988) found that the impact of aid on investment to be greater than unity for Sub-Saharan African countries.

Islam (1992) tested the effect of foreign aid on economic growth using

time series data for Bangladesh for the period of 1971-1988. He used several equations to test the effect of foreign aid on growth. His results suggested that foreign capital, especially the loans and food had some positive role in the economic growth of Bangladesh, but domestic savings had the highest effect.

In another study, Snyder (1993) introduced an interesting point about the donor bias towards small countries. He presented several motivations for the donor to favor small countries. The donor can get better results for its aid through several small countries than through one or two large countries since aid represents a big portion of the GDP in small countries than in large countries. Snyder (1993) tested the hypothesis that small countries usually have close ties with previous colonial rulers who in most of the cases are the donors using data for 69 developing countries representing the period 1960's, the 1970's, and the 1980-1987 period. He added GDP to Mosely's model as a proxy for country size. The results of the model suggested that the coefficient of aid was small and not significant when the country size variable was omitted; but when country size was included, the aid coefficient become positive and significant. He concluded that the previous studies underestimated the strong relationship between aid and growth by failing to

allow for the effect of country size.

On the other hand, the opponents of foreign aid argue that it has a negative effect on domestic savings and economic growth in the less developed countries. Some contend that the governments in the recipient countries may reduce the tax rates, reduce their effort to collect taxes and / or increase public consumption (non-developmental expenditure) as a result of aid inflow (Rahman, 1968; Griffin and Enos, 1970; Weisskopf, 1972; and Boone, 1994). These results imply that foreign aid can neither promote growth nor continue for a long period of time before its effect is noticed. In the mean time, Bauer (1981) argued that the official aid does not go to poor people, but rather to their rulers whose spending policies are determined by their own personal political interest with low priority for the poor.

By using cross-section data for 32 developing countries in the 1960's, Griffin (1970) argued that aid served as a substitute for savings and that a large fraction of the aid inflow was used to increase consumption rather than investments. His results supported the original hypothesis that aid has a negative effect on growth through its direct negative effect on savings.

To confirm his results, he used time series data for Colombia for the period of 1950-1963. He reached the same conclusion that aid had a negative

effect on growth. He explained the inverse relationship between savings and foreign aid by the decline in public savings as a result of the flow of foreign aid since the governments in the recipient countries may reduce their tax rates, reduce their efforts to collect taxes, or change the composition of their expenditures by increasing public consumption. Foreign capital can also have a negative effect on private savings in that the availability of the foreign capital may result in the reduction of the interest rates which in return may reduce the incentive of local people to save. Griffin (1970) and Griffin and Enos (1971) further argued that the availability of foreign capital may result in increasing the imported goods which may lead to an increase in consumption and that capital flow from one country to another may not be determined by its need, or its potential, or its past economic performance, but by the benefit it yields in terms of political support. Several studies have found that aid allocation is not influenced by the recipient's income level, but rather by donor's interest (McKinlay and Little, 1979).

Heller (1975) used panel data for 11 African countries to test the government response on aid flow. He found that 30-60 percent of the value of the aid was used for government expenditure and about one third was used to reduce taxes.

In another study, Boone (1994) argued that the flow of aid to the recipient is driven by political motives rather than by economic needs. Boone conducted a study using data for 96 developing countries for the period between 1971-1990 to test the impact of aid on investment and growth. He found that a big portion of the aid was used for government consumption and overall, he found that aid had little effect on growth.

Among other factors which influence economic growth is the human capital. Several studies have tested the role of the human capital in economic growth (Schultz, 1961; Nelson and Phelps, 1966; Becker, 1964; Otani and Villanueva, 1989; Lucas, 1988,1990; and Benhabib and Spiegel, 1994). Using annual average enrollment for 1970-1985 for 55 developing countries Otani and Villanueva (1989) tested the role of the human capital in the economic growth process. Their results suggested that expenditures on improving human capital resulted in a substantial increase on output growth.

Benhabib and Spiegel (1994) used cross country data 1965-1985 for 78 countries to test the effect of physical and human capital stocks on economic growth using Cobb-Douglas production function. They used gross investment as proxy for physical capital and enrollment ratios, or literacy rates as a proxy for human capital. Their results showed negative but insignificant role for the

human capital in the determination of economic growth. Human capital, however, contributed to growth through its role in encouraging other factors, particularly physical capital. Benhabib and Spiegel (1994) suggested that the human capital effects growth through their direct influence on the rate of domestically produced technological innovation and on the speed of adoption of technology from abroad. A summary of the empirical studies is presented below. The following chapter will discuss the theoretical model, the methodological approach, and the data sources.

