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EFFECTS OF POPULATION ON
EXTERNAL DEBT

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BY
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MARCH 1992

BEIRUT, LEBANON

EFFECTS OF POPULATION
ON EXTERNAL DEBT

A Research Topic
Presented to Business Division
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Management

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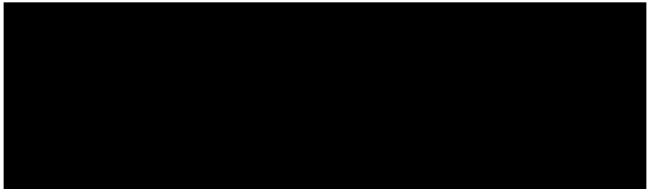
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CHAPTER I
Introduction

I . Background Information

In an increasingly interdependent world, the consequences of continuous population growth affects everyone, regardless of where the growth actually occurs. Every person, however poor, added to the world's population, and exerts an additional claim on earth's food, energy, and other resources. Expanding food production requires either fossil fuels or animal draft power. It also requires growing quantities of fresh water. Land is required for living space as well as for food production. Even minimal needs for clothing and shelter exert additional claims on the earth's resources. Nowadays, it is evident that "There are many people in the world. We are running out of space. We are running out of energy. We are running out of food. And, although too few people seem to realize it, we are running out of time".¹

In an earlier age, the addition of another person to the existing world population was of little consequence, since resources far exceeded man's

1. Jacqueline Kasun, The War against Population, (San Francisco, Ignatus Press, 1988), p. 21.

wildest visions of potential needs. The supply of primary commodities exceeded effective demand, resulting in depressed prices and markets highly favorable to buyers. Vast areas of fertile land awaited the plow; petroleum reserves were greater than envisaged needs; fresh water was in abundant supply, and the regenerative capacity of forests surpassed man's offtake.

Suddenly all this is changing. The assumption of boundless abundance of raw materials is being replaced by the prospect of the scarcity of many vital materials. World markets for energy and protein are being converted from buyers' to sellers' markets. Because of the seriousness of these changes, dramatic means have been devised by population growth analysts to alert mankind to the consequences of the continuous rapid population growth. The third quarter and the fourth quarter of the twentieth century have witnessed dramatic alterations in demographic trends as the global death rate has sharply dropped while the birth rate has remained high. "During the first fifteen centuries of the Christian era, world population increased at 2 to 5 percent per century. Prior to World War II, few countries had ever experienced a rate of natural increase in excess of 1

percent per year. In some countries today, the rate is between 3 and 4 percent annually, very close to the biological maximum... . We need to remind ourselves of the law of exponential growth, and the variation in long-term consequences of even relatively modest population growth".²

World population, now 5.3 billion, will increase by another billion (one thousand million) people during the 1990s. During the next century, it will probably double and could triple, says the 1990's "State of World Population" Report from the United Nations Population Fund (UNFPA).³ The biggest increase will be in the poorest countries; consequences for the environment and for development prospects will be serious. They could be catastrophic. "The next ten years will decide the shape of the 21st century. They may decide the future of the earth as a habitation for humans", said Dr. Nafis Sadik, UNFPA Executive Director.⁴

The 1990s will see greater increases in human numbers than any decade in history, according to the Report. World population is increasing by three people

2. Lester R. Brown, In the Human Interest, (New York: W. W. Norton and Company Inc., 1974), p. 22.

3. "State of the World Population 1990", UNFPA Newsletter, Population, (N.Y.: Information and External Relations Division, Vol. 16, No. 16, June 1990), p. 1.

4. Ibid, p. 1.

every second -about a quarter of a million each day. Between 90 and 100 million people -roughly equivalent to the current population of Eastern Europe or Central America- will be added every year during the 1990s.

World population growth continues to be grossly out of balance, with more than 90 percent of the growth coming in the developing regions. By and large, the biggest increases will be in the poorest countries - those that are, by definition, the least equipped to meet the needs of the new arrivals and invest in the future.

II . Population Growth's Problems

"With the persistence of human poverty and misery, the staggering growth of human population and ever increasing human demands, the possibilities of further stress and permanent damage to the planet's resources base are very real".⁵

"Of the present 5.3 billion people on earth, about a billion live in poverty. Can the earth meet even

5.Kasun, The War against Population, p. 33.

modest aspirations for this 'bottom line', let alone those of the better-off and their descendents, without irreparable damage to its life support systems?" asks the Report.⁶ As an answer, it states: "Already our impact has been sufficient to degrade the soils of millions of hectares, to threaten the rain forests and the thousands of species they harbour, to thin the ozone layer, and to initiate a global warming whose full consequences cannot yet be calculated. By far the largest share of resources used and waste created is currently the responsibility of the 'top billion' people, those in industrialized countries. These are the countries responsible for damage to the ozone layer and acidification, as well as, for roughly two thirds of global warming.

"However, in developing countries the combination of poverty and population growth among the 'bottom billion' is damaging the environment, notably through deforestation and land degradation. Deforestation is a prime source of carbon dioxide, one of the principal 'greenhouse gases' responsible for global warming. Rice paddies and domestic cattle -food suppliers for two

6. "State of the World Population 1990", p. 1.

billion people in developing countries- are also major producers of methane, another of the greenhouse gases".⁷

The report also says that developing countries are also doing their best to increase their share of industrial production and consumption. Their share of industrial pollution is rising and will continue to rise.

In fact, the problems that are most likely to be associated with population growth in the developing countries are the food problem (economic conditions), the environmental stress and the human social conditions. One of the main reasons of the famine in Africa is that this continent is torn by war. In addition, lack of government administration and loyalty increased poverty and unemployment. The failure of different welfare projects, especially health and education, put the region into further misery and debt. However, the continuous population growth accelerated the problem and increased the poverty.

Hence, the idea that rapid population growth slows

7. Ibid, p. 1.

per capita income rests on two assumptions. First, as the number of dependent children per worker increases, it is assumed that the consumption power per person will decrease. Second, the rapid increase in the number of workers brings into the picture the law of diminishing returns; thus, each worker will produce less in relation to the land and the capital with which each worker has to work. As a result, overpopulation will create a main problem to the family, the nation and the world as a whole.

It's worth mentioning here that the less developed countries are divided into three groups:

1. Countries with both high birth rate and high death rate. Mainly in Africa and some in Asia where per capita is extremely low and the process of modernization has just begun. Only a few hundred million people are in this group.

2. Countries with high birth rate and low death rate. This second group is mainly in Latin America, Asia and some in Africa.

3. Countries with intermediate and declining birth rate and low death rate. This last group is found in some part of Asia and Latin America where improvement in social and economic conditions have marked the last

three decades.

This study will be confined to the problems of population growth in developing countries belonging to Africa and Latin America.

To increase the welfare of the people, developing countries need to improve the quality of health, education, employment, infrastructure, and so on. They believe that the only way to do so was through loans. Unfortunately, debts increased the crisis, and the countries were obliged to cut back even further on public expenditure to serve their accumulated debt.

III. How Did the Debt Turn Out to Be a Crisis?

Policy makers in both creditor and debtor countries believed that through feasible and essential investment projects, developing countries would grow and maintain strong export performance which would enable them to repay their debts. No one could foresee that the combination of negative development would accumulate the debt crisis in the 1980s. The main aspects of this negative development were the following:

1. Between 1980-1988 the drop in the real price of

selected commodities (such as the price decrease of sugar by 57%, coffee by 30%, cotton 32%, wheat 17%, tin 57%, lead 28%, crude oil 53%, and iron 17%) only increased the burden of debt servicing.⁸

2. Loss of imports in relation to the purchasing power of exports have only worsened their terms of trade.

3. The interest rate created a new problem. To curb inflation and increase a major outflow of capital, U.S. pushed the real interest rate to a high level.

4. Finally, many loans were misused and invested in unfeasible projects.

Hence, these problems strengthened the debt crisis and created financial, economical, political and social crisis to the developing countries. UNICEF has found that in the 37 poorest countries which are heavily burdened by debt, health spending per head has fallen by over 50%, spending on education has declined by 25%, infant and child mortality has risen, and poverty has been increasing.

To decrease this burden on developing countries, rescheduling debts was assigned. In analysing the economic effects of debt servicing, it is important to

8.Ibid, p. 27.

distinguish between developing countries and much less developed countries.

In some countries, especially in Africa, to continue debt service is immoral. Total debt forgiveness was called for, since the average person is paying the debt through disease, malnutrition, unemployment and poverty. In addition, with the excessive calculation of interest charge, the debtor countries would have repaid the principal.

But unfortunately, creditors refused this assumption believing that it is a loss on their behalf. On the other hand, if these countries refuse to fulfill their debt obligations, they would ruin their credit worthiness reputation.

Rescheduling was the only option for both the debtors and creditors. They renegotiated the repayment schedule, the maturity period and interest rate.

IV . Population and Development

Slowing population growth in developing countries is one of the main concerns of economists. Voluntary family planning should be oriented through increased education and awareness of the problem under the

government help. An understanding of the population growth in developing countries should be oriented. Families should understand that increasing the number of their children would only increase their poverty and misery. Many international organizations are helping developing countries to be aware of family planning and to assist and support the government in orienting people towards the negative effects of the overpopulation growth trend.

As a well known Chinese proverb says: "We have not inherited this planet from our parents, we have borrowed it from our grand-children".

V . Statement of the Problem

Over time, a mountain of Literature emerged to deal with LDC's (Less Developing Countries) external debt. Many have revolved around one concept of default and rescheduling, neglecting the population dimension of the dilemma. This is not to say that there was a shortage of ideas about how to solve the debt problems, but to mention that little interest has been given to the question of how demographic characteristics relate to the debt capacity.

VI . Need of the Study

The importance of this topic arises from the fact that in recent years there has been a considerable interest in using discriminant function in comparing the indicators of countries that encountered debt servicing problem with those that did not. This study will include the population as a variable, and a selected multivariant statistical model for sovereign risk analysis would be theoretically applicable taking the population as a main variable to attain certain quantitative result.

VII. Purpose of the Study

This study intends to reveal certain descriptive aspects of certain developing countries, mainly those in Africa and Latin America; 75 countries will be used for this purpose. Moreover, the correlation and regression between aspects of countries servicing their debt and population growth will be identified.

CHAPTER II

Review of Literature.

I . Subjective Analysis of Debts.

In the period between 1960 and 1970 any developing country seeking growth had the confidence to borrow money and pay its debt through strong export performance. On the other hand, commercial bankers from the industrialized countries hoped to extend funds especially to those oil exporting developing countries because they were viewed as low risk borrowers. At that time, governments of developed countries restrained from giving any grants or assistance to meet the needs of LDC's.

The debt crisis started as an accumulation of different economic problems of the debtor countries. Some are:

- "Real prices in primary commodities dropped an average of 18 per cent between 1980-88"¹. Hence, for debtors, the situation was getting worse since the cost of imports, especially that of capital goods increased while trade of primary resources fell.

1. United Nations, Debt, (United Nations Department of Public Information, March 1990), p. 13

- Loans were repaid through a system of floating interest rates which increased the instability to borrowers in terms of projected future payments on their debt"2. In 1979, the United States adopted a tight monetary policy, in part to try to curb inflation and stanch a major outflow of capital". Interest rates increased, thus borrowing became more expensive. Debtors found themselves in difficulties to pay interest on their old debt as well as to borrow new ones. The repayment problem became an economic, social and political problem.

Debt burden took a different dimension in every country, its severity in some countries was expressed as an increase in debt servicing obligations. The pressure to keep up with interest and principal payment was extremely heavy to most LDC's. Poor growth and low export earnings to most indebted regions affected their different social political and economic structures. In order to pay-off their debt obligations, LDC's domestic investment declined, especially expenditures on health and education which are the necessary revenues for

2. Ibid, p. 14

development. In addition, imports decreased, hence limiting the economic growth in these regions. For instance, agricultural production whether for export or domestic consumption can not be increased without fertilizers. in a similar manner for industry which depends heavily on imported technology. The debt crisis in LDC's led to the cancelation of many foreign investment projects and the criteria became a practiced tool by lenders to discriminate among potential borrowers.

One of the main impacts of debt on LDC's was the social impact. Cutbacks in public expenditures affected society as a whole. School fees were introduced, for poor families, education became a luxury. As for health conditions, medicine and basic equipments were often non existent. As a consequence, sanitary conditions in LDC's deteriorated further. Individual governments and international organizations all recognized the severity of the debt crisis for which many ideas and solutions started emerging.

Rescheduling was accepted from the creditors point of view for countries that are extremely poor and can not keep-up with payments. Two groups emerged: the official creditors group formed what is known as "Paris

Club", and the commercial banks coordinated their rescheduling through the "London Club".

The "Paris Club" offered specific guidelines:

- "Forgiving one third of debt service due, and rescheduling the rest.
- Extending the maturity date on loans.
- Reducing interest rate to below market level"³.

