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DEVELOPMENT OF A JORDANIAN PLANNING MODEL

AN EMPIRICAL STUDY

BY

MOHAMMAD AHMAD TARAWNEH

A dissertation submitted to the Graduate Faculty in Business in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York.

1987

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The City University of New York

Abstract

DEVELOPMENT OF A JORDANIAN PLANNING MODEL

AN EMPIRICAL STUDY

by

Mohammad Ahmad Tarawneh

Advisor: Professor Harris J. Shapiro

Developing countries seem eager to launch themselves on the paths towards development whatever it means. This ideology of development evolved from purely economic (undisciplinary) to include other social and political aspects (multidisciplinary). Based on this interaction, a comparative analysis of development models of Jordan and Singapore is conducted. A detailed interpretation of the results identifies the factors behind variations in development levels, with the aim of mobilizing the appropriate engines on the paths towards the development of a Jordanian planning model.

DEDICATION

This work is dedicated to my

wife, daughter and son:

Afnan, Rawan and Ahmad

ACKNOWLEDGMENTS

I wish to express my sincere appreciation to my advisor, Dr. Harris J. Shapiro, for his guidance, encouragement and providing the idea of this study. It is my honor to have the unique experience of having been a student of Professor Shapiro. He is an outstanding teacher and a highly knowledgeable advisor.

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Chapter I

Introduction

1.1 Purpose and Scope of the Study

This study compares and evaluates the socio-economic development models of Jordan and Singapore and explores the structural factors, both internal and external, that characterize each of these models. Although the two countries are at different levels of development, they share several common factors such as population size, political stability, and the dualistic nature of their economies during the period under consideration. For this purpose, data for twenty-two economic, social and demographic variables have been collected and analyzed. Empirical conclusions are explained and the facts observed in each of the two models are provided. The two main principles guiding the selection of variables were of parsimony and inclusiveness. With respect to parsimony, the chosen variables are expected to capture most socio-economic aspects of development. With regard to inclusiveness, we tried to combine interrelated variables

that are representative in nature and through which some other indicators can be deduced. This level of "organized complexity" brings us closer to the nature of the socio-economic development process. The variables and their definitions are provided in Appendix A. The study covers the period from 1960 to 1985. For analytical purposes, this period is divided into five subperiods: 1960-65, 1966-70, 1971-75, 1976-80, and 1981-85. The year 1960 has been chosen as the beginning of our analysis as Jordan had not embarked on any regular form of socio-economic development before then, and, therefore, no significant statistics were available prior to that year.

This empirical study of the development models of the two countries is expected to produce two kinds of results. First, we should be able to observe some general features of growth and secondly, some specific characteristics associated with the development experience of each country shall be observed. This is due to certain economic, social, political, geographical, and historical peculiarities in each country. These special characteristics can act as qualifications for or constraints on the development models of the two countries, and provide the guidelines under which we introduce a planning model for Jordan.

1.2 Data Collection

Due to the length of the period covered in the study (1960-1985) and the number of variables included, considerable amount of time and effort have been spent in collecting data. Different sources have been used to obtain this data. These include: Annual statistical reports of both countries, World Bank and World Development reports, publications of the Overseas Development Council, United Nations reports, and other relevant publications. Some data were obtained by corresponding with some agencies in both countries.

1.3 Methodology and Summary of Results

Due to the large number of variables considered, the technique of factor analysis is applied to reduce dimensionality, and the twenty-two socio-economic variables are reduced to three representative factors. These three factors represent economic, social and growth aspects. It was found that the highest degree of explanation is offered by the economic factor as it explains more than 80% of the two countries variations in their socio-economic performance. It was also found that the economic variables represented by this factor are:

Agriculture, Banking and Finance, Construction, Manufacturing and Mining, Trade, Transportation and Communication, Services and Utilities. These economic sectors, of each country, are ranked based on four criteria which are equally weighted. These criteria include (a) Rank ordering of these variables based on the three factors for each country, and (b) Rank ordering based on structural transformation (shifts in the shares of these variables in the total national product) from 1960 to 1985. In order to conclude the development models of both countries the aggregate ranks, based on previous criteria, are analyzed using the method of Analytical Hierarchical Process (AHP). It was found that development models of Jordan and Singapore are largely different in terms of priorities and weights given to economic sectors.

The previous steps are expected to identify the structural differences and/or similarities of growth models of the two countries. The performance gap that appears is traced to the particular economic, political, social and other strategic aspects that characterize each of the two countries. This process of environmental assessment proceeds as follows: (1) Dividing the environment into four major levels (economic, social, political and general), (2) Equal numbers of relevant indicators (segments) are listed under each level, (3)

Determination of scale in terms of type, values and meanings, (4) Comparing the two countries based on the scaled values and (5) Generating weights to each level and segment. These weights serve in detecting the environmental factors that have largely influenced the shaping of development models of both countries. They also support the process of framing more integrated development policies and evaluating potential future scenarios. The results of this process show that the two countries differ widely on certain economic aspects such as diversity level of economic structure level of foreign investments, modernization of industry and trade orientation. Finally, a planning model is developed for Jordan under the assumption of either maintaining or changing the status quo.

A schematic framework of the methodology and sequence of the study is shown in Figure 1.3.1.

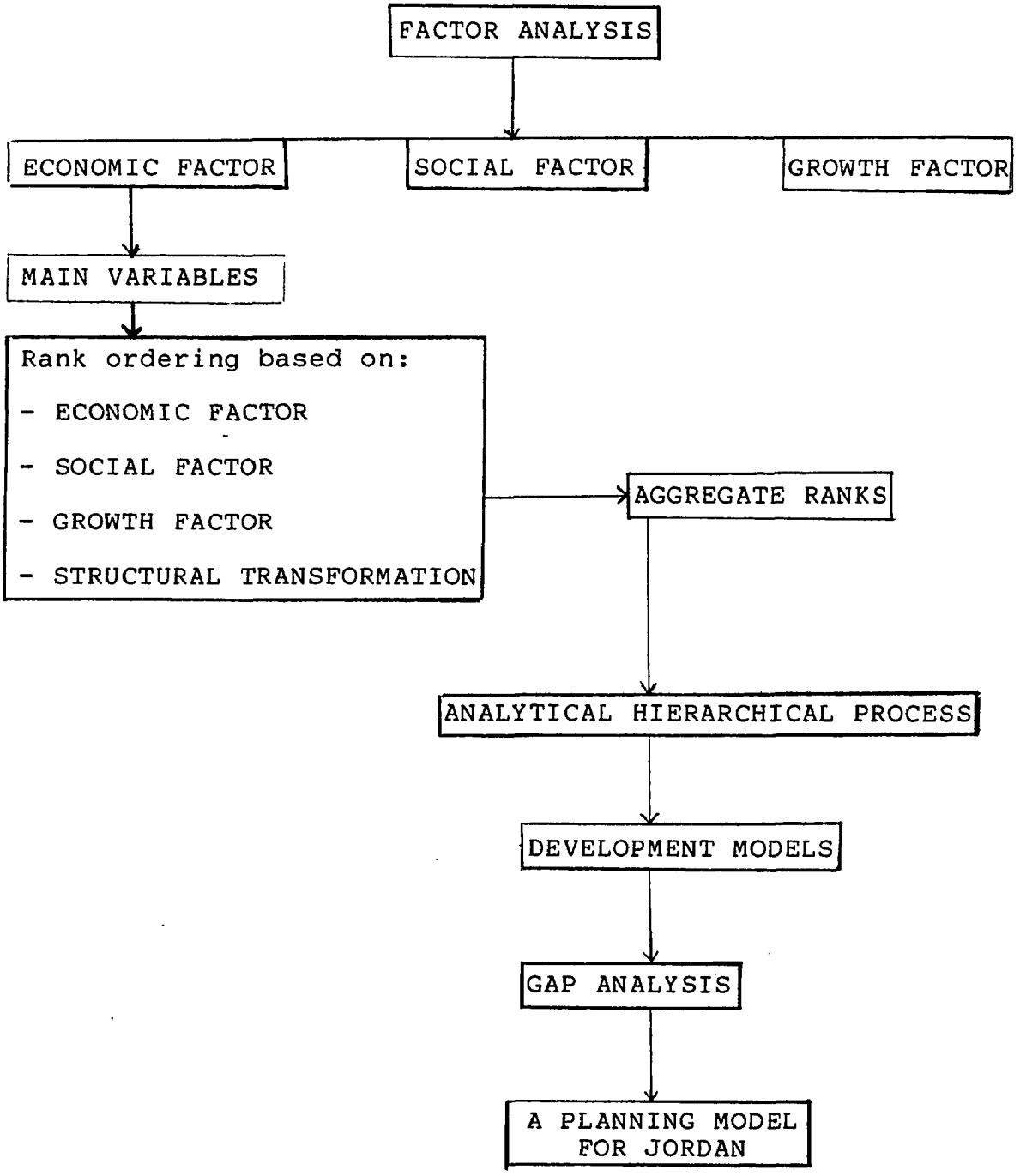

Figure: 1.3.1 A Schematic Framework of the Methodology

1.4 Structure of the Study

Following the introductory chapter, the study is divided into six chapters. Chapter II covers the pertinent literature and contribution of the study. Chapter III presents the factor analysis results and compares the development structures in both countries based on all socio-economic variables. In Chapter IV the development models of the two countries are concluded based on factor and criteria analysis. Chapter V links the concluded development models to the particular circumstances that characterize each individual country in order to determine the significantly different environmental aspects between the two countries. In Chapter VI, a development planning model for Jordan is introduced, and Chapter VII includes a summary of findings and suggestions for future research. Definitions of study variables and segments of the environment are provided in the appendices along with some statistical results.

Chapter II

Review of Literature and Contribution of the Study

2.1 Review of Literature

The literature review implicitly includes main models of development planning, most widely applied measures of development, and nature of comparative studies performed.

Over the past three decades, the literature of development planning has been mainly dominated by three strands of thought: (a) linear stages of economic growth, (b) neoclassical structural change models, and (c) international dependence paradigms.

The thinking of the 1950s and early 1960s focused mainly on the concept of stages of economic growth in which the process of development was viewed as a series of successive stages through which all countries must pass (Rostow 1960). These stages as described in Rostow's model are: the traditional society, the pre-condition for take-off into self-sustaining growth, the drive to maturity, and the age of high mass consumption. For any nation to move from one stage to the other, sufficient

economic growth has to be generated through the mobilization of domestic and foreign savings. Therefore, the main obstacle to development according to this theory was the relatively low level of capital formation in most developing countries. This problem still exists despite the continuing remedial efforts such as aid programs, establishment of international financial institutions, and endeavors of stimulating domestic capital sources (privatization). Food crises and malnutrition are evident examples in the case.

This linear stages approach has been replaced to a great extent by two other schools of thought: the neoclassical structural change models and the international dependence paradigms.

The neoclassical structural change models focus on the mechanism by which developing economies transform their domestic economic structures from traditional agriculture to a more modern, more urbanized, and more diverse economy. Two well known representative examples of the structural change approach are the "two-sector surplus labor" theoretical model of W. Arthur Lewis (Lewis, 1955), and the "pattern of development" of Hollis Chenery (Chenery, 1975).

In the Lewis model, the underdeveloped economy is perceived as to consist of two sectors: (a) a traditional

overpopulated rural sector characterized by zero marginal productivity and (b) a highly-productive modern urban industrial sector into which the labor from the traditional sector is gradually transferred. According to Lewis, the structural transformation will take place with the balance of economic activity shifting from agriculture to modern urban industry. This simplified perception of development does not fit the conditions of developing countries as most of them lack the basic structures for agriculture or industry.

Like the Lewis model, the "pattern of development" analysis of structural change focuses on the sequential process through which the economic, industrial, and institutional structure of a developing economy is transformed over time to permit new industries to replace traditional agriculture as the engine of economic growth. Unlike the Lewis model and the original stages view of development, the structural changes involve all economic functions including the transformation of production and changes in the composition of consumer demand, international trade, and resource use as well as changes in socio-economic factors such as urbanization and the growth and distribution of a country's population. The model recognizes that differences can arise among countries in their pattern of development depending on

their particular set of domestic and international circumstances.

This structuralist model is based largely on the empirical work of Chenery, who used time-series and cross-sectional analysis to examine patterns of development for numerous developing countries during the period 1950-1973. His empirical studies of countries at different levels of per capita income led to the identification of several characteristics features of development process (Chenery et al, 1975). While Chenery gave a special attention to per capita income in his model, the problems of how to bring about any improvement in the level or distribution of per capita income have not been resolved.

Based on the works of Lewis and Chenery, some comparative studies were performed: Little (1970), Chen (1979), and Gustav et al (1984), and some general and specific planning models were introduced: Blitzer (1970), Blitzer et al (1975), Brian (1982), and Werner (1983).

While the models of Rostow, Lewis, and Chenery place more emphasis on attempts to measure capital/output ratios, to increase savings and investment ratios, or to maximize GNP growth rates, another stream of models place more emphasis on international power imbalances and on needed fundamental economic, political, and institutional

reforms, both domestic and worldwide. These are the international dependence paradigms (Baran (1968a, 1968b, and 1971), and Magdoff (1969 and 1974). Although these models provide a sound theoretical diagnosis for the worsening conditions of most developing countries, the remedies they suggest do not seem applicable under national and international prevailing conditions.

Within the context of international dependence models, Todaro (1985) emphasized the multidimensionality of the development process which its realization, according to him, requires fundamental modifications of the international economic and social systems, although its goals should be defined in a national context.

Along with shifting paradigms about the meaning and aspects of development, there has been shifting emphasis on how to measure it. GNP is one of the most widely used methods of measuring development. When adjusted to population size, GNP has been commonly used to measure the performance of individual countries over time and to compare performance among countries (Chenery 1975). As a measuring instrument, GNP is not free of defects. One of its limitations is that it does not measure total welfare. It measures goods and services that are valued in money terms while it fails to measure the economic activities of nonmonerized sectors, such as productive activities

carried out at home. Moreover, it includes some public activities which may not be included (e.g., police protection and other similar activities). It does not also measure subjective elements, such as justice and freedom that a society can provide (Vangich 1974). Economists have early recognized the difficulties associated with GNP. Abramovitz (1959) stated that, "We must be highly skeptical of the view that long-term changes in the rate of growth of welfare can be gauged even roughly from changes in the rate of growth of output."

The previous limitations are compounded when comparison of the performance of two or more countries is attempted. How to value the output of different countries in a common measure poses a major problem. The most widely used method adopted by the World Bank is to convert local prices into U.S. dollars at official exchange rates. This issue is difficult to resolve due to the complexity and instability of the exchange market. Even if the exchange issue can be resolved, the problem of what method of GNP comparison to use would remain. The relative levels and rates of change in per capita national income are used nationally and internationally in making a wide range of decisions (Chenery et al 1974, Horowitz, 1976. Even with this method the problem of measuring equality in

the distribution of growth gains still remains.

To remedy these defects and to create other composite indicators that could serve as complements or alternatives to GNP, many efforts have been undertaken. Such efforts fall into two groups -- those that seek to measure development in terms of interaction among social, economic, and political factors and those that measure it in terms of the quality of life.

One of the major studies on the first group of composite indicators was carried out by the United Nations Research Institute on Social Development (UNRISD, 1970). The study was concerned with the selection of the most appropriate indicators of development and analysis of the relationship between these indicators at different levels of development. The result was the construction of a social development index. Originally, 73 indicators were examined, and only 16 core indicators (9 social indicators and 7 economic indicators) were ultimately chosen. These indicators were selected on the basis of their high intercorrelation to form a development index using weights derived from their various degrees of correlation.

Another study that sought to measure development in terms of a pattern of interaction among social, economic, and political factors was carried by Adelman and Morris. In their study, they classified 74 countries according to

41 variables. Factor analysis was used to examine the interdependence between social and political variables and the level of economic development. They found numerous correlations between certain key variables and economic development (Adelman and Morris, 1969).

These studies were criticized on the grounds that they seek to measure development in terms of structural change rather than in terms of human welfare, as they implicitly assume that developing countries must develop along the lines of developed countries. Furthermore, they were criticized as they put more emphasis on measuring inputs, such as the number of doctors or hospital beds per 1000 population or enrollment rate in schools to measure health and education, when outputs, such as life expectancy and literacy, are the actual objectives of development. In response to these criticisms, several studies have sought to develop composite indicators that measure development in terms of meeting the basic needs of the majority of the population or in terms of the "Quality of Life."

One well known endeavor in this area was the development of the Physical Quality of Life Index (PQLI) undertaken by Morris (Morris, 1974). Three indicators - life expectancy at age one, infant mortality, and literacy - were used to form a simple composite index (PQLI). For

each indicator, the performance of individual countries is rated on a scale of 1 to 100, where 1 represents the "worst" and 100 represents the "best" performance. The PQLI for a country is calculated by averaging the three ratings, giving equal weight to each.

The main potential uses of the PQLI, as Morris identified them include: First, measuring performance of countries on providing certain needs to their population. Second, complementing per capita GNP in obtaining more equal distribution of capital gains. Third, PQLI can be used to establish targets and to measure progress toward them. Furthermore, it can be used for comparisons at national levels between different regions or social groups. In addition to identifying the potential uses of PQLI, Morris recognized its limitations which mainly stem from its limited basis, as it does not measure economic growth or total welfare, and its lack of support by any underlying theory.

As a measuring instrument, the PQLI has been used along with GNP and per capita GNP to measure the efficiency of U.S. aid programs to most aid recipients of developing countries and to classify countries at different levels of development according to their performance on these measures (U.S. Foreign Policy and Third World: Agenda 1979-1986).

With the United Nations projecting that the world population will be about 6.1 billion by the end of the century and over four-fifths of this population will be inhabiting the Third World, the growing population dilemma has been an inseparable part of development literature (World Bank, 1984). The linkages between economic growth and population growth, their strength, and direction of operations have been tackled in three main approaches of analysis: The Malthusian "population trap," the theory of demographic transition, and the "microeconomics" theory of fertility.

The Malthusian population trap, which was developed in the late eighteenth and early nineteenth century, was built on the assumption that, the only way to control population growth is through dwindling food supplies (Ronald 1976). Although Malthus' theory was mainly applied to the agrarian societies that existed then, it can be regarded as an early warning for the problem of population control which still exists.

The theory of demographic transition provides an explanation to why all developed nations have almost passed through three main stages of population growth. These stages are: high birth and death rates, high birth rates and low death rates, and low birth and death rates. The main conclusion of this theory is that modernization

and industrialization eventually leads to a decline in population growth.

There is a supportive evidence for this theory in some developing countries which can be classified as "newly industrialized" countries such as Taiwan, South Korea, and Singapore. The modernization which was accompanied by improvements in living conditions of populations of these countries resulted in lower population growth rates than those of other developing countries. This was enhanced also by the population control programs carried out in these countries (Todaro, 1983).

The microeconomic theory of fertility provides some theoretical and empirical explanation for the down-trend of population growth in the third stage of the demographic transition. This theory assumes that the household demand for children is determined by family preferences for a certain number of surviving children, by the price of rearing those children, and the levels of family income. Children in poor societies are seen partially as economic investment goods in that there is an "expected return" in the form of both child labor and the provision of financial support for parents at an older age (Leibenstein, 1974).

Statistical studies in some developing countries have given a supportive evidence to the economic theory of fertility. For example, it has been found that high female employment opportunities outside the home and higher female and male school attendance are associated with low levels of fertility (Shultz, 1974).

The conclusion from this argument is that the effect of social and economic progress in lowering fertility in developing countries will be greater when the majority of the population share in its benefits.

2.2 Contribution of the Study

In light of this review of literature, nature of comparative studies performed and nature of our study, the contribution of this study resides in its uniqueness and level of integration. With regard to the first, no comparative studies have been done between development models of the two countries or between Jordan and any other country. The number of variables, length of period covered, depth of analysis and the inclusion of environmental aspects support the second argument.

Chapter III

Structures of Development
A Comparative Analysis

This chapter presents the various dimensions of development in the two countries based on the socio-economic aspects considered in this study. The data presented here will on the one hand give a general idea of the contours of development in both countries, and on the other form the basis for subsequent analyses . In doing so, the technique of factor analysis is applied to reduce dimensionality as the large number of variables is reduced to a smaller number of representative factors.

3.1 The Factor Analysis Model

This step of factor analysis proceeds as follows: (1) Determination of the appropriate number of factors that can adequately represent the data, (2) Determination of factor or factors that can explain the highest portion of the inter-country variations in their socio-economic performance, and finally, the variables that have their

highest weights on the most important factor will serve as a basis for our comparative analysis.

Several procedures have been examined for determining the appropriate number of factors to represent the data. First, only factors that account for variances (eigen values) greater than 1 were considered (Noruvsis, 1985). According to this criterion, only two common factors were obtained for Jordan and three for Singapore. Second, the number of factors was set equal to two. In this case, most of the high loadings appeared on one common factor for Jordan and two factors for Singapore. Third, only factors that account for a greater than .1 variance were considered. Applying that, three and four factors were obtained for Jordan and Singapore respectively. Finally, the number of factors was set equal to 3. It was found that three factors are more appropriate for representing the data as they explain about 98% of its variance (Dillon and Goldstein, 1984).

The results of the step of factors extraction are presented in Tables 3.1.1 and 3.1.2 and Figures C.1 and C.2 (Appendix C).