Table: 2.1 Impact of Aid and on Economic Growth: Results of Selected Studies

Study	Sample	Model	Dependent Variable	Independent Variable	Variables of Significant
Rahman 1968	n = 31 Cross -sec 1962	OLS	S	A, Y	- A
Griffin 1970	n = 32 Cross-Sec 1962-64	OLS	S	A	- A
Griffin & Enos 1970	n = 12 Cross-Sec 1957-1964	OLS	Y	A	- A
Weisskopf 1972	n = 44 Cross-Sec 1954-1965	OLS	S	A , Y , E	- A
Papanek (1973)	n = 38 Cross-Sec 1950-1960	OLS	Y	S, A, OI, FI	+ A + S + FI
Gupta (1975)	n = 40 Cross-Sec 1960's	OLS	Y	S, A, OI, FI	All +
			S	Y , PERCI, A, DR	+ Y - DR + PERCI - A

(Continued)

Study	Sample	Model	Dependent Variable	Independent Variables	Variables of Significant
Over 1975	n = 36 Cross-Sec 1962-1964	TSLS	S	A	+ A
Mosely 1980	n = 83 Cross-Sec 1970-1977	TSLS	Y	A, OI, S	+ A
Mosley 1987	n = 67 Cross-Sec 1960-1983	OLS	Y	A, S, FIX, L, E	+E
		TSLS	A	Y	
Levy 1987	n = 46 Cross-Sec 1968-1980	OLS	I	A, S	+ A + S
		TSLS	S	A, Y, PG, DR, PERCI	+ PERCI, + PG
Islam 1992	n = 17 Time-Series 1971-1988	OLS	Y	PG, S, FA, CA, PA	+ S +FA

(Continued)

Study	Sample	Model	Dependent Variable	Independent Variable	Variables of Significant
Mbaku	n = 20 Time-Series 1971-1990	OLS	Y	PG, A, S	+S
Benhabib & Spiegel	n = 78 Cross-Sec 1965-1985	OLS	Y	I , L, H	+I + L

Sources: See, References.
List of Variables Used in the above Selected studies:

A = Foreign Aid , DR = Dependency Rate, E = Export, FA = Food Aid, CA = Commodity Aid, FIX = Foreign Investments, H = Human Capital I = Investments, L = literacy Rate, OI = Other Inflow, PA = Project Aid, PG = Population Growth, PERCI = Per Capita Income, S = Domestic Savings Y = GDP Growth.
(+) and (-) = Sign of the coefficient of variables of significance .

Chapter III

The Model, Data Sources, and Estimation Methods

This chapter will develop the theoretical specification of the relationship among foreign aid, human capital, and economic growth. According to the new economic growth theory, the production function expresses output as a function of physical capital, labor force, and human capital. The extended production function arises from the Lucas (1988) and Romer's (1990) endogenous growth model which argues that accumulated human capital has a direct and positive long-run impact on the productivity of labor and economic growth (Tallman and Wang, 1994).

The model that explains economic growth (Y) may be specified as a function of investments (I), labor force (L), human capital (H), trade (export) (X), and political and civil liberty (PCL). The export sector is included in the growth model as a proxy for the openness of the economy to trade.

The initial growth model can be specified as follows:

$$Y = \alpha_0 + \alpha_1 I + \alpha_2 H + \alpha_3 L + \alpha_4 X + \alpha_5 PCL + \epsilon \quad (1)$$

The investment (I) can further be divided according to its two specific sources, investment arising from domestic sources, and from foreign sources. The investment from domestic sources can be proxied by gross domestic savings, and investments from foreign sources can be specified by the net capital inflow from official development assistance (ODA) following Islam (1992). The growth model can now be rewritten as:

$$Y = \beta_0 + \beta_1 AY + \beta_2 SY + \beta_3 H + \beta_4 L + \beta_5 X + \beta_6 PCL + \epsilon \quad (2)$$

Where:

Y = Average Annual growth rate of real gross domestic product (1987 constant price);

A Y = Average foreign aid as a percentage of gross domestic product;

S Y = Average gross domestic savings as a percentage of gross domestic product;

X = Average percentage of annual rate of growth of real export values (1987 constant price);

L = Average annual rate of growth of labor forces;

H = Percentage of pupils enrolled in vocational or teacher-training secondary school;

PCL = An index of political and civil stability, decreasing with increasing liberties.