II . Debt And Human Development Analysis

The main question to be asked is how much are debts affecting LDC's population generally and human development specifically? The average or poor person is paying heavily through unemployment, disease, malnutrition, and poverty although he did not benefit from loans. On the contrary, those loans only increased his misery. Unfeasible investments and wrong management on the part of LDC's depressed the growth of their economies even more.

Different criteria are used to measure human development in a country, some are:

3. Ibid, p.36

- Life expectancy
- Literacy rates
- Purchasing power,GNP/N

Budget priority should be restructured by the LDC's government considering that human resources are assets to the development and growth plans of a country, and not liabilities. Allocation of scarce and needed goods and services such as hospitals, education ,urban and rural services should be the main tools for development.

A human development index (HDI) was created by the United Nation Development Programme. For instance, "Japan comes out with the highest HDI ranking " . "Average life expectancy in Japan was 78 years. Adult literacy rate was 99 percent. The average real per capita income level, adjusted to reflect purchasing power was U.S\$ 13,135"4. On the other hand, in Nigeria, life expectancy is 45 years, literacy rate 14 percent, average adjusted real per capita income only \$452.

4.Gall Petev, "Human Development", Human Development Report, 1990, P.5.

III. Subjective Analysis Of Population Growth

The main concern of demographers, International organization and many others is to slow population growth in many LDC's."There is an imperative need to slow population growth in those many developing countries where it is too high to permit sustainable development"5.

In industrialized countries population growth rate has either stabilized at a low rate if not decreased in some instances. On the other hand, the high and even increased rate of population growth in LDC's is a serious problem. Various U.N. agencies estimate that population growth in LDC's is threatening their hope to achieve sustainable development and will increase the poverty level which already affects some one billion people.

"Population, environment, food and energy are issues that have assumed global significance,the

5. Joseph C. Wheeler, Development Co-Operation, (Paris:OECD, December, 1990), p.101

Table 1

Projected Population Growth In Developing Countries 6.
1965-2025

	Average growth rate (per cent)			Absolute population (millions)			
	1965-88	1988-2000	2000-2025	1965	1988	2000	2025
ASIA & PACIFIC	2.2	1.7	1.1	1627	2678	3298	4318
South-East Asia	2.2	1.3	0.8	74	122	142	174
NIEs	1.8	1.0	0.5	34	51	57	65
Others	2.5	1.5	1.0	40	71	85	109
Asian LIC's	2.2	1.7	1.1	1549	2550	3149	4132
China	2.0	1.2	0.6	700	1104	1286	1493
India	2.3	2.0	1.3	487	819	1043	1446
Bangladesh	2.4	2.7	1.8	63	110	151	235
Indonesia	2.3	1.5	0.9	105	175	208	263
Pakistan	3.2	2.9	2.0	56	115	162	267
Philippines	2.7	2.3	1.5	32	59	77	111
Others	2.0	2.3	1.4	106	168	222	317
Pacific	2.4	1.9	2.0	3	6	7	12
LATIN AMERICA, Central America & The Caribbean	2.5	1.9	1.4	223	394	495	702
Mexico	3.0	1.9	1.4	43	85	107	150
Others	2.4	2.2	1.7	28	49	64	99
South America	2.4	1.9	1.4	151	260	324	453
Brazil	2.5	1.8	1.3	82	144	179	246
Argentine	1.5	1.2	0.9	22	32	36	45
Others	2.6	2.1	1.6	47	84	109	162
AFRICA	2.9	3.1	2.4	299	576	829	1517
Sub-Saharan Afr.	2.9	3.3	2.6	238	465	681	1302
Nigeria	2.7	3.5	2.6	58	106	159	301
Ethiopia	3.0	2.7	2.4	23	45	61	112
Zaire	2.5	3.2	2.8	19	34	49	99
Sudan	2.5	2.9	2.3	14	24	34	60
Tanzania	3.2	3.8	3.1	12	25	40	85
Kenya	3.6	4.2	2.9	10	23	38	78
Ghana	2.6	3.1	2.4	8	14	20	37
Sahel Group	2.7	3.0	2.5	22	40	57	105
Other LICs	3.2	3.1	2.6	56	116	168	319
MICs	3.5	3.1	2.6	17	38	55	106
North Africa	2.7	2.4	1.5	61	111	148	215
Egypt	2.4	2.2	1.4	30	51	67	94
Others	2.9	2.6	1.6	31	60	81	121
MIDDLE-EAST	3.2	3.1	2.4	60	123	178	319
Memo items							
Developing countries, total	2.4	2.0	1.4	2208	3771	4801	6856
LLDCs	2.6	2.9	2.2	233	417	586	1011
OECD countries	0.8	0.5	0.3	697	846	900	961

6. Ibid, P.103

implication of these problems will be felt in terms of worldwide environment damage"7.

"The present high rate of population growth increases the burden of dependency and reduce the resources available for raising and maintaining subsistence level"8. This pressure of the growing numbers in LDC's affect different areas: it increases dependency, hunger, poverty, poor sanitation and widespread disease. The main result to moderate population growth must be through voluntary family planning. To increase the effectiveness of population development, high priority should be given to areas of socio-economic and environmental planning.

There are "more than 5 billion people in the world today , more than 70 percent live in developing countries"9. "More than 80 percent of the population increase is occurring in developing countries"10.

7.Ibid, P.102

8.Ibid, P.35

9.United Nations, World Economy,(United Nations Department Of Public Information, March 1990),P.2

10.Ibid, P.3

"The number of people living in extreme poverty is estimated to have risen from 950 million in 1970 to more than 1.1 billion on 1985"¹¹. Henceforth, hunger is increasing and the gap between developed and developing countries in both economic as well as social scales are only getting wider as measured in terms of per capita GNP, income, reserve, purchasing power, etc For instance, "in Africa GDP growth rate have consistently lagged behind population growth, so that output per person on the continent has declined every year since 1980 "¹².

In addition the repayment of debt by LDC's is diverting public funds from the essential sectors such as health and education, therefore, the people are the one who suffer.

For instance, "the interest alone that Brazil has to pay on its debt in 1988 corresponded to 266 million monthly salaries at the minimum wage, or 81,700 schoolrooms , or 7.7 million low income housing units"¹³.

A country growth and development should be first invested in human centered development ,an

11. Ibid, P.5
12. Ibid, P.8
13. Ibid, P.24

interrelationship between economic development and social advancement should be made. If hunger, malnutrition, illiteracy exist at a high rate, then this will affect the growth and development of a country because its main asset is the human being. Still, the burden of debt is increasing in LDC's and an explosive population growth is only creating more strain on their societies and governments.

IV . Certain Analytical Figures

For a suitable analytical purpose, developing countries would be grouped according to characteristics such as their per capita income, their financial situation and their economic structure.

1. Real product growth rate.

"The purpose of the real product growth rate is to give some overall impression of the growth in final output achieved by developing countries and territories during the years covered".¹⁴

14. Development Center of the Organization for Economic Co-operation and Development. Information on National Accounts of Developing Countries. December 1990.

2. Population growth rate.

For many developing countries, the population growth rate is underestimated in official statistics. "Some lack regularity in the the growth of population which can be explained by large migration movement or occurrence of some catastrophe".¹⁵

3. Per capita real product growth rate.

"Growth rate of real product per capita for countries were obtained by dividing the growth rate of real product by those of the population. Hence, per capita can be significantly affected by the economic or demographic performance of the country".¹⁶

Table below shows the average annual growth rate of real product, population and real product per capita for the years between 1959-69, 1969-79 and 1979-89.¹⁷

15. Ibid.
16. Ibid.
17. Ibid.

TABLE 1. AVERAGE ANNUAL GROWTH RATES OF TOTAL AND PER CAPITA REAL PRODUCT AND POPULATION
TAUX DE CROISSANCE ANNUELS MOYENS DU PRODUIT REEL TOTAL ET PAR HABITANT ET DE LA POPULATION

	TOTAL REAL PRODUCT PRODUIT REEL TOTAL			POPULATION			PER CAPITA REAL PRODUCT PRODUIT REEL PAR HABITANT		
	1959-1969	1969-1979	1979-1989	1959-1969	1969-1979	1979-1989	1959-1969	1969-1979	1979-1989
ALGERIA	2.9	7.3	2.4	2.9	3.2	3.1	0.0	4.0	-0.7
EGYPT	5.7	6.5	4.4	2.6	2.3	2.7	3.0	4.1	1.7
MAROC	26.1	1.6	-4.5	3.9	4.3	4.2	21.4	-2.6	-8.4
LIBYA	3.7	4.8	4.0	2.8	3.0	2.8	0.8	1.8	1.1
MOROCCO	4.6	8.1	3.5	2.2	2.6	2.6	2.4	5.4	0.9
TUNISIA									
WESTERN SAHARA									
ANGOLA	6.2	5.8	2.2	2.7	2.7	2.9	3.4	3.0	-0.7
BENIN									
BOZOTAKA	5.4	-6.4	0.5	1.9	3.2	2.6	3.5	-9.3	-2.1
BURUNDI	3.2	2.6	1.8	2.5	2.7	3.2	0.8	-0.1	-1.4
BURUNDI	4.9	15.5	11.3	2.4	3.2	3.7	2.5	11.8	7.3
BURUNDI	3.1	0.8	4.3	2.0	2.1	3.6	1.1	-1.3	1.3
BURUNDI	3.0	4.1	4.0	2.4	1.8	2.8	0.7	2.3	1.2
BURUNDI	3.4	4.1	5.2	2.0	2.4	3.2	1.4	1.5	2.0
BURUNDI	3.4	1.4	1.3	1.9	2.3	2.4	-0.6	-0.9	-1.0
BURUNDI	0.4	0.5	5.9	2.0	2.1	2.4	-1.6	-1.5	3.5
BURUNDI	4.0	4.0	2.4	2.1	2.5	2.7	2.0	2.0	-0.2
BURUNDI	8.3	5.8	0.2	3.8	4.3	4.3	1.9	1.5	-3.3
BURUNDI	4.5	2.1	1.7	2.0	2.5	2.7	4.3	3.5	1.0
BURUNDI	4.0	8.4	-1.6	0.5	3.1	3.4	3.4	7.3	-1.2
BURUNDI	2.2	0.6	2.1	2.5	3.1	3.4	-0.3	-2.5	0.4
BURUNDI	3.6	4.4	2.9	2.5	2.3	2.4	2.0	2.0	-0.6
BURUNDI	5.7	5.1	4.1	3.3	3.3	4.7	2.3	1.5	-0.6
BURUNDI	6.0	8.7	3.2	3.0	3.5	2.8	1.4	6.3	0.4
BURUNDI	2.4	0.6	-0.4	2.2	2.6	3.2	0.2	-3.1	-5.6
BURUNDI	4.3	7.2	2.7	2.7	2.7	3.2	2.5	4.4	-0.5
BURUNDI	3.2	4.2	2.8	2.2	2.7	2.9	0.9	1.8	-0.1
BURUNDI	7.2	3.5	0.9	2.1	3.0	2.7	5.2	0.8	-1.8
BURUNDI	4.1	3.3	5.3	2.4	2.3	1.2	0.4	6.2	4.1
BURUNDI	3.8	-2.0	-1.5	1.5	2.7	2.7	2.6	-4.6	-4.2
BURUNDI	4.1	3.6	-0.7	2.7	2.8	2.9	-2.1	-2.2	-4.6
BURUNDI	3.8	6.3	0.7	2.7	3.2	3.4	-0.2	2.8	-0.3
BURUNDI	2.3	5.6	3.1	3.3	3.1	3.4	-2.9	2.4	-0.3
BURUNDI	1.4	3.5	3.0	2.4	2.6	2.5	0.2	0.0	0.5
BURUNDI	2.6	2.6	3.0	2.2	2.2	1.9	3.8	-0.8	-0.8
BURUNDI	4.0	1.3	1.0	2.3	2.7	3.6	-1.5	0.2	-0.2
BURUNDI	0.7	3.8	3.4	2.2	2.6	3.1	-0.8	0.9	-1.1
BURUNDI	2.4	1.7	2.1	2.5	2.8	3.3	3.2	2.4	-1.4
BURUNDI	5.8	4.3	0.2	2.6	2.6	3.1	5.7	0.0	-2.8
BURUNDI	8.4	2.6	0.2	2.5	2.6	3.4	-3.9	-0.8	-0.8
BURUNDI	4.3	2.6	2.6	2.6	3.3	3.4	-2.2	-2.8	-2.6
BURUNDI	4.3	-0.7	2.6	2.6	3.1	3.8	-2.2	-2.4	-2.6
BURUNDI	4.8	1.7	1.9	4.5	3.1	3.0	2.2	-0.8	0.7
BURUNDI	4.5	2.5	3.5	3.2	3.3	2.8	3.3	-0.8	-0.5
BURUNDI	7.2	2.9	2.3	2.3	2.6	2.9	4.7	0.4	-0.5
OTHER (1)									
SOUTH OF SAHARA	3.8	3.1	2.0	2.5	2.9	3.2	2.2	0.2	-2.2
AFRICA	4.6	4.1	2.6	2.6	2.9	3.1	2.0	2.2	-1.5