Table 3.1.1 Results of Factor Extraction For Jordan

Factor	Eigen Value	Percent of Variance	Cumulative Percent
Economic	16.81801	80.1	80.1
Growth	2.70075	12.9	92.9
Social	1.04014	5.0	97.9

Table 3.1.2 Results of Factor Extraction For Singapore

Factor	Eigen Value	Percent of Variance	Cumulative Percent
Economic	18.761888	85.3	85.3
Growth	1.92899	8.8	94.1
Social	.81305	3.7	97.8

In order to determine the weight of each of the study variables on each of the obtained factors, factor matrices were obtained for both countries, as presented in Tables 3.1.3 and 3.1.4.

Table 3.1.3: Factor Matrix (Jordan)

	ECONOMIC FACTOR	GROWTH FACTOR	SOCIAL FACTOR
Agriculture	.94502	-.03333	.20546
Manufacturing	.96081	-.11090	.21515
Construction	.98175	-.09879	.14900
Utilities	.96103	-.13691	.16409
Trade	.97889	-.10533	.16237
Transportation	.97374	-.12658	.17038
Banking/Finance	.97541	-.15979	.12378
Services	.99231	-.01017	.04307
GNP	.99051	-.05076	.12049
GNP growth rate	.16711	.93336	.14190
GNP per capita	.98667	.-01360	.12342
GNP per capita growth rate	.15963	.91695	.23669
Population	.96620	.09595	-.21336
Birth rate	-.94254	-.01852	.27599
Death rate	-.96423	-.08464	.21264
Infant mortality	-.94423	-.12067	.29723
Life expectancy	.99105	-.03529	-.07001
Literacy rate	.92504	.21833	-.28720
PQLI	.95880	.13915	-.24283
Urbanization	.96357	.07854	-.24401
Exports	.96624	-.08218	.13798
Imports	.97229	-.08445	.12944

Table 3.1.4: Factor Matrix (Singapore)

	ECONOMIC FACTOR	GROWTH FACTOR	SOCIAL FACTOR
Agriculture	.97574	.11632	.03003
Manufacturing	.97965	-.13393	.12986
Construction	.90984	-.32912	.10367
Utilities	.96706	-.20974	.07238
Trade	.99145	.06117	.06866
Transportation	.96683	-.21922	.11631
Banking/Finance	.94802	-.25653	.12478
Services	.96980	-.11592	.13537
GNP	.97804	-.17193	.11250
GNP growth rate	-.05847	.89192	.44152
GNP per capita	.98281	-.14563	.10925
GNP per capita growth rate	.03055	.91144	.40005
Population	.97035	.18327	-.12886
Birth rate	-.89325	-.33485	.28938
Death rate	-.63702	-.40615	.56024
Infant mortality	-.94521	-.23238	.17562
Life expectancy	.96330	.21020	-.09156
Literacy rate	.89517	.37292	-.17777
PQLI	.92069	.32655	-.15791
Exports	.95574	-.19703	.16470
Imports	.96454	-.12462	.19384

Since one of the goals of factor analysis is to identify factors that are meaningful, in the sense that they summarize sets of closely related variables, the rotation phase of factor analysis was performed with the purpose of transforming the initial matrices (Tables 3.1.3 and 3.1.4) into more interpretable ones. The rotated factor matrices are presented in Tables 3.1.5 and 3.1.6 for Jordan and Singapore, respectively. Examining these matrices, no major improvements over the results obtained in the nonrotated matrices can be observed at the rotation phase. This is due to the fact that the rotation step did not satisfy its main purpose of having a "simple structure" (Dillon and Goldstein, 1984 and Thurstone, 1947). This is based on first, the large positive and negative values (bipolarities) were maintained on the three factors after the rotation step. Second, the number of variables that loaded on any of the factors has not been reduced. And finally, some variables have high loadings on more than one factor. For instance, population, death rate and life expectancy have loadings of more than .60 on both of the economic and the social factors, and many other variables have loadings of more than .50 on the same two factors.

These discussions imply that the rotation step had not produced satisfactory results and it did not add to

the meaningfulness and simplicity of the initially obtained factors. Therefore, the nonrotated factor matrices (Tables 3.1.3 and 3.1.4) are used as a basis for our comparative analysis.

With the purpose of selecting only the most important variables on each factor, factor loadings that are less than 0.60 were not considered. A further distinguishing step is undertaken by linking the variables to the factors they are closely associated with. This step implies that if a certain variable has high loadings on more than one factor, it will be classified under the factor which is closer in nature to that particular variable (Adelman and Morris, 1969).

Under the previous considerations, the variables observed on the first factor are economic in nature. These variables include GNP and its composites: Agriculture, Manufacturing and Mining, Construction, Utilities, Trade, Transportation and Communication, Banking and Finance, and Services. Therefore, this factor is called the Economic Factor.

The variables that came on the second factor, which is classified as the Growth Factor, are GNP Growth Rate and Per Capita GNP Growth Rate.

The variables that loaded highly on the third factor are social and demographic variables: Population, Birth

Rate, Death Rate, Infant Mortality Rate, Life Expectancy at Age One, Literacy Rate, PQLI, and Urbanization. According to that, the second factor is called the Social Factor.

Table 3.1.5 Rotated Factor Matrix (Jordan)

	ECONOMIC FACTOR	SOCIAL FACTOR	GROWTH FACTOR
Agriculture	.86319	.42434	.10595
Manufacturing	.89923	.41455	.03548
Construction	.87417	.48024	.03128
Utilities	.87573	.44981	-.00309
Trade	.88126	.46718	.02832
Transportation	.88688	.45450	.00962
Banking, Finance	.86878	.48610	-.03456
Services	.79999	.58201	.08896
GNP	.85317	.51511	.07052
GNP growth rate	-.00514	.14123	.94829
Per capita GNP	.84321	.51630	.10663
Per capita GNP growth rate	.04810	.06124	.95720
Population	.60549	.77926	.12000
Birth rate	-.56866	-.80050	-.02689
Death rate	-.60702	-.77571	-.10917
Infant mortality rate	-.53376	-.83387	-.11939
Life expectancy	.73899	.66409	.03453
Literacy rates	.50186	.82954	.21411
PQLI	.57248	.80406	.15294
Urbanization	.58962	.79839	.09488
Total exports	.85180	.48167	.04291
Total imports	.85207	.49163	.03898

Table 3.1.6 Rotated Factor Matrix (Singapore)

	ECONOMIC FACTOR	SOCIAL FACTOR	GROWTH FACTOR
Agriculture	.79603	.56425	.12030
Manufacturing	.92224	.37838	-.02845
Construction	.91346	.26592	-.20433
Utilities	.91009	.37535	-.1236
Trade	.88217	.46173	-.00344
Transportation	.93232	.34031	-.10637
Banking, Finance	.93201	.30650	-.13235
Services	.91074	.37778	-.01059
GNP	.92517	.37149	-.06958
GNP growth rate	.13441	.08607	.98407
Per capita GNP	.91945	.38882	-.04979
Per capita GNP growth rate	-.08416	.17240	.97719
Population	.70011	.70317	.08477
Birth rate	-.51663	-.84445	-.11729
Death rate	-.15916	-.92677	-.01959
Infant mortality rate	-.64285	-.74521	-.09829
Life expectancy	.70222	.68629	.12809
Literacy rates	.55565	.78628	.21218
PQLI	.60046	.76436	.18558
Total exports	.93744	.31130	-.06065
Total imports	.93494	.33030	.01552

The three factors for both countries are represented in Figures 3.1.1, 3.1.2 and 3.1.3. The gaps that appear between performance levels of the two countries indicate that they are at different levels of development and growth. In exploring the structural forces behind these differences, a comparative discussion of the study variables is undertaken. As the largest gap between the two countries appears on the economic factor, it is used as a basis for further comparative purposes.

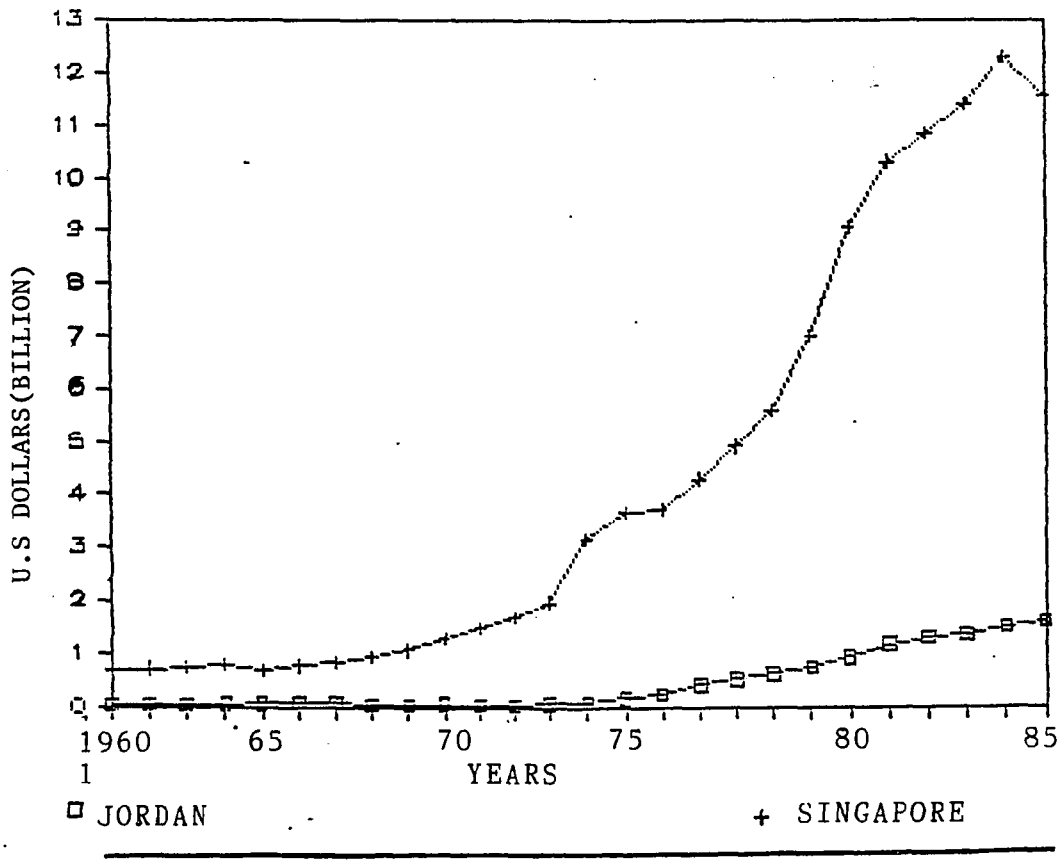

Figure 3.1.1: Trends of the Economic Factors

(Jordan vs. Singapore)

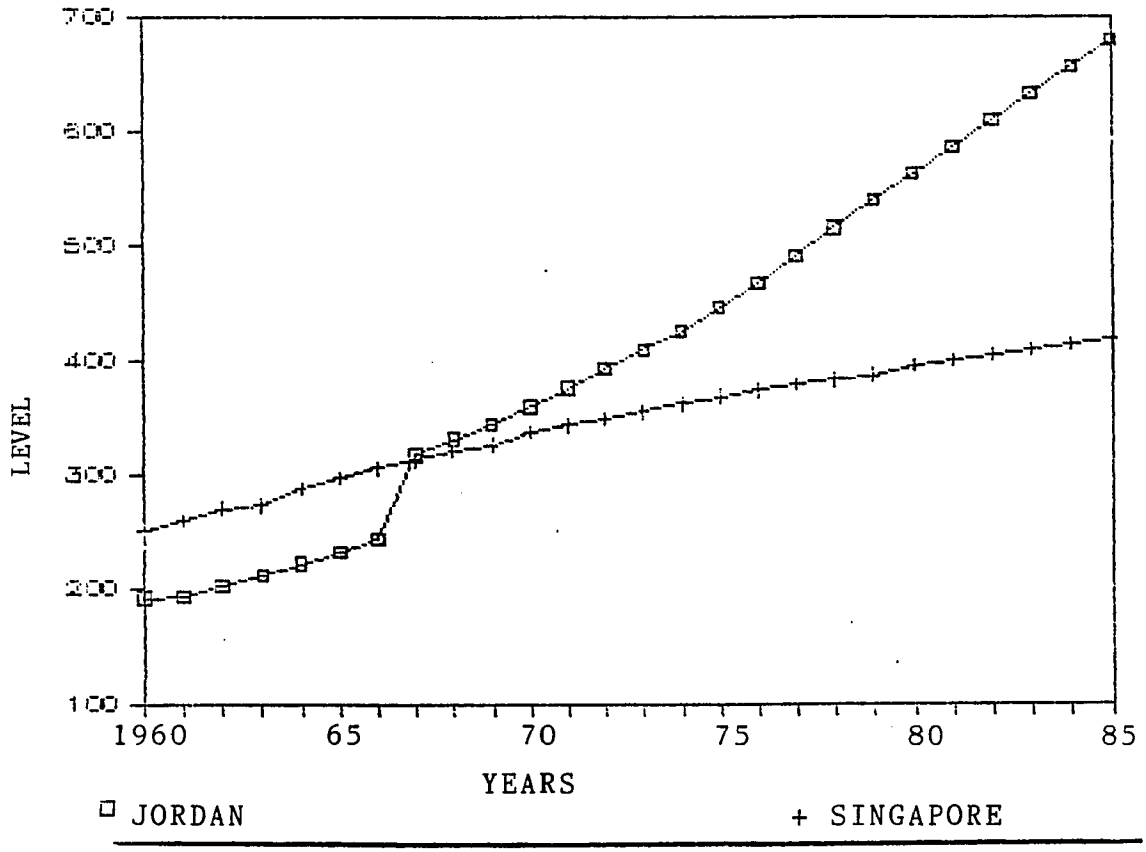

Figure 3.1.2: Trends of the Social Factors

(Jordan vs. Singapore)

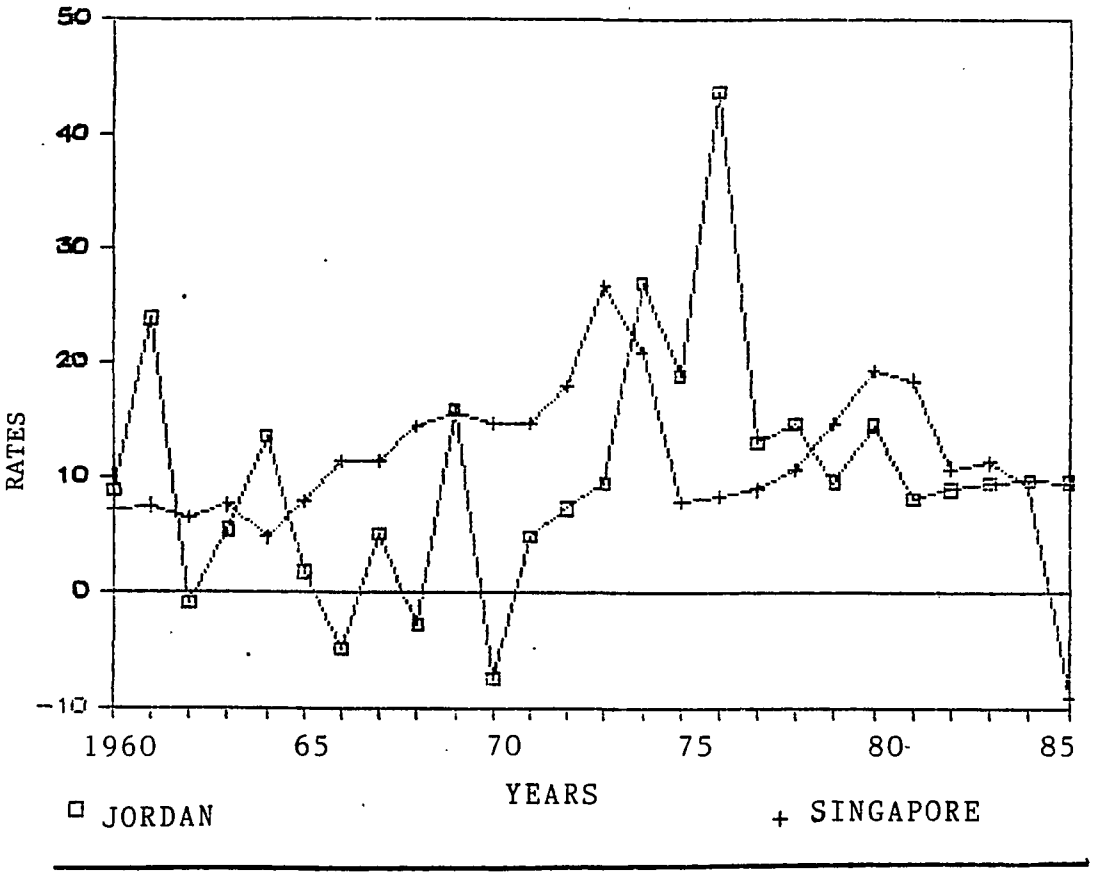

Figure 3.1.3: Growth Factors (Jordan vs. Singapore)

3.2 Contours of Development

The focus of this step is on gaining more quantitative and qualitative insight into the long-run interaction of various types of social and economic aspects of development. For this purpose, the results of the factor analysis, previously mentioned, have been interpreted. This step is introduced to by representing the aggregate data, in order to test for the validity of relationships through the consistency which appears in the subgroups analyzed.

The Aggregate Data

The results of the factor analysis for the aggregate data (both countries) are summarized in Table 3.2.1.

Such as in the case of the two countries, the variables are grouped into three factors, namely (1) a factor representing the economic aspects of development, (2) a factor representing social aspects of development, and (3) a factor representing growth rates of GNP and per capita GNP. These three factors and the variables they represent are explained for each of the two countries.

Table 3.2.1: Rotated Factor Matrix (Total)

Variable	Economic Factor	Social Factor	Growth Factor	Communality
Agriculture	.53710	-.05089	.50020	.54126
Manufacturing	.93833 *	.32920	.05895	.99231
Construction	.94033 *	.23937	-.04431	.94349
Utilities	.91281 *	.38450	-.01746	.98137
Trade	.88388 *	.44147	.04736	.97838
Transportation	.94537 *	.31584	.01065	.99359
Banking	.92580 *	.31949	-.05679	.96241
Services	.88913 *	.43526	.02603	.96793
GNP	.93887 *	.33349	.07408	.99818
GNP growth rate	-.13618	.06149	.88508 *	.80569
Per capita GNP	.93495 *	.34467	.07630	.99876
Per capita GNP growth rate	-.05625	.18195	.84382 *	.74830
Population	.44507	.65704 *	.38339	.78578
Birth rate	-.51182	-.79545 *	.01483	.89492
Death rate	-.22842	-.94984 *	-.11890	.96851
Infant mortality	-.34704	-.93263 *	-.07744	.99624
Life expectancy	.44905	.86746 *	.14120	.97406
Literacy rates	.63021 *	.45155	.46671	.81888
PQLI	.52677	.78826 *	.26435	.96872
Urbanization	.23219	.96215 *	-.01152	.97978
Total exports	.92204 *	.32969	-.02278	.95938
Total imports	.92288 *	.34335	.04468	.97160

JORDAN

The results of the factor analysis for Jordan parallel in important respects those for the aggregate data. The grouping of variables into the three factors is very similar and the directions of the relationships between the variables are almost the same within these factors. The interpretation of the variables that the three factors represent is the subject of the following discussions.

The Economic Factor: (GNP composites)

Manufacturing and Mining

Jordan has a very limited number of large scale industries and none of them has reached yet to a competitive level. The main markets for Jordan industries are some of the neighboring Arab countries. The major mineral resource is phosphate which faces high competition at the international level.

The industrial sector has witnessed significant growth during the past two decades. Income from manufacturing and mining increased from $22 million (8.3%

of GNP) in 1960, to $980 million (20.6% of GNP) in 1985. About 10% of the total work force in Jordan is employed in this sector.

The rapid growth of this productive sector during the 1960-85 period is the result of increased domestic demand, some import substitution policies and to sharp increase in phosphate prices.

Transportation and Communication

The transportation sector includes roads, the civil aviation directorate, the Royal Jordanian Airlines, railways, and the public transportation corporations. It also includes joint public venture companies in the field of road and sea transport as well as the activity of the private sector in the transport of freight and passengers.

The communication sector includes telecommunication services offered by the telecommunications corporation as well as postal services, postal savings, and other associated services offered by the ministry of communications.

Income accruing from the transportation and communication sector increased from $33 million in 1960 to $431 million in 1985. For the same period its contribution to GNP declined from 12.5% to 9%. In order

to stimulate this sector, the government is considering privatizing most of the public activities related to this sector (airlines, public transportation and telecommunications).

Trade

The trade sector plays a major role in the national economy both in terms of contribution to GNP and in meeting the country's needs of consumer and capital goods. Since the free movement of capital and free trade lies at the heart of Jordan's economic system, most trade activities fall under the private sector, while the government imports and distributes a limited number of basic food items with the purpose of providing them to the consumers at controlled prices. The contribution of this sector to GNP decreased from 21.3% in 1960 to 13% in 1985. The reason for this decline lies behind the absence of sufficient regulations to direct the flow of goods and services to the benefit of the whole economy.

At the foreign trade level, Jordan maintains economic relations with many western and eastern countries and all the Arab countries. To meet the demands of development and to satisfy the needs of its people, the country imports almost all its needs from consumer goods,

intermediate goods, and capital goods. Exports of Jordan are very limited and most of them go to Arab countries.

There is always a deficit in the balance of trade. In absolute value, the deficit increased from $115 million in 1960 to $2580 million in 1985. The ratio of the deficit to GNP increased from 43% in 1960 to 54% in 1985. Domestic exports show an upsurge while commodity imports show a greater increase. In order to close this gap, major changes in the country's economic structure have to be considered. This might include gearing the economy toward more productive activities, adjusting the related regulations to cope with the changing nature of the economy and more incentives for private investors.

