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PENINSULAR MALAYSIA.

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BIOGRAPHICAL SKETCH

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To Harpurdie and Nathan Schiepel

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CHAPTER I

INTRODUCTION

Malaysia in Perspective

By most conventional criteria, national and rural development in Malaysia provides an example of success almost unequalled in Asia. Current material living standards are generally exceeded only in Japan, the city-states of Singapore and Hong Kong, and the oil-rich protectorate of Brunei. Per capita national income in 1970 was \$294, much higher than the Southeast Asian average of \$100 (U.N., 1976: Table 192). In urbanization (28.9 percent of the population living in places of 10,000 or more), roads (one mile per 6.4 square miles of area, with 80 percent of non-urban mileage paved), motor vehicles (84.4 per mile of hard-surfaced road), electrification (43.7 percent of all dwelling units), and non-extractive employment (49.2 percent of the labor force), Malaysia exceeds the norm of its Asian neighbors. Furthermore, the rate of improvement in a number of key indicators since independence has also been substantial. Between 1957 and 1970 literacy increased from 51 percent to 61 percent of the population over nine years old, while the proportion over 15 having completed secondary school increased from 1.5 percent to 7.6 percent. During the same period infant mortality dropped from 75.7 per thousand live births to 40.8; life expectancy increased from 55.8 to 63.5 years for

males and from 58.2 to 68.2 years for females. The number of physicians and dentists, though a low 33 per thousand population in 1970, had nevertheless risen 37.5 percent from only 24 per thousand in 1957.

Yet, as is well known, at least in broad terms, by most persons familiar with the Malaysian situation, the distribution of these substantial benefits is far from even. A glance at a road map is sufficient to indicate the main line of cleavage as that which divides the country along a generally north-south axis.

The western region--loosely, the area consisting of the strip of territory running along most of the length of the peninsula and extending about 40 miles inland from the Straits of Malacca--is served by a relatively extensive road network connecting numerous towns and villages, including all but two of the 15 towns of 50,000 or more. In the remaining two-thirds of the country the transportation system is much thinner and over large areas disappears altogether. Settlements are sparsely distributed across the landscape, though here and there a sizeable town appears, occasionally surrounded by a web of feeder roads which more or less define the immediate hinterland. Generally, however, these connect only in linear fashion with other nucleated places. One might infer from this that patterns of social and economic organization are likely to be quite different in the two regions. It might be presumed further that the standards of life in the two regions might likewise be considerably different.

As a matter of fact, this first impression is not misleading. The marked differences between regions are often remarked, and the imbalance is officially recognized as a situation requiring rectification. The

Mid-Term Review of the Second Malaysia Plan, 1971-1975 notes that "The different regions in Malaysia do not share equally in the economic progress of the nation. The less developed East Coast States of Peninsular Malaysia, . . . and the rice-growing States of the north, for example, have a relatively smaller share of the national income" (p. 17). The Mid-Term Review also recognizes significant differences in manufacturing output, health services, and the provision of water, sewerage facilities, and electricity, and concludes that "The aim of regional development is to reduce the marked economic disparities which currently exist between States" (p. 18).

The formal recognition of regional inequalities as a social and political problem, and a determination to overcome disparities through the application of policy imply a need for a social information system organized in such a way as to (1) describe the extent of the maldistribution of a number of important characteristics, (2) permit the monitoring of changes in levels and distributional patterns through time, and (3) provide some basis for systematic empirical evaluation of major policy efforts and the assessment of the probable effects of broad structural characteristics on social goals.

Almost any system of national social and economic accounts must naturally perform at least some of these functions. Or perhaps it is more accurate to say that to the extent that distribution, as distinct from aggregate levels and rates of growth, is becoming increasingly the focus of development policy (and there is evidence from Malaysia and elsewhere that such a shift is in progress--see Malaysia, 1973: 1-13, and Rondinelli and Ruddle, 1976:4-11), established and familiar

information systems are being called upon to serve purposes for which they were unintended and for which they are often poorly suited. Malaysia's current data gathering and processing capabilities are of quite a high order, but there as in most countries, the more industrially advanced Western countries not excluded, the orientation is heavily toward the individual or household on the one hand, and national-level aggregates on the other. What is most often neglected or inadequately treated is that broad middle ground lying between these two extremes. The relevance of individual-level and national-level data for many questions of public interest is not in question. But this emphasis does have important limitations and biases which seem not to be widely appreciated, and opportunities which a fuller consideration of middle range units of analysis might provide remain unexploited.