TABLE 1. AVERAGE ANNUAL GROWTH RATES OF TOTAL AND PER CAPITA REAL PRODUCT AND POPULATION
TAUX DE CROISSANCE ANNUELS MOYENS DU PRODUIT REEL TOTAL ET PAR HABITANT ET DE LA POPULATION

	TOTAL REAL PRODUCT PRODUIT REEL TOTAL		POPULATION POPULATION		PER CAPITA REAL PRODUCT PRODUIT REEL PAR HABITANT	
	1959-1969	1979-1989	1959-1969	1979-1989	1959-1969	1979-1989
COSTA RICA	6.1	6.2	2.3	2.5	2.5	3.6
CUBA	1.5	0.3	2.3	1.5	-0.6	-1.1
DOMINICAN REP.	4.1	7.3	2.5	3.1	1.1	4.1
EL SALVADOR	6.2	5.0	-0.5	3.6	2.5	2.2
GUATEMALA	5.4	5.9	0.3	2.9	2.4	2.9
HAITI	0.8	4.0	0.3	1.6	-0.7	2.3
HONDURAS	5.5	5.5	1.9	3.3	2.5	2.1
JAMAICA	5.0	0.6	0.7	1.4	3.5	-0.8
MEXICO	7.3	6.2	1.2	3.4	3.7	3.7
NICARAGUA	7.7	2.8	0.3	3.7	4.8	-0.9
PANAMA	7.8	4.2	1.4	2.8	4.6	1.3
TRINIDAD TOBAGO	4.6	4.6	-3.6	1.1	2.1	3.4
OTHER (2)	5.5	2.4	1.6	0.8	3.6	1.6
NORTH AMERICA	6.3	5.5	1.1	3.0	3.2	2.5
ARGENTINA	4.1	2.6	-0.4	1.4	2.6	1.2
BOLIVIA	5.8	5.2	-1.4	2.7	3.1	2.5
BRAZIL	5.1	8.8	2.6	2.7	2.7	5.9
CHILE	4.6	0.7	2.6	1.8	2.4	-1.1
COLOMBIA	4.9	5.6	3.3	3.0	1.9	2.7
ECUADOR	4.4	9.7	2.1	3.1	1.3	6.5
PALCQUAY	4.3	7.9	2.6	3.0	1.7	4.7
PERU	5.5	3.4	0.8	2.6	2.5	0.6
URUGUAY	0.9	2.6	0.1	3.3	-0.4	1.9
VENEZUELA	6.0	5.4	0.3	3.3	2.4	2.0
OTHER (3)	5.8	2.6	-1.5	2.5	3.2	1.3
SOUTH AMERICA	4.9	6.2	1.7	2.6	3.2	3.6
AMERICA	5.3	6.0	1.5	2.7	2.5	3.2
COSTA RICA				2.6		-0.3
CUBA				0.9		1.5
REP. DOMINICAINE				2.9		-0.6
EL SALVADOR				1.5		-2.0
GUATEMALA				2.7		-2.5
HAITI				3.0		-1.3
HONDURAS				2.9		-1.4
JAMAIQUE				1.6		-1.1
MEXIQUE				3.3		-1.0
NICARAGUA				1.9		-3.1
PANAMA				2.2		-0.8
TRINITE ET TOBAGO				3.5		-5.2
AUTRES (2)				2.2		0.6
AMERIQUE DU NORD				1.8		-1.0
ARGENTINE				2.2		-1.9
BOLIVIE				1.6		-4.1
BRESIL				2.8		0.4
CHILI				1.7		0.9
COLOMBIE				2.2		1.2
EQUATEUR				1.7		-0.8
PAPAGOUY				2.0		-0.6
PEROU				2.9		-1.8
URUGUAY				3.2		-0.6
VENEZUELA				0.6		-2.4
AUTRES (3)				2.8		-3.2
AMERIQUE DU SUD				1.8		-0.5
AMERIQUE				2.2		-0.6

(2) (3) See notes at the end of table 5
Voir les notes a la fin du tableau 5

TABLE 1. AVERAGE ANNUAL GROWTH RATES OF TOTAL AND PER CAPITA REAL PRODUCT AND POPULATION
TAUX DE CROISSANCE ANNUELS MOYENS DU PRODUIT REEL TOTAL ET PAR HABITANT ET DE LA POPULATION

	TOTAL REAL PRODUCT PRODUIT REEL TOTAL		POPULATION POPULATION		PER CAPITA REAL PRODUCT PRODUIT REEL PAR HABITANT	
	1959-1969	1969-1979	1959-1969	1969-1979	1959-1969	1969-1979
YEMEN	3.9	6.6	2.9	2.5	6.9	4.0
IRAQ	6.5	10.3	3.2	3.5	3.2	6.6
ISRAEL	8.6	5.5	3.5	3.7	4.9	2.6
JORDAN	8.3	8.5	2.9	3.8	5.2	5.1
KUWAIT	6.7	2.5	10.6	6.4	-3.5	-3.6
LIBANON	4.8	6.1	2.9	1.3	1.8	4.7
SAUDI ARABIA	10.6	11.3	2.6	3.3	7.8	7.7
SYRIA	4.7	10.2	3.3	3.4	1.3	6.7
U. ARAB EMIRATES	10.3	15.0	4.9	5.1	3.1	-1.3
YEMEN ARAB REP.	3.5	9.2	3.9	2.0	1.6	7.0
YEMEN DEM. REP.	1.9	10.8	3.3	2.9	-1.4	7.6
OTHER (4)	11.7	5.4	3.1	4.5	8.3	0.9
MIDDLE EAST	8.3	8.1	3.0	2.9	5.2	3.0
AFGHANISTAN	2.0	2.8	2.2	2.2	-0.2	0.5
BANGLADESH	4.4	4.6	2.5	2.7	1.9	1.8
BRUNAI	1.9	0.9	2.0	1.9	-0.1	-1.0
INDIA	3.7	3.3	2.2	2.3	1.5	1.0
KHAMBAR	2.7	3.9	2.2	2.2	0.5	1.7
NEPAL	2.5	2.7	1.7	2.2	0.7	0.5
PAKISTAN	6.3	4.8	2.6	3.0	3.6	1.7
SRI LANKA	4.5	4.6	2.4	1.6	2.1	2.9
OTHER (5)	3.1	5.2	2.4	2.7	0.7	2.5
SOUTH ASIA	4.2	3.7	2.3	2.4	1.9	1.3
HONG KONG	9.5	8.9	3.0	2.3	6.3	6.5
INDONESIA	2.4	7.8	2.6	2.2	-0.2	5.3
KAMPUCHEA	3.8	4.5	2.8	0.9	1.0	0.0
KOREA SOUTH	7.7	8.7	2.7	1.7	4.9	7.8
LAOS	3.8	3.4	3.4	2.4	1.3	1.3
MALAYSIA	5.9	9.1	3.1	2.7	2.8	6.2
PHILIPPINES	4.9	6.3	3.0	2.9	1.9	3.3
SINGAPORE	7.2	8.9	2.5	1.5	3.2	7.3
TAIWAN	9.3	9.8	3.1	2.0	6.2	7.6
THAILAND	8.3	7.1	3.2	1.9	5.0	4.3
VIETNAM	2.9	8.7	2.1	2.4	0.7	6.2
OTHER (6)	7.0	13.1	4.3	2.7	2.5	10.1
PAC EAST	5.7	8.2	2.7	2.4	2.9	5.6
CHINA	7.1	5.5	2.1	1.9	4.9	3.5
ASIA	6.0	6.0	2.3	2.2	3.6	3.7
IRAN						-1.2
IRAQ						-5.9
ISRAEL						1.5
JORDAN						0.8
KUWAIT						-5.7
LIBANON						-6.4
SAUDI ARABIA						-4.8
SYRIA						-1.2
U. ARAB EMIRATES						-7.0
YEMEN ARAB REP.						1.5
YEMEN DEM. REP.						-5.0
OTHER (4)						-3.5
MOYEN ORIENT						-2.7
AFGHANISTAN						-0.7
BANGLADESH						1.7
BRUNAI						4.3
INDON						3.4
KHAMBAR						-0.7
NEPAL						1.8
PAKISTAN						3.4
SRI LANKA						2.7
OTHER (5)						6.5
ASIE DU SUD						3.1
HONG KONG						5.8
INDONESIE						2.3
KAMPUCHEA						1.9
CORÉE DU SUD						7.2
LAOS						-1.9
MALAYSIE						2.4
PHILIPPINES						-1.4
SINGAPOUR						3.3
TAÏWAN						6.1
THAÏLANDE						4.0
VIETNAM						2.1
AUTRES (6)						-4.3
EXTRÊME ORIENT						3.9
CHINE						7.4
ASIE						2.5

(4) (5) (6) See notes at the end of Table 5
Voir les notes à la fin du tableau 5

CHAPTER III

Methodology

This chapter will present the methodology used and the procedure taken in this study.

1. 75 countries would be chosen with their corresponding debt, dated 1988.

2. Sources about each country are given from the International Financial Statistics (IFS), Euromoney and the Balance of Payment (BOP).

3. 32 relevant variables could be extracted from the available data source and would be used in a statistical analysis. Therefore, this study will include an analysis of different correlation and regression of projected variables.

Following are the list of the countries chosen for the study and list of the 32 variables to be analyzed. Also, a definition and an explanation of the different variables are provided.

The 75 countries are:

Algeria	Argentina	Bahamas
Bangladesh	Barbados	Benin
Bolivia	Botswana	Burundi
Cameroon	Center Afr.Rep	Chile
China	Colombia	Comoros
Congo	Costa Rica	Cote D'Ivoire
Cyprus	Dominican Rep.	Ecuador
Egypt	El Salvador	Ethiopia
Gabon	Gambia	Ghana
Grenada	Guatemala	Guinea Bissau
Guyana	Haiti	India
Indonesia	Jamaica	Jordan
Kenya	South Korea	Lesotho
Malawi	Malaysia	Mali
Mauritius	Mexico	Morocco
Nepal	Nicaragua	Niger
Nigeria	Pakistan	Panama
Papua New Guinea	Paraguay	Peru
Philippines	Rwanda	Sao Tome
Seychelles	Solomon Islands	Sri Lanka
Swaziland	Syria	Thailand
Togo	Trinidad&Tob.	Tunisia
Turkey	Uganda	Uruguay
Vanuata	Venezuela	Western Samoa
Yemen Arab Rep.	Yemen Fdr	Zaire

The 32 variables are:

X1	GNP	X2	Exports
X3	Imports	X4	Reserves
X5	Current Account	X6	Total Debt
X7	Interest Arr	X8	Princ. Resch.
X9	Interest Resch.	X10	Pub.G.Debt
X11	Priv.N.G.Debt	X12	Population
X13	DSR	X14	Imp/Reserves
X15	Amortization	X16	DS/Reserves
X17	DOD	X18	Disbursements
X19	Princ. Paymt	X20	Net Flows
X21	Interest Paymt	X22	TOT D.S
X23	DS/GNP	X24	Res/GNP
X25	A.C/Exp	X26	Cap/Acc
X27	Trade Bal	X28	EDT/GNP
X29	Imp/GNP	X30	Exp/GNP
X31	EDT/Reserves	X32	EDT/Exp

- X1 * GNP: Gross National Product. It is the dollar value of all final goods and services produced in an economy during a specified period of time, usually yearly.
- X2 * Exports: Total spending by foreigners on domestically produced goods and services. This expenditure flow is an injection to national income.
- X3 * Imports: Total spending by domestic residents on foreign-produced goods and services. This constitutes a leakage from domestic income flow.
- X4 * RES: International Reserves: Assets that can be used directly to meet an excess demand for foreign exchange such as foreign exchange, gold, SDRs, etc...
- X5 * Current Account: The sum total of exports of goods and services, minus net unilateral transfers abroad.

- X6 * Total debt: It encompasses public long-term debt, IMF debt, as well as estimated public and private short-term debt.
- X7 * Interest Arrears: Interest payments on unpaid or overdue debt.
- X8 * Principal Rescheduled: Unpaid, due principal that has been rescheduled, hence representing additional debt.
- X9 * Interest Rescheduled: Unpaid, due interest on a loan that has been rescheduled, hence representing additional debt.
- X10 * Public/Publicly Guaranteed Debt: External debt of either is guaranteed by a public entity, a government or a branch of government.
- X11 * Private Non-Guaranteed Debt: External obligations of a private debtor without local government guarantee.
- X12 * Population: Proxy for country size variable.

- X13 * (DSR) Debt-Service-Ratio: It is total debt service, i.e. principal plus interest payments divided by Exports.
- X14 * Imp/Reserves: Ratio of imports to total international reserves - foreign exchange, gold, SDRs.
- X15 * Amortization Ratio: Ratio of principal payment to total debt.
- X16 * DS/Reserves: Ratio of debt servicing to international reserves.
- X17 * (DOD) Debt Outstanding and Disbursed: Total outstanding debt at the end of the year.
- X18 * Disbursements : Drawings on loan commitments during the specified year.
- X19 * Principal Payment: That part of debt servicing devoted to reducing the principal.