β_0 is the intercept term and is expected to capture the effect of excluded variables including changes in technology. ϵ is an error disturbance term based on the following assumptions: (1) the error term has zero expected value and constant variance for all observation ,i.e, $E(\epsilon_i) = 0$ and $E(\epsilon_i^2) = \sigma^2$; (2) the random variables (ϵ_i) are statistically independent of each other ,i.e., $E(\epsilon_i, \epsilon_j) = 0$ for $i \neq j$ and (3) the error term is normally distributed.

All variables are the averages for three time periods, 1971-1980, 1981-1990, and 1971-1990.

Definitions of Variables and Data Sources:

Gross Domestic Product (Y):

The gross domestic product (GDP) is defined by the World Bank as the total output of goods and services for final use produced by residents and nonresidents regardless of allocation to domestic and foreign claims taking place on the national territory (World Bank, 1991). The GDP values are at constant 1987 prices. The real gross domestic product growth will be used as a measure of economic growth. The data for GDP will be collected from the World Bank Tables.

Foreign Aid (AY):

Foreign aid is defined as all loans and grants made on concessional financial terms by bilateral and multilateral agencies to promote economic development. Foreign aid contains a grant element of at least 25 percent. The grant element concept is what distinguishes the foreign aid from ordinary loans provided by lending institutions. In addition to the grant element,

concessional loans have longer maturities and substantial grace periods (the interval until the first repayment of capital). The foreign aid variable is measured as a percentage of recipient's GDP to control for the effect of country size and price changes across time (Mosely, 1987). To compute the aid as a percentage of GDP, the GDP will be converted to US dollars using the World Bank annual average exchange rate. The ratio of foreign aid to GDP covers three sub-periods: 1971-1980, 1981-1990, and 1971-1990 for 80 countries. Data for the aid variable are obtained from the OECD's "Geographical Distribution of Financial Flows to Developing Countries" series covering the period from 1971-1990.

Gross Domestic Savings (SY) :

The nominal gross domestic savings (SY) is calculated by deducting total consumption from gross domestic product. Domestic savings is broken down into personal savings, corporate savings, and government savings. The gross domestic savings is measured as a percentage of the country's GDP to control for the effect of country size and price changes across time (Mosely, 1987). The data for gross domestic savings are obtained from the World Bank Tables 1971-1990.

Labor Force (L):

The World Bank definition of labor force comprises economically active persons aged 10 years and over including the armed forces and the unemployed who are actively seeking work. This definition excludes house-wives, students, and other economically inactive groups. The rate of growth of the labor force peaked during the 1980's, and it is projected to decline through the end of this century. The high rate of growth of the labor force during the 1980's resulted from high rates of population growth in the period after the World War II. The predicted decline in labor force growth reflects declining population growth rate in the recent decade. The most rapid growth rate in the labor force is occurring in Sub-Saharan Africa (Poulson, 1994) . The average growth rate of labor force (L) is used as one of the variables that may explain economic growth. Data on the annual rate of growth of labor forces are obtained from the World Development Report and United Nations' Statistical Year Book.

Human Capital (H) :

Human capital is considered to be an important factor in economic growth (Lucas, 1990; Romer, 1990; Barro, 1991; Mankiw, Romer, and Weill,

1992). According to the new growth theory, human capital is an important complementary input to the physical capital and a prerequisite for economic development. Schultz (1961) suggests that technological changes, often viewed as an external factor affecting the economy may be explainable within a model embodying the human capital investments. Lucas (1988) also argues that human capital accumulation is the main driving force for economic growth. Tallman and Wang (1992) argue that education improvement at the primary, secondary, and higher education levels appears to have great impact on economic growth. The current study will utilize education, particularly at the secondary level as a proxy for human capital. The data for secondary education are obtained from the World Bank Tables for the period from 1971-1990.