Utilities

This sector occupies a special position because of the reliance of all other sectors on it. Owing to the expansion of Jordan's economy during the last few years, energy consumption increased from 0.85 million tons of fuel in 1975 to 1.8 million tons in 1980, at an average annual rate of 16.2%. Fuel consumption per capita almost doubled from 0.42 tons to 0.81 tons, it remains at a modest level by international standards (World Development Atlas, 1984).

Of this total energy, the transportation sector consumes about 50% and electricity generation 18%, while the rest is used for industrial and domestic purposes. This indicates that energy consumption among the different sectors is uneven. Besides the inadequate and uneven distribution, Jordan lacks domestic energy resources which can be commercially utilized. The contribution of this sector to GNP increased from .77% in 1960 to about 1.2% in 1985. The magnitude of this increase is almost negligible compared to the length of the period and to other economic activities.

Construction

This sector did not register any improvement in its relative contribution to GNP for the period 1960-85 as it only increased from .05 in 1960 to .055 in 1985. It is also unable to meet development requirements since it is confronted by major bottlenecks. The absence of sound management and planning, the inability to absorb modern technology, the lack of proper financing, the shortage of skilled labor, and the dearth of local contractors capable of implementing large projects are major features of the construction industry.

These problems are accelerated more by increases in land values and construction costs.

Banking and Finance

This sector consists of the Central Bank, commercial banks, specialized credit institutions, the Amman Financial Market, and various financial intermediaries comprised of investment banks, companies in financial brokerage, savings and investment, real estate investment, insurance and exchange.

In absolute terms, the contribution of this sector to GNP increased from about $2.6 million in 1960 to about $71 million in 1985. This increase does not represent any significant improvement when compared to other sectors and GNP in general.

The banking sector is characterized by a small and relatively undeveloped monetary market with limited tools, narrow capital market, inflexible structure and levels of interest rates and concentration of banks in the capital and some large cities. Specialized banks (housing and industrial) have not been able to meet the rising needs of development.

Agriculture

This sector is of special importance to all developing economies. Food shortages and malnutrition in some parts of the world still exist in spite of the short-term remedies that have been taken. The development of this sector can support in solving some economic and social problems (rural development, more homogeneous distribution of population between rural and urban areas, food supply and higher contribution to GNP).

The contribution of this sector to GNP declined from 15% to 6% over the period (1960-85). This is not surprising under the existing policies in terms of land distribution and development, elementary irrigation systems, lack of orientation toward agriculture, invasion of arable land by housing units and ill-structured trade policies.

Services

The services sector plays a major role in Jordan's economy in terms of investments and share of GNP. With its ambitions to be a major trade center in the region, Jordan is striving to build a more integrated and advanced system of services to provide the necessary infrastructure

for development in general. As a result, the contribution of this sector to GNP increased from 35% in 1960 to 44% in 1985.

Total GNP, generated from all these economic sectors, increased from about $267 million in 1960 to about $4746 in 1985. In parallel to that, GNP per capita increased from $296 in 1960 to reach $1765 in 1985.

The changes in the contribution of economic sectors to GNP between 1960 and 1985 are shown on Figure 3.2.1 and the general trend of the economic factor is presented in Figure 3.2.2.

Examining figure 3.2.2, some observations can be made about the trend of economic development in Jordan. The take-off stage of Jordan started late and slowly. Although the general trend is rising, there are some apparent fluctuations.

From 1960-64, small improvements appear. This observation can be true for any developing nation due to the absence of development requirements accompanied by high levels of uncertainty.

A small shift occurred between 1964-67. This can be related to the adoption of the first development plan (1964-67). Improvements occurred in all sectors except agriculture which was mainly rainfed. The slope started to decline in 1967 and 1968. This might be related to the

1967 Arab-Israeli war which dramatically shocked the whole region. As a result, military expenses were increased, the main economic activities, especially manufacturing, were stopped as they were mainly concentrated in the West Bank, and hundreds of thousands of refugees fled to Jordan after the war. In spite of that, and because of some monetary aids, mainly from Arab countries, considerable growth rates were registered in 1969. Jordan did not enjoy those aids nor the growth for long. In September of 1970, major clashes happened between Jordan and the Palestine Liberation Organization (PLO) which was based there. The main result was down-shifting the economy again as Arab countries sustained their financial aids to Jordan. in 1971 and 1972, small improvements appear. After 1972, the trend started to rise steadily. This is due to some internal and external factors. These include the country's political stability, increase in phosphate prices, more investment incentives, the Lebanese war, and the Iraq-Iran war which contributed to the creation of Jordan as a financial and trade center in the region, and the boom in oil prices which dramatically increased remittances of Jordanians working abroad. The combined effects of these factors were higher growth rates between 1976 and 1985.

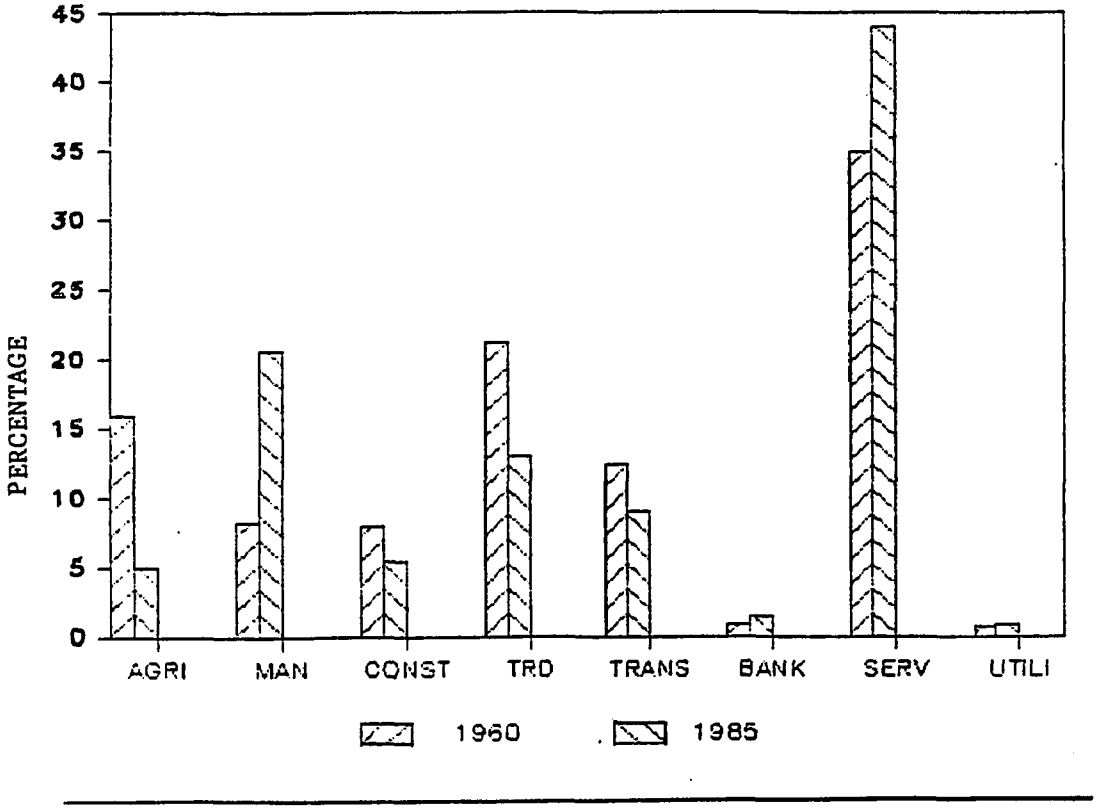

Figure 3.2.1: Contribution of Economic Sectors to GNP for 1960 and 1985(Jordan)

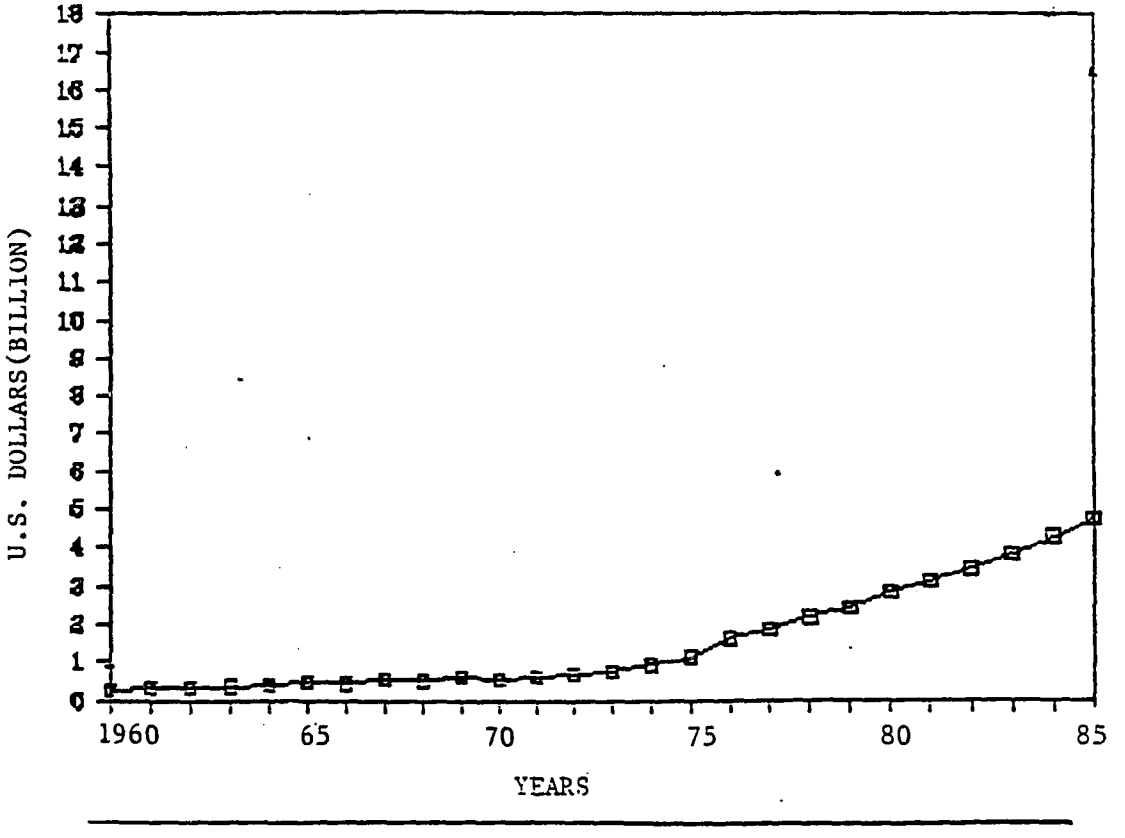

Figure 3.2.2: Trend of the Economic Factor (Jordan)

The Social Factor

The variables included under this factor are life expectancy, infant mortality rate per 1000, literacy rate, PQLI, birth rate per 1000, urbanization, population and death rate per 1000.

While the economic factor explains the levels of progress in the various economic sectors, this factor assists in measuring the degree to which the whole society benefited from that progress.

Jordan has shown a remarkable progress on all aspects represented in the social factor.

Life expectancy increased from 46 in 1960 to 66 in 1985, infant mortality showed a substantial decline from 136 in 1960 to 60 in 1985. During the same period, literacy more than doubled as it increased from 32 to 72. PQLI has also improved from 40 in 1960 to 71 in 1985. Birth rates and death rates also decreased, but at different levels. The decline in birth rates is slower than that of death rates. According to that, Jordan can be classified as approaching the second stage of "demographic transition" previously discussed. The population of Jordan almost tripled over the period 1960-85. This increase did not come only from natural sources (difference between birth rates and death rates),

but also because of the successive waves of Palestinian refugees, and thousands of emigrants from some Arab countries (e.g. Lebanon) who sought shelter in Jordan because of instability in their countries. The number of people living in urban areas also increased from 43% in 1690 to 73% in 1985. Most of this increase happened in the capital, Amman, where most of the refugee camps are concentrated, and where most of the services and job opportunities are available.

The changes that occurred in the levels of the social aspects represented by this factor over the period 1960-85, are shown in Figure 3.2.3.

The general trend of the social factor, as shown in Figure 3.2.4, shows high resemblance to the trend of the economic factor (Figure 3.2.2).

The major shift appears between 1966 and 1967 is due to the sharp increase in population as more than 200,000 Palestinians sought refuge in Jordan after the 1967 Arab-Israeli war.[4] The other small fluctuations are negligible and they can be linked to small changes in all the variables represented in this factor, rather than to a major shift in one of them.

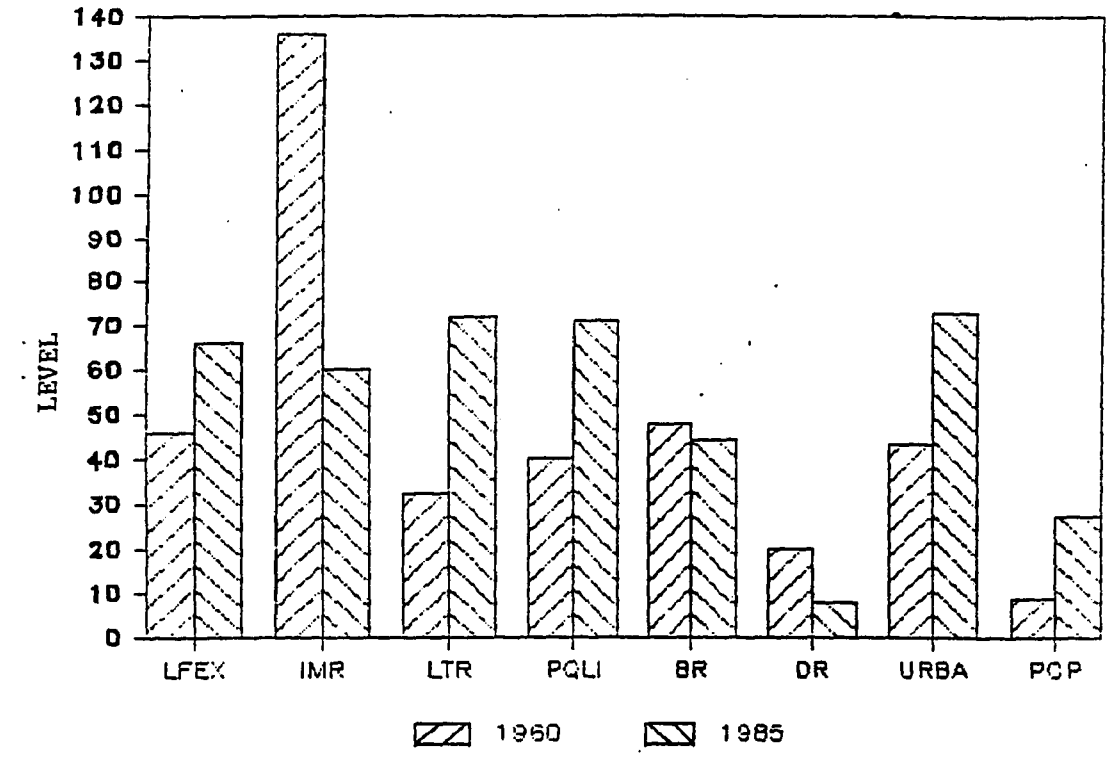

Figure 3.2.3: Changes in the Levels of Social Variables between 1960 and 1985 (Jordan)

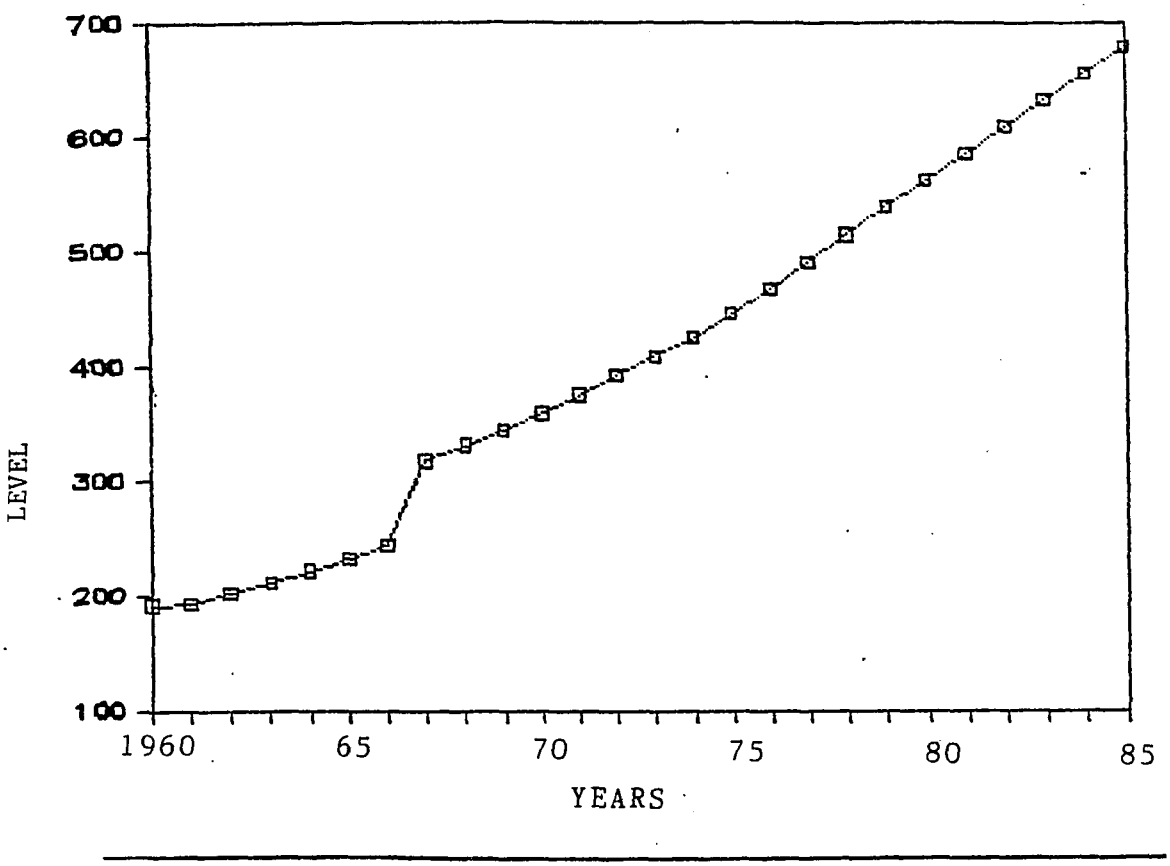

Figure 3.2.4: Trend of the Social Factor (Jordan)

The Growth Rates Factor

This factor represents GNP and per capita GNP growth rates. Although the general trend of these growth rates is rising, some negative shifts were observed. Those negative rates did not occur in isolation of the economic and social factors. As the country's economy shrunk in 1967 and 1970, GNP growth rate registered significant declines over the two years. The decline in GNP growth rate was magnified by a high unexpected increase in population to bring substantial declines in per capita GNP growth rate. The fluctuations appear on the behavior of this factor (Figure 3.2.5), including the sharp increase in 1976, are due to the same internal and external conditions discussed under the economic and social factors.

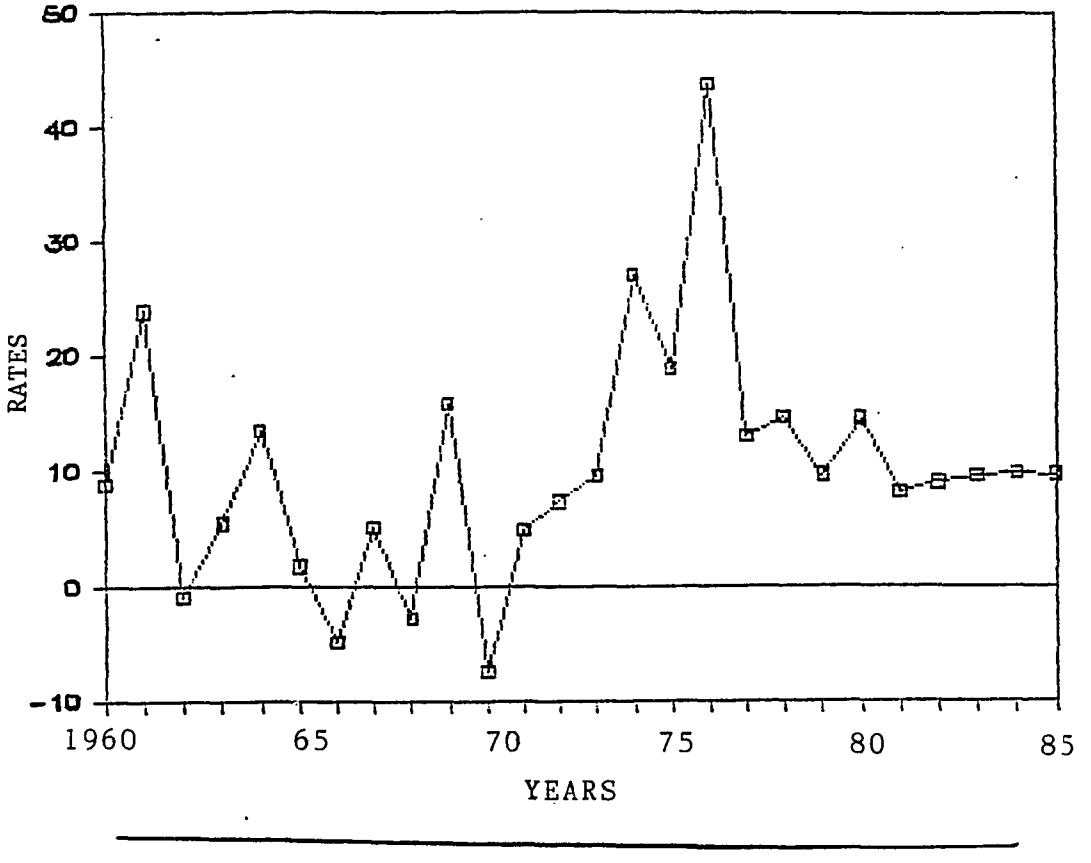

Figure 3.2.5: The Growth Rates Factor (Jordan)

SINGAPORE

The results of the factor analysis for Singapore also display a typically regional pattern while showing marked similarities to those for the aggregate data and Jordan on economic, social, and growth aspects. The performance achieved on all these aspects is presented in the following discussions.