- X20 * Net Flows: Disbursements used by debtor net of that part used to repay the principal.
- X21 * Interest Payment: That part of debt servicing devoted to payment of interest during the specified year.
- X22 * (TOT DS) (Total Debt Servicing): Principal plus interest payment.
- X23 * (DS/GNP): Ratio of debt service to GNP, i.e. that portion of a country's gross income devoted to service its debt.
- X24 * (RES/GNP): Ratio of international reserves to GNP. a proxy variable for a country's international liquidity.
- X25 * (A.C/Exp): Ratio of current account to Exports.
- X26 * (CAP/A.C): Ratio of capital inflow to current account.

- X27 * Trade Bal.: Merchandise exports minus merchandize imports evaluated on a f.o.b. basis.
- X28 * EDT/GNP: Ratio of external debt to GNP, an indication of the size of a country's debt as a percentage of its total income.
- X29 * IMP/GNP: Ratio of imports to GNP. Proxy for percentage of income due to flow out of the income.
- X30 * EXP/GNP: Ratio of exports to GNP. That percentage of income expected to flow into the economy from non domestic sources.
- X31 * EDT/Reserves : Ratio of external debt to international reserves. An indicator of a country's ability to provide funds in meeting its external debt.
- X32 * EDT/EXP: Ratio of external debt to exports. Indication of a country's foreign exchange earnings from merchandise trade in meeting its external debt.

The analysis will include regression and correlation.

* Regression: The regression analysis describes the way in which one variable is related to one or more other variables. This analysis will provide estimates of the dependent variable for given values of the independent variables.

* Correlation: The correlation analysis is concerned with the strength of the relationship between two variables. The coefficient of correlation and the coefficient of determination are two measures generally used for this purpose.

CHAPTER IV

Study Findings

Having identified the design and the methodology of this research, the variables to be included, and the analysis tools to be used, it is an important step now to list the findings and the implications of the study and to evaluate them in the light of the facts prevailing in the developing countries.

In chapter I, it was stated that the purpose of the study is to describe the situation prevailing in the developing countries based on certain factors majorly reserves, external debt, interest payment, population size, ratio of current account to exports, and to build up certain regression models to study the effect of some factors upon critical variables such as debt and reserves. The aim of this chapter is to answer these questions in the light of the findings obtained and the interpretation of results.

I. Descriptive Analysis of the Major Features Prevailing in the Developing Countries

As was mentioned earlier, 75 countries were selected as the major area for this study. The common feature among them is that they are all developing

countries -belonging either to Africa or Latin America-facing major economic problems. Now, based on the frequency distributions of five important variables and the statistics associated with them, some conclusions about certain situations prevailing in the developing countries selected for this study will be drawn. A detailed list of all the frequency distributions is found in Appendix A. The statistical measures to be used are the mean, median, mode for skewed data which are the three common measures of location. These will be applied on the following variables:

1. International Reserves
2. Debt outstanding and disbursed
3. Population size
4. Interest payment
5. Ratio of current account to exports

A. International Reserves

These are some reserves that each nation holds, in such forms as gold, currencies of other nations, and Special Drawing Rights (SDR)s. International reserves serve as "international money", to be used when a country encounters foreign liquidity or balance-of-

payments difficulties. The importance of international reserves comes from the fact that no country is prepared to allow its exchange rate to float freely.

The distribution of the international reserves among the 75 countries selected for this study is shown in Table 4.1.

Table 4.1 -Frequency Distribution - International Reserves

Reserves	Percentage	Cumulative Percentage
1-2,000	80%	80%
2,001-4,000	7.8	87.8
4,001-6,000	1.3	89.1
6,001-8,000	6.5	95.6
8,001-10,000	1.3	96.9
10,001-12,000	0	96.9
12,001-14,000	1.3	98.2
14,001-16,000	0	98.2
16,001-18,000	0	98.2
18,001-20,000	0	98.2
20,001-	1.3	99.5

As the table shows, a large number of these developing countries has low international reserves. 80% have an amount of reserves ranging between \$1 mill - \$2,000 mill; 7.8%, \$2,001 mill - \$4,000 mill; 1.3%, \$4,0001 mill - \$6,000 mill; ... 0%, \$14,001 mill - 20,000 mill; and 1.3%, \$20,001 and above. This can clearly show that a significant percentage of these countries are poor countries with serious problems and difficulties concerning foreign liquidity and balance-of-payment aspects. The same results could be derived by analyzing the statistical measures that stand as measures of location or skewness. These are found in Table 4.2.

Table 4.2 -Mode, Median and Mean for Skewness
International Reserves

Mean	1651.684	Std. Err	411.960
Mode	237.000	Std. Dev.	3567.677
Kurtosis	20.376	S.E Skurt	0.548
SE Skew	.277	Range	23746.000
Maximum	23752.000	Sum	123876.300
Median	297.000		
Skewness	4.010		
Minimum	6.000		

The analysis that could be derived from these statistical measures and from the histogram shown in Appendix A is that the data representing the international reserves is skewed to the right (Mode = 237; Median = 297; Mean = 1651.684). This means that a high percentage of the data is located to the left of the mean, which again implies a low amount of international reserves in most of the developing countries being studied.

B. Debt Outstanding and Disbursed

As an international working on external debt statistics composed of the Bank for International Settlements (BIS), the International Monetary Fund (IMF), the Organization for Economic Cooperation and Development (OECD) and the World Bank has defined it, the "Gross external debt is the amount, at any given time, of disbursed and outstanding contractual liabilities of residents in a country to non-residents to repay principal, with or without interest".¹ Most developing countries have a core of public and publicly guaranteed debt that has for a long time been reported

¹World Bank, IMF, BIS and OCED, External Debt (Definition, Statistical Coverage and Methodology), Paris, 1988, p. 19.

every six months to the World Bank. This core debt is of concern to the Ministry of Finance because it requires government fiscal resources for debt servicing. It is also of concern to the Central Bank because of its claims on foreign exchange earnings. In addition, the Central Bank must worry about the non-guaranteed external debt of the private sector as well as other liabilities such as remittances of returns on direct foreign investment, leasing contracts, short-term trade credits and interbank lines, etc.

The build-up of external debt by developing countries has of course been going on for a long time. It was a corner stone in their strategy for economic and social development from the 1950s onwards. However, as was mentioned in Chapter II, and for a number of reasons, the orderly process of borrowing for development has gotten out of hand during the last 10-15 years. Total medium and long-term debt of developing countries doubled in real terms from 1974 to 1982.

The distribution of the external debt in this study is shown in Table 4.3..

Table 4.3 -External Debt: Frequency Distribution

Debt Outstanding & Disbursed	Percentage	Cumulative Percentage
-7,000	68%	68
7,001-14,000	9.1	77.1
14,001-21,000	7.8	84.9
21,001-28,000	5.2	90.1
28,001-35,000	3.9	94
35,001-42,000	1.3	95.3
42,001-49,000	1.3	96.6
49,001-56,000	1.3	97.9
56,001-63,000	0	97.9
63,001-70,000	0	97.9
70,001-77,000	0	97.9
77,001-84,000	0	97.9
84,001-91,000	0	97.9
91,001-98,000	1.3	97.9

As results show, a large percentage (68%) of the developing countries selected for the study have an amount less than or equal to \$7,000 million. Also, an

analysis of the statistics that represent the measure of location was performed. These statistical results are shown in Table 4.4.

Table 4.4 -Mode, Median and Mean for Skewness: External Debt

Mean	9223.020	Std. Err	1760.706
Median	71.800	Std. Dev	15248.165
Kurtosis	14.597	SE Skurt	0.548
SE Skew	.277	Range	96847.200
Maximum	96919	Sum	691726.500
Median	2606.000		
Skewness	3.277		
Minimum	71.800		

These along with the detailed frequency distribution and distribution histogram of this variable presented in Appendix A can clearly reveal that the distribution is skewed to the right with most of the developing countries having low amounts of Debt Outstanding and Disbursed (DOD). Of course, this result highly contradicts the literature presented in Chapter II and

the debt situation in the developing countries which is very well known. However, a deep analysis of these statistical results can tell that the set of data representing DOD has no mode since no one value occurs more frequently than another. In this case, the mode can no more be used as an indicative measure of location. On the other hand, the mean also cannot be used as a reliable measure. This is because of the three common measures of location, the mean is most affected by a skewed distribution. Thus, although it is the most commonly used statistical measure, the mean is not always the best measure of location. Therefore, the median will be the most proper measure to be used to describe the distribution of data. Thus, it would be safer in this case to say that 50% of the developing countries selected for this study have an amount of debt below \$2606 mill. and the other 50% have an amount exceeding \$2606 mill.

C. Population

Since 70% of the world population growth is taking place in the developing countries, accompanied

with the lack of resources, good planning and effective education this will lead to the increase in the debt crisis faced by these countries.

The distribution of data related to the population variable in this study is clearly shown in the frequency distribution and Histogram presented in Appendix A. Table 4.5 will be a presentation of the measures of location for population.

Table 4.5 -Mode, Median and Mode for Skewness:

Population			
Mean	43.635	Std. Err	17.967
Mode	0.690	Std. Dev.	155.598
Kurtosis	34.969	SE Skurt	.548
SE Skew	.277	Range	1083.780
Maximum	1083.890	Sum	3272.650
Median	6.920		
Skewness	5.833		
Minimum	0.110		

These results can show that the population variable is highly skewed to the left with most of the developing countries having low population rates. However, here

again, an analysis of the data distribution shows that this data set has no mode; that is no value is significantly occurring more than the others. This means that the mode cannot be used as an indicative measure of location in this case. Also, and for the same reason just mentioned for the previous variable, the mean cannot be considered as the best measure of location. Therefore, based on the median value, it could be stated that 50% of the developing countries have a population size less than or equal to 6.920 mill., and 50% of them have a population size greater than or equal to 6.920 mill..

D. Interest Payment

It is the part of debt servicing devoted to payment of interest during a certain period of time. As is well known, the international debt crisis became acute in 1982. Excessively high nominal interest rates used to stamp out inflation, together with an appreciation of the U.S. dollar to more than twice its former value, had by then dramatically increased the cost of servicing the debt. Even when interest rates returned to more normal levels and the dollar was devalued in the mid-1980s,

prices of oil and other commodities also fell and this, of course, reduced the export reserves of developing countries, so that the ratio of their debt service to exports remained unchanged or even rose.

The frequency distribution of this variable (shown in Table 4.6) clearly reveals the seriousness of the debt crisis faced by the developing countries.

Table 4.6 -Frequency Distribution: Interest Payment

Interest Cumulative Payment	Percent Percentage
0-100	48.6% 48.6
101-200	14.3 62.9
201-300	7.8 70.7
301-500	2.6 73.3
501-600	2.6 75.9
601-800	2.6 78.5
801-1000	1.3 79.8
1001-1400	6.5 86.3
1401-1500	3.9 90.2
1501-1800	1.3 91.5
1801-2300	1.3 92.8
2301-2700	2.6 95.4
2701-3000	1.3 96.7
3001-5000	1.3 98
5000-	1.3 99.3

The results show that the part of debt servicing devoted to payment of interest is very small in most of the developing countries (48%). This means a higher accumulation of liabilities and a larger debt burden to be carried over the years, which in turn leads to a higher inability to meet the debt servicing requirements. The same result can be obtained from the three measures of location and skewness. These are presented in Table 4.7.

Table 4.7 -Mode, Median and Mean for Skewness: Interest
Payment

Mean	526.165	Std. Error	123.751
Mode	15	Std. Dev.	1071.712
Kurtosis	19.429	SE Skurt	.548
SE Skew	.277	Range	7090.100
Maximum	7091.000	Sum	39462.400
Median	106.000		
Skewness	3.881		
Minimum	.900		

The values of these measures (Mode = 15, Median = 106, and Mean = 526.165) can clearly show that the data set is skewed to the right which means that most of the developing countries are not meeting this part of debt service because of the accumulation of debt and thus the accumulation of the Interest Payment amounts which makes it difficult for these countries to pay their interest liabilities.

E. Ratio of Current Account to Exports

The part of a nation's balance of payments that deals with merchandise (or visible) imports or exports is called the balance of trade. When "invisibles", or services, are included, the total accounting for imports and exports of goods and services is called the balance on current account.

The frequency distribution of this ratio variable shows negative values which is natural because of the deficits in the balance of payments in most of the developing countries. Table 4.8 shows the mode, median and mean for the ratio of current account to exports.

Table 4.8 -Measures of Location: Ratio of Current
Account to Exports

Mean	-0.220	Std. Err.	0.043
Mode	-0.090	Std. Dev.	0.371
Kurtosis	21.043	SE Skurt	0.548
SE Skew	0.277	Range	2.820
Maximum	0.260	Sum	-16.510
Median	-0.140		
Skewness	-3.738		
Minimum	-2.560		

The mode presented cannot be considered indicative since the data set has no mode value, meaning that no one data value is occurring more than the others. The analysis would be based upon the median, and thus it could be stated that 50% of the developing countries selected for this study have a ratio of current account to export less than or equal to -0.14 and 50% have a ratio equal to or greater than -0.14. Such a deficit, comes naturally as a result of the trade deficit, the inability of achieving an equilibrium between exports and imports.