A Macrosocial Approach to Social Indicators Research

The goal of this research is to describe statistically the distribution of social welfare among the 70 administrative districts of Peninsular Malaysia for the period around 1970, and to attempt to account for differences among districts by means of broad social structural characteristics.¹ The analytical framework employed is a variant of the macrosocial accounting technique developed by Young (1972), whereas the general notion of "social welfare" and related

¹Peninsular Malaysia is now the official designation for the mainland territory of Malaysia--i.e., excluding the Borneo states of Sabah and Sarawak. It corresponds with the former Federation of Malaya. Singapore, which was part of British Malaya during most of the colonial period, is now an independent state.

operational procedures are derived from a social indicators perspective.

Macrosocial Accounting

Macrosocial accounting (MSA) is designed to address some of the issues raised in the first section of this chapter. With the growth of concern for equity as well as economic expansion, the need for reliable information about the actual extent of maldistribution of social and economic goods, and for a system whereby the regular monitoring of changes in levels and distributional patterns can be accomplished, has become increasingly apparent. And if a major goal of development programs is to induce social change and promote higher levels of welfare for a larger proportion of the population, then some kind of mechanism for the systematic evaluation of policy efforts is needed, along with a clearer understanding of how broad structural characteristics are related to the achievement of social goals.

MSA deals with group-level attributes in a comparative format. One of its purposes is to describe the structural framework of a country in a way analogous to a topographic map. Just as altitude, soil type, climatic conditions, and other physical characteristics vary from place to place within a given territory, so too do levels of urbanization, land utilization and cultivation practices, ethnic composition, degrees of economic and political inequality, technological sophistication, social cohesion, and so on vary among the constituent units of a social system. This variability is often recognized in a general way but seldom is there a systematic effort to operationalize these social structural attributes, identify broad underlying

patterns, chart their spatial distribution, and perhaps most importantly, monitor changes over time.²

The macrosocial approach is based on several assumptions. The first is that groups rather than individuals are the most important agents of social change, and that group characteristics determine or influence individual behavior, beliefs, attitudes, living conditions, etc. more than these affect group structure. By definition, the major groups into which societies are typically subdivided exist independently of particular members and usually continue over a period longer than the human lifespan. Moreover, "like grammar, the formal structure of society [or of a social subsystem] holds its shape and in so doing sets limits and gives direction to particular behavior" (Young, 1977). Therefore, group attributes have priority in studies of social organization and change in both a temporal and a conceptual sense.

A social group may be defined as a bounded, interacting population which shares a common set of institutions. Institutions are basic to the macrosocial perspective not because they perform necessary or desirable functions, which of course they do, but rather because they are formalized and publicly recognized patterns of social symbols. As such, they are carriers of social meaning both within the group itself and in its relations with its external environment. Families and small communities are among the purest and most familiar forms of symbol- or institution-sharing groups, but the definition may be applied

²A notable example of time-series analysis using a variety of social institutional data is Leinbach's (1971) study of the spatial diffusion of "modernization" in Malaya over the period from 1895-1969.

at any system level, including nation states and their political and administrative subdivisions. There is obviously considerable variation in the degree to which more or less arbitrarily demarcated civil units are "real" social groups. Specific circumstances must be considered in each case, but as a general rule it appears that the older and more important such units are the closer they will approximate "natural" communities.

Two potential uses of MSA have already been mentioned: to map the social landscape and monitor changes over time. Although these uses are in a sense "merely" descriptive they are nevertheless crucial, particularly where large-scale social change is a major goal of national policy. This is particularly likely in developing countries. Much of the research which has derived from the symbolic structural framework has in fact been concerned with development as a process of institutional accumulation and structural differentiation (Nakahara and Witton, 1971; Wheelock and Young, 1973; R. Young, 1968).

Moreover, certain types of description are more analytical than others. If the characteristics in terms of which districts or provinces are described have numerical values, as is the case with MSA, then simple maps showing highs and lows on different structural dimensions can be visually compared, and similarities and differences noted; or all units may be rank-ordered according to their scores on each dimension, and these rankings compared. Regions or isolated pockets unusually high or low on particular attributes, or whose rate or direction of change sets them apart are easily identified, and can be earmarked for more intensive examination. Such deviant cases--in the

sense of markedly higher levels on some structural dimension or a more rapid rate of growth than in neighboring areas--might be expected to appear in districts where development efforts are being concentrated. If this is not observed, then questions about the general developmental impact of these efforts might be pertinent. MSA would thus serve as part of an evaluation process by which broad structural effects, as distinct from concrete technical accomplishments such as miles of road constructed or acres planted, might be assessed.

Another general category of uses for MSA concerns analysis in a more formal sense--the study of interrelationships among structural variables themselves and the effects of such variables on human well-being, productivity, social participation, and other important social concerns. Theory construction and hypothesis testing are generally more appropriate to academic research than to policy formulation and evaluation, though naturally the two should not be unrelated. But an understanding of some of the basic relationships between social structure and the conditions of human welfare could hardly be more relevant to the practical concerns of policy makers and planners.