The Economic Factor: (GNP Composites)

Manufacturing:

The Singaporian industrial sector contains a wide variety of large scale industries. This sector grew from labor intensive industries such as textiles, clothing and electronic assembly to high technology and more skill intensive industries. Industries such as petroleum products, shipbuilding and repairing, transport equipment, basic metals and metal products and precision instruments have become more important.

The Singapore government owns or participates in a large number of key industries and businesses in trading, transportation, communications, finance, construction, shipbuilding and repairing, electronics, engineering and

other manufacturing activities. The government's participation in industries and business enterprises has been aimed at stimulating industrialization with the purpose of restructuring the economy, apart from generating government revenue (Chen, 1983).

The contribution of this sector to GNP increased from 12 percent in 1960 to more than 25 percent in 1985.

Transportation and Communication:

Due to the size of the country, its strategic location, trade orientation, industrial prospects and development policies in general, Singapore managed to build a very advanced transportation and communication system. In addition to its contribution to GNP, this sector provides a necessary atmosphere for socio-economic growth in general. The link between this sector and development is well attested to in the case of Singapore. International trade, foreign investments, tourism, flow of information, social integration and many others could not have been accomplished in Singapore without providing a sufficient network of transportation and communication. The importance of this sector does not depend only on its contribution to GNP, but rather, on the degree of facilitating the functioning of other socio-economic

activities. For example, in spite of the advanced level of this sector in Singapore, its contribution to GNP increased slightly from 14 percent in 1960 to 15 percent in 1985.

Trade:

As the country has no natural resources and because it imports all its needs from abroad, its trade balance shows a constant but declining deficit. The ratio of this deficit to GNP decreased from 30 percent in 1960 to 20 percent in 1985. This is due to improvement in both terms of trade (export prices relative to import cost) and substantial increases in trade volume. The instability of oil prices, world inflation, high wage policies and international competition, all together, increase the complexity of solving this deficit problem. The contribution of the trade sector to GNP decreased from 35 percent in 1960 to 19 percent in 1985. This decline came as a result of government policies that lean more towards industrialization.

Banking and Finance:

Singapore has emerged in recent years as a major banking center, providing a varied range of financial services in South-East Asia and outside the region.

The contribution of this sector to the country's GNP improved from 9.6 percent in 1960 to 16 percent in 1985. This is due to a continuous attention and adaptation to cope with the financial needs of development and growth.

Construction:

The construction sector, which accounted for only 3.6% of GNP in 1960, grew to contribute 11.6% in 1985. The execution of large projects and the accelerated housing program provided the momentum.

Through the housing development program, over 70% of Singapore's population live in low-cost housing. These activities and other urban development policies have provided continued impetus in the construction sector.

Utilities:

The country has no domestic energy resources and the progress registered in this sector is owed to the overall

economic performance as no production or service activities can be performed without the support of this sector. Due to the small size of the country, high productivity and efficiency of other sectors and high prices of imported energy, this sector did not register any improvement in its contribution to GNP, although its absolute returns increased from $22 million to $361 million between 1960 and 1985.

Services:

In spite of the fact that Singapore maintains the necessary infrastructure of private and public services, the contribution of this sector to GNP declined from 18 percent in 1960 to about 10 percent in 1985. This should not underestimate the role of this sector in supporting the functions of other social and economic sectors. In absolute terms, the returns generated by this sector increased from $162 million in 1960 to $1532 million in 1985.

Considering the interaction of these economic sectors, GNP increased sharply over the period (1960-1985). With this increase in GNP and low population growth, per capita GNP increased from around $600 in 1960 to about $7000 in 1984 and $6500 in 1985 as a significant

decline occurred in GNP during that year. With this level of GNP per capita, Singapore should be considered as a developed country according to Chenery's classification (Chenery, 1975).

While GNP increased more than 18 times over the twenty six years, the relative contributions of the various economic sectors fluctuated over the same period (Figure 3.2.6). Manufacturing, construction and banking show higher improvement than the other sectors. The improvement in those three sectors occurred in light of the country's economic objectives. The economy was geared more toward industrialization to decrease reliance on trade as the main fund generator. With more than 70% of the population dwelling in housing projects and more attention given to tourism, the construction sector got a high share of growth. The financial incentives to attract more of foreign investments along with similar incentives to local (public and private) investors, led to the improvement of this sector (Hafez, 1986).

The behavior of the Economic Factor is shown on Figure 3.2.7. Seven phases of change can be recognized in the trend of this factor: 60-64, 64-72, 72-74, 74-78, 78-80, 80-84 and 85. At the first phase (60-64), no improvements appear as the country was still at its take-off stage after gaining its independence. After building

a general framework for development, the trend started to rise steadily during the second phase (64-72). A major shift happened in the third phase (72-74). During this phase, all economic sectors improved with major shifts in the areas of manufacturing, construction, trade and banking. The improvements registered in those sectors were a result of internal economic policies that oriented the economy more towards international markets. The inward (import substitution) policies were complemented by outward (export and re-export) oriented ones. During the fourth phase (74-78), the growth drive achieved in the previous stage continued with no major shifts. Another leap happened during the fifth phase (78-80). This is mainly related to the experience gained during previous phases, flexibility of the country's planning mechanism in adapting to changes, increase in export prices and large construction (transportation and housing) projects. The trend continued to grow during the sixth phase (80-84.) In 1985, a downward shift occurred. This is mainly related to the difficulty in coping with rapid change and growth with limited natural and human resources, emergence of other strong economies in the region, shifts in foreign investments, and international competition.

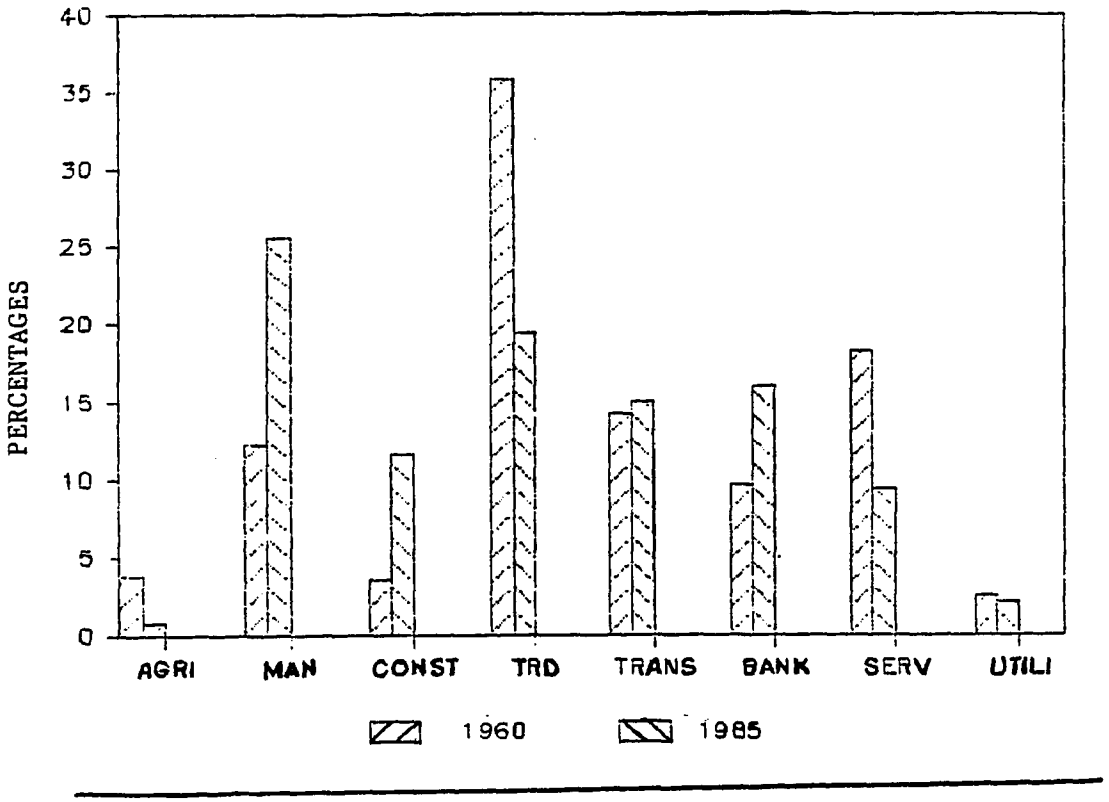

Figure 3.2.6: Contribution of Economic Sectors to GNP for 1960 and 1985 (Singapore)

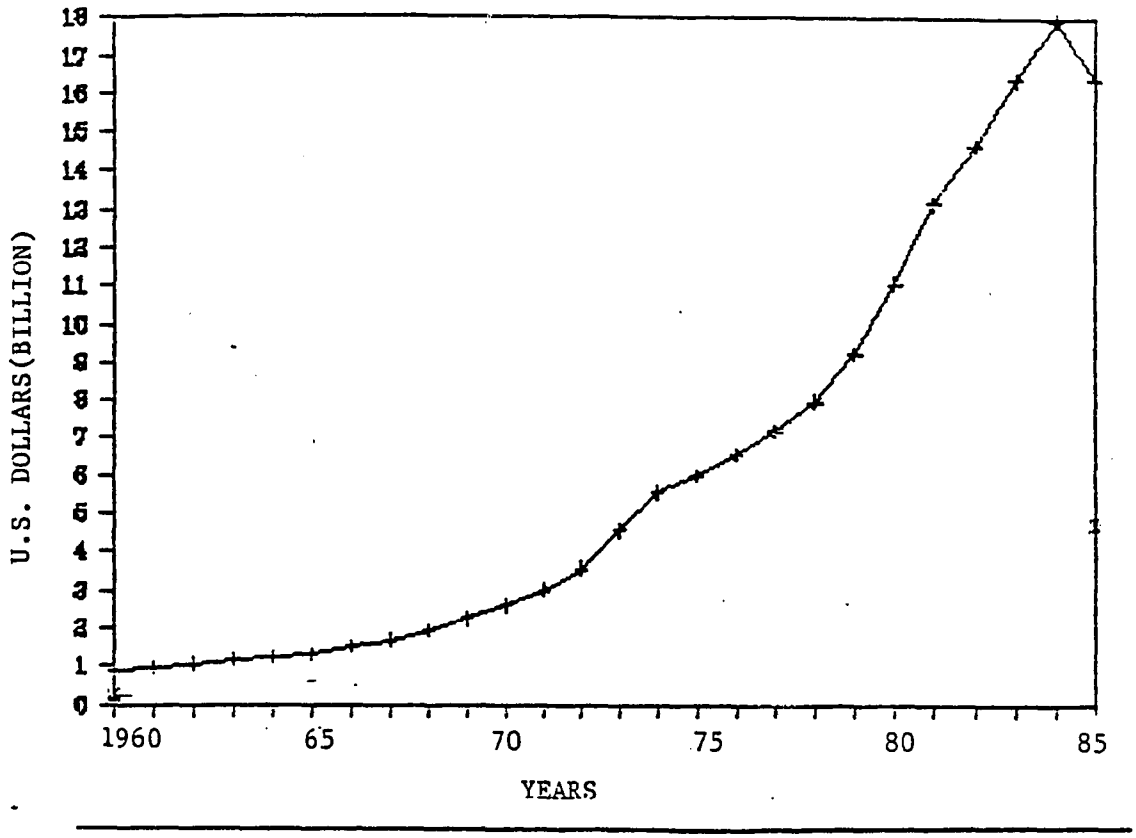

Figure 3.2.7: Trend of the Economic Factor (Singapore)

The Social Factor

The social and demographic variables represented here are: population, birth rate, death rate, infant mortality rate, life expectancy, literacy and PQLI.

Birth rate and death rate both declined but at different rates (more decline in birth rate). This is attributed to such factors as modernization and industrialization, urbanization, rising standards of living, and family planning programs. This indicates that Singapore has reached the third stage of "demographic transition" which implies that at higher levels of economic growth the gap between birth and death rates starts to close. Over the period (1960-85), birth rate declined from 37.8 to 16.2, while death rate declined from 6.2 to 5.2.

A continuous and marked decline in infant mortality is also found. This downward trend is attributed to advances in medical and health services in general.

Literacy increased from 32 in 1960 to 86 in 1985. This remarkable performance left its marks on the economic sector as the society became more adaptable and flexible to absorb new technologies and to cope with change.

Life expectancy increased from 63 in 1960 to 73 in 1985. During the same period PQLI increased from 60 to

become 86. The increase in population is due to natural sources (birth and death rate) and migration as the country applies flexible emigration policies to meet development requirements of human resources (Chen, 1983).

The changes in levels of social and demographic variables between 1960 and 1985 are shown on Figure 3.2.8.

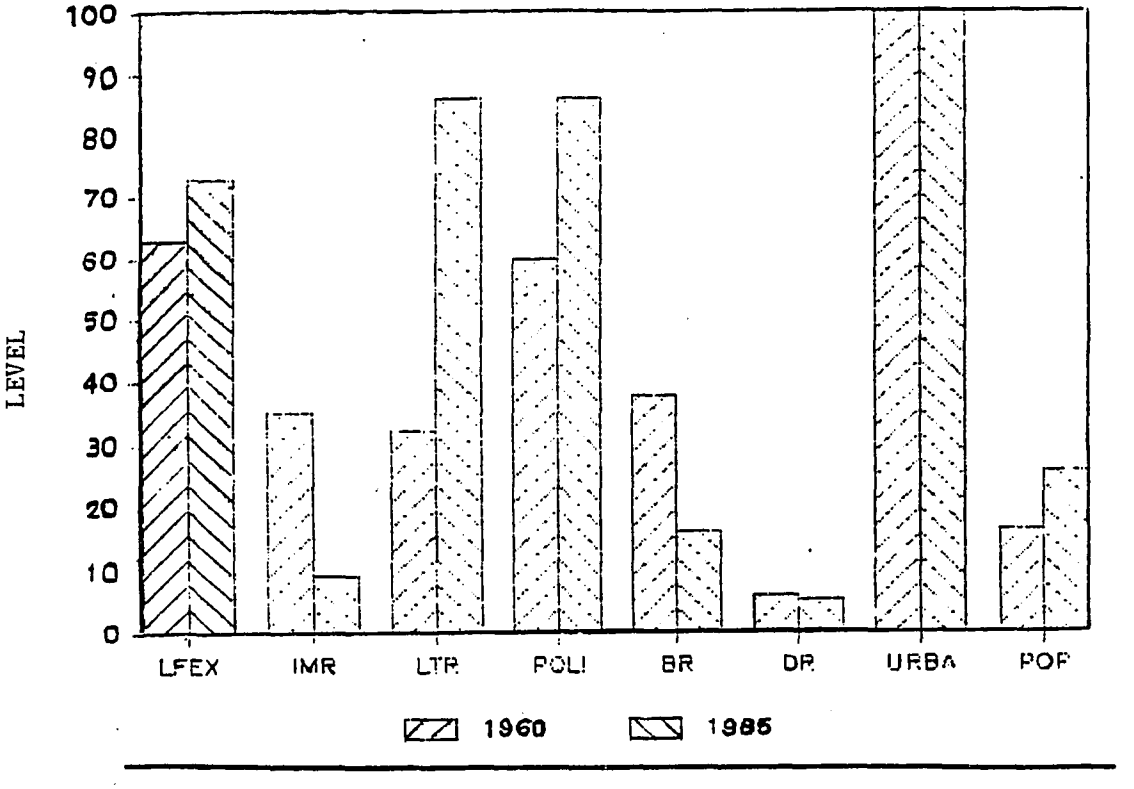

Figure 3.2.8: Changes in the Levels of Social Variables between 1960 & 1985 (Singapore)

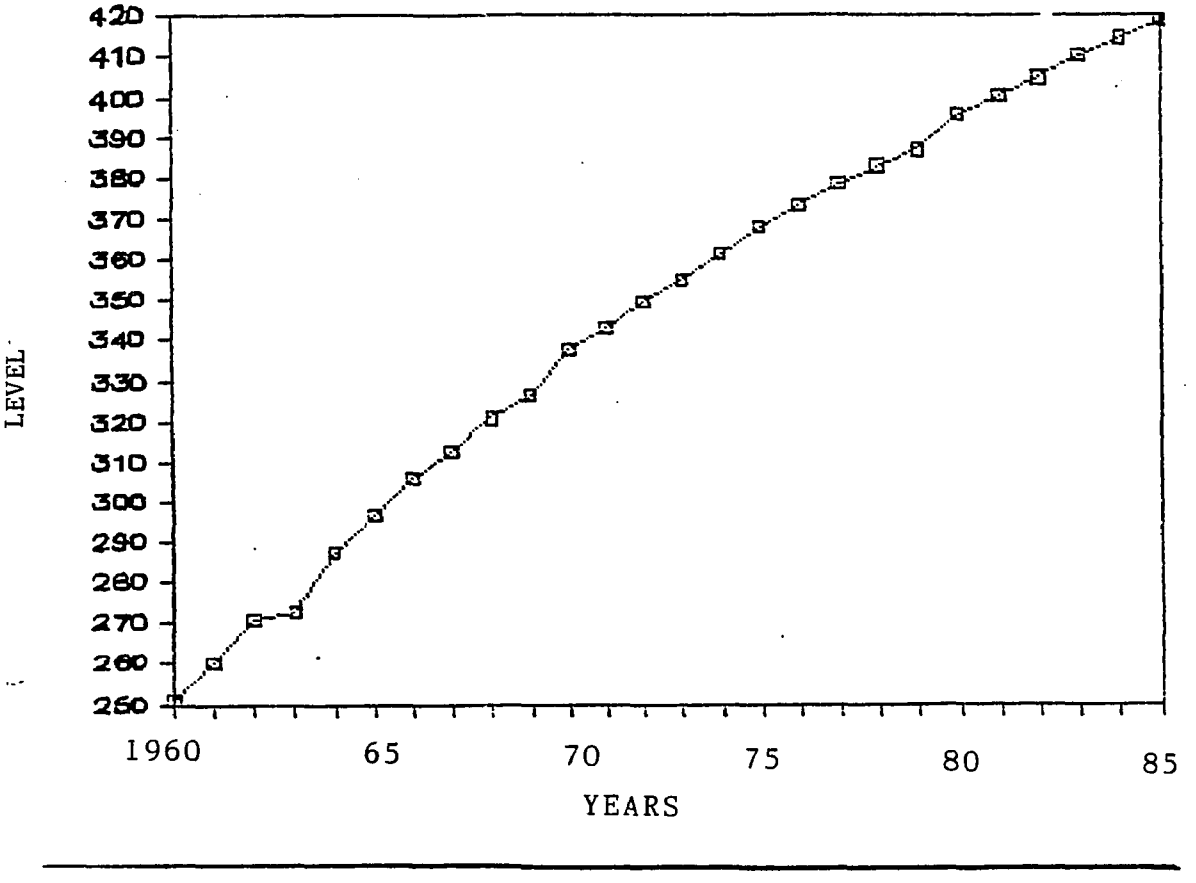

Figure 3.2.9: Trend of the Social Factor (Singapore)

The Growth Rates Factor

The flow of this factor (Figure 3.1.10) does not differ significantly from that of Jordan. The inconsistent trend of this factor is due to fluctuations in growth rates resulted from changes (seven phases) in economic aspects, previously discussed, and partially to changes in social and demographic aspects.

This chapter concluded that the two countries differ in their performance on all economic, social and growth aspects. Further analysis and interpretation of the two development models is provided in the following chapters.