Export (X):

The role of exports in the economic growth of the developing countries has received much attention in recent years. It is widely accepted that trade especially exports, permit developing countries to overcome the limitation of their domestic market by selling their goods and services in the international market (Balassa, 1988). Export growth contributes indirectly to output

growth by increasing the supply of foreign exchange which increases the developing countries' capacity to import raw materials, equipment, and provide opportunities to gain access to new technology, all of which are essential for rapid economic growth (Levy, 1988; Tsai, 1994). Several empirical studies find positive and significant relationships between export growth and output growth (Emery, 1967; Tyler, 1981; Riedel, 1987; Balassa, 1988; and Poon, 1994). For all the above reasons, export growth will be used in the growth model as one of the variables that may explain economic growth.

Political and Civil Freedom (PCL):

Some scholars argue that political and civil freedom is a necessary condition for an economy to achieve a path of rapid economic growth (Poulson, 1994). The link between freedom and development can be seen clearly in many developed countries where citizens enjoy high level of both civil and political freedom. During the last decades a number of indices of freedom has been developed to measure both political and civil liberties among nations. These include: Survey of Freedom, the Gross National Time Series Archive, and the World Hand Book of Political and Social Indicators

(Poulson, 1994).

Gastil's annual survey of freedom ranks countries according to 30 specific tests under two criteria, political rights and civil rights. This survey covered over 160 nations and the data have been available since 1972. Political rights are defined as "rights to participate meaningfully in the political process" and civil liberties are rights to free expression, to organize or demonstrate, freedom of religion, education, travel, free business or cooperative rights. Gastil categorized economic systems as capitalist, mixed capitalist, capitalist-statist, mixed-socialist, or socialist (Scully, 1988). The rating for political and civil freedom are on a one to seven-point scale with seven being the least free and one the most free.

Several studies have found political and civil rights are positively and significantly correlated with economic growth. (Scully, 1988; Dasgupta, 1990; and Ghura, 1995). Several foreign aid donor countries are considering withholding aid if recipient countries do not respect the human rights of their citizens. Gastil's index of political and civil freedom is utilized as one of the independent variables that may contribute to economic growth for the period from 1971-1990.

Sample

The sample data consist of 80 countries. However data for only 77 countries were complete for all the sub-period 1971-1980, 1981-1990, and 1971-1990 (see, appendix A).

Chapter IV

Analyses and Interpretation of Results

This chapter presents the results of statistical analyses of the effect of foreign aid and human capital on the economic growth of developing countries. First, the discussion of results is broken down into three sub-periods: 1971-1980, 1981-1990, and 1971-1990. Second, the estimation problems of multicollinearity and heteroscedasticity are addressed. The last section of the chapter investigates the contribution of foreign aid, human capital, and domestic savings to investment.

The Effect of Foreign Aid and Human Capital on Economic Growth 1971-1980:

The regression estimates of the effect of foreign aid and human capital on economic growth for a sample of 77 developing countries are presented in Table 4.1. To eliminate short term cyclical fluctuations, all the data in the

Table 4.1 Regression Estimates of the Effect of Foreign Aid and Human Capital on Economic Growth 1971-1980

Equation	1	2	3	4
Constant	.810	-.444	2.082	-.069
	(0.72)	(0.39)	(1.31)	(0.04)
SY	.067***	.060	.070***	.061
	(1.74)	(1.51)	(1.78)	(1.48)
AY	.094	.121**	.116	.125**
	(1.36)	(2.20)	(1.47)	(1.93)
X	.218*	.184*	.206*	.183*
	(4.42)	(3.35)	(4.04)	(3.39)
L	.594***	.726**	.542***	.707**
	(1.75)	(2.14)	(1.59)	(2.01)
H	-------	.035**	-------	.034***
		(2.18)		(1.85)
PCL	-------	--------	-.262	-.065
			(0.94)	(0.22)
Observations	77	77	77	77
Adjusted R^2	.31	.35	.36	.34
F-values	9.5*	9.1*	7.8*	7.5*
D.W	1.83	1.80	1.89	1.81

White's (1980) heteroscedasticity correction was used in all the above regressions. Absolute value of t-ratio are in parentheses.

* Significance at $p \leq .01$.