That social structural characteristics have an important impact on crime, poverty, health, and many other aspects of behavior and welfare is one of the fundamental propositions of the social sciences, and in general terms the connection appears to have become part of the conventional wisdom, not only in highly industrialized countries but in much of the rest of the world as well. Unfortunately, the precise nature of these associations is not well understood, and solutions to social problems are still formulated predominantly on assumptions of

cause and effect relationships between individual or family attributes such as wealth or education and other micro-level characteristics such as health and housing quality. The existence of such associations is not in dispute, but at least in a certain sense they are tautological, and largely ignore the questions most directly relevant to policy-- i.e., those relating to the conditions which foster or inhibit a whole array of family level benefits of both the wealth-and-education and health-and-housing varieties.

A question of the latter type is the basis for the present study. The aim is to identify a number of macrostructural dimensions which characterize the districts and states of Peninsular Malaysia, and assess their statistical relationships with average social welfare at the district level. This research is actually an extension of a pilot macrosocial accounting project undertaken in Malaysia,³ and might be regarded as a first test of its utility.

The Social Indicators Perspective

While social indicators have gained considerable currency in recent years, particularly in the United States but increasingly elsewhere, there is still a surprising amount of disagreement among

³The pilot project was established during 1975 while the author was informally attached to the Department of Statistics in Kuala Lumpur. With the cooperation and assistance of Department officials and staff a considerable quantity of baseline data was gathered, organized, codified, and stored on punch cards for all the districts and states of Peninsular Malaysia. Most of the material was taken from the Department's own publications and files or from other official sources. This data archive is now in the custody of the Census and Demography Division of the Statistics Department. It is the source of almost all statistical material used in the present analysis.

proponents and practitioners on a number of matters of basic importance.

Perhaps consensus is not to be expected in a field of study which has developed so recently. The so-called social indicators "movement" (Duncan, 1969:1) is generally dated from the early and middle 1960s with calls from several commissions, agencies, and quasi-public bodies for better information on where American society stood and where it was headed with regard to major social conditions, and more specifically, what were the costs, benefits, and likely unplanned consequences of the large and growing number of federally funded and administered public programs. At a time when phrases like The Great Society and War on Poverty were very much in the air, it appears to have struck a number of people that the governmental bureaucracy was ill-equipped to find out much of what was needed to be known if at least a modicum of rational evaluation and foresight were to be brought to bear in social policy formulation. And not only was much necessary data unavailable. It soon became clear that in many cases there was little knowledge regarding what data would actually meet the requirements or how to go about getting it. Closely related to these policy concerns, obviously, were the riots, protests, and general turbulence of the 1960s which quite forcibly called attention to rapid social change and the interrelatedness of diverse elements of the social system.

Most of the fundamental issues associated with social indicators research were laid out or represented in several widely publicized books, reports, papers, and monographs of the latter half of the

decade.⁴ Activity in the field has escalated in the 1970s--though little of it has attracted public attention as the earlier efforts did --and it has spread well beyond the U.S. Consensus on basic issues has nevertheless been elusive. Land and Felson (1976:566), for example, are unwilling to characterize the common ground of social indicators researchers beyond an agreement that "social indicators are measures of social conditions." Similar issues have arisen in an international context, and considerable work on social indicators proper, as well as broader indicators of "development," has been carried on for a number of years at the United Nations Research Institute for Social Development (see McGranahan et al., 1972; Baster and Scott, 1969; and Baster (1972).

Definitions and boundaries of the field. Whether social indicators are properly restricted to the study of social conditions, or should rather serve a broader function in charting and helping to explain the processes of social change is one of the principal points of disagreement among social indicators advocates. These two orientations are not, of course, inherently incompatible or mutually exclusive, but it has proved difficult in practice to treat them both simultaneously on an equal footing.

One very serious difficulty which arises particularly from the comprehensive "social change" viewpoint is that of defining any

⁴ There are a number of good accounts of the historical antecedents of the social indicators movement and the basic issues involved. For an overview, see Sheldon and Parke (1975), Land (1975), and Hauser (1957). More complete treatments of many specific issues and points of view are included in Bauer (1966), Gross (1969), and Sheldon and Moore (1968) on the U.S. situation, and Baster (1972) and McGranahan et al. (1972) from an international perspective.

boundaries at all to the substantive domain of social indicators other than those which traditionally apply to the behavioral sciences generally. For example, Sheldon and Parke's (1975:188) definition of a "social science approach" which "starts with social behavior, and seeks to comprehend and measure it and to account for any changes in it" appears to comprehend nearly the whole of sociology. Land's (1971:323) proposal "that the term social indicator refer to social statistics that . . . are components in a social system model (including sociopsychological, economic, demographic, and ecological) or of some particular segment or process thereof" is at least equally comprehensive, the only apparent limitation being that a variable must be quantifiable.