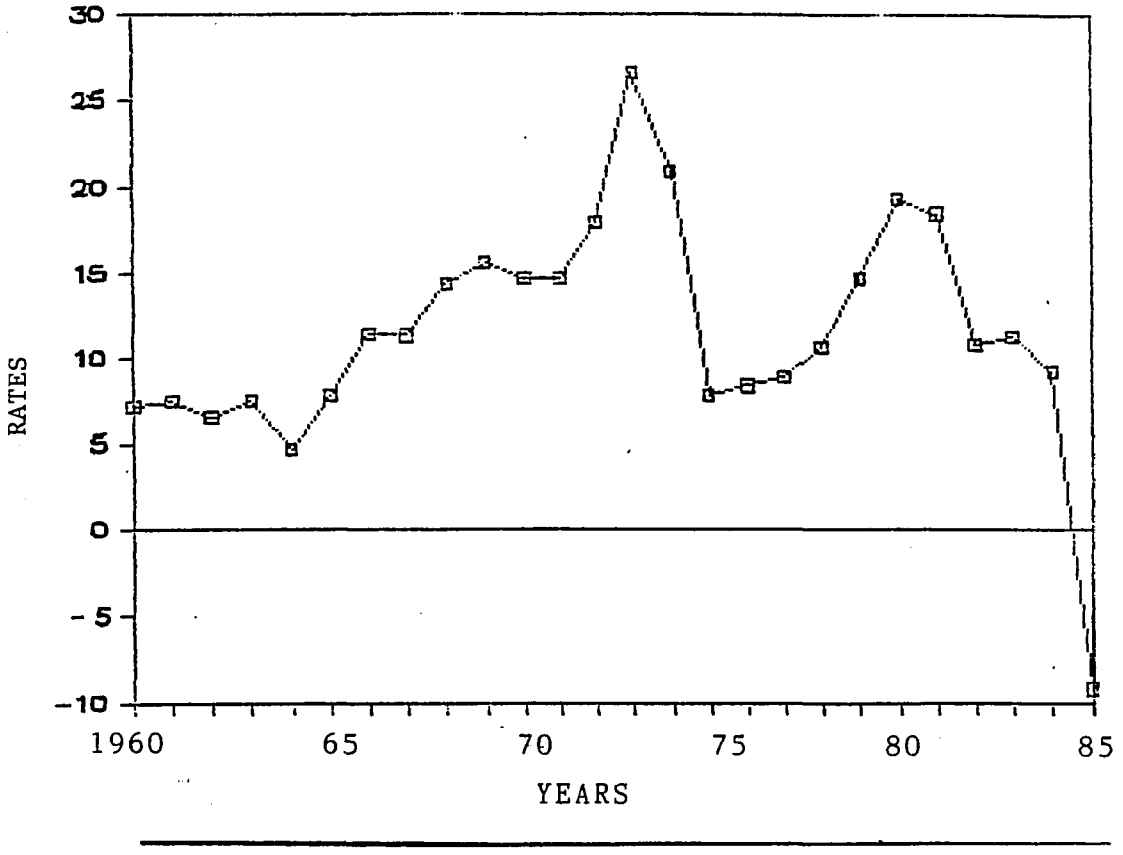

Figure 3.2.10: The Growth Rates Factor (Singapore)

Chapter IV

Models of Development

The purpose of this chapter is to identify and compare the development models of Jordan and Singapore based on our empirical results. These results showed that the economic factor explains more than 80% of the socio-economic performance of both countries. An analysis of the components of this factor showed that it is mainly composed of eight economic sectors, namely, Agriculture, Banking and Finance, Construction, Manufacturing and Mining, Trade, Transportation and Communication, Utilities and Services. Therefore, these sectors have been considered as a basis for our comparative analysis. In doing so, the following steps of analysis have been undertaken:

First, rank ordering of the eight economic sectors based on four equally important criteria. These are:

- Rank ordering based on the results of the economic factor
- Rank ordering based on the results of the social factor

- Rank ordering based on the results of the growth factor
- Rank ordering based on contributions to GNP (structural transformation).

Second, determination of the sectorial priorities based on the aggregate ranks obtained at the previous step.

Third, identification and comparison of the two development models based on these sectorial priorities.

A detailed illustration of the previous steps is provided in the following sections.

4.1 Rank Ordering Based on the Four Criteria

At this step, the eight economic sectors are ranked on all criteria based on a scale of 8 to 1, with 8 to represent the highest rank and 1 to represent the lowest. The fact that the sectorial priorities will be based on the aggregate ranks is the reason for considering this particular method of scaling.

The ranks obtained for both countries, based on the first three criteria (Economic, Social and Growth Factors), are presented in Tables 4.1.1, 4.1.2 and 4.1.3 respectively.

These ranks are based on the factor analysis results shown in Tables 3.1.3 and 3.1.4. According to this, the eight economic sectors are ranked based on to their coefficients (loadings) on each of the three factors. The sector that has the highest coefficient on any of the factors is given a rank of 8 on that particular factor and the one that has the lowest coefficient is given a rank of 1. This implies that the variables (sectors) that offer the highest degree of explanation on any of the factors should be given higher weights in representing these factors and vice-versa.

In performing the fourth criteria (structural transformation), the period 1960-1985 has been divided into five subperiods (1960-65, 1966-70, 1971-75, 1976-80 and 1981-85). The average contribution of each sector to GNP was found for all periods and the total averages were computed to represent the structural changes over the whole period. The results of this step and the sectorial ranks based on them are shown in Tables 4.1.5 and 4.1.6.

Based on the previous steps, the aggregate ranks were found for all sectors by adding the four ranks representing each sector on the four criteria. These aggregate ranks are presented in Tables 4.1.6 and 4.1.7 for Jordan and Singapore respectively.

Table 4.1.1: Ranks Based on the Economic Factor

Jordan

Rank	Sector
8	Services
7	Construction
6	Trade
5	Banking
4	Transportation
3	Utilities
2	Manufacturing
1	Agriculture

Singapore

Rank	Sector
8	Trade
7	Manufacturing
6	Agriculture
5	Services
4	Utilities
3	Transportation
2	Banking
1	Construction

Table 4.1.2: Ranks Based on the Growth Factor

Rank	Sector
8	Banking
7	Utilities
6	Transportation
5	Manufacturing
4	Trade
3	Construction
2	Agriculture
1	Services

Rank	Sector
8	Construction
7	Banking
6	Transportation
5	Utilities
4	Manufacturing
3	Agriculture
2	Services
1	Trade

Table 4.1.3 Ranks Based on the Social Factor

Jordan

Rank	Sector
8	Manufacturing
7	Agriculture
6	Transportation
5	Utilities
4	Trade
3	Construction
2	Banking
1	Services

Singapore

Rank	Sector
8	Services
7	Manufacturing
6	Banking
5	Transportation
4	Constructions
3	Utilities
2	Trade
1	Agriculture

Table 4.1.4: Changes in Contribution of Economic Sectors to (GNP): (Structural Transformation)

		Economic Sectors							
		AGR	MNG	CON	UTL	TRD	TRN	BNK	SRV
1960-65	Jordan	3.52	1.52	.83	.12	3.55	1.73	.20	5.23
Average	Singapore	.54	2.32	.86	.40	5.13	2.07	1.75	3.56
1966-70	Jordan	2.41	1.98	1.03	.19	3.29	1.63	.37	9.03
Average	Singapore	.53	3.74	1.21	.52	5.91	2.18	2.14	3.85
1971-75	Jordan	1.85	2.23	.95	.20	2.72	1.45	.25	10.31
Average	Singapore	.40	4.84	1.35	.38	5.5	2.42	2.52	2.77
1976-80	Jordan	1.32	2.67	.96	.15	2.51	1.63	.25	10.51
Average	Singapore	.31	5.42	1.37	.41	5.04	2.79	2.18	2.49
1981-85	Jordan	1.08	3.72	1.08	.22	2.63	1.82	.30	10.32
Average	Singapore	.20	5.21	2.15	.38	4.01	2.84	2.91	2.31
1960-85	Jordan	2.04	2.42	.97	.18	2.94	1.65	.28	9.08
Average	Singapore	.40	4.31	1.39	.42	5.2	2.42	2.3	3.00

Table 4.1.5: Ranks Based on the Structural Transformation

Jordan

Rank	Sector
8	Services
7	Trade
6	Manufacturing
5	Agriculture
4	Transportation
3	Construction
2	Banking
1	Utilities

Singapore

Rank	Sector
8	Trade
7	Manufacturing
6	Services
5	Transportation
4	Banking
3	Construction
2	Utilities
1	Agriculture

Table 4.1.6: Aggregate Ranks of Economic Sectors Based on Four Criteria: Jordan

Criteria	AGR	MNG	CON	UTL	TRD	TRN	BNK	SRV
Economic factor	1	2	7	3	6	4	5	8
Growth factor	2	5	3	7	4	6	8	1
Social factor	7	8	3	5	4	6	2	1
Structural transformation	5	6	3	1	7	4	2	8
Ranks	15	21	16	16	21	20	17	18

Table 4.1.7: Aggregate Ranks of Economic Sectors Based on Four Criteria: Singapore

Criteria	AGR	MNG	CON	UTL	TRD	TRN	BNK	SRV
Economic factor	6	7	1	4	8	3	2	5
Growth factor	3	4	8	5	1	6	7	2
Social factor	1	7	4	3	2	5	6	8
Structural transformation	1	7	3	2	8	5	4	6
Ranks	11	25	16	14	19	19	19	21

4.2: Determination of Priorities

This step is derived from the aggregate ranks previously obtained (Tables 4.1.6 and 4.1.7). For the purpose of priority determination, the method of the Analytical Hierarchical Process (AHP) is applied in performing pairwise comparisons between the aggregate ranks obtained for each country (Saaty, 1980; Saaty and Alexander, 1982; Wind and Saaty, 1980, and Cook etal, 1984). These pairwise comparisons of the aggregate ranks and their obtained results are illustrated in Figures 4.2.1, 4.2.2 and Tables 4.2.1, 4.2.2. These results show that the priorities (weights) obtained for all economic sectors are not identical for both countries. This implies that the two countries have achieved two different levels of development as will be discussed in the next section.

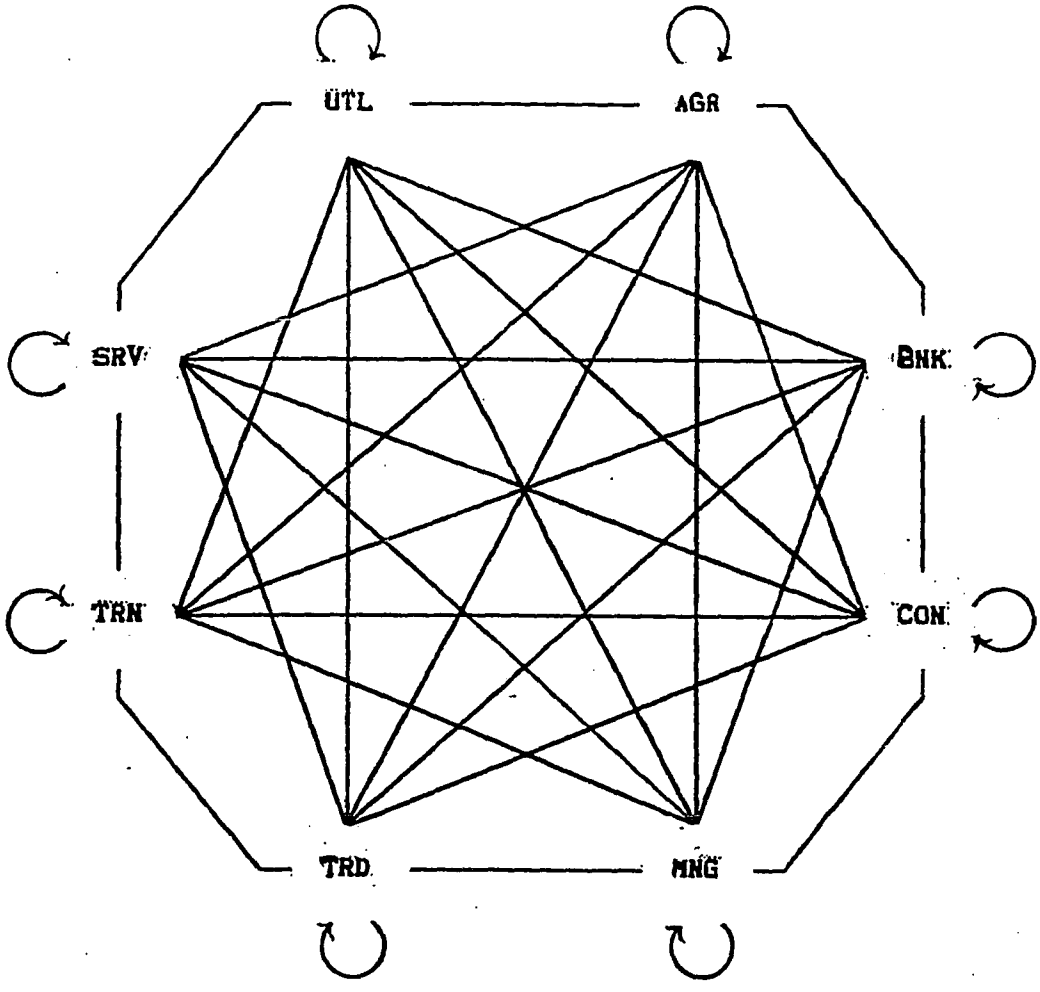

Figure 4.2.1: Network Structure of Priority Determination

Table 4.2.1 Overall Weights of Sectors Based on Aggregate Ranks: Jordan

	AGR	BNK	CON	MNG	TRD	TRN	UTL	SRV	Wt
AGR	1	0.88	0.93	0.71	0.71	0.75	0.93	0.83	.104
BNK	1.13	1	1.06	0.81	0.81	0.85	1.06	0.94	.118
CON	1.06	0.94	1	0.76	0.76	0.80	1	0.89	.11
MNG	1.4	1.23	1.3	1	1	1.05	1.3	1.2	.146
TRD	1.4	1.23	1.3	1	1	1.05	1.3	1.2	.146
TRN	1.33	1.18	1.25	0.95	0.95	1	1.25	1.11	.14
UTL	1.06	0.94	1	0.76	0.76	0.80	1	0.88	.11
SRV	1.2	1.06	1.13	0.86	0.86	0.90	1.13	1	.125

λ max=7.98

Table 4.2.2: Overall Weights of Sectors Based on Aggregate Ranks: Singapore

	AGR	BNK	CON	MNG	TRD	TRN	UTL	SRV	Wt
AGR	1	0.58	0.69	0.44	0.58	0.58	0.79	0.52	.078
BNK	1.3	1	1.2	0.76	1	1	1.4	0.76	.127
CON	1.5	0.84	1	0.64	0.84	0.84	1.4	0.76	.117
MNG	2.3	1.3	1.6	1	1.3	1.3	1.8	1.2	.177
TRD	1.3	1	1.2	0.76	1	1	1.4	0.76	.127
TRN	1.3	1	1.2	0.76	1	1	1.4	0.76	.127
UTL	1.3	0.74	0.86	0.56	0.73	0.73	1	0.67	.10
SRV	1.9	1.1	1.3	0.84	1.1	1.1	1.5	1	.15

λ max=7.98

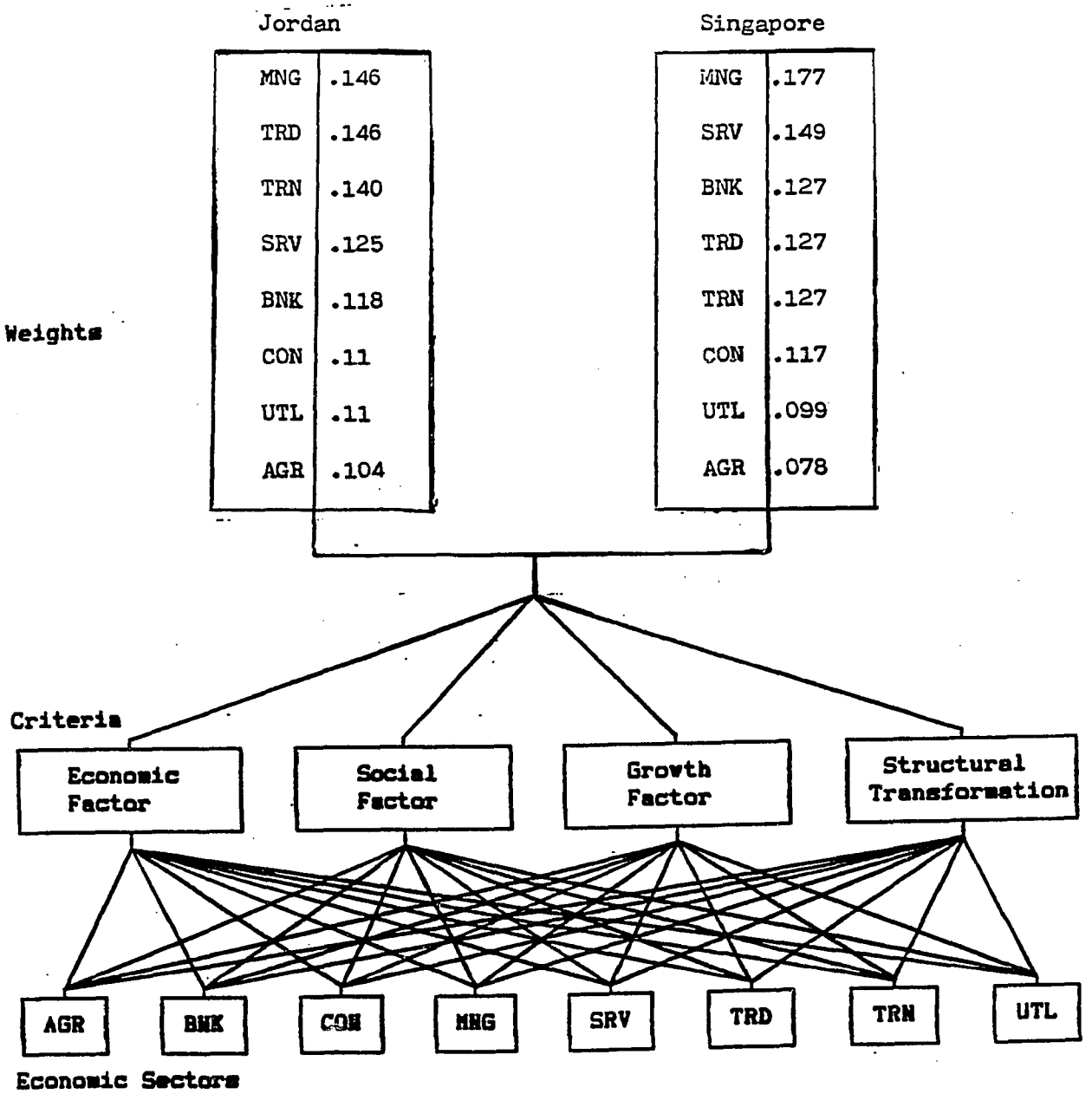

Figure 4.2.2: An Analytical Hierarchical Model of Economic Sectors and Criteria

4.3 Development Models

Based on the sectorial ranks and weights previously obtained, the development models of Jordan and Singapore are identified and briefly discussed in this section.

In order to determine the areas at which the two countries are highly different, the magnitudes of the differences between the sectorial weights have been obtained as presented in Table 4.3.1. The weights of these differences show that Singapore has performed higher than Jordan on all economic aspects except agriculture. It is also shown that the largest differences appear in the areas of manufacturing, services, trade and transportation and communication. This is due to the fact that these sectors represent the basic structure of the Singaporian economy as previously discussed. The only sector at which Jordan scored higher than Singapore is agriculture. This is not surprising due to the small size of Singapore and the nature of the Jordanian economy. The similarities in the ranks between some sectors of the two models (Figure 4.3.1), and the large differences between the weights of these sectors (Table 4.3.1), imply that Jordan has to reconsider its priorities. For instance, the similar and low ranks of the agricultural sector on both models can be justified for Singapore but not for

Jordan. This means that while Jordan is not an industrialized country, it is not giving enough attention to the basic sector in its economy (agriculture). The similar ranks obtained for the manufacturing sector is due to the combination of the manufacturing and mining activities and to the fact that exports of phosphate provides the highest contribution to Jordan's GNP.

Based on the previous observations and Chenery's classification (Chenery, 1975), Singapore can be classified at the last stage of Chenery's model (industrialization) while Jordan has yet to determine the appropriate paths for better development.

Table 4.3.1: Magnitude of Differences Between Ranks of Economic Sectors of Both Models

	AGR	BNK	CON	MNG	TRD	TRN	UTL	SRV	Wt
AGR	1	2.89	3.7	0.87	1.37	2	2.6	1.04	0.187
BNK	0.35	1	1.29	0.30	0.47	0.69	0.90	0.36	0.065
CON	0.27	0.78	1	0.23	0.37	0.54	0.70	0.28	0.05
MNG	1.15	3.33	4.29	1	1.58	2.31	3	1.2	0.216
TRD	0.73	2.1	2.7	0.63	1	1.46	1.9	0.76	0.136
TRN	0.50	1.44	1.86	0.43	0.68	1	1.3	0.52	0.09
UTL	0.38	1.11	1.43	0.33	0.53	0.77	1	0.40	0.072
SRV	0.96	2.78	3.57	0.83	1.32	1.92	2.5	1	0.18

$\lambda_{max}=7.98$

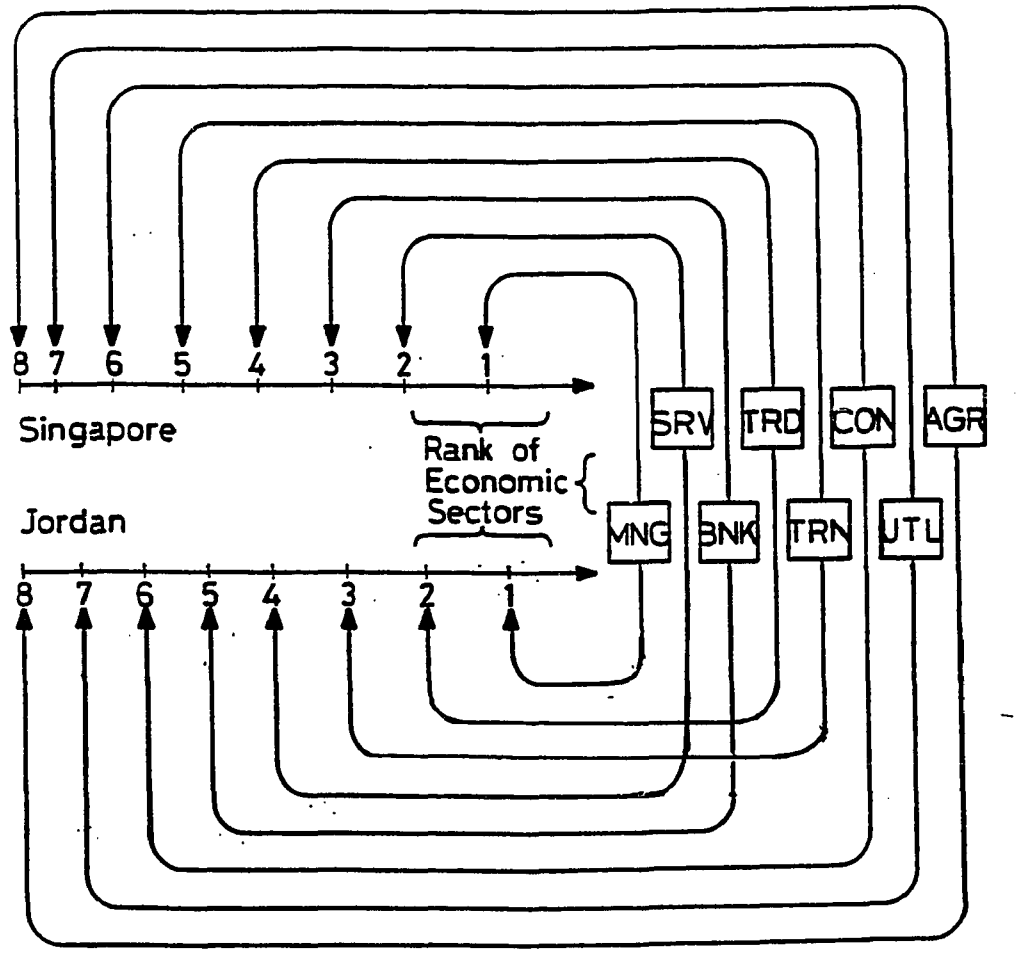

Figure 4.3.2: Development Models Based on Ranks and Weights of Economic Sectors

Chapter V

Comparison and Evaluation of Economic, Social, Demographic, Political and General Environmental Aspect

In this chapter, we link the gap that appears between the two countries in their socio-economic performance, to the particular circumstances that characterize each of them.