** Significance at $p \leq .05$.

*** Significance at $p \leq .10$

growth model are calculated as arithmetic averages over 1971-1980 period. Table 4.1 reports Ordinary Least squares (OLS) estimates for several specifications of the growth model. The signs of all the coefficients are consistent with theoretically predicted signs. The F-values for equations 1-4 indicate that the regressions are statistically significant.

Equation 1 reveals a significant and positive role of domestic savings (SY), export sector growth (X), and labor force growth (L) in explaining economic growth. Foreign aid (AY) has a positive sign, but is statistically insignificant at the 10 percent significance level ($p \leq .10$ is the maximum tolerable level of significance). The second specification adds the human capital (H) variable to the first equation. All the variables are positive and significant at the 5 percent level, except domestic savings. Equation 2 also shows that including the human capital variable increases the explanatory power of the regression equation to a considerable extent as revealed by the adjusted R^2.

The political and civil liberties (PCL) are incorporated in equation 3-4. The coefficient of political and civil liberties variable yields the expected signs, but fails a significance test at the 10 percent level in both equations. The coefficient of export sector growth (X) enters positively and significantly

at the 1 percent significance level. The coefficients of both human capital and labor force growth are also statistically significant and positively related with the growth of real GDP over the 1971-1980 period in equations 3-4.

The Effect of Foreign Aid and Human Capital on Economic Growth 1981-1990

This section discusses the results for the more recent period in details. The regression results presented below in Table 4.2 confirm that foreign aid and human capital have an ever stronger positive effect on economic growth than the earlier period. The overall explanatory power of the regression equations for the 1981-1990 period is higher than that of the estimates for the earlier period 1971-1980.

Domestic savings (SY) continues to have a strong positive effect on economic growth at the 5 significance level in all the growth model equations. The results from equations 5-8 suggest that an increase in domestic savings during the 1980's, other things being equal, is strongly and positively related with the growth of real GDP. These findings are consistent with those of several researchers (Papanek, 1973; Gulati, 1975; Gupta, 1975;

Table 4.2 Regression Estimates of the Effect of Foreign Aid and Human Capital on Economic Growth 1981-1990

Equation	5	6	7	8
Constant	-.357	-1.58	.351	-.946
	(0.37)	(1.47)	(0.33)	(0.79)
SY	.068**	.066**	.068**	.067**
	(2.06)	(2.17)	(2.17)	(2.22)
AY	.101*	.139*	.128*	.148*
	(2.95)	(4.00)	(3.83)	(4.32)
X	.236*	.234*	.243*	.238*
	(4.96)	(5.06)	(5.60)	(5.37)
L	.220	.296	.302	.326
	(0.87)	(1.12)	(1.19)	(1.26)
H	-------	.022**	-------	.017***
		(2.04)		(1.60)
PCL	-------	--------	-.247***	-.142
			(1.59)	(1.05)
Observations	80	80	80	80
Adjusted R^2	.40	.42	.41	.42
F-values	14.1*	12.3*	12.0*	10.4*
D.W	2.19	2.22	2.25	2.25

White's (1980) heteroscedasticity correction was used in all the above regressions. Absolute value of t-ratio are in parentheses.

* Significance at $p \leq .01$.

** Significance at $p \leq .05$.

*** Significance at $p \leq .10$

Gupta and Islam, 1983; Levy, 1987; Islam, 1992; Mbaku, 1993; and Snyder, 1993).

The positive relationship between foreign aid (AY) and growth is confirmed for equations 5-8. Foreign aid (AY) is positively related with growth of real GDP and statistically significant at the 1 percent level. The coefficient of foreign aid ranged from .10 to .14 in various models which suggests that a 1 percentage point increase in the foreign aid ratio results in an increase in the rate of growth of GDP in the range of .10 to .14 percent, holding other independent variables constant. The results from Table 4.2 consistently imply that foreign aid positively contributed to economic growth in developing countries in general. Similar results are obtained from Papanek (1973), Gulati (1975), Gupta (1975), Gupta and Islam (1983), Levy (1988), and Snyder (1993).

The coefficient of export sector growth (X) is positively and significantly related to economic growth at the 1 percent level in all specifications for both sub-periods, exhibiting a high degree of regularity. The coefficient of .23 suggests that a 10 percentage point increase in the rate of growth of exports is associated with a 2.3 percentage point increase in the

rate of growth of GDP, other things being equal. The results may also suggest that countries that neglect the export sector may experience a lower rate of growth than those that adopt export-promotion policies. The importance of the export sector in the seventies and eighties confirms the findings of other researchers (Tyler, 1981; Balassa, 1985; Mosley, 1987; Levy, 1987,1988; Fasu, 1990; Alam 1991; and Snyder, 1993).