From a macrosocial point of view there is a clear and important distinction to be made between social organization and change on the one hand and living conditions or social problems on the other. It has been explained above that the characteristics of group structure have theoretical priority over micro-level phenomena. In methodological terminology, these characteristics are treated as independent (or explanatory, or causal) variables, and "social indicators" is a convenient term for a certain class of dependent variables. Though obviously this greatly oversimplifies the situation--the social world is not so tidily divisible into "independent" and "dependent" categories--some such division is necessary if social indicators is to have any independent meaning.

Normative Content and Objective Conditions. Another issue relates to the content of social indicators. Most would probably agree that

even after excluding broad measures of social structure and change, the residual of actual or potential social statistics is somewhat too inclusive to be useful in defining the field. A commonly adopted criterion is that social indicators should have "direct normative meaning" (U.S. Department of Health, Education, and Welfare, 1969:97) or relate to fairly well established areas of social concern. It is true, obviously, that "normative" is itself a slippery term, and that social concerns have a way of waxing and waning in response to broader events and trends. There is, nevertheless, considerable stability in much of what is regarded as important to social well-being. It is unlikely, for example, that the eight social concerns treated in Social Indicators 1973 (Executive Office of the President, Office of Management and Budget, 1973)--health, public safety, education, employment, income, housing, leisure and recreation, and population--are markedly different from a similar list that might have been drawn up in 1923, with the possible exceptions of leisure and recreation or population. Furthermore, most of these are problem areas which appear to have very general applicability throughout the world (Hauser, 1975: 347-349).⁵

The present study adopts the "normative interest" criterion in its working definition of social indicators, along with one other.

⁵Hauser (1975:346-47) notes that in 1938 the ILO also proposed a list of eight major components of level of living which included the following: health; food and nutrition; education; housing; conditions of work; unemployment; consumption levels; and individual security and welfare. The similarity to the Office of Management and Budget's list is apparent.

This second restriction requires that the indicators relate to the objective conditions of life and life opportunities of individuals or families. Thus health, education, and housing measures are permitted, while attitudes and perceptions about happiness or job satisfaction, for example, are excluded, as are group-level phenomena such as anomie, alienation, or corruption.

The exclusion of attitudinal indicators is due not so much to theoretical considerations as practical ones. In Malaysia, as in most other countries, public opinion polls and attitudinal surveys have not yet been widely attempted, and it is unlikely that they will be for some time to come. In any event, it is probable that there is a substantial correlation between the sum total of material living conditions and perceptions of satisfaction. A recent worldwide Gallup poll, for example, found that "Even among the lower economic groups in the United States, satisfaction levels for the items tested are higher than the national averages recorded in the developing regions of the world." The poll "indicates that the gulf which separates the advanced societies from the developing nations in respect to material well-being is just as wide in respect to psychological well-being" (New York Times: Nov. 7, 1976, p. 2). The evidence is far from conclusive, however, and the precise nature of the relationship between objective social conditions and personal satisfaction is of considerable interest in its own right (Andrews, 1973; Wilcox et al., 1976:103-5). But for the time being social indicators research must be limited largely to objective measures.

Social Indicators in Malaysia: Previous Research

Though the scarcity of suitable data has been an inhibiting factor, studies of what might be regarded as social indicators are not wholly lacking in Malaysia. Hirschman (1972) has examined 1957 census data on years of schooling completed and, utilizing the breakdowns by age groups, extrapolated backward in time to detect trends in educational attainment over a period of 30-40 years. Hirschman's main interest is in differences among Malaysia's major ethnic groups, but he also includes in his analysis a dummy variable for state. State deviations from the mean number of years of schooling for the total population (ages 20-64) range from .71 years for Penang to -1.18 years in Kelantan (Hirschman, 1972:492). These are striking differences, considering that the population mean was only 2.27 years. Furthermore, Hirschman notes that "the analysis of state 'effects' seems to divide the states into two groupings that are remarkably similar to the colonial administrative areas before World War II. . . . Only Pahang among the Federated Malay States fell below the grand mean" (491). In further analysis of the regions defined according to whether a state fell above or below the overall average,⁶ the patterns of both educational attainment and continuation ratios for Malays, Chinese, and Indians are shown to be quite different in the developed and underdeveloped states.