In doing so, four major environmental levels are analyzed. Seven environmental segments are discussed under each level. The environmental levels, segments and their definitions are provided in Appendix B. This step enables us to explore the reasons behind the differences between the development models of the two countries and provides us with the guidelines under which we introduce a planning model for Jordan.

As the "success model" of Singapore did not happen without endogenous and exogenous precedents, the environmental segments relevant to Jordan are compared to those of Singapore based on a scale of -3 to 3. According to this scale, zero implies similarity and the other two values (-3 and 3) represent the negative and positive

extremes of the differences between the two countries. for instance, if the two countries are identical on a certain aspect a zero value is assigned, if Jordan is extremely higher than Singapore a value of 3 is assigned and if its extremely lower a value of -3 is assigned.

Based on this scale, the differences between the two countries are carefully calculated or estimated and the largely differing aspects are determined. For this purpose, all environmental aspects included in Appendix B are briefly discussed for both countries. Tables 5.1 and 5.2 summarize all these aspects for Jordan and Singapore, respectively.

5.1: Jordan:

The nation of Jordan is the creation of recent political events. Prior to the twentieth century, no such entity existed. When the post-World War II British Mandate extended to Transjordan at the beginning of the century, Transjordan was in some ways tied to Palestine, but essentially it was separate from the Palestine Mandate administration.

In Transjordan under the Mandate, manufacturing industry was almost nonexistent. Most industries were carried on at home or in small workshops and even these activities were relatively rare.

World War II brought greater prosperity to Transjordan. The war stimulated commercial activity in Transjordan, particularly in the capital Amman . After the 1948-49 Arab-Israeli war, the flight of the Palestine refugees, the partition of Palestine, and Transjordan's annexation of the West Bank, the new state of Jordan came into existence (Muzar, 1979).

At its birth Jordan inherited very little manufacturing industry, small population and low per capita income, very limited natural resources, i.e. phosphate and mineral salts, high unemployment and limited farmland which is mainly rainfed.

Under these unstable conditions, Jordan did not embark on any formal national planning until 1962. Since 1962, successive development plans have been set: 1962-64, 1964-70, 1973-75, 1976-80, and 1981-85.

Early Development Plans

The first development plan in Jordan was the five year plan (1962-1967). This plan projected 8% increase in GNP. It was substituted with another plan (1964-70). The reason for the abandonment of the 1962-67 plan and adoption of the seven year plan was a change in the expected magnitude of future budget of support. The

1964-70 plan could not be accomplished because of the 1967 Arab-Israeli war.

For almost five years after the 1967 war, development plans were not carried out in a systematic manner. A three year plan (1973-75) was prepared to oversee the recovery of the long-term development planning. The plan projected an average annual growth in GDP of 8%.

Striking changes occurred during 1973-75 that could not have been foreseen when the three year plan was drawn up: the oil price revolution, a great increase in aid available to Jordan, enhanced employment prospects for Jordanians abroad, and a boom in world phosphate prices. These and other circumstances contributed to the abandonment of this three year plan.

The Five Year Plan 1976-1980:

This plan tried to build a comprehensive framework of development strategy, with the objectives of achieving an annual growth of 12% in GDP, increasing the reliance of the general budget on domestic revenues and reducing the deficit in the balance of trade.

The economic performance of this plan was characterized by a realization of growth rates which were quite close to the targets set by the plan. The plan

achieved a real annual rate of growth of the GDP of 8.5% compared to the targeted rate of 12%.

The GNP increased at a real annual growth rate of 11%, in comparison with the target of 11.5%. Per capita income in current prices increased 2.4 times during the plan period. The main increases were in the areas of manufacturing and mining due to the sharp increases in phosphate prices and trade and services as Jordan substituted Lebanon as a main trade center in the region. At the same time, remittances of Jordanians working abroad increased significantly.

1981-1985

This plan was an outcome of the prevailing economic conditions and the experience gained in the previous socio-economic development plans. While it was treated as a transitional period in a continuing development process, further quantitative and qualitative progress was registered. The general objectives were set within the framework of comprehensive planning for the entire country with a view of sustaining the development drive and meeting its challenges while taking into consideration the imperatives and requirements of integration with the international economic system. During this period, GNP

increased at an average annual growth rate of 11% and per capita GNP increased 1.5 times. The social indicators such as literacy, infant mortality rate and urbanization were also improved.

The Planning Mechanism and the Decision Making Process:

The planning mechanism follows the top-to-bottom approach with high degree of centralization. The ministry of planning the successor of the National Planning Council (NPC) is in charge of formulating, executing and monitoring the progress of national development plans. Nevertheless, its role of negotiating and administering foreign-assisted projects remains the ministry's biggest concern and one elevated in importance by great increases on aid reliance.

The Jordanian budget is divided into two virtually unrelated sections. The first part includes all self-financing budgeted receipts and expenditures. The second consists of aid-assisted projects. Where the ministry of planning has some control on the expenditures in the second part, it has no control on the expenditures in the first.

Characteristics and Problems

The planning mechanism in Jordan is generally characterized by:

- absence of a comprehensive concept of administrative development
- low efficiency and productivity
- complicated regulations, procedures and methods of operations which hinder the development process
- vagueness of objectives, functions, and responsibilities
- overlapping and duplication in numerous government department functions. These problems complicate coordination, implementation, and control
- centralization of authority at the top of the hierarchy
- absence of job classification, description and evaluation
- lack of contingency planning to face emerging conditions
- weakness in the mechanism of financial and administrative control
- inadequate mastery of information for decision making purposes and absence of a sound system of data collection, compilation, analysis and retrieval

Table 5.1: A Summary of Economic, Social Demographic, Political and Other Environmental Aspects of Jordan

Geographical Area

98,000 square kilometers

Population at 1985

2.69 million with an average annual growth rate of 3.16% for the period 1960 to 1985

Social Structure

The population of Jordan is relatively homogeneous in the sense that they share many cultural aspects. The official language is Arabic which is spoken by the whole population. The main religion is Islam and about 10% of the population is Christian.

Political System

A stable monarchy system that provides a suitable and encouraging atmosphere for development and growth.

Economic System

Mainly capitalist system with features of mixed economy. There are some private enterprises, some public ones and some of mixed nature.

The government participates with the private sector in areas where more government control is necessary. The phosphate mining company is an example in this case. Sometimes, the government competes with the private sector to keep prices under control. Education and health services are mainly provided by the government while leaving doors open for private investments.

Housing is provided on a limited basis through the housing bank with private housing projects also available.

Industrialization

Low levels of industrialization as a result of the lack of the necessary inputs such as technology, capital, raw materials and expertise. Limited protection is provided for the local industries which can hardly compete with the imported goods. Under these circumstances, it becomes difficult for local industries to generate adequate returns that will enable them to expand or raise the quality of their products.

Trade Orientation

Exports are very limited in terms of variety, size, and markets. These include phosphate, textiles, leather, fruits and vegetables and some other small industries.

The main markets for the Jordanian industries are some of the neighboring Arab-countries, except phosphate which has international markets.

Deficit is the main feature of Jordan's balance of trade and the gap is widening rather than diminishing.

This deficit gap has been given significant consideration in Jordan's consecutive development plans. Why is it growing? and what can be done? are the two questions that still persist.

Natural Resources

Jordan lacks domestic energy resources which can be commercially utilized through traditional technologies. Also, natural resources are relatively scarce, with the exception of phosphate, potash, dead sea brines, oil shale, gypsum, quartz, cement areas, building materials, marble rock and industrial dolomite. Most of these resources are not well exploited with the exception of phosphate. The lack of a highly skilled labor force and the absence of sufficient technical and economic

feasibility studies are the main characteristics and obstacles of this economic sector.

Foreign Investments

Very limited to some joint ventures between Jordan and other members of the Arab Common Market. Jordan receives grants and loans from some countries and international financial institutions. These include the United States of America, members of the European Economic Community (EEC), some Arab oil producing countries, and the World Bank. Due to high levels of uncertainty and instability in the region, foreign investors are reluctant to enter the Jordanian market in spite of several investment incentives (Investment Act of 1984).

External Environment

Jordan is destined to be closely associated with the Palestinian problem. The complexity of this problem exposes the country to many external threats that occupy a significant part of the planner's thinking and increase the burden of military expenses. In absolute terms, per capita military expenses averaged to about $86 over the period 1973 to 1985 and to about .081 percent of per capita GNP over the same period (U.S. Foreign Policy and the Third World: Agendas 1973-85).

The surrounding Arab countries are not at higher levels of development which makes it difficult for Jordan to learn from their experience or to adopt more integrated economic policies in coordination with them.

Planning Horizon

Long-term plans with long-term goals.

Per Capita Education Expenses

It averaged about $42 over the period 1965-1985.

Urbanization

Increased from 43% in 1960 to 73% in 1985.

5.2 Singapore:

Singapore is the smallest state in Southeast Asia, which has no hinterland nor other natural resources, and yet is the country which has enjoyed the most remarkable social and economic growth during the past two decades. In the past two decades, Singapore has faced and successfully solved a series of critical internal and external problems such as the Communist threat, Indonesian confrontation, expulsion from Malaysia, the British military withdrawal, rising unemployment, labor unrest, a serious housing shortage and racial conflict. Singapore not only has been able successfully to meet all these challenges but has, at the same time, effectively carried out many social and economic development programs to industrialize its economy and to raise the living standards of its population (Chen, 1983).

During the period 1960-1985, Singapore achieved an annual growth rate of 12.4% for its GNP. Its per capita GNP increased from $546 million in 1960 to $6,424 million in 1985. The share of the manufacturing sector in the country's GNP increased from 12% in 1960 to more than 25% in 1985. The amount of housing provided by the Housing Development Board (HDB) increased from 23,000 units in

1960 to over 358,000 units in 1980. Education is free for all Singaporian children in primary and secondary levels. Public health services are adequate for the needs of the population (Statistical Reports, 1960 and 1985).

These impressive achievements in social and economic development have made Singapore one of the most outstanding models of development.

Singapore is the only country in the Association of South-East Asian Nations (ASEAN) that does not formulate long-term social and economic development plans. Although it does not have periodical development plans, it has long-term national goals, based on the five fundamental principles of the national ideology, namely, multi-racialism, multiculturalism, multilingualism, meritocracy and self-reliant society. On this basis, Singapore is forging ahead towards a highly industrialized economy, striving for the highest efficiency and raising the living standards of the people (Chan, 1976).

In the pursuit of these goals, Singapore's economic policy has adopted the most typical features of the capitalist system, encouraging foreign investment and free competition, and protecting businessmen's and entrepreneurs' interests so as to acquire the highest and the fastest economic effects. In other words, Singapore's first objective has been to emphasize the importance of

economic production, making as much profit as possible, and then to consider the problem of the distribution of wealth.

In view of this, since 1960, the government has carried out various social construction programs to help low income families raise their living standards. The most obvious ones are in housing, public health, education and social welfare. The purpose of these measures is to redistribute social wealth, and use large portions of government revenue to help low-income families. The method used in this approach is that of a typical socialist system. In other words, the economic development policy and the social construction policy adopt the capitalist and the socialist approaches respectively.

THE PLANNING MECHANISM AND DECISION-MAKING PROCESS

Singapore planning style is characterized by its flexibility both in initiating required changes and in responding to new problems, and the process of decision-making is distinguished by efficiency, pragmatism and the "top-to-bottom" approach.

There is no formal centralized planning body in Singapore. Planning and implementation are carried out by the various ministries and statutory boards in accordance with development priorities set up by the government. The cabinet is the highest policy-making agency as far as the national development policies are concerned.

Generally speaking, the planning rationale in Singapore is project oriented. A project is initiated to deal with some well-defined objective and task, and such projects may be initiated by a ministry, a department of the ministry, a statutory board, or may be as a response to the directive of the cabinet. Once a policy is regarded as a national policy, cooperation from all related government bodies to ensure its success is expected. This principle applies to the implementation of all public policies and the subsequent programs formulated by either statutory boards or other government departments. Therefore, the decision-making process in Singapore takes the "top-to-bottom" approach (Chen, 1983).

POLITICAL LEADERSHIP AND DEVELOPMENT STRATEGIES

The political system in Singapore is characterized by its stability. The People's Action Party (PAP) has been in power since 1959. This political stability left its marks on the economic prospects of the country. The (PAP) has recognized Singapore's economic strengths and weaknesses and the necessity to adapt to changing circumstances. Since the initiation of Singapore's development plan in 1961, the emphasis in development policy has been upon industrialization, in recognition of the limits of growth based only on trade. The country has very few natural resources and has to obtain almost all its basic requirements including food, water, and raw materials, from external sources. Furthermore, the population is too small to create a significant domestic market. But the country has a favorable geographical position and natural harbors, and has an urbanized, highly literate population which makes it highly adaptable. These factors, together with the country's experience as a trade center, have enabled the government to redirect the economy toward industrialization and away from its historical reliance on trade. The development objectives were to build up a manufacturing sector geared to the export market, to provide suitable economic

infrastructure, to attract foreign and local capital to industry, to develop technical, managerial and marketing expertise and to train and discipline the labor force.

The economic policy was to diversify the economy, to upgrade industries to higher skill levels and higher value-added and to develop the country into a regional service and international financial center. In the area of industrial development, more skill-intensive and higher technology industries are being encouraged.

Growth in Singapore's manufacturing has depended to a large extent on foreign investment. Singapore remained a stable, competitive and profitable location for investment. Cumulative foreign investment in manufacturing, in terms of gross fixed assets, reached $6,603 million at the end of 1984. More than two-thirds of those investments came from the USA, Europe and Japan. The USA remained the largest investing country, accounting for 43% of total investments, most of which were in electronics and computer related fields. A large proportion of investment commitments from Europe went into the petroleum industry. Local investments took up to 27% of total investment commitments. There is a growing trend in the participation of local investors and the number of joint ventures with foreign companies in new technology industries such as computers and robotics (Hafez, 1986).

Table 5.2 A Summary of Economic, Social, Demographic, Political and Other Environmental Aspects of Singapore

Geographical Area

1000 square kilometers

Population at 1985

2,558 million, with an average annual growth rate of 1.8% for the period 1960 to 1985.

Social Structure

Multiracial, multiculturalism and multilingualism are the main social features of Singapore's population. The government is giving special attention to making English as the main language in order to facilitate lines of communication between the several minorities living in Singapore.

Political System

One ruling party (PAP) that maintains stability which is a necessary condition for growth and prosperity.

Economic System

A mixture of capitalism and socialism as the government tries to create an appropriate business atmosphere for investors while providing the necessary infrastructure of services to maintain equal distribution of growth gains and stimulate the industrial sector.

Industrialization

Highly industrialized with continuous attention and determination to keep this economic sector at diversified competitive levels.

Trade Orientation

Singapore maintains economic relations with many countries. The Singaporian products have almost international markets with main emphasis on the United States, Europe, Japan and the ASEAN countries. Their economic policy is out-oriented as they import the necessary production requirements and export them as manufactured products.

Natural Resources

Almost none.

Foreign Investments

Very high and reached about 73% of total investments in 1985. Because of its location as an international trade center and because of substantial incentives for investments, Singapore succeeded in drawing rigorous amounts of foreign investments. Those investments mainly come from the USA, Europe and Japan.

External Environment

Singapore faces the Communist threat which requires high military and social expenses to absorb. In absolute terms, per capita military expenses averaged to about $166 over the period 973 to 1985 (U.S. Foreign Policy and Third World: Agendas: 1973-1985). During the same period, it only averaged .041% of per capita GNP. This is mainly due to the high growth achieved in per capita GNP. Because of its geographical location as an important trade center and the high levels of industrialization in the surrounding countries, economic prospects for Singapore are better than those of Jordan. The high levels of industrialization the country achieved brought it to new levels of competition which are difficult for a country with limited natural and human resources to always face successfully.

Planning Horizon

Short-term and project oriented plans with long-term goals.

Per Capita Health Expenses

It averaged about $32 between 1965 and 1985

Per Capita Education Expenses

Its annual average between 1965 and 1985 is $85

Urbanization from 1960-1985

100%. This is due to the small size of the country as it is referred to sometimes as the "city-state."

A comparison of these environmental aspects of Jordan and Singapore is concluded in Table 5.3 In this table each environmental segment for Jordan is rated on a scale from -3 to +3 in comparison to the corresponding environmental segment of Singapore. Where -3 implies that Jordan is extremely lower on any particular segment, 3 implies that it is higher and zero means that the two countries are identical on that particular segment.

Due to the difficulties involved in measuring some environmental aspects, the differences between the two countries with regard to these aspects are based on our estimations. These estimations are justified in the previous discussion of the environmental aspects of both countries. On the other hand, the values assigned for other aspects such as population, population growth rate, per capita military expenses, per capita education expenses, per capita health expenses and urbanization are based on more accurate calculations. For instance, the 3.16% population growth of Jordan is almost twice the 1.8 population growth of Singapore, therefore, a value of 2 is given to this segment. The absolute values for all environmental segments are added, and based on their summations, weights are derived for all levels and segments. Our justification for considering the absolute values, for our analysis, is that we are looking for the

magnitude of differences between all considered aspects of the two countries. Whether these differences are in the negative or positive direction should be the guideline if any adjustments on these differences are to be made.

The results of performing these steps indicate that the largest differences between the two countries appear on the economic and the general environmental aspects which have equal weights of .30 each. The segments that have their highest weights on the economic level are diversity level, foreign investments, modernization of industries and trade orientation. The segments with the highest weights on the general level are regional stability and strategic aspects of geographical location. Due to the uncontrollable nature of these last two segments, more attention is given to the more controllable segments at the economic level.

Based on these findings and findings in previous chapters, a Jordanian planning model is introduced and discussed in the next chapter.

Table 5.3: Comparison of Environmental Aspects

(Jordan vs. Singapore)

Economic Level	-3	-2	-1	0	1	2	3	Weight
Economic System				x				0
Degree of Government Intervention				x				0
Diversity Level	x							.23
Foreign Investments	x							.23
Modernization of Industries	x							.23
Trade Orientation	x							.23
Resources availability					x			.08
Total	12			0	1			13

Table 5.3: Continued, Comparison of Environmental Aspects (Jordan vs. Singapore)

Social & Demographic Level	-3	-2	-1	0	1	2	3	Weight
Population Size					x			.09
Population Growth Rate						x		.18
Ethnic and Cultural-Homogeneity					x			.09
Per Capita Education Expenses		x						.18
Per Capita Health Expenses		x						.18
Urbanization			x					.09
Flexibility of Social Values		x						.18
Total		6	1	0	2	2		11

Table 5.3: Continued, Comparison of Environmental Aspects (Jordan vs. Singapore)

Political Level	-3	-2	-1	0	1	2	3	Weight
Political System				x				0
Political Stability			x					.17
Planning Mechanism			x					.17
Coordination between Government Agencies		x						.33
Leadership Commitment to Development				x				0
Flexibility of Regulatory Activities		x						.33
Strength of Democratic Institutions				x				0
Total		4	2	0				6

Table 5.3: Continued, Comparison of Environmental Aspects (Jordan vs. Singapore)

Others	-3	-2	-1	0	1	2	3	Weight
Regional Stability	x							.25
Coordination with Neighboring Countries		x						.15
Strategic Aspects of Geographical Location	x							.23
Defense and Military Expenses		x						.15
Dynamics (Adaptability to Change)			x					.08
Modernization of Outlook				x				0
Historical Perspectives (Inherited Economic Structures)		x						.15
Total	6	6	1	0				13

Chapter VI

A Planning Model for Jordan

Based on the results of our empirical analysis, a planning model for Jordan is introduced in this chapter. While Jordan does not have to go through the same stages as the Singaporian model in order to grow, there are important lessons that can be learned from the Singaporian experience and Jordan's own experience. This learning process should be enhanced by basic questions that reflect past performance and the future image of the country. Where are we?, how did we get here?, where do we want to go?, and how to get there? should be the framework under which we learn from the past, assess the present and plan for the future.

This process of thought represents the guidelines under which we introduce a planning model for Jordan. A schematic representation of this model is given in Figure 6.1. The methodology of formulating and implementing each of the various components of this model is the subject of our discussions in this chapter.