II . Regression Analysis

The regression analysis was used to build regression equations that could depict the potential relationships between dependent variables and independent variables. A dependent variable is the variable whose explanation is likely to be explained. An independent variable is a variable used to explain variation in the dependent variable. The intention was to build a recursive system of three regression equations, taking Reserves and Debt Outstanding and Disbursed as dependent variables, and other variables as independent variables.

A. Building a Regression with Reserves Being the Dependent Variable

A first step in developing the regression model was to examine the relationship between each independent variable and dependent variable, and between each independent variables and other independent variable. The dependent variable was Reserves (Res), and the independent variables were population and Interest Payment. The resulting correlation matrix is shown in

Table 4.9..

Table 4.9 -Correlation Matrix between Reserves and Independent Variables

		Res.	Pop.	Int. Pay.
		L18	L37	L62
Res.	L18	1.000	.703	.781
Pop.	L37	.703	1.000	.684
Int. Pay.	L62	.781	.684	1.000

As noticed, high correlation coefficients exists between the reserves variable and the variables population size and Interest Payment. The correlation coefficient could also assist in assigning a relative importance to each independent variable in explaining the variations in the dependent variable. The larger the correlation coefficient, the stronger the linear association. The results show that the independent variables could be ranked in the order of

their importance as potential predictors of Reserves. Also, a stepwise regression analysis was used to build the regression equation through a forward selection of variables.

As expected, the first independent variable that entered the regression equation was the Interest Payment. Table 4.10 shows the results of the first regression output at a significance level of 0.1.

Table 4.10 -Regression Output - Dependent Variable =
Reserves
(First run)

Equation Number 1	Dependent Variable--
	RES International Reserves
Variables (S)	Entered on Step Number
1.. L62	Interest Payment
Multiple R	0.78101
R Square	0.60998
Adjusted R Square	0.60463
Standard Error	0.54395
Analysis of Variance	
	DF
Regression	1
Residual	73
F = 114.16841	Signif. F = 0.0000

R Square (R²), the coefficient of determination, shows how much of the variation in the dependent variable could be explained by the independent variables included. In this output, R² = 0.609, i.e., 60.9%, which means that about 61% of the variations in the Reserves of the developing countries selected for this study could be explained by the "Interest Payment" factor. In step number 2, "population" was included, and thus the final regression output was as follows:

Multiple R	0.81443
R Square	0.66329
Adjusted R Square	0.65394
Standard Error	0.50890

Analysis of Variance

	DF
Regression	2
Residual	72
F = 70.91712	Signif. F = 0.0000

The coefficients of the independent variables are the beta values listed in Table 4.11.

Table 4.11 -Beta Coefficients and the Test for Significance of the Independent Variables

Variable	Beta	T	Sig T
Int. Payment	0.52476	6.021	0.0000
Population	0.32283	3.376	0.0012
(Constant)	1.19631	8.338	0.0000

Beta shows the value of change in the dependent variable, holding other variables constant. As a result, the resulting regression equation is:

$$\begin{aligned}
 \text{RES} &= 1.19631 + 0.52476 \text{ Interest Payment} + 0.32283 \text{ Population} \\
 &\quad (0.0000) \qquad (0.0000) \qquad (0.0012)
 \end{aligned}$$

$$R^2 = 0.66329 = 66.3\%$$

1. The Significance of the Overall Regression Model

The R square (multiple coefficient of determination) is given in the output run generated by

the computer (Appendix B) as 0.663. Therefore, almost 66.3% of the variation in Reserves can be explained by the two independent variables included in the regression model.

An analysis of variance F test can be used to test the overall significance of the regression model. To test the model's significance, the proba of calculated F value which is 0 is less than theoretical (Alpha) which is 70.911712. Therefore it is significant.

2. The Significance of the Individual Variables

We can test the significance of each independent variable using a t-test. The calculated t-value for each variable is provided in Table 4.11, and the significant t is put in parentheses under each relevant independent variable in the equation. The significance is achieved if the t calculated for each independent variable exceeds the significant t. The Test is: - For Interest Payment: Calculated t = 6.021

Since $6.021 > 0.0000$ (significant t), Interest

Payment is a significant variable.

- For population: calculated $t = 3.376$

Since 3.376 is > 0.0012 , population is a significant variable.

Thus, the two variables included in the model are significant.

3. Interpretation of the Equation

The resulting regression equation could be easily interpreted. As for Interest Payment, the value of beta, 0.52476 indicates that for each added value in Interest Payment (holding other variables consistent), Reserves would directly vary by the value of 0.52476 . Moreover, the positive sign of the beta coefficient of this variable indicates that the linear relationship between Interest Payment and Reserves is positive. The higher the part of debt servicing devoted to Interest Payment, the higher the amount of reserves. This would be explained by the fact that the accumulation of debt and interest liabilities restrain developing countries, and thus, relatively speaking, the amount of reserves (which are not used to pay debt or fulfill the interest payments) would tend to be higher.

As for population, the positive beta coefficient of this variable suggests that the higher the population size, the higher the amount of reserves. This is a surprising result; however, it could be interpreted as follows.

In general, as population grows, the amount of money taken from the public by the government in the forms of taxes would increase. This amount would be reduced by the governmental expenditures. The outflows might overweigh the inflows, and thus the country will fall in a deficit problem. To solve this problem, the developing countries will resort to debt. However, with the accumulation of debt, the developing countries won't meet their debt service requirements. Thus, reserves would tend to increase with the increase of population.

B. Building a Regression Model with External Debt As the Dependent Variable

The same procedure followed with International Reserves would be followed here to derive a regression equation that could help in explaining variations in the dependent variable Debt Outstanding and Disbursed (L47). The independent variables selected were: population

(L37), Reserves (L18), Interest Payment (L62) and the ratio of current account to exports (L82). The correlation matrix presented in Table 4.12 shows the relationship between the dependent variable and each of the independent variables, and the relationship between each independent variable and other independent variables.

Table 4.12 -Correlation Matrix among Variables

	L47	L37	L18	L62	L82
L47	1.000	0.761	0.721	0.939	0.047
L37	0.761	1.000	0.703	0.684	0.053
L18	0.721	0.703	1.000	0.781	0.153
L62	0.939	0.684	0.781	1.000	0.245
L82	0.047	0.053	0.153	0.245	1.000

The Table shows that interest payment is the most important variable in determining the external debt

since it has the strongest positive linear relationship with the dependent variable. This is followed by the ratio of current account to exports, population and then Reserves.

Here also, a stepwise regression method was used to examine the forward selection of variables, and the extent of each variable's influence on External Debt. The final regression output was as follows:

Multiple R	0.97072
R Square	0.94230
Adjusted R square	0.93901
Standard Error	0.18972

Analysis Variance

	DF
Regression	4
Residual	70
F = 285.80421	Signif. F = 0.0000

The coefficients of the independent variables, are the beta values listed in Table 4.13.

Table 4.13 -Beta Coefficients and the Test for
Significance of the Independent variables

Variable	Beta	T	Sig.	T
Int. Pay.	0.77411	18.868	0.0000	
A.C/Exp.	-1.37576	-5.754	0.0000	
Population	0.21087	5.435	0.0000	
Reserves	-0.13179	-3.000	0.0037	
(Constant)	2.68592	22.556	0.0000	

As a result, the regression equation that could be built for predicting the variations in the external debt is:

$$\begin{aligned}
 \text{DOD} = & 2.68592 + 0.77411 \text{ Int. Pay.} - 1.37576 \text{ A.C/Exp.} \\
 & (0.0000) \quad (0.0000) \quad (0.0000) \\
 & + 0.21087 \text{ Population} - 0.13179 \text{ Reserves} \\
 & (0.0000) \quad (0.0037)
 \end{aligned}$$

$R^2 = 0.94 = 94\%$

1. The Significance of the Overall Regression Model

The R square (multiple coefficient of determination) is given in the computer printout as 0.9423. This means that almost 94% of the variation in External Debt could be explained by the four independent variables included in the model.

Moreover, to test the model's significance, the proba of calculated F value which is 0 is less than theoretical (Alpha) which is 285.5. Therefore, it is significant.

2. The Significance of the Individual Variables

The significance of each independent variable could be tested using the t-test. The calculated t-values are presented in Table 4.13. Taking into consideration that the significance of each variable is achieved if the t-calculated exceeds the t-significant, then the four variables (population, interest payment, A.C/Exp., and Reserves) included in the regression model are

significant in explaining the variation of user satisfaction.

3. The Interpretation of the Regression Equation

The beta coefficient of the interest payment (0.77411), shows that for each added value in interest payment (holding other variables constant), the external debt would directly vary by the value of 0.77411. Moreover, the relationship between the interest payment and the external debt is positive. This means that the higher the amount of interest payment, the higher would be the external debt. This is logical, especially if it is assumed that the developing countries are not servicing their debts and not paying the interest part of these debts. The accumulation of these interest payments will increase the amount of debts which will in turn increase the interest liability.

As for the ratio of current account to exports, the negative sign indicates the existence of inverse relationship between this variable and the external debt amount. As was previously mentioned, the current account balance showed the balance of imports and exports of "visible" and "invisible" products and services.

Of course, when the outflows outweigh the inflows, the country will fall into a deficit. This deficit is directly responsible for the negative sign of the ratio of current account to exports. Of course, as these deficits increase, the developing countries will resort to borrowing in order to cover these deficits. But this will only add to the problem, magnify the deficit and thus, increase the amount of debt outstanding and disbursed.

The positive and direct relationship between the external debt and population size can be very easily explained. Because of the scarcity of resources, the larger the population size becomes, the poorer would the developing nation become. To achieve some economic growth, these countries will arrange to get loans. But loans will only increase the problem because of the lack of programming, planning and efficient use of these loans.

As to reserves, it is logical to say that as the amount of debt increases, the country will use a part of its reserves to service its debt. Also, as reserves increase, the developing country is expected to meet its debt servicing requirements. This explains the negative sign of the reserves coefficient, which means that as

reserves increase the amount of debt will decrease and vice versa.

In another regression model, where the external debt was taken again as the dependent variable and the independent variables: population, interest payment and the ratio of current account to exports were included, the same results as above were reached. The regression equation derived was the following:

$$\text{External Debt} = 2.52792 + 0.70484 \text{ Int. Pay.} - 1.37309 \text{ A.C/Exp.}$$

(0.000) (0.0000) (0.0000)

+ 0.16839 pop.

(0.0000)

R2 = 0.93

F = 339.79

Sig. F = 0.0000

CHAPTER V

Conclusion and Recommendations

The purpose of this study was to describe the situation prevailing in the developing countries through studying major factors such as Reserves, Debt Outstanding and Disbursed, Populations Size, Interest Payment and the Ratio of Current Account to Exports.

As a first step, a descriptive analysis was conducted to study the major characteristics of developing countries from the perspective of certain indicative factors. After that a regression analysis was performed to identify the factors that have a high potential in determining or affecting the variation of two selected dependent variables, namely reserves and external debt.

As for the descriptive analysis, the computer facilities were used to prepare the frequency distribution of the five major factors mentioned above. Also, the statistics associated with these variables were calculated to study their central tendency and to infer from them major aspects pertaining to the developing countries. As to reserves, the descriptive analysis showed that a large percentage (80%) of these developing countries has low international reserves. This means that most of these countries are poor

countries facing serious foreign liquidity and balance-of-payment problems. Also, the measures of location showed that the data representing reserves is showed to the right, meaning that most of these countries have low reserves.

As for the Debt Outstanding and Disbursed, the findings reported were based on the median since the set of data representing DOD had no mode, and the mean could not be used as a reliable measure for it is highly affected by the skewness of data. Based on the median, 50% of the developing countries selected for the study were found to have an amount of debt below \$2606 mill, and the other 50% have an amount exceeding \$2606 mill.

The same analysis was applied to population, and thus based on the median, 50% of the developing countries have a population size less than or equal to 6.920 mill, and 50% have a population size greater than or equal to 6.920 mill.

As for the interest payment, the results show that the part of debt servicing devoted to payment of interest is very small in most of the developing countries (48%). This was attributed to the fact that the developing countries are overburdened with debt

which makes the amount of interest to be paid so high that the developing countries will restrain from paying it. This of course will increase the amount of accumulated debt which leads to higher interest liabilities, and thus to higher inability to meet the debt servicing requirements.

Finally, as for the ratio of current accounts to exports, the frequency distribution showed negative values which could be attributed to the deficits in the balance of payments in most of the developing countries.

Coming to the regression analysis, it was performed to identify the factors that are most likely to be associated with reserves and external debt. Two regression equations were built. The first related to the independent variables population size and interest payment. The coefficient of determination, R^2 , was 60.9% indicating that 63% of the variations in reserves could be explained by these two factors. The second regression equation related the external debt to the independent variables reserves, population, interest payment and the ratio of current account to exports. R^2 here was computed to be 0.94 implying that 94% of

the variation in external debt could be explained by these four factors. In both equations, the individual independent variables were tested for significance, and they were shown to be highly significant in predicting the dependent variables.