In the underdeveloped region the gap between Malays and the other races tend to be quite marked except in the proportion of those

⁶Hirschman's more developed and less developed regions correspond closely with those termed "core" and "periphery," respectively, in Chapter II of this study.

who continued in primary school once enrolled. In this respect the level for Malays was comparable to that for Indians and higher than for Chinese. In the developed region, on the other hand, Malay performance on all measures except the continuation ratio from primary to lower secondary school was comparable to, or greater than, that of the other racial groups. Hirschman interprets his data as casting doubt on differential motivation between Malays and the immigrant ethnic communities as a major explanatory factor, and argues that more probably the discrepancy is to be accounted for in terms of greater access among the more urbanized immigrant groups to more and better schools, particularly to English medium schools which provided the key to educational advancement throughout the colonial period.

A more recent study of drop-out rates in Peninsular Malaysia (Malaysia, 1973) supports Hirschman's contention that the motivational factor is of little importance as an explanatory variable, and that access and school quality are much more crucial. The "Drop-Out Report" is based primarily on a detailed survey of a sample of school children in two age cohorts, and is thus able to employ a variety of attitudinal, family background, and school-level variables unavailable from the census or other secondary sources. The orientation of this research was toward school- and individual-level explanatory variables, and it does not attempt to assess the effects of higher level administrative or political units. The report does include, however, a table showing numbers of pupils who sat for and passed the Standard V Assessment Tests in science and arithmetic in 1969 (Malaysia, 1973:46-47). These figures are broken down by state,

urban-rural location, and medium of instruction (English and Malay), and provide some indication of state and regional variations in educational quality. Computations based on the science test data show the highest pass rate to be 51.2 percent in Penang. Among west coast states (excluding Kedah and Perlis), the rates vary from 42.4 percent to 51.2 percent, with an overall rate of 48.3 percent. In the remaining states they range from 32.8 percent to 38.5 percent, with an overall rate of 34.4 percent. Similar calculations for the Arithmetic Assessment Test reveal the same pattern, but with even more pronounced interregional and interstate differences.

A third study--this one on housing quality in Malaysia in 1970 (Gibbons et al., 1973)--might be included under the rubric of social indicators, though here, as with the two education studies, it is not explicitly identified as such. Two characteristics of the housing quality study are of particular interest. The first is that the units of analysis are ecological units--states, districts, and the larger towns; the second is that the measure of housing quality is constructed from multiple concrete indicators. Gibbons and his associates constructed a Guttman scale from household data from the 1970 Census of Housing and applied it to each district, state, and principal town of the Peninsula. By this means they were able to estimate for each of these units the number of dwellings which fell below a specified status level of quality. The common unit of analysis (the district), as well as the compatibility of housing quality with the broader concept of level of living, make it possible to incorporate the Gibbons et al. measure into the present research. A more detailed description of the scale will therefore be given in a later section.

A final treatment of social indicators in Malaysia which should be mentioned is that which is included in the Third Malaysia Plan (Malaysia, 1976:200 ff). This time explicitly identified as social indicators. The Plan employs a different definition than is used here--that is, it includes "access" measures, such as hospital bed availability, as well as individual and family attributes--and the breakdown is by states only. Nevertheless, it is a strong indication of official awareness of the need to take such factors into account in the planning process, and of a recognition that such indicators and their spatial distribution should have a place in the assessment of social progress. The statistical information given, and the accompanying discussion, indicate wide variation among states on such measures as housing crowdedness, persons per doctor, automobiles and motorcycles per hundred persons, and the proportion of households in poverty.

CHAPTER II

REGIONALISM AND ITS HISTORICAL CONTEXT

The regional dualism mentioned at the beginning of the last chapter is a factor which will come up repeatedly as this study proceeds. It will be helpful, therefore, to note at this point the extent of regional differences in Malaysia in some detail. Some of the historical circumstances which contributed to the current situation will be considered in the following section.

Contemporary Regional Differences

Regional boundaries are always somewhat arbitrary. In Malaysia, the major distinction is popularly made between the "east coast" and the rest of the country, though in fact the northwestern states of Kedah and Perlis appear to have more in common with those situated along the eastern seaboard than with their west coast neighbors. For reasons which will be specified in more detail below, the classification of the six states of Penang, Perak, Selangor, Negri Sembilan, Malacca, and Johore in the western region, and the five remaining states in the "eastern" region will be followed here.