The coefficient of the labor force growth (L) has also the expected positive sign, but it is statistically insignificant at the 10 percent significance confidence level. This result is as expected since labor force has noticeably increased during the 1980's in most developing countries as a result of the high rate of population growth in the period after World War II. Similar results are obtained from Tsai (1994).

The positive relationship between human capital and economic growth for the 1970's data is also confirmed using the 1980's data. The coefficient of investment in human capital (H) is statistically significant at the 10 percent significance level and is positively related with the growth of real GDP. Incorporating human capital (H) into equation 6 increases the explanatory power of the regression equation as well as the statistical significance of all the independent variables as judged by R^2. The results are consistent with

Lucas (1988) and Romer (1990) who characterize human capital as the engine of growth. The findings suggests that human capital plays an important role in explaining the output growth in developing countries which implies that government policies that augment human capital can have high returns.

The political and civil liberties (PCL) variable is incorporated into equation 7-8 along with other factors which may play a role in determining GDP growth. The coefficient of PCL is statistically significant at the 10 percent significance level and negatively related with growth of real GDP. The negative sign indicates that the higher the index value (lower level of political and civil rights), the lower the rate of growth of real GDP. The PCL coefficient is, however, statistically insignificant once the human capital (H) is incorporated into the regression equation. They have the expected negative sign. Similar results are obtained by Scully (1988) and Dasgupta (1990).

The Effect of Foreign Aid and Human Capital on Economic Growth 1971-1990:

Table 4.3 presents the regression estimates of the effect of foreign aid and human capital on economic growth for the 1971-1990 period. The entire period results confirm those obtained earlier. All the coefficients are correctly signed and consistent with theoretically predicted signs. The F-values for all equations in Table 4.3 indicate that the regressions are statistically significant. The foreign aid and domestic savings continue to contribute significantly and positively to economic growth. The export sector growth continues to contribute positively and enters significantly at 1 percent significance level to economic growth. The coefficient of human capital (H) continues to be positive and significant at the 5 percent level of significance.

The coefficient of political and civil liberties has the expected sign, however, it is statistically insignificant at the 10 percent level which makes its empirical regularity a suspect. Some studies have found that the relationship between political and civil freedom is ambiguous (Grier and Tullock, 1989).

Table 4.3 Regression Estimates of the Effect of Foreign Aid and Human Capital on Economic Growth 1971-1990

Equation	9	10	11	12
Constant	-.257	-1.36	.681	-.676
	(0.30)	(1.48)	(0.63)	(0.59)
SY	.059***	.060***	.062***	.061***
	(1.64)	(1.73)	(1.76)	(1.78)
AY	.039	.078***	.063	.0866***
	(.95)	(1.67)	(1.22)	(1.64)
X	.251*	.231*	.246*	.231*
	(3.92)	(3.69)	(4.20)	(5.37)
L	.747*	.823*	.743*	.809*
	(3.18)	(3.48)	(3.20)	(3.44)
H	-----	.023**	-----	.0198***
		(1.94)		(1.57)
PCL	-----	------	-.230	-.129
			(1.20)	(0.68)
Observations	80	80	80	80
Adjusted R^2	.49	.51	.50	.51
F-values	19.7*	17.4*	16.5*	14.5*
D.W	2.10	2.06	2.17	2.09

White's (1980) heteroscedasticity correction was used in all the above regressions.
Absolute value of t-ratio are in parentheses.
* Significance at $p \leq .01$.
** Significance at $p \leq .05$.
*** Significance at $p \leq .10$

Tests for Heteroscedasticity and Multicollinearity:

All the growth model equations are tested for the presence of heteroscedasticity which is common in the analysis of cross-section data. Heteroscedasticity occurs when the variance of the disturbance is not constant. In this case, Var $(\epsilon_i) = E(\epsilon_i^2) = \sigma_i^2$, where i = 1,2,3...n. The parameter estimators in this case are unbiased but are inefficient. In other words, the estimated parameters do not have minimum variance (Pindyck and Rubinfeld, 1991). Applying OLS to heteroscedastic data will also result in a biased standard errors in which case the t-distribution are likely to be invalid and the hypothesis tests are likely to be misleading.