Recommendations

Recommendations here will be given for further research and for external debt management and population control. Further research is needed to investigate more about the relationship between population and reserves which was reported in this study to be a positive and a direct relationship. Also, a further research is recommended to study population as a dependent variable and measure the effect of other independent variables on its variation.

Moreover, a recommendation is given to developing countries for better population control and external debt management. While social conditions for millions of people in developing countries have improved during the past near decades, the absolute number of poor has also increased. Many developing countries are still experiencing widespread poverty, low per capita incomes, high infant, child and maternal mortality, high fertility and rapid population growth, rapid urbanization, inadequate food supplies, widespread illiteracy, high unemployment, debt and environmental degradation. One particularly significant outcome of the last few decades is that countries are becoming more

interdependent economically, socially and politically. This interdependence is to be seen most vividly in the areas of population, resources, and sustainable development.

Within the context of the critical decade a broad set of measures should be advanced, including the following:1

1. Development of comprehensive population policies to help achieve sustainable development.

2. Formulation of national population strategies in an effort to mobilize the appropriate political, economic, social and other sources of a nation.

3. Deceleration of rapid population growth through expansion of information, education and communication, and services for family planning.

4. Lowering the current levels of infant, child, and maternal mortality.

5. Instituting policies aimed at reducing rapid population growth in major cities by encouraging the expansion of secondary towns and improving conditions in rural areas with a view to keeping people in land.

1. UNFPA, "The Critical Decade", Meeting the Population Challenge, (New York: UNFPA, 1987), p. 10.

As to external debt, although liability management is highly technical and carries its own risks, developing countries are nonetheless well advised to study and practice these techniques because of the potential savings or reduction of exposure that can be achieved. Governments thus should improve their systems for recording and reporting on how much they owed to their creditors and how much debt service they would have to pay in the years ahead. Better systems for actual payments are also needed to avoid penalties for late payment. Furthermore, a massive effort by debtor countries and the creditor countries is necessary before external debt becomes unmanageable in a limited sense.

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X14 'IMP/RES' X15 'AMORT' X16 'DS/RES' X17 'DOD' X18 'DISB' X19 'PRINC'
X20 'NETFLOW' X21 'INT.PAY' X22 'T.D.S' X23 'DS/GNP' X24 'RES/GNP'
X25 'A.C/EXP' X26 'CAP.A/c' X27 'T.BAL' X28 'EDT/GNP' X29 'IMP/GNP'
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Appendix A

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75 cases are written to the uncompressed active file.

***** Memory allows a total of 6898 Values, accumulated across all Variables
 There also may be up to 862 Value Labels for each Variable.

 SPSS/PC+

X4

RES

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	8.70	1	1.3	1.3	4.0
	9.00	1	1.3	1.3	5.3
	13.60	1	1.3	1.3	6.7
	16.80	1	1.3	1.3	8.0
	17.40	1	1.3	1.3	9.3
	20.00	1	1.3	1.3	10.7
	20.20	1	1.3	1.3	12.0
	29.00	1	1.3	1.3	13.3
	29.40	1	1.3	1.3	14.7
	39.60	1	1.3	1.3	16.0
	40.70	1	1.3	1.3	17.3
	44.00	1	1.3	1.3	18.7
	49.00	1	1.3	1.3	20.0
	49.20	1	1.3	1.3	21.3
	56.30	1	1.3	1.3	22.7
	71.00	1	1.3	1.3	24.0

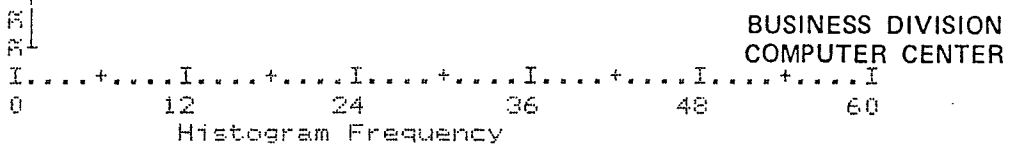
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X4	RES					
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		113.00	1	1.3	1.3	30.7
		118.30	1	1.3	1.3	32.0
		138.00	1	1.3	1.3	33.3
		140.00	1	1.3	1.3	34.7
		141.00	1	1.3	1.3	36.0
		147.00	1	1.3	1.3	37.3
		148.00	1	1.3	1.3	38.7
		163.00	1	1.3	1.3	40.0
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		261.00	1	1.3	1.3	48.0
		295.00	1	1.3	1.3	49.3
		297.00	1	1.3	1.3	50.7
		310.00	1	1.3	1.3	52.0
		311.00	1	1.3	1.3	53.3
		338.00	1	1.3	1.3	54.7

		SPSS/PC+			1/1/80	
X4	RES					
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		354.00	1	1.3	1.3	57.3
		372.00	1	1.3	1.3	58.7
		400.00	1	1.3	1.3	60.0
		416.00	1	1.3	1.3	61.3
		419.00	1	1.3	1.3	62.7
		463.00	1	1.3	1.3	64.0
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		836.00	1	1.3	1.3	70.7
		933.00	1	1.3	1.3	72.0
		976.00	1	1.3	1.3	73.3
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		1193.00	1	1.3	1.3	76.0
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		1602.00	1	1.3	1.3	78.7
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	SPSS/PC+			1/1/80
RES				
	3700.00	1	1.3	85.3
	3788.00	1	1.3	86.7
	3912.00	1	1.3	88.0
	5158.00	1	1.3	89.3
	6322.00	1	1.3	90.7
	6327.00	1	1.3	92.0
	6966.00	1	1.3	93.3
	7112.00	1	1.3	94.7
	7491.00	1	1.3	96.0
	9190.00	1	1.3	97.3
	12478.00	1	1.3	98.7
	23752.00	1	1.3	100.0
	TOTAL	75	100.0	100.0

6 SPSS/PC+ 1/1/80

Count	Midpoint	RES
58	703	R
4	2100	R
4	3497	R
1	4894	R
3	6291	R
2	7688	R
1	9085	R
0	10482	R
1	11879	R
0	13276	R
0	14673	R
0	16070	R
0	17467	R
0	18864	R
0	20261	R
0	21658	R
1	23055	R



SPSS/PC+

1/1/80

X4 RES

Mean	1651.684	Std Err	411.960	Median	297.000
Mode	237.000	Std Dev	3567.677	Variance	12728318.1
Kurtosis	20.376	S E Kurt	.548	Skewness	4.010
S E Skew	.277	Range	23746.000	Minimum	6.000
Maximum	23752.000	Sum	123876.300		

Valid Cases	75	Missing Cases	0
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SPSS/PC+

1/1/80

X17 DOD

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	71.80	1	1.3	1.3	1.3
	83.90	1	1.3	1.3	2.7
	84.70	1	1.3	1.3	4.0
	85.00	1	1.3	1.3	5.3
	124.60	1	1.3	1.3	6.7
	174.70	1	1.3	1.3	8.0
	187.70	1	1.3	1.3	9.3
	237.00	1	1.3	1.3	10.7
	272.70	1	1.3	1.3	12.0
	273.00	1	1.3	1.3	13.3
	390.70	1	1.3	1.3	14.7
	479.90	1	1.3	1.3	16.0
	501.00	1	1.3	1.3	17.3
	514.40	1	1.3	1.3	18.7
	520.00	1	1.3	1.3	20.0
	544.40	1	1.3	1.3	21.3
	591.00	1	1.3	1.3	22.7
	673.00	1	1.3	1.3	24.0

SPSS/PC+

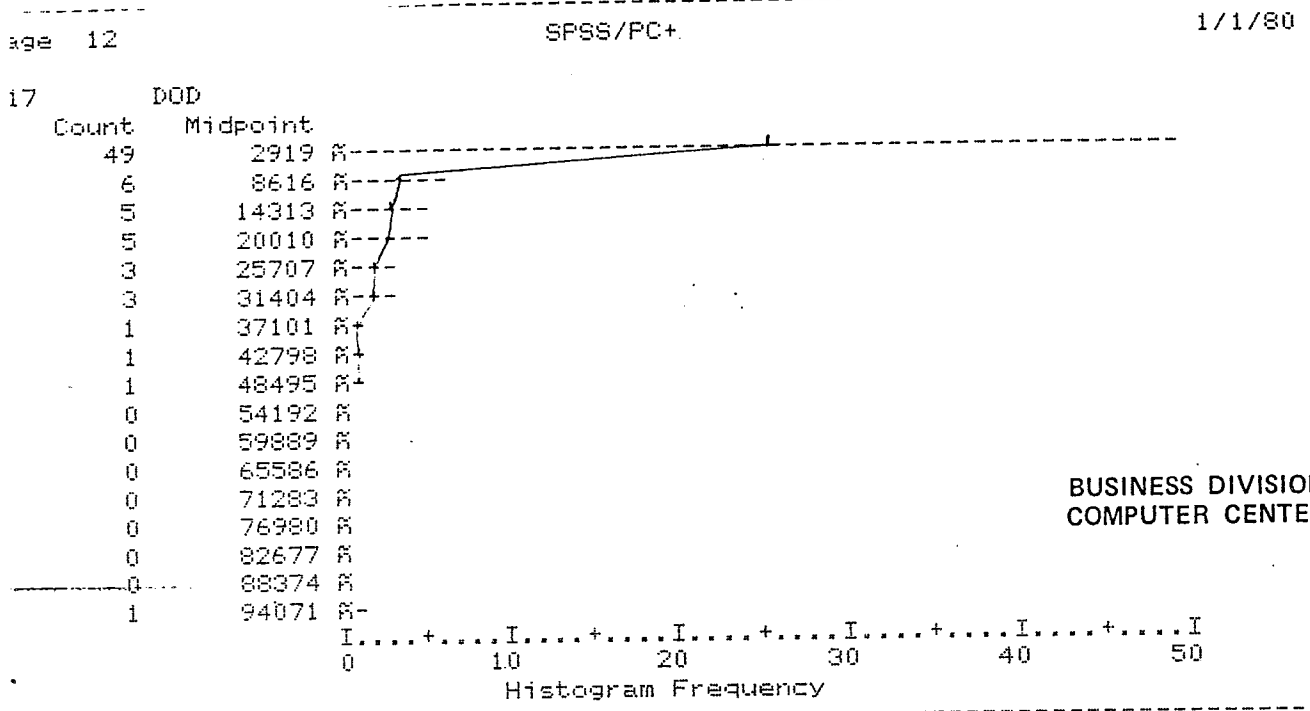
1/1/80

X17 DOD

	718.00	1	1.3	1.3	25.3
	874.00	1	1.3	1.3	26.7
	902.00	1	1.3	1.3	28.0
	929.00	1	1.3	1.3	29.3
	1042.00	1	1.3	1.3	30.7
	1116.00	1	1.3	1.3	32.0
	1155.00	1	1.3	1.3	33.3
	1419.00	1	1.3	1.3	34.7
	1513.00	1	1.3	1.3	36.0
	1605.00	1	1.3	1.3	37.3
	1635.00	1	1.3	1.3	38.7
	1667.00	1	1.3	1.3	40.0
	1669.00	1	1.3	1.3	41.3
	1847.00	1	1.3	1.3	42.7
	2155.00	1	1.3	1.3	44.0
	2237.00	1	1.3	1.3	45.3
	2246.00	1	1.3	1.3	46.7
	2434.00	1	1.3	1.3	48.0
	2461.00	1	1.3	1.3	49.3
	2606.00	1	1.3	1.3	50.7
	3071.00	1	1.3	1.3	52.0
	3192.00	1	1.3	1.3	53.3

		SPSS/PC+	1/1/80		
X17	DOD				
		3306.00	1	1.3	54.7
		3518.00	1	1.3	56.0
		3569.00	1	1.3	57.3
		3648.00	1	1.3	58.7
		3679.00	1	1.3	60.0
		3722.00	1	1.3	61.3
		3919.00	1	1.3	62.7
		4226.00	1	1.3	64.0
		4978.00	1	1.3	65.3
		6150.00	1	1.3	66.7
		6415.00	1	1.3	68.0
		7334.00	1	1.3	69.3
		8651.00	1	1.3	70.7
		9056.00	1	1.3	72.0
		10767.00	1	1.3	73.3
		11714.00	1	1.3	74.7
		13205.00	1	1.3	76.0
		13918.00	1	1.3	77.3
		15352.00	1	1.3	78.7
		17131.00	1	1.3	80.0
		18007.00	1	1.3	81.3
		18840.00	1	1.3	82.7

		SPSS/PC+	1/1/80		
X17	DOD				
		18866.00	1	1.3	84.0
		19246.00	1	1.3	85.3
		21675.00	1	1.3	86.7
		23659.00	1	1.3	88.0
		23837.00	1	1.3	89.3
		26057.00	1	1.3	90.7
		30644.00	1	1.3	92.0
		31356.00	1	1.3	93.3
		32749.00	1	1.3	94.7
		35613.00	1	1.3	96.0
		45389.00	1	1.3	97.3
		50309.00	1	1.3	98.7
		96919.00	1	1.3	100.0
		TOTAL	75	100.0	100.0