Some of the social and economic dimensions of the regional dichotomy are suggested by the figures shown in Table 2-1. Though somewhat smaller in areal extent, the western region contains 70 percent of the total population, 86 percent of all non-Malays, and

Table 2-1. Regional Shares of Selected Aspects of Social and Economic Organization in Peninsular Malaysia, 1970

	Percentage Shares	
	West	East
Total population, 1970	69.6	30.4
Number Malays	55.2	44.8
Number Chinese	86.5	13.5
Number Indians	86.4	13.6
Number Fuzetted areas	73.6	26.4
Population in Fuzetted areas	80.2	19.8
Population in urban places	83.0	17.0
Total land area	43.7	56.3
Total agricultural area, 1960	66.1	33.9
Area in smallholdings, 1960	46.0	54.0
Area in padi, 1960	29.8	70.2
Area in rubber, 1960	72.5	27.5
Area in estate agriculture, 1960	80.7	19.3
Number estates, 1960	76.2	23.8
Total labor force	65.9	34.1
Employed in mining and quarrying	83.6	16.4
Employed in agriculture	54.6	45.4
Employed in modern agriculture	67.7	32.3
Employed in manufacturing	78.3	21.7
Professional, technical and related	75.8	24.2
Administrative and managerial	82.3	17.7
Combined state contributions to GNP, 1965-68 average	78.9	21.1

83 percent of the urban population (defined as those living in places with a population of 10,000 or larger). This region also has a disproportionate share of "modern" agriculture, including 81 percent of the total estate area and almost three-quarters of the total area planted to rubber, both estate and smallholding. And while only 66 percent of the total labor force resided in the six western states in 1970, this region accounted for 78 percent of those employed in manufacturing, 76 percent of all professional, technical, and related workers, and 82 percent of the total number of administrative and managerial workers. The concentration of mining activity along the western foothills is shown by the fact that nearly 84 percent of all persons employed in mining and quarrying worked in one of the western states. Economic productivity is also markedly higher in the west. With a labor force constituting about two-thirds of the total, these states generated an estimated average of nearly 80 percent of the total Peninsular Malaysian GDP for the years 1965-68.

This regional imbalance in a number of aspects of social and economic organization is paralleled in the maldistribution of social welfare. As Table 2-2 indicates, in 1970 the west clearly led in almost every aspect of social well-being. Moreover, the disadvantaged position of the eastern area manifests itself not only in absolute terms as a region but, more importantly, in per capita or per household terms. This is roughly indicated by the fact that the shares of both households and total population in the eastern states, about a third of the total in each case, are larger than their share of illiterate and educated people, piped water, electricity, health facilities,

Table 2-2. Regional Shares of Selected Measures of Social Welfare, 1970

	Percentage Shares	
	West	East
Total population	69.6	30.4
Registered doctors (1971)	86.4	13.6
Government hospitals (1971)	67.9	32.1
Hospital beds, government hospitals (1971)	76.1	23.9
Dispensaries, fixed and mobile (1971)	62.6	37.4
Persons literate in any language	73.3	26.7
Persons with any post-primary schooling	79.2	20.8
Persons with any post-secondary schooling	84.5	15.5
No. Government-assisted primary schools	66.8	33.2
No. Government-assisted secondary schools	67.5	32.5
Total dwelling units	64.9	35.1
Piped water supply (indoors or outdoors)	81.8	18.2
Electricity	81.9	18.1
Flush toilets (private or shared)	81.4	18.6
living quarters in deteriorating or dilapidated condition	52.8	47.2
Motor vehicles (four-wheeled)	82.6	17.4
Motorcycles and scooters	78.9	21.1
Pupils sitting for Standard V Arithmetic Assessment Test, 1969	66.0	34.0
Pupils passing Standard V arithmetic test	74.3	25.7

etc. Conversely, the number of living quarters in deteriorating or dilapidated condition is, on a proportional basis, substantially greater among the states of the eastern region than in the west. Among the indicators shown, the disparity is greatest for registered doctors, 86 percent of which are available to 70 percent of the total population, leaving only 14 percent to serve the remaining population which resides in the less favored region.

On the subject of health care, it is worth noting that although the proportional distribution of hospitals and dispensaries actually favors the eastern and northern states, the shortage of qualified doctors and hospital beds in these areas strongly suggests that the quality of available health service is not commensurate with its quantity. Similarly, the distribution of schools slightly favors the eastern region, but the pass rate on the 1969 standardized arithmetic test is much higher for the western region. Again, the inference is that the quality of secular schooling is uneven and tends to discriminate against the population residing in Malaysia's northern and eastern states.

The list of such disparities could be extended, but the pattern is clear. It is recognized, of course, that such comparisons as these indicate only the roughest outlines of the actual situation. Neither region is a completely homogeneous entity, and there may well be highly developed pockets in the east which fare much better than localized areas in the west. This possibility is one of the major topics to be examined in this study, and to which we shall return.