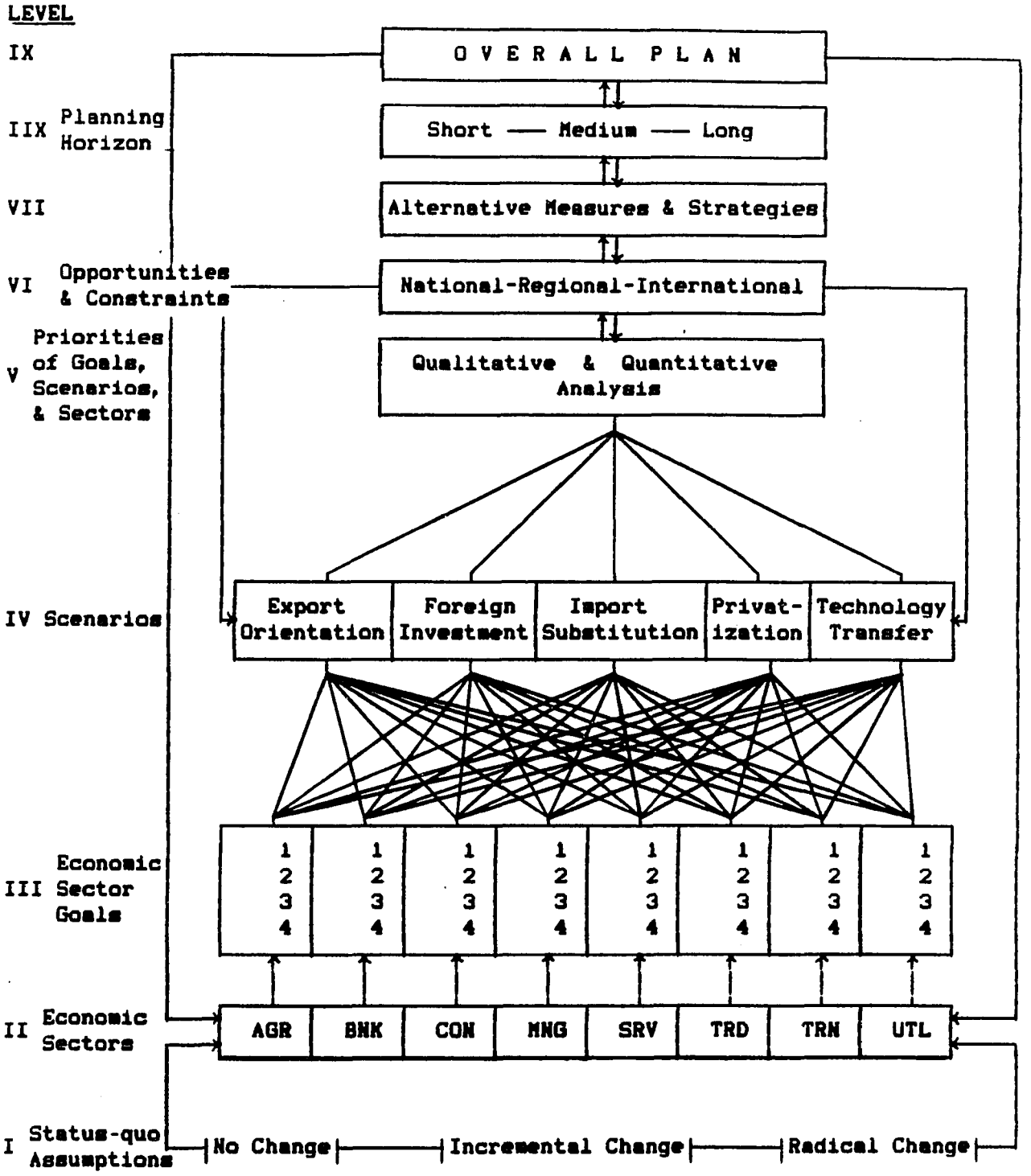

Figure 6.1 A Schematic Representation of the Model.

The Model: Construction and Implementation

As presented in Figure 6.1, the model is composed of nine levels. A backward (bottom-up) reading of these levels, represents the sequence of the steps we follow in constructing this model. In this section, we discuss these steps through their representative levels.

At Level I, we base the study on three assumptions related to the conditions of the status quo. These three assumptions are no change, incremental change, and radical change of the status quo. The second and third assumptions are based on the results of our environmental analysis. These results show that the aspects of coordination between neighboring countries and regional stability had contributed significantly to the "success model" of Singapore. Therefore, they are the basis of these two assumptions. While the second assumption (incremental change) can be best represented by having more coordination between Jordan and neighboring countries, the third (radical change) is based on having more stability in the region.

Under theses assumptions, alternative planning models can be developed and evaluated so they can be implemented under the right conditions. In addition to that, we will be able to determine which of the assumptions brings us

closer to our national goals (Mitroff et al, 1979, and Emshoff et al, 1979).

Level II represents the eight economic sectors discussed in previous chapters. These are Agriculture, Banking and Finance, Construction, Manufacturing and Mining, Services, Trade, Transportation and Communication and Utilities. How to improve the country's performance on all these sectors is the main objective of our model.

At Level III, we determine the future image we are striving to achieve in the long-run. This implies that the goals of all economic sectors have to be determined. This step can be accomplished by specialized planning units that represent all sectors, in order to increase coordination and to avoid potential conflicts in implementing these goals. For the purposes of analysis, we assume that we have an equal number of goals for all sectors. Examples of sectorial goals that might be considered are presented in Table 6.1. Some of these goals are derived from the Jordanian 1986-1990 Socio-Economic Development Plan. The number of these goals can be increased or decreased based on the changing needs and the feasibility of achieving each of them.

Table 6:1: Potential Goals of the Economic Sectors

Agriculture

- Increasing net income generated from this sector
- Improving agriculture and irrigation methods
- Increasing agricultural exports
- Preserving arable land

Banking and Finance

- Increasing and diversifying the capital market
- Applying more modern techniques in financial and banking operations
- More flexibility in the structure and levels of interest rates
- Increasing the number of specialized credit institutions

Construction

- Encouraging the private sector investment in this sector and mobilizing savings for this purpose
- Lowering the cost of construction and of lands allocated for housing
- Encouraging the establishment and development of construction materials industry
- Increasing the number of specialized credit institutions in order to stimulate construction activities

Table 6:1: Potential Goals of the Economic Sectors, Cont'd

Manufacturing and Mining

- Establishing export-oriented industries and encouraging existing industries to enter the export market
- Attracting Arab and foreign investors especially those employing appropriate technology
- Achieving a higher degree of Arab industrial coordination
- Achieving optimal utilization of local and imported machinery and raw materials

Services

- Encouraging private investments and taking the necessary measures for accomplishing that
- Improving the education system in order to meet development requirements
- Providing more flexible regulations to cope with the rising needs
- Increasing and improving social activities with regard to entertainment, recreation and tourism

Table 6:1: Potential Goals of the Economic Sectors, Cont'd

Trade

- Increasing domestic exports
- Adopting import rationalizing and substitution policies
- Strengthening Jordan's trade position in transit and international trade
- Improving trade relations with Arab and foreign countries

Transportation and Communication

- Expanding the role of the private sector in the transport of passengers and freight
- More structuring of sea transport activities
- Increasing capacity and safety of airports
- Building an integrated network of highways and agricultural roads to stimulate trade and agricultural activities

Table 6:1: Potential Goals of the Economic Sectors, Cont'd

Utilities

- Exploring and exploiting energy fields if economically feasible
- Coordinating with neighboring Arab countries in increasing the mutual benefits of available energy
- Better utilization of existing energy sources such as dams
- Increasing the role of the private sector in this sector especially in providing electricity to various regions of the country.

As these goals represent the national image in the long run, Level IV provides us with what can be done in the short run in order to achieve that image. For this purpose, five scenarios are considered at this level. Four of these scenarios (export orientation, foreign investments, import substitution and technology transfer) are based on the results of our environmental analysis, where we found that Jordan is scaled significantly lower than Singapore on all these aspects. The fifth scenario (privatization) is considered since Jordan is embarking on privatization of some service activities (i.e. airlines, transportation and telecommunications) as a way of

stimulating the local investments and decreasing the financial burden of the public budget (Savas, 1982).

At Level V, we determine the priorities of each of the economic sectors, goals and scenarios. In doing so, a matrix is constructed in which the goals constitute the rows and the five scenarios constitute the columns (Figure 6.2). This matrix can be filled using one or more of the following techniques:

(a) The Delphi process where a team of experts will be involved in performing this task (Turoff, 1970).

(b) The dialectical approach where a group of experts at one side and a group of public representatives and decision makers at the other get involved in this process. These two groups will be formulated under the assumption that the first is relatively independent of the government influence and the second one represents it. As the country has no political parties, any other groups with different interests should be considered such as representatives of the public and the private sectors (Chanin and Shapiro, 1985, and Mason, 1969).

(c) Democratic institutions (Parliament). This third alternative might be more feasible in the case of Jordan as the parliament represents all regions

inside the country. At this level of participation, all interest groups will be represented and domination of power by a certain group can be reduced to a minimum.

After determining the technique to be applied, a detailed explanation of the assumptions and all components of the matrix is given to the groups involved in the planning process. Based on that explanation, the participants will be asked to fill in the matrix by answering the following question: What do you think will be the relative contribution of each of the five scenarios to the achievement of each of the sectorial goals under each assumption? The answers will be ranked on a predetermined scale (i.e. -5 to 5).

For this purpose, three matrices representing the three assumptions will be provided for each participant. After filling the 160 cells of each matrix, the average of every cell is calculated and entered on a final matrix (Figure 6.3). These averages are added horizontally to represent the sectors and their goals, and vertically to represent the scenarios. According to that, each of the three final matrices should include 32 averages under each scenario. These thirty-two averages are composed of the eight subtotals that represent the averages of the four goals under each sector. These averages will be used as a

basis for determining the priorities of the sectors, the goals and the scenarios.

Economic Sectors & Goals		Scenarios					
		Export Orientation	Foreign Investment	Import Substitution	Privatization	Technology Transfer	AVG.
AGR	1						
	2						
	3						
	4						
BNK	1						
	2						
	3						
	4						
CON	1						
	2						
	3						
	4						
MNG	1						
	2						
	3						
	4						
SRV	1						
	2						
	3						
	4						
TRD	1						
	2						
	3						
	4						
TRN	1						
	2						
	3						
	4						
UTL	1						
	2						
	3						
	4						
AVG.							

Figure 6.2 The Matrix of Economic Sectors & Goals with Scenarios.

	Scenarios					
Economic Sectors & Goals	Export Orientation	Foreign Investment	Import Substitution	Privatization	Technology Transfer	AVG.
AGR 1						
AGR 2						
AGR 3						
AGR 4						
T. AVG.						
BNK 1						
BNK 2						
BNK 3						
BNK 4						
T. AVG.						
CON 1						
CON 2						
CON 3						
CON 4						
T. AVG.						
MNG 1						
MNG 2						
MNG 3						
MNG 4						
T. AVG.						
SRV 1						
SRV 2						
SRV 3						
SRV 4						
T. AVG.						
TRD 1						
TRD 2						
TRD 3						
TRD 4						
T. AVG.						
TRN 1						
TRN 2						
TRN 3						
TRN 4						
T. AVG.						
UTL 1						
UTL 2						
UTL 3						
UTL 4						
T. AVG.						
CUM. AVG.						

Figure 6.3 The Final Matrix of Economic Sectors & Goals with Scenarios.

At Level V, we determine the priorities (weights) of the sectors, the goals under each sector, and the scenarios based on the results of the previous step (final matrices). In doing so, four steps of pairwise comparisons have to be undertaken based on each of the three final matrices.

First, we determine the sectorial priorities based on the eight subtotals that appear at the right hand side of the final matrix. These values represent the effect of each scenario on each of the sectorial goals (Figure 6.4).

Second, we determine the priorities of the goals under each sector based on the four averages that compose each of the eight subtotals. In performing that, eight (4x4) matrices have to be solved for each matrix. These eight matrices represent the goals of the eight sectors under consideration (Figure 6.5).

Third, priorities of all goals are to be determined. In doing so, we use the 32 values at the right hand side of each final matrix. These 32 values represent the estimated effects of all scenarios on the 32 goals (figure 6.6).

Finally, we determine the priorities of the scenarios by using the five values at the bottom of the final matrix. These values are the results of adding the 32 averages under each scenarios (Figure 6.7).

The first three steps (priority determination of sectors, sectorial goals and overall goals) should enable us to test the feasibility of our goals under the given scenarios. Goals that are found to be infeasible should be reconsidered. In addition to that, we should also be able to wisely allocate our resources between the sectors and between the goals under each sector.

The determination of scenario priorities enables us to evaluate the effectiveness of our scenarios in meeting the national goals, and also to determine the goals that can be better achieved under each scenario. Scenarios that are found to be of less or no effect on the achievement of our goals can be modified or substituted.

If we have predetermined weights for the goals, these weights should be compared to the obtained ones. At this step, if the obtained and determined weights are different, we might modify the predetermined ones, or consider alternative scenarios that might be more appropriate for achieving these goals.

Graphical illustrations of priority determination for sectors, sectorial goals, overall goals and scenarios are given in the following figures:

Sector	AGR	BNK	CON	MNG	SRV	TRD	TRN	UTL	Weight
AGR	1								
BNK		1							
CON			1						
MNG				1					
SRV					1				
TRD						1			
TRN							1		
UTL								1	

Figure 6.4 The Matrix for Sectoral Priority Determination.

Goal	1	2	3	4	Weight
1	1				
2		1			
3			1		
4				1	

Figure 6.5 The Matrix for Sectoral Goals Priority Determination.

Sectors and Goals		AGR				BNK				CON				MNG				SRV				TRD				TRN				UTL				Wt.
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
AGR	1	1																																
	2		1																															
	3			1																														
	4				1																													
BNK	1					1																												
	2						1																											
	3							1																										
	4								1																									
CON	1									1																								
	2										1																							
	3											1																						
	4												1																					
MNG	1													1																				
	2														1																			
	3															1																		
	4																1																	
SRV	1																	1																
	2																		1															
	3																			1														
	4																				1													
TRD	1																					1												
	2																						1											
	3																							1										
	4																								1									
TRN	1																									1								
	2																										1							
	3																											1						
	4																												1					
UTL	1																													1				
	2																														1			
	3																															1		
	4																																1	

Figure 6.6 The Matrix for Overall Goals Priority Determination.

Scenario	Export Orientation	Foreign Investment	Import Substitution	Privatization	Technology Transfer	Weight
Export Orient.	1					
Foreign Invest.		1				
Import Substit.			1			
Privat.				1		
Technol. Transfer					1	

Figure 6.7 The Matrix for Scenario Priority Determination.

Level VI should be based on the question of whether nations can determine their own future, or that these futures are predestined. While we support the first argument, that nations can determine their own future, we also emphasize that the process of future determination should be analyzed at a broad context. Therefore, potential opportunities and constraints at the national, regional and international levels should be considered. For this purpose, quantitative and qualitative methods of analysis should be applied. These analyses give support in drawing the directions and the areas of emphasis for the achievement of our goals. For instance, if we want to increase our agricultural exports, we should determine the types of agricultural products to be emphasized, the potential markets and the necessary courses of action to be undertaken in order to achieve that goal. These steps of analysis have to be performed to all goals at the eight sectors according to the priorities obtained at the fifth level of this model. As a result of this, different strategies and organizational measures will emerge (Level VII).

At Level VIII, we determine the time horizons in which we expect to achieve each of our goals. This is due to the fact that different goals and strategies require different periods to be achieved. For instance,

increasing agricultural exports does not require the same time needed to attract foreign investments or establish a new industry. Determination of the different periods needed to achieve our goals should facilitate the process of measuring performance and making the necessary changes when required.

A careful consideration of all the previous steps is expected to produce a comprehensive and well structured planing model (Level IX).

After performing all the previous steps under the three assumptions, we shall be able to determine the differences between these assumptions at all levels. At this step, two kinds of results will be obtained. First, we should be able to determine the most preferable conditions for achieving our goals, and second, three alternative strategies will be obtained to be implemented under the right conditions.

At the stage of implementing the model, the planning units at all the departments or the ministries in charge of the eight economic sectors should be provided with a worksheet (Figure 6.8). This worksheet contains a summary of the results obtained through the previous steps of analysis. These results serve as guidelines for achieving the goals by adopting the appropriate courses of action in pursuit of our goals.

Sectors and Goals		Weight	Opportunities and Constraints			Alternative Measures & Strategies	Planning Horizon
			National	Regional	International		
AGR	1						
	2						
	3						
	4						
BNK	1						
	2						
	3						
	4						
CON	1						
	2						
	3						
	4						
MNG	1						
	2						
	3						
	4						
SRV	1						
	2						
	3						
	4						
TRD	1						
	2						
	3						
	4						
TRN	1						
	2						
	3						
	4						
UTL	1						
	2						
	3						
	4						

Figure 6.8 Implementation and Control Worksheet.

Advantages of the Model

In addition to its empirical basis, several advantages over the existing planning mechanism in Jordan can be recognized in this model. These include: (1) Level of participation required in building the model, (2) The realistic nature of goals based on levels of achievability under different conditions, (3) More appropriate allocation of resources based on the priorities of sectors and goals, (4) Determination of future directions in terms of alternative strategies and time considerations, (5) The comprehensive nature of the model at the construction, implementation and control levels and, finally, the results the model can support in establishing a data base for planning purposes.

The complexity and cost involved in developing this model, in terms of effort and time, should not underestimate the potential rewards of having a national plan. Considering all the difficulties, it might take years to build a model, but it might require generations to correct a social or economic national mistake.

Chapter VII

Conclusion and Topics for Future Research

7.1: Conclusion

The results of our empirical analysis for the socio-economic development models of Jordan and Singapore showed that the two countries are at different levels of development. These results concluded that the Singaporian model is characterized by high performance on the economic front. It was also found that the high economic performance had left its positive marks on all social aspects such as PQLI, population growth rate, literacy and quality of life in general. This is due to the high correlations found between GNP, as a measure of economic performance, and all the social aspects considered in this study.

In exploring the forces that characterized each of the development models, it was found that the two countries also differ on many endogenous and exogenous aspects. These include size of foreign investments, diversification of production activities, modernization of industry, trade orientation, coordination between

neighboring countries and regional stability.

These results imply that national development should be approached by combining the economic with the social and political aspects. Therefore, development has to be seen as a process of change with economic, social, political and institutional dimensions. This means that it does not depend only on variables which affect the economic growth, but also on the capacity of the society to absorb the necessary changes and on the creation of whatever environment is appropriate to accommodate these economic and social adjustments.

Within the frame of our comparative analysis, and based on the fact that each country requires policies that are suited to its particular conditions, a Jordanian planning model has been introduced. Considering the environmental dynamics, this model is based on three assumptions with regard to the conditions of the status (no change, incremental change and radical change). In addition to that, the long term goals, the establishment of alternative measures and strategies, the level of participation required in constructing and implementing the model and the feedback mechanism included are the main advantages of this model when compared to the existing planning process in Jordan.

7.2: Topics for Future Research

In addition to implementing and validating the model, there are some promising areas that might be considered for future research. One of these is comparing the results (priorities) obtained through the model with the results of applying other techniques such as time series and AHP. This enables us to determine our future paths and whether they should be a continuation of the past or a certain level of change is required. In addition to that, we will be able to test the power of the model and whether its methodology can be generalized for other countries.

The second area, which goes beyond the boundaries of one or few countries to include a large number of countries, is the creation of a more integrated index for measuring the socio-economic performance of any country. For this purpose, data about the existing measures such as GNP, GNP growth rate and PQLI should be collected for the largest possible number of countries (developing and developed). Through statistical techniques the countries will be clustered according to the level of association between the variables (measures) considered. A further step leads to the creation of an international model to represent the relationship between the variables (i.e. GNP, GNP growth rate and PQLI). This model represents the index and countries will be scored based on their

deviations from that model. By doing that, the social and economic measures included can work in a complementary manner in measuring the performance of any country.

The model we introduced and the proposed research areas were suggested far from the "can't be done" pessimistic view that dominates the literature of development planning. This view represents a lack of determination to be added to the shortages of food and medicine that characterize most of the developing world.

APPENDICES

Appendix (A)

List and Definitions of the Study Variables

Economic Variables

Agricultural sector (AGR): Comprises agriculture, forestry, hunting, and fishing

Banking sector (BNK): Includes the financial activities of both private and public banks and all other financial institutions

Construction (CON): All private and public activities that are involved in research, design, and establishment of all types of projects including housing.

Gross National Product (GNP): The total final outputs of goods and services produced by the country's economy plus factor incomes accruing to residents from abroad, less the income earned in the domestic economy accruing to persons abroad

GNP growth rate (GNPR): The net annual change of GNP divided by GNP of previous year

GNP per capita (GNPC): Total GNP of a country divided by total population

GNP per capita growth rate (GNPCR): Net annual change of GNP per capita compared to GNP per capita for previous year

Manufacturing (MNG): Includes all production and mining activities

Services (SRV): This includes all private and public services such as public administration and other social and personal services such as health care and education

Trade (TRD): All retail and wholesale activities, exports and imports, entropot trade and free zones.

Transportation and communication (TRN): Private and public transportation activities such as, airlines, railways, aviation, transport of passengers and freight, telecommunications, postal services and other related activities

Utilities (UTL): Electricity and energy generating activities

Total exports (TEX): All types of commodities exported or re-exported by a country.