SPSS/PC+ 1/1/80

X17 DOD

Mean	9223.020	Std Err	1760.706	Median	2606.000
Mode	71.800	Std Dev	15248.165	Variance	232506535
Kurtosis	14.597	S E Kurt	.548	Skewness	3.277
S E Skew	.277	Range	96847.200	Minimum	71.800
Maximum	96919.000	Sum	691726.500		
Valid Cases	75	Missing Cases	0		

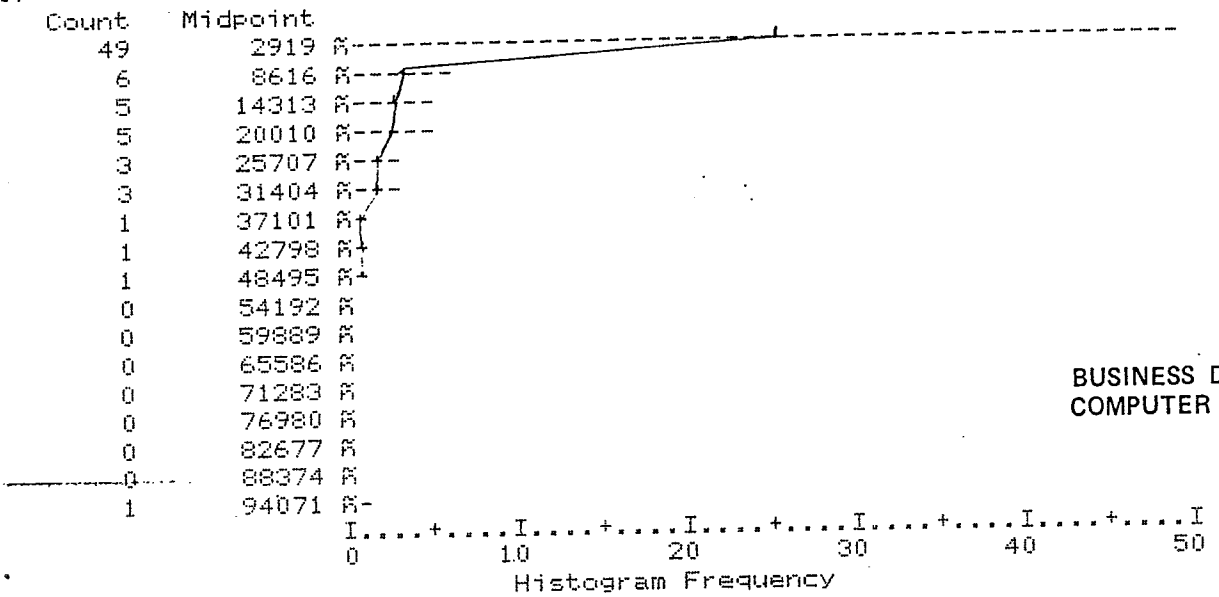
age 12

SPSS/PC+

1/1/80

17

DOD



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SPSS/PC+

1/1/80

X17

DOD

Mean	9223.020	Std Err	1760.706	Median	2606.000
Mode	71.800	Std Dev	15248.165	Variance	232506535
Kurtosis	14.597	S E Kurt	.548	Skewness	3.277
S E Skew	.277	Range	96847.200	Minimum	71.800
Maximum	96919.000	Sum	691726.500		

Valid Cases

75

Missing Cases

0

SPSS/PC+

1/1/80

X12 POP

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.11	1	1.3	1.3	1.3
	.15	1	1.3	1.3	2.7
	.17	1	1.3	1.3	4.0
	.19	1	1.3	1.3	5.3
	.25	1	1.3	1.3	6.7
	.26	1	1.3	1.3	8.0
	.31	1	1.3	1.3	9.3
	.44	1	1.3	1.3	10.7
	.69	2	2.7	2.7	13.3
	.74	1	1.3	1.3	14.7
	.80	1	1.3	1.3	16.0
	.82	1	1.3	1.3	17.3
	.94	1	1.3	1.3	18.7
	1.05	1	1.3	1.3	20.0
	1.08	1	1.3	1.3	21.3
	1.16	1	1.3	1.3	22.7
	1.29	1	1.3	1.3	24.0
	1.67	1	1.3	1.3	25.3

SPSS/PC+

1/1/80

X12 POP

	1.81	1	1.3	1.3	26.7
	2.11	1	1.3	1.3	28.0
	2.24	1	1.3	1.3	29.3
	2.40	1	1.3	1.3	30.7
	2.43	1	1.3	1.3	32.0
	2.67	1	1.3	1.3	33.3
	2.79	1	1.3	1.3	34.7
	2.98	1	1.3	1.3	36.0
	3.36	1	1.3	1.3	37.3
	3.62	1	1.3	1.3	38.7
	3.94	1	1.3	1.3	40.0
	4.04	1	1.3	1.3	41.3
	4.45	1	1.3	1.3	42.7
	5.06	1	1.3	1.3	44.0
	5.15	1	1.3	1.3	45.3
	6.25	1	1.3	1.3	46.7
	6.66	1	1.3	1.3	48.0
	6.86	1	1.3	1.3	49.3
	6.92	1	1.3	1.3	50.7
	7.00	1	1.3	1.3	52.0
	7.79	1	1.3	1.3	53.3
	8.00	1	1.3	1.3	54.7

		SPSS/PC+			1/1/80
X12	POP				
		8.16	1	1.3	56.0
		8.69	1	1.3	57.3
		10.15	1	1.3	58.7
		11.00	1	1.3	60.0
		11.21	1	1.3	61.3
		11.58	1	1.3	62.7
		11.67	1	1.3	64.0
		12.76	1	1.3	65.3
		14.04	1	1.3	66.7
		16.19	1	1.3	68.0
		16.57	1	1.3	69.3
		16.92	1	1.3	70.7
		18.05	1	1.3	72.0
		18.76	1	1.3	73.3
		20.68	1	1.3	74.7
		23.02	1	1.3	76.0
		23.81	1	1.3	77.3
		23.92	1	1.3	78.7
		30.01	1	1.3	80.0
		31.51	1	1.3	81.3
		33.62	1	1.3	82.7
		42.00	1	1.3	84.0

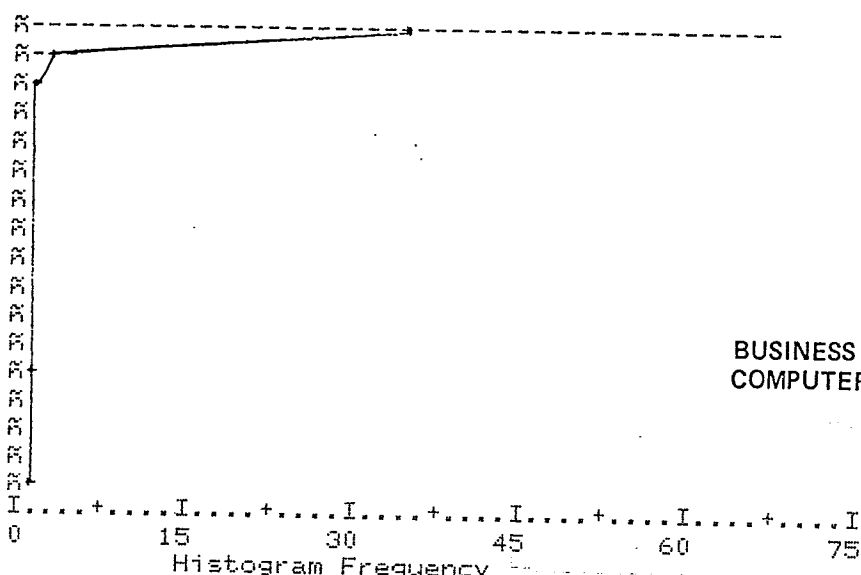
		SPSS/PC+			1/1/80
X12	POP				
		46.14	1	1.3	85.3
		51.45	1	1.3	86.7
		53.77	1	1.3	88.0
		54.67	1	1.3	89.3
		60.00	1	1.3	90.7
		83.59	1	1.3	92.0
		105.68	1	1.3	93.3
		108.85	1	1.3	94.7
		110.13	1	1.3	96.0
		174.83	1	1.3	97.3
		813.99	1	1.3	98.7
		1083.89	1	1.3	100.0
	TOTAL		75	100.0	100.0

age 18

SPSS/PC+

1/1/80

Count	POP	Midpoint
68		30
4		94
1		158
0		222
0		286
0		350
0		414
0		478
0		542
0		606
0		670
0		734
1		798
0		862
0		926
0		990
1		1054



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LL

SPSS/PC+

1/1/80

X12		POP	
Mean	43.635	Std Err	17.967
Mode	.690	Std Dev	155.598
Kurtosis	34.969	S E Kurt	.548
S E Skew	.277	Range	1083.780
Maximum	1083.890	Sum	3272.650
		Median	6.920
		Variance	24210.757
		Skewness	-5.833
		Minimum	.110

Valid Cases 75 Missing Cases 0

SPSS/PC+

1/1/80

X21 INT.PAY

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.90	1	1.3	1.3	1.3
	1.30	1	1.3	1.3	2.7
	1.70	1	1.3	1.3	4.0
	2.10	1	1.3	1.3	5.3
	3.00	1	1.3	1.3	6.7
	4.10	1	1.3	1.3	8.0
	4.50	1	1.3	1.3	9.3
	5.20	1	1.3	1.3	10.7
	6.80	1	1.3	1.3	12.0
	7.20	1	1.3	1.3	13.3
	9.00	2	2.7	2.7	16.0
	12.00	2	2.7	2.7	18.7
	13.00	1	1.3	1.3	20.0
	13.60	1	1.3	1.3	21.3
	14.00	1	1.3	1.3	22.7
	15.00	3	4.0	4.0	26.7
	16.00	1	1.3	1.3	28.0
	24.00	1	1.3	1.3	29.3

SPSS/PC+

1/1/80

X21 INT.PAY

	26.00	1	1.3	1.3	30.7
	29.00	1	1.3	1.3	32.0
	31.00	1	1.3	1.3	33.3
	32.00	2	2.7	2.7	36.0
	45.00	2	2.7	2.7	38.7
	50.00	1	1.3	1.3	40.0
	57.00	1	1.3	1.3	41.3
	58.00	1	1.3	1.3	42.7
	62.00	1	1.3	1.3	44.0
	73.00	1	1.3	1.3	45.3
	76.00	1	1.3	1.3	46.7
	94.00	1	1.3	1.3	48.0
	96.00	1	1.3	1.3	49.3
	106.00	1	1.3	1.3	50.7
	112.00	1	1.3	1.3	52.0
	119.00	1	1.3	1.3	53.3
	121.00	1	1.3	1.3	54.7
	126.00	1	1.3	1.3	56.0
	132.00	1	1.3	1.3	57.3
	139.00	1	1.3	1.3	58.7
	153.00	1	1.3	1.3	60.0
	157.00	1	1.3	1.3	61.3

		SPSS/PC+			1/1/80
X21	INT.PAY				
		176.00	1	1.3	62.7
		183.00	1	1.3	64.0
		203.00	1	1.3	65.3
		225.00	1	1.3	66.7
		231.00	1	1.3	68.0
		244.00	1	1.3	69.3
		273.00	1	1.3	70.7
		279.00	1	1.3	72.0
		346.00	1	1.3	73.3
		386.00	1	1.3	74.7
		569.00	1	1.3	76.0
		597.00	1	1.3	77.3
		623.00	1	1.3	78.7
		806.00	1	1.3	80.0
		1057.00	1	1.3	81.3
		1069.00	1	1.3	82.7
		1177.00	1	1.3	84.0
		1260.00	1	1.3	85.3
		1377.00	1	1.3	86.7
		1419.00	1	1.3	88.0
		1461.00	1	1.3	89.3
		1497.00	1	1.3	90.7

		SPSS/PC+			1/1/80
X21	INT.PAY				
		1517.00	1	1.3	92.0
		1805.00	1	1.3	93.3
		2375.00	1	1.3	94.7
		2518.00	1	1.3	96.0
		2748.00	1	1.3	97.3
		3775.00	1	1.3	98.7
		7091.00	1	1.3	100.0
		TOTAL	75	100.0	100.0