Historical Background

The regionalization of the Malay Peninsula has a rather long and complex historical background, of which only the main outlines can be given here. Unlike many countries in which regions have emerged as a result of superior agricultural potential or the local possession of some other form of natural wealth, economic factors in a direct sense played a subsidiary role in setting the pattern of regional distinctiveness in Malaya, though they were later to become of utmost importance in reinforcing and intensifying it.

Initially, the characteristics of location and terrain had provided natural barriers to social and commercial interchange between the eastern and western parts of the country. The structural grain of what is now Peninsular Malaysia, which runs in a roughly north-south direction, has since earliest times inhibited coast to coast lateral movement, and these natural conditions were only reinforced by later events. The main geographic features are described by Fisher (1966:588) as follows:

... The alignment of the mountain ranges, and in particular the Main Range, provided a major obstacle to E/W movement, and the resultant separation between the two sides was reinforced by the contrast between the ease of maritime access in the west and the great difficulty of navigation along the east coast. And since the Malacca Straits have for many centuries been both a link between Malaya and Sumatra and a highway frequented by the vessels of many lands, the western coastline has traditionally been the "front door" of the peninsula while the east, especially Pahang, has been in Sir High Clifford's telling phrase, "the further side of silence."

Its location at the narrowest point of the Straits is, of course, the principal factor accounting for Malacca's rise to prominence during

the pre-European period. Founded around 1400, by 1500 Malacca had become the leading maritime power in Southeast Asia and an important center for the spread of Islam. Nevertheless, it had always been unable to support even its own population in food. Fisher (1966:291) notes that "the strength of Malacca was already restricted by the decidedly limited capacity for food production of its immediate hinterland." Even in the mid-1400s "rice was being imported from Java and throughout the Portuguese and Dutch periods the town's dependence on imported foodstuffs remained a strategic weakness curiously foregrounding that of Malaya as a whole in modern times."

But Malacca's century-long history as an independent power, and even Portuguese (1511-1641) and Dutch (1641-1824) occupation, had relatively little impact on the Peninsula itself. It was only with the coming of the British that initial geographic separation between the eastern and western coastal regions began to develop into a distinct and self-perpetuating comparative advantage for the west.

In the early 19th century the Dutch had become Britain's only major rival in Greater Malaysia--the predominantly Islamic territories of the Malay Peninsula and the Indonesian archipelago. In 1824 the Treaty of London delineated and regularized the respective spheres of influence of these two powers in the area, and set the pattern which was to be maintained in all essential respects until the colonial period came to a close following World War II. Among other provisions, the treaty called for Malacca to be relinquished by the Dutch, and the recognition of British rights to Penang and Singapore, which had been founded (in 1786 and 1819, respectively) on virtually uninhabited

territory ceded by local sultans in exchange for British support in disputes with neighboring states or with rival factions at home.

Thus, British holdings in Malaya consisted at this time of small outposts spaced at fairly equal intervals along the Straits coastline: Penang and the adjacent strip of the mainland known as Province Wellesley in the north; Singapore at the Peninsula's southernmost tip; and Malacca in between.⁷ These territories, which later became known as the Straits Settlements, were constituted at first as a separate Presidency of the East India Company, but in 1867 became a Crown Colony under the local jurisdiction of a Governor in Singapore.

The indigenous political systems on the mainland during this period were in a state of disarray. The Malay states corresponded roughly with the main drainage basins of the Peninsula, and were nominally ruled by hereditary sultans. In fact, however, these rulers had little actual control over the various district chiefs, who owed them formal allegiance but frequently possessed their own bands of fighting men and an independent power base derived from the control of strategic positions on the principal rivers (Gullick, 1958). Given the difficulty of communication and the lack of agricultural resources to support even modest population concentrations, the political integration of the Malay states under indigenous leadership would have been

⁷The Dindings in Perak is sometimes included as a British territory following Low's Treaty of 1826, by which Britain acquired some minor islands lying just off the Perak coast. Both the treaty and the official interpretations of it were somewhat ambiguous, however, and in any case the mainland Dindings was not occupied by the Europeans and formally incorporated into the colony until after the Pangkor Engagement of 1874. It was finally retroceded to Perak in 1934. See Emerson (1937:120, 373-74).

highly problematic in any case; but the breaking of Malacca hegemony in the area and the disruption of coastal communications upon which any unification would have depended, effectively put an end to any such possibility (Emerson, 1937:116).

The disrupting influence of the British presence was felt in more tangible ways, despite the fact that for some time direct interference in the affairs of the Malay states was surprisingly slight. Britain's principal concerns in establishing a presence in the Straits Settlements were to obtain strategic outposts for the protection of its Indian possessions and to command the trade routes between the Indian Ocean and the Far East. The venture soon proved a marked commercial success, particularly in Singapore. But it was the view of the authorities in Calcutta, and later in London, that expansion of any kind into the mainland could only lead to political complications and an unwanted administrative burden. A policy of non-interference was therefore adopted and for fifty years firmly upheld.