Total imports (TIM): All commodities imported for consumption or production purposes

Social Variables

Birth rate (BR): Number of children born alive each year per thousand population

Death rate (DR): Yearly number of deaths per thousand population

Infant mortality rate (IMR): The death among children between birth and one year of age per thousand live births

Life expectancy at birth (LFEX): Number of years that newborn children would live under the mortality conditions prevailing at the time of their birth

Literacy rate (LTR): Percentage of population aged 15 and over able to read and write

Physical Quality of Life Index (PQLI): Arithmetic average of country's ranks on infant mortality, life expectancy, and literacy rates assuming that they are equally weighted

Population growth rate (POP): Rate at which population increased over a period of time (one year) due to natural sources (e.g. birth rate - death rate) or immigration

Urbanization (URB): Percentage of population who dwell in cities. Urbanization, in general, represents the economic and demographic growth of the urban centers

Appendix (B)

List and Definitions of Environmental Levels and Segments

Economic Level

Economic system

Type of economic policies adopted whether of free, centralized or mixed nature

Degree of government intervention

Government participation in setting and implementing development plans

Diversity level

Number, type and scale of productive activities

Foreign investments

The percentage of foreign funds invested inside the country compared to total funds invested

Modernization of industries

Adoption of advanced production techniques

Trade orientation

Structure of foreign trade whether import or export based

Resources availability

The natural resources that can be feasibly produced inside the country

Social and Demographic

Population size

Number of people who have the citizenship of the country or reside on a permanent basis

Population growth

Change in population size divided by population size of previous year

Ethnic and cultural homogeneity

Similarities between population segments in terms of language, race, religion and other social aspects

Per capita education expenses

Public education expenses to population size

Per capita health expenses

Public health expenses to population size

Urbanization

Percentage of population who live in urban areas (cities)

Flexibility of social values

Responsiveness of the social value system to changes in economic performance

Political Level

Political system

Degree of centralization of political power

Political stability

Stability of leadership over the period covered in the study

Planning mechanism

Type of decision making process whether it is upward, downward or of participatory nature

Coordination between government agencies

Level of integration required in setting and implementing the development plans

Leadership commitment to development

Readiness of leadership to cope with the development requirements (i.e. readiness for change)

Flexibility of regulatory activities

Adaptation and creation of the necessary regulations to cope with the changing economic conditions

Strength of democratic institutions

Availability and involvement of political parties or elected representatives (parliament) in the planning process

Others

Regional stability

Stability of economic, political and social conditions between countries of the region

Coordination with neighboring countries

Existence of mutual trade, investments and joint ventures between each country and its neighbors

Strategic aspects of geographic location

This is based on several factors:

- Natural (i.e. availability of harbors or other trade facilitating aspects)
- Economic (i.e. closeness to sources of supply and markets)
- General (international interest)

Per capita defense and military expenses

Defense and military expenses divided by population size

Dynamics (adaptability to change)

Ability of mobilizing national forces to cope with environmental changes

Modernization of outlook

Readiness of individuals to participate and coordinate with each other and also with members of other societies

Historical perspective (inherited economic structure)

Level of development that has been achieved on economic activities, at the time the countries got their independence

APPENDIX C: STATISTICAL RESULTS

Table C.1: Factor Score Coefficient Matrix (Jordan)

	ECONOMIC FACTOR	SOCIAL FACTOR	GROWTH FACTOR
Agriculture	.19047	-.16539	.05535
Manufacturing	.20746	-.18031	.02001
Construction	.15946	-.11619	.00441
Trade	.16971	-.12943	.00553
Transportation	.17781	-.13889	-.00244
Banking, Finance	.14851	-.09754	-.03426
Services	.07327	.00862	.01374
GNP	.13358	-.08507	.01897
GNP growth rate	-.00435	-.06259	.51174
Per capita GNP	.13102	-.08494	.03840
Per capita GNP growth rate	.06525	-.14367	.53468
Population	-.12441	.24124	-.01784
Birth rate	.16090	.29329	.07704
Death rate	.12260	-.23957	.02323
Infant mortality rate	.18841	-.32170	.03320
Life expentancy	-.00477	.09606	-.03591
Literacy rates	-.19383	.31953	.01860
PQLI	-.15106	.27233	.00606
Urbanization	-.14437	.26867	-.03658
Total exports	.14891	-.10494	.00897
Total imports	.14332	-.09687	.00507

Table C.2: Factor Score Coefficient Matrix (Singapore)

	ECONOMIC FACTOR	SOCIAL FACTOR	GROWTH FACTOR
Agriculture	.04794	.03196	.05230
Manufacturing	.11977	-.07839	.03083
Construction	.12789	-.09752	-.04295
Utilities	.10352	-.05385	-.02374
Trade	.08584	-.02446	.01945
Transportation	.12330	-.08477	-.00256
Banking, Finance	.13032	-.09758	-.00928
Services	.11952	-.07921	.03932
GNP	.11673	-.07356	.00975
GNP growth rate	.08099	-.13902	.51320
Per capita GNP	.11252	.06662	.01598
Per capita GNP growth rate	.06552	-.10510	.49647
Population	-.02774	.14936	-.01436
Birth rate	.11754	-.28040	.05619
Death rate	.25388	-.46501	.18296
Infant mortality rate	.05460	-.18831	.02504
Life expectancy	-.01535	.12903	.01426
Literacy rates	-.07439	.21284	.01653
PQLI	-.05927	.19229	.01331
Total exports	.14075	-.11345	.03069
Total imports	.14515	-.11983	.06869

Table C.3: Factor Scores and Original Data

YEAR	JORDAN			SINGAPORE		
	ECONOMIC FACTOR	SOCIAL FACTOR	GROWTH FACTOR	ECONOMIC FACTOR	SOCIAL FACTOR	GROWTH FACTOR
1960	19.87	191.08	8.84	704.54	251.13	7.19
61	47.33	192.16	23.87	707.42	260.42	7.51
62	44.11	200.96	-.93	739.12	270.72	6.56
63	51.86	211.22	5.41	786.19	273.02	7.53
64	69.36	221.45	13.53	703.28	287.40	4.72
65	81.18	232.22	1.69	769.85	296.75	7.79
66	73.35	243.63	-4.93	854.38	305.78	11.38
67	37.68	317.30	5.09	928.71	312.58	11.32
68	25.93	330.93	-2.79	1075.19	320.85	14.35
69	52.25	344.88	15.85	1294.51	326.52	15.61
70	27.72	359.46	-7.57	1480.08	337.47	14.65
71	37.11	375.37	4.87	1707.37	343.07	14.70
72	57.88	392.22	7.30	1973.79	349.28	17.89
73	71.42	408.87	9.56	3151.53	354.71	26.67
74	161.82	425.71	27.05	3675.10	361.57	20.87
75	229.48	447.25	18.86	3718.31	368.22	7.83
76	412.71	467.73	43.83	4298.98	373.51	8.39
77	518.66	491.14	12.97	4918.64	378.76	8.94
78	611.25	515.78	14.71	5595.70	382.82	10.66

YEAR	JORDAN			SINGAPORE		
	ECONOMIC FACTOR	SOCIAL FACTOR	GROWTH FACTOR	ECONOMIC FACTOR	SOCIAL FACTOR	GROWTH FACTOR
79	738.22	540.38	9.57	7021.31	386.94	14.65
80	923.62	563.56	14.50	9079.07	395.78	19.30
81	1163.61	586.81	8.17	10314.79	400.36	18.44
82	1304.40	610.60	8.95	10860.73	404.77	10.76
83	1358.18	633.26	9.54	11417.26	410.27	11.27
84	1481.91	656.24	9.68	12299.11	414.52	9.20
85	1614.82	680.24	9.62	11555.46	418.84	-9.19

Table c.4 :Correlation matrix(Jordan)

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12
v1	1.00000											
v2	.94333	1.00000										
v3	.95313	.99053	1.00000									
v4	.92932	.99468	.98849	1.00000								
v5	.95718	.98639	.99699	.98310	1.00000							
v6	.95826	.98759	.99548	.98129	.99698	1.00000						
v7	.94334	.98317	.99313	.98247	.99386	.99242	1.00000					
v8	.95216	.96031	.98036	.95438	.97843	.97387	.97001	1.00000				
v9	.96032	.98525	.99605	.97994	.99482	.99123	.98869	.99186	1.00000			
v10	.18635	.08935	.09130	.05488	.09073	.06448	.03482	.15478	.13413	1.00000		
v11	.96851	.96826	.98608	.95713	.98712	.98283	.97555	.99472	.99466	.16986	1.00000	
v12	.13378	.10392	.10414	.07243	.09655	.08397	.03778	.16354	.14093	.83776	.17063	1.00000

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12
v13	.85002	.78079	.91019	.89242	.90177	.89242	.90500	.94406	.92796	.22235	.91884	.19285
v14	-.85011	-.85052	-.87916	-.86280	-.87343	-.86373	-.88275	-.92281	-.89944	-.13904	-.89279	-.10112
v15	-.86932	-.86484	-.90705	-.87818	-.90151	-.89712	-.89930	-.94366	-.92324	-.20118	-.92323	-.18916
v16	-.82730	-.83522	-.87148	-.84750	-.86276	-.85056	-.86572	-.91824	-.89260	-.23763	-.89028	-.18293
v17	.91965	.93677	.96770	.94402	.96631	.96197	.96598	.97990	.97439	.12459	.97079	.10612
v18	.80651	.79737	.84301	.80524	.83501	.82569	.82712	.91147	.87142	.30037	.88009	.29339
v19	.84958	.85269	.89169	.86130	.88441	.87518	.88116	.94238	.91390	.25148	.91621	.22599
v20	.85170	.86376	.90264	.87350	.89551	.88692	.89953	.94199	.92035	.20282	.91813	.16563
v21	.93552	.95662	.97183	.94632	.97280	.96969	.97137	.95931	.97326	.09973	.97006	.11520
v22	.94344	.96010	.97607	.94785	.97780	.97411	.97776	.97062	.98017	.09464	.97923	.11406

	V13	V14	V15	V16	V17	V18	V19	V20	V21	V22
v13	1.0000									
v14	-.96869	1.00000								
v15	-.98214	.96166	1.00000							
v16	-.98947	.97433	.98234	1.00000						
v17	.96818	-.94371	-.97180	-.95316	1.00000					
v18	.97064	-.94949	-.97068	-.97977	.92593	1.00000				
v19	.99061	-.96766	-.98713	-.99334	.96277	.99141	1.00000			
v20	.99238	-.97014	-.98541	-.99283	.97176	.97645	.99428	1.00000		
v21	.89373	-.86315	-.89408	-.86220	.94717	.83947	.88172	.89656	1.00000	
v22	.89929	-.87534	-.90185	-.86753	.95237	.84901	.88944	.90146	.00319	1.00000

Table c.5: Correlation matrix(Singapore)

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12
v1	1.00000											
v2	.94870	1.00000										
v3	.82555	.93678	1.00000									
v4	.90665	.98327	.96174	1.00000								
v5	.97635	.99060	.91489	.97204	1.00000							
v6	.91745	.99381	.96116	.99285	.97915	1.00000						
v7	.87966	.97517	.98427	.98254	.95451	.98672	1.00000					
v8	.93337	.97923	.95652	.96873	.97571	.97811	.96741	1.00000				
v9	.93478	.99560	.96351	.99006	.98679	.99690	.98800	.98767	1.00000			
v10	.05263	-.11940	-.29312	-.20762	-.08526	-.19902	-.22525	-.09483	-.15915	1.00000		
v11	.94571	.99665	.95610	.98742	.99124	.99485	.98329	.98559	.99945	-.13831	1.00000	1.00000
v12	.13944	-.04078	-.21875	-.12949	-.00104	-.12177	-.14887	-.01504	-.07982	.98984	-.05744	.14375
v13	.95898	.90881	.81034	.89338	.93963	.88360	.86103	.89763	.90274	-.05144	.91186	

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12
v14	-.90325	-.79190	-.67149	-.77242	-.84405	-.75642	-.72228	-.78849	-.78264	-.11726	-.79665	-.21495
v15	-.83140	-.50395	-.41020	-.50171	-.56320	-.47281	-.44006	-.52291	-.49973	-.09670	-.51253	-.18826
v16	-.95861	-.87025	-.75504	-.84444	-.91558	-.83694	-.80693	-.85865	-.86131	-.06602	-.87438	-.16211
v17	.96772	.90046	.79053	.87852	.93840	.87063	.84513	.88542	.89226	.08277	.90367	.17783
v18	.90974	.79895	.67186	.77286	.84988	.75861	.73396	.78759	.78776	.19512	.80259	.26727
v19	.93220	.82362	.71059	.80834	.88092	.79586	.77069	.82137	.82312	.16158	.83701	.25415
v20	.91987	.99304	.92822	.98180	.97499	.99193	.96703	.96433	.98632	-.15743	.98537	-.08500
v21	.94220	.99428	.91607	.97157	.98252	.98555	.96202	.96892	.98556	-.08216	.98700	-.00813

	V13	V14	V15	V16	V17	V18	V19	V20	V21
v13	1.00000								
v14	-.96558	1.00000							
v15	-.76156	.85626	1.00000						
v16	-.97835	.97638	.75249	1.00000					
v17	.98506	-.95902	-.70933	-.99050	1.00000				
v18	.96368	-.97902	-.77149	-.97876	.97407	1.00000			
v19	.97559	-.97966	-.76282	-.98881	.98657	.99726	1.00000		
v20	.86906	-.73859	-.45449	-.82225	.85760	.74157	.78082	1.00000	
v21	.88734	-.76230	-.46661	-.84495	.87951	.77460	.80998	.99327	1.00000

Variables as Presented in the Correlation Matrices

V1 Agriculture

V2 Manufacturing and Mining

V3 Construction

V4 Utilities

V5 Trade

V6 Transportation and Communication

V7 Banking and Finance

V8 Services

V9 Gross National Product (GNP)

V10 GNP-Growth Rate

V11 Per Capita GNP

V12 Per Capita GNP Growth Rate

V13 Population

V14 Birth Rate/1000

V15 Death Rate/1000

V16 Infant Mortality Rate

V17 Life Expectancy at Age One

V18 Literacy Rate

V19 Physical Quality of Life Index (PQLI)

V20 Urbanization

V21 Total Exports

V22 Total Imports

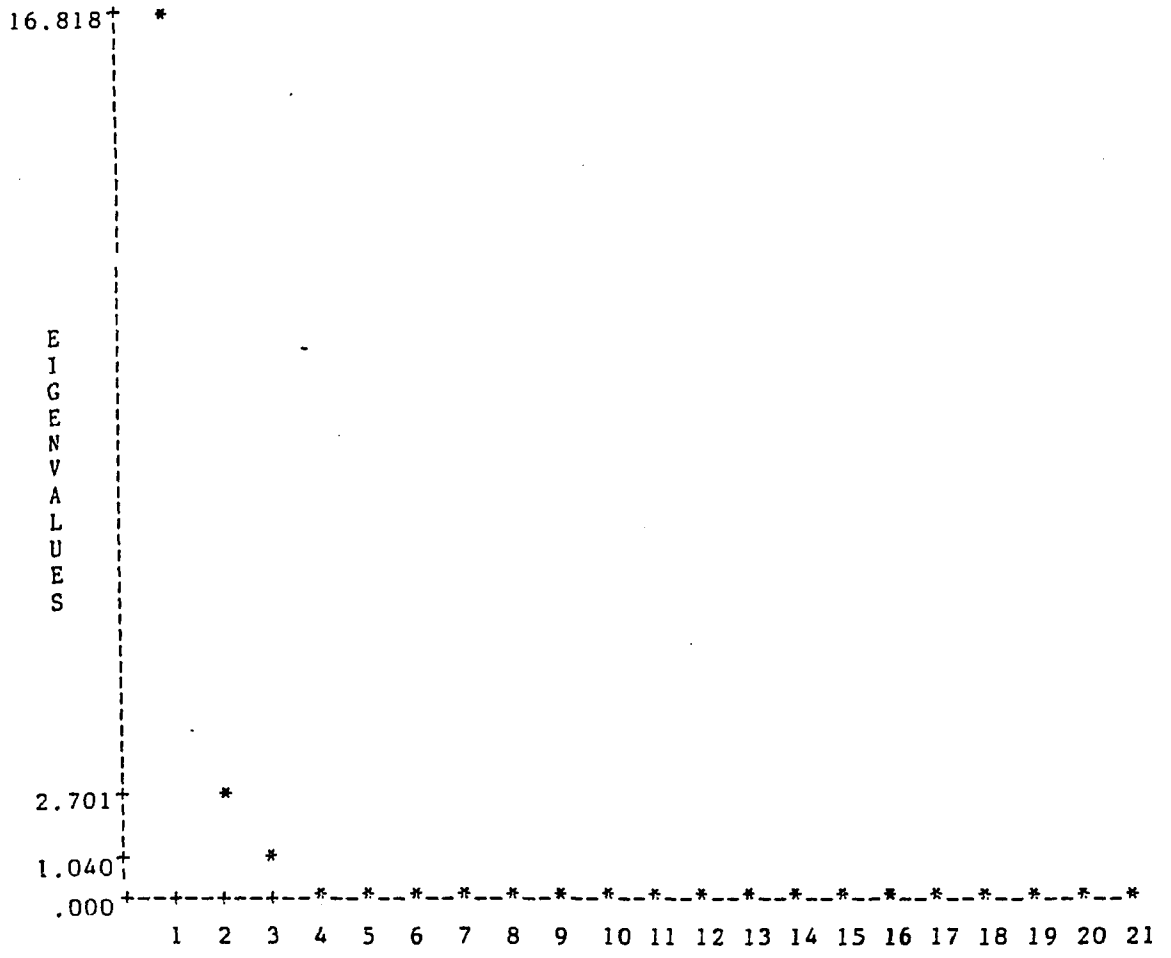

Figure c.1: A scree plot of three factors(Singapore)

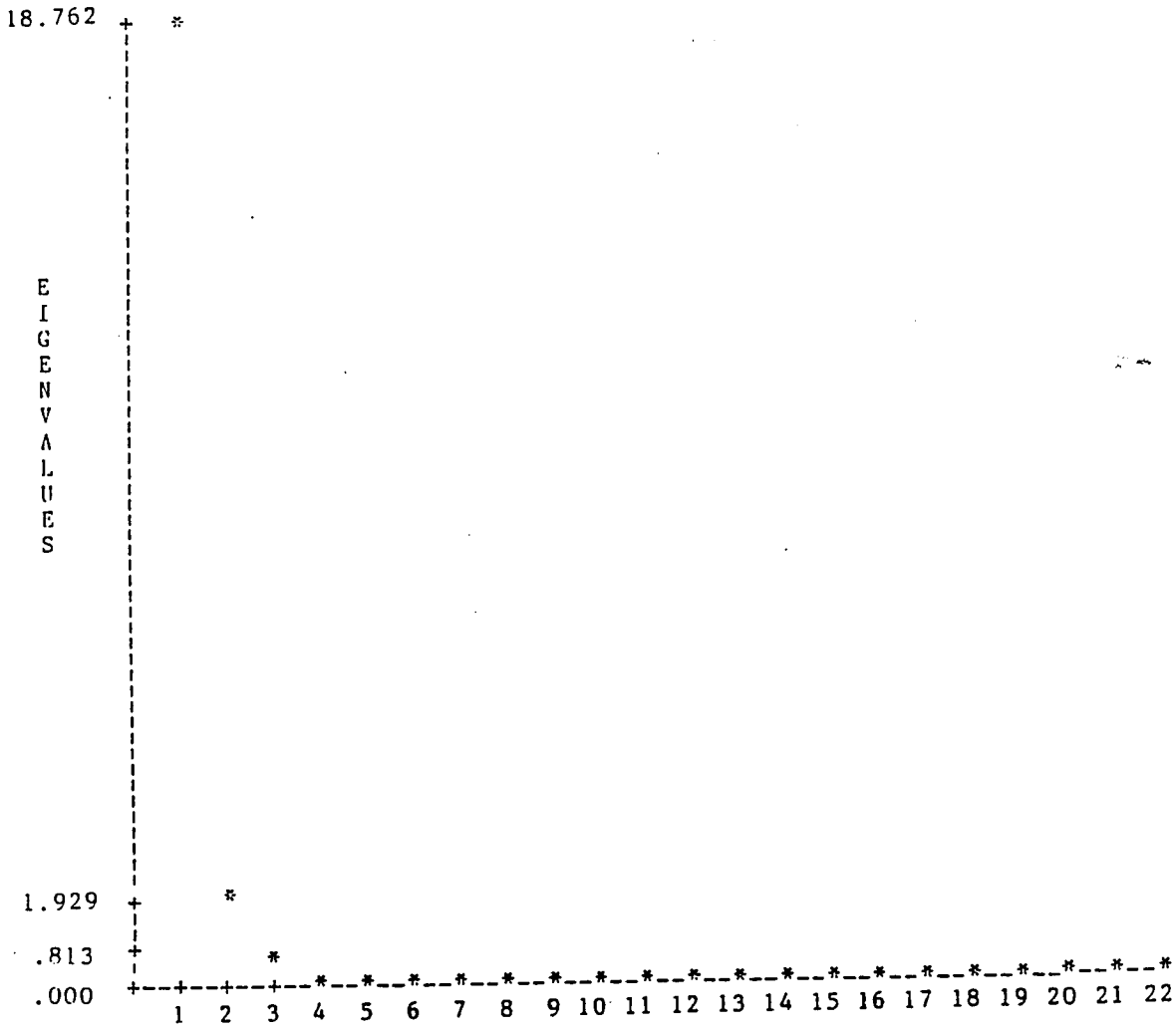

Figure c.2: Ascree plot of three factors(Jordan)

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