It is very important to detect the presence of heteroscedasticity and adjust the estimation procedures accordingly (Doran, 1989). The Breusch-Pagan heteroscedasticity test is used to test the null hypothesis that there is no heteroscedasticity or that the Var (ϵ_i) is homoscedastic. If heteroscedasticity is detected, we can not make inference based on the results of the least squares. White (1980) argues that it is still possible to obtain an appropriate estimator for the variance of the least squares estimator in the case of

detection of heteroscedasticity. Greene (1993) suggests that White's heteroscedasticity correction is an extremely important and useful method. Since the Breusch-Pagan test suggests that heteroscedasticity is present, White's heteroscedasticity-consistent covariance estimation method is used.

The model is also tested for the presence of multicollinearity which generally occurs when two or more of the independent variables used in the model are correlated. Such correlation inflates the standard errors of the estimates ($s\hat{\beta}_i$) which leads one to accept the null hypothesis that there is no relation between the dependant variable and the explanatory variable in question. The presence of multicollinearity can result in an unexpected sign of the parameter estimates. The growth model is tested for the presence of multicollinearity using the Variance Inflation Factor (VIF). A VIF for a parameter which is greater than 10 indicates that multicollinearity exists. The test indicates that multicollinearity is not a problem in the estimated models since the VIF is found to be less than 10 in all the equations estimated .

Finally, this section attempts to investigate the effect of foreign aid, domestic savings, and human capital on recipient's investment. Table 4.4 presents estimates of the investment equation for three sub-periods as specified below.

$$I = \lambda_0 + \lambda_1 AY + \lambda_2 SY + \lambda_3 H + \epsilon$$

Where I is average investment as a percentage of gross domestic product, and ϵ is a disturbance term. The other variables (AY, SY, and H) are as defined before. The results of these regressions indicate that all the coefficients have the predicted sign. The F-values for the equations indicate that the regressions are statistically significant.

Foreign aid consistently exhibits the predicted positive sign at the 1 percent significance level for all the sub-periods. The results may also lend support to the assumption that most foreign aid which is intended for capital formation may indeed be used for that purpose. These findings are similar to those obtained by Levy (1987, 1988). Domestic savings has the predicted positive sign and is significant at the 1 percent significance level for the 1970's; however, it is statistically insignificant at the 10 percent level for the 1980's.

Table 4.4 Regression Estimates of the Effect of Foreign Aid and Human Capital on Investments 1971-1990

	1971-1980	1981-1990	1971-1990
Constant	9.842*	9.64*	8.90*
	(3.61)	(3.64)	(3.42)
SY	.381*	.147	.216
	(2.84)	(.64)	(1.06)
AY	.666*	.539*	.697*
	(5.17)	(5.00)	(5.87)
H	.125*	.144*	.143*
	(4.83)	(2.91)	(3.37)
Observations	77	80	80
Adjusted R^2	.48	.12	.19
F-values	24.7*	12.2*	7.2*
D.W	2.16	2.27	2.17

White's (1980) heteroscedasticity correction was used in all the above regressions.
Absolute value of t-ratio are in parentheses.
* Significance at $p \leq .01$.
** Significance at $p \leq .05$.
*** Significance at $p \leq .10$

The coefficient of human capital (H) has a positive and statistically significant relation with investment at the 1 percent significance level in all the three sub-periods. Lucas (1990) suggests that physical capital fails to flow to poor countries because of their poor human capital endowments. The results may also imply that human capital works as an agent in attracting physical capital (Banhabib and Spiegal, 1994). A summary of all results from this study and policy implication which may be drawn are presented in the following chapter.

Chapter V

Summary and Conclusions

The primary objective of this research is to analyze the impact of foreign aid and human capital on the economic growth of developing countries. Other sources of economic growth such as raw labor, export sector growth, and the degree of political and civil liberties (PCL) have also been considered. Using recent modern economic growth theories as a guide, the study is conducted on a sample of 80 developing countries. The data are averaged over three time periods 1971-1980, 1981-1990, and 1971-1990 to determine whether there have been any significant changes in these variables over time.