32 24

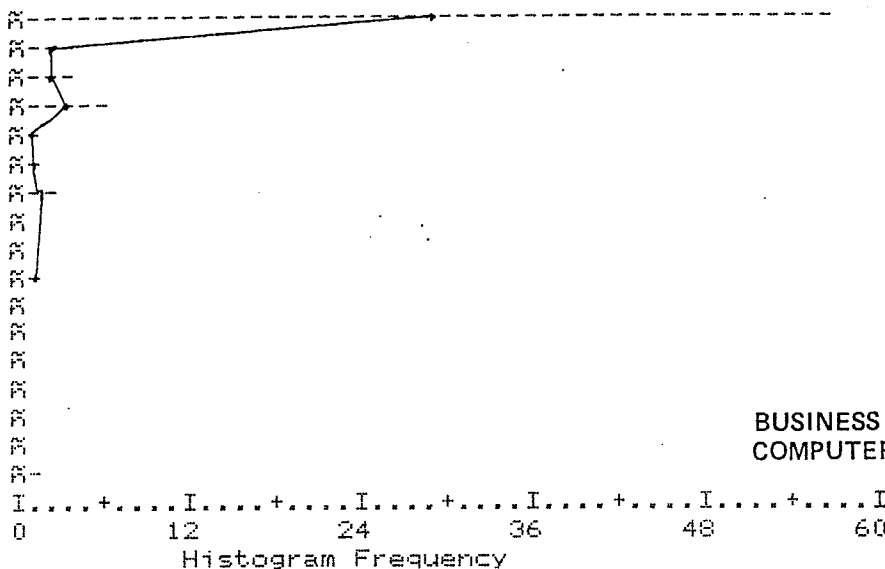
SPSS/PC+

1/1/80

1 INT.PAY

Count Midpoint

56	202
4	620
3	1038
6	1456
1	1874
1	2292
2	2710
0	3128
0	3546
1	3964
0	4382
0	4800
0	5218
0	5636
0	6054
0	6472
1	6890



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SPSS/PC+

1/1/80

X21 INT.PAY

Mean	526.165	Std Err	123.751	Median	106.000
Mode	15.000	Std Dev	1071.712	Variance	1148566.72
Kurtosis	19.429	S E Kurt	.548	Skewness	3.881
S E Skew	.277	Range	7090.100	Minimum	.900
Maximum	7091.000	Sum	39462.400		

Valid Cases 75 Missing Cases 0

SPSS/PC+

1/1/80

X25 A.C/EXP

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	-2.56	1	1.3	1.3	1.3
	-1.12	1	1.3	1.3	2.7
	-.94	1	1.3	1.3	4.0
	-.71	1	1.3	1.3	5.3
	-.68	1	1.3	1.3	6.7
	-.66	1	1.3	1.3	8.0
	-.62	1	1.3	1.3	9.3
	-.56	1	1.3	1.3	10.7
	-.50	1	1.3	1.3	12.0
	-.46	1	1.3	1.3	13.3
	-.45	1	1.3	1.3	14.7
	-.43	1	1.3	1.3	16.0
	-.42	1	1.3	1.3	17.3
	-.38	1	1.3	1.3	18.7
	-.36	2	2.7	2.7	21.3
	-.34	1	1.3	1.3	22.7
	-.32	1	1.3	1.3	24.0
	-.30	2	2.7	2.7	26.7

SPSS/PC+

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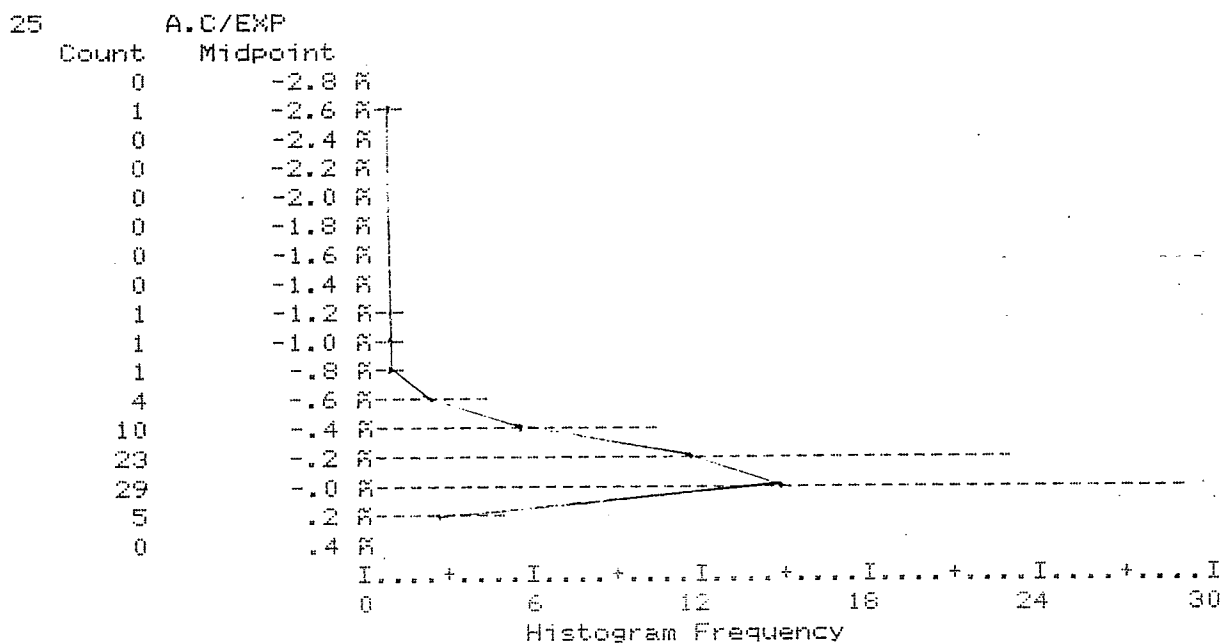
X25 A.C/EXP

	-.29	2	2.7	2.7	29.3
	-.28	1	1.3	1.3	30.7
	-.27	2	2.7	2.7	33.3
	-.24	2	2.7	2.7	36.0
	-.22	1	1.3	1.3	37.3
	-.21	2	2.7	2.7	40.0
	-.18	1	1.3	1.3	41.3
	-.17	1	1.3	1.3	42.7
	-.16	4	5.3	5.3	48.0
	-.15	1	1.3	1.3	49.3
	-.14	1	1.3	1.3	50.7
	-.13	1	1.3	1.3	52.0
	-.12	2	2.7	2.7	54.7
	-.10	2	2.7	2.7	57.3
	-.09	6	8.0	8.0	65.3
	-.08	3	4.0	4.0	69.3
	-.07	1	1.3	1.3	70.7
	-.06	2	2.7	2.7	73.3
	-.03	4	5.3	5.3	78.7
	-.02	1	1.3	1.3	80.0
	.00	1	1.3	1.3	81.3
	.02	2	2.7	2.7	84.0

SPSS/PC+ 1/1/80

X25	A.C/EXP					
		.04	1	1.3	1.3	85.3
		.07	3	4.0	4.0	89.3
		.08	2	2.7	2.7	92.0
		.09	1	1.3	1.3	93.3
		.11	1	1.3	1.3	94.7
		.16	1	1.3	1.3	96.0
		.17	1	1.3	1.3	97.3
		.20	1	1.3	1.3	98.7
		.26	1	1.3	1.3	100.0
		-----		-----		
	TOTAL		75	100.0	100.0	

age 29 SPSS/PC+ 1/1/80



SPSS/PC+ 1/1/80

X25	A.C/EXP				
Mean	-.220	Std Err	.043	Median	-.140
Mode	-.090	Std Dev	.371	Variance	.138
Kurtosis	21.043	S E Kurt	.548	Skewness	-3.738
S E Skew	.277	Range	2.820	Minimum	-2.560
Maximum	.260	Sum	-16.510		
Valid Cases	75	Missing Cases	0		

 SPSS/PC+ 1/1/80
 This procedure was completed at 0:44:30
 REGRESSION VAR=L18 L37 L62/DEPENDENT=L18/METHOD=STEPWISE/DESCRIPTIVE=CORR.

SPSS/PC+ 1/1/80
 * * * * MULTIPLE REGRESSION * * * *

Listwise Deletion of Missing Data

N of Cases = 75

Correlation:

	L18	L37	L62
L18	1.000	.703	.781
L37	.703	1.000	.684
L62	.781	.684	1.000

 SPSS/PC+ 1/1/80
 * * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. L18

Beginning Block Number 1. Method: Stepwise

Variable(s) Entered on Step Number
 1.. L62

Multiple R .78101
 R Square .60998
 Adjusted R Square .60463
 Standard Error .54395

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	33.78027	33.78027
Residual	73	21.59932	.29588

F = 114.16841 Signif F = .0000

SPSS/PC+

1/1/80

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. L18

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
L62	.72604	.06795	.78101	10.685	.0000
(Constant)	1.05931	.14709		7.202	.0000

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	T	Sig T
L37	.31654	.36972	.53210	3.376	.0012

SPSS/PC+

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* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. L18

Variable(s) Entered on Step Number
2.. L37

Multiple R	.81443
R Square	.66329
Adjusted R Square	.65394
Standard Error	.50890

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	36.73276	18.36638
Residual	72	18.64683	.25898

F = 70.91712 Signif F = .0000

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. L82

Beginning Block Number 1. Method: Stepwise

Variable(s) Entered on Step Number
1.. L62

Multiple R	.24525
R Square	.06015
Adjusted R Square	.04727
Standard Error	.09412

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	.04138	.04138
Residual	73	.64665	.00886

F = 4.67159 Signif F = .0339

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. L82

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
L62	.02541	.01176	.24525	2.161	.0339
(Constant)	.39646	.02545		15.577	.0000

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	T	Sig T
L37	-.21502	-.16179	.53210	-1.391	.1685

End Block Number 1 PIN = .050 Limits reached.

This procedure was completed at 0:46:10
REGRESSION VAR=L47 L37 L18 L62 L82/DEPENDENT=L47/METHOD=STEPWISE/
DESCRIPTIVE=CORR.

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1/1/80

***** MULTIPLE REGRESSION *****

Equation Number 1 Dependent Variable.. L47

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
L62	.70484	.03577	.85383	19.704	.0000
L82	-1.37309	.25219	-.17235	-5.445	.0000
L37	.16839	.03810	.18593	4.419	.0000
(Constant)	2.52722	.11253		22.458	.0000

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	T	Sig T
L18	-.14842	-.33749	.33368	-3.000	.0037

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***** MULTIPLE REGRESSION *****

Equation Number 1 Dependent Variable.. L47

Variable(s) Entered on Step Number

4.. L18

Multiple R	.97072
R Square	.94230
Adjusted R Square	.93901
Standard Error	.18972

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	4	41.14970	10.28743
Residual	70	2.51963	.03599

F = 285.80421 Signif F = .0000

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* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. L47

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
L62	.77411	.04103	.93774	18.868	.0000
L82	-1.37576	.23908	-.17269	-5.754	.0000
L37	.21087	.03880	.23283	5.435	.0000
L18	-.13179	.04394	-.14842	-3.000	.0037
(Constant)	2.68592	.11908		22.556	.0000

End Block Number 1 POUT = .100 Limits reached.

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This procedure was completed at 0:47:53
 REGRESSION VAR = L47 L37 L62 L82/DEPENDENT=L47/METHOD=STEPWISE/DESCRIPTIVE=COI

* * * * MULTIPLE REGRESSION * * * *

Listwise Deletion of Missing Data

N of Cases = 75

Correlation:

	L47	L37	L62	L82
L47	1.000	.761	.939	.047
L37	.761	1.000	.684	.053
L62	.939	.684	1.000	.245
L82	.047	.053	.245	1.000

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. L47

Beginning Block Number 1. Method: Stepwise

Variable(s) Entered on Step Number

1.. L62

Multiple R	.93874
R Square	.88124
Adjusted R Square	.87961
Standard Error	.26654

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	38.48316	38.48316
Residual	73	5.18617	.07104

F = 541.68525 Signif F = .0000

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* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. L47

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
L62	.77493	.03330	.93874	23.274	.0000
(Constant)	1.91139	.07208		26.519	.0000

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	T	Sig T
L37	.22299	.47200	.53210	4.543	.0000
L82	-.19499	-.54853	.93985	-5.567	.0000

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* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. L47

Variable(s) Entered on Step Number
2.. L82

Multiple R	.95759
R Square	.91697
Adjusted R Square	.91467
Standard Error	.22441

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	2	40.04358	20.02179
Residual	72	3.62575	.05036

F = 397.59219 Signif F = .0000

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* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. L47

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
L62	.81441	.02892	.98656	28.165	.0000
L82	-1.55341	.27906	-.19499	-5.567	.0000
(Constant)	2.52725	.12618		20.028	.0000

----- Variables not in the Equation -----

Variable	Beta In	Partial	Min Toler	T	Sig T
L37	.18593	.46448	.48840	4.419	.0000

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* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. L47

Variable(s) Entered on Step Number

3.. L37

Multiple R	.96689
R Square	.93489
Adjusted R Square	.93213
Standard Error	.20012

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	3	40.82582	13.60861
Residual	71	2.84351	.04005

F = 339.79561 Signif F = .0000

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* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable.. L47

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
L62	.70484	.03577	.85383	19.704	.0000
L82	-1.37309	.25219	-.17235	-5.445	.0000
L37	.16839	.03810	.18593	4.419	.0000
(Constant)	2.52722	.11253		22.458	.0000

End Block Number 1 POUT = .100 Limits reached.

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This procedure was completed at 0:49:09

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FINISH