The analysis shows that foreign aid is positively associated with economic growth in developing countries for the periods under study. The findings are consistent with the economic theory of foreign aid which asserts that overseas development assistance accelerates economic growth by

supplementing the domestic capital formation (Chenery and Strout, 1966). The results are also confirmed with the experience of individual countries such as Bangladesh and India where foreign aid appears to have played an important role in the development process (Cassen, 1994). The study also finds that foreign aid significantly contributes to investment which lends support to the notion that most foreign aid which is intended for capital formation may indeed be used for that purpose.

Although foreign aid has played an important role in developing counties, gross domestic savings remains crucial for economic growth in developing countries because it serves as an important source of the investment. Moreover, the export sector growth is found to have a consistent and substantial positive effect on economic growth. The sector permits developing countries to overcome the limitation of their domestic market and increases their capacity to import raw materials, equipment, and provide opportunities to gain access to new technology all of which are essential for rapid economic growth (Levy, 1988; and Tsai, 1994). The results also support the view that export promotion policies will have significant effects on growth in developing countries.

Furthermore, the inclusion of human capital into the growth equation reveals that it has a statistically significant positive effect on economic growth. These results suggest that government policies that augment human capital can have high returns. Human capital also positively contributes to investment which implies that it serves as an agent in attracting physical capital.

In addition, the study demonstrates that political and civil liberties have had a direct positive effect on economic growth. The analysis, however, shows that the impact of political and civil liberties on economic growth is not significantly different from zero over the observation period (1971-1990).

Policy Implications:

Several general policy implications can be drawn from this study.

1. Governments in developing countries may consider the use of foreign aid for improving the sectors (education, health, export) which make significant contribution to their growth.

2. Governments of developing countries may adopt monetary and credit policies that provide incentives to increase domestic savings such that aid resources can complement local efforts rather than substitute for them.

3. Governments need to focus more heavily on the use of external funds for development of human resources. Expenditures on improving human capital can have a substantial positive effect on economic growth. Foreign aid can contribute to education in developing countries by building institutions and providing training for teachers and administrations both domestically and abroad (Mikesell, 1983).

4. Governments in developing countries may adopt export-promotion development strategy to reduce its dependencies on foreign aid because the reliance on foreign aid does not offer the solution for sustained rapid growth. This strategy requires developing countries to remove all obstacles to trade including maintaining competitive real exchange rates and providing better export infrastructures such as better telecommunications and warehousing.

5. Governments in industrial countries can enhance trading opportunities with developing counties by granting exporters from developing countries access to their markets. This can be accomplished by reducing tariffs and non-tariff barriers.

Appendix A: List of Sample Countries

1	Algeria	34	Indonesia
2	Argentina	35	Iran, Islamic Rep.
3	Bangladesh	36	Israel
4	Benin	37	Jamaica
5	Bolivia	38	Jordan
6	Botswana	39	Kenya
7	Brazil	40	Korea, Rep.
8	Burkina Faso	41	Lao, PDR *
9	Burundi	42	Lesotho
10	Cameroon	43	Madagascar
11	Central African Rep.	44	Malawi
12	Chad	45	Malaysia
13	Chile	46	Mali
14	China	47	Mauritania
15	Colombia	48	Mauritius
16	Congo	49	Mexico
17	Costa Rica	50	Morocco
18	Cote d'Ivoire	51	Mozambique *
19	Cyprus	52	Nepal
20	Dominican Rep.	53	Nicaragua
21	Ecuador	54	Niger
22	Egypt, Arab Rep.	55	Nigeria
23	El Salvador	56	Oman
24	Ethiopia	57	Pakistan
25	Gabon	58	Panama
26	Ghana	59	Papua New Guinea
27	Greece	60	Paraguay
28	Guatemala	61	Peru
29	Guinea-Bissau	62	Philippines
30	Haiti	63	Portugal
31	Honduras	64	Rwanda
32	Hong Kong	65	Senegal
33	India	66	Sierra Leone

(Continued)

67	Somalia
68	Sri Lanka
69	Sudan
70	Syrian Arab Rep.
71	Tanzania
72	Thailand
73	Togo
74	Tunisia
75	Turkey
76	Uganda
77	Uruguay
78	Yemen, Rep. *
79	Zaire
80	Zambia

Note: * Data for these countries are available only after 1975. Hence they were excluded from the 1971-1980 regressions.

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