It was a policy which found little sympathy with Settlement officials and local European and Chinese businessmen. Though conditions in the Peninsula's interior were little known, there was widespread belief within the business community that it contained great natural wealth and commercial opportunities. Also, the very proximity of the Straits Settlements, as well as the official policy of systematically encouraging immigration, particularly by Chinese, soon resulted in the establishment of sizeable communities of alien residents. It was not long before these immigrant groups, having gained a secure foothold in Singapore, Penang, or Malacca, began to spill over into the mainland.

A particular attraction for the Chinese were the tin fields along the western foothills of the Main Range, mainly in Perak, Selangor, and Negri Sembilan. The Chinese had been involved in a small way in tin production for many years, but it was only in the latter half of the 1800s that large-scale exploitation got underway. And inevitably the "tin rush" which developed following the discovery of the rich Kinta field in 1848 had far-reaching consequences. Emerson (1937:116-117) describes some of these consequences, which were eventually to force a reversal of London's non-interventionist position:

At the door of the British must also be laid a major share in the responsibility for the mass invasion of Chinese in the tin areas after the middle of the nineteenth century. From the beginning the British settlements attracted large numbers of Chinese to themselves and it was inevitable that they should seek their fortunes in the rich hinterland whose tin and trade had long been known to them. Far from setting up any stable governments of their own they were speedily broken up into warring clans, factions, and secret societies, often with headquarters in British territory. For their local feuds they were largely dependent on arms and supplies imported from the Colony, and to aid in the fighting they even imported gangsters direct from China through Straits ports. From the middle of the century Singapore and Penang were full of the stories of the barbarous strife which raged between the Chinese and the Malays and within these racial groups. Nor were the Settlements themselves free from the repercussions of these struggles.

Early Political Development in British Malaya

This increasingly chaotic situation obviously could not be allowed to continue, and when at last the realities had been brought home to the Colonial Office the British government was remarkably quick to reconsider its long-held position. The instructions given to the newly-appointed Governor of the Straits Settlement in 1873 included the

injunction "especially to consider whether it would be advisable to appoint a British officer to reside in any of the States."

Once the door was opened events moved swiftly. The British "forward movement" had begun. The Pangkor Engagement with the leading Perak chiefs was signed in January 1874. This provided for British protection for Perak and support for its ruling elite. In return the Sultan undertook to receive a British officer, to be called Resident, who would be accredited to the court "and whose advice must be asked and acted upon in all questions other than those touching Malay religion and custom."

The Pangkor agreements set the pattern for others which were soon to follow. Residents were established in Selangor and in Sungai Ujong, the most important member of the Negri Sembilan confederation, by the middle of the same year. Some 14 years later, in 1888, the state of Pahang came under British protection, in part because the government of the ruling Sultan was so corrupt that the situation there seemed too dangerous to leave unattended; in part because a policy review of the Residential system had resulted in the recommendation that the proper future course was to extend the system to the other Malay states as opportunities presented themselves; and, perhaps not least, because Pahang was thought--mistakenly, as it turned out--to be exceedingly rich in gold (Fisher, 1966:597). Pahang was a very large state, but it was also sparsely populated and relatively very underdeveloped. And, unlike the Settlements and the other protected states, it was situated on the eastern side of the Peninsula adjoining the South China Sea rather than the Straits of Malacca.

With the addition of Pahang, and the gradual falling into place of the eight minor components of Negri Sembilan which had not accepted the Residency arrangements when Sungai Ujong had done so in 1874, the next step in the consolidation of the British position was a relatively small one. In 1895 the four protected states were joined together as the Federated Malay States (FMS), under the general jurisdiction of a Resident-General based in Kuala Lumpur who was in turn responsible to the Governor of the Straits Settlements in Singapore. The Straits Governor was now concurrently High Commissioner for the Malay States.

At this time five of the elements of what would eventually become British Malaya remained formally outside British control. The northern states of Perlis, Kedah, Kelantan, and Trengganu were under Siamese suzerainty. Johore remained formally autonomous but, by virtue of its being the only land connection between Singapore and the other British territories to the north, and as Singapore's only hinterland, it had been closely associated with the British since early in the 19th century (Hall, 1961:488; Emerson, 1937:197-220). The Siamese states were transferred to Britain, in return for certain considerations, by treaty in 1909. All declined to join the FMS, but each agreed to accept an Adviser under conditions similar to, but somewhat looser than, those obtaining for the states of the Federation. In 1914 the Sultan of Johore accepted a British General Adviser, at last bringing all the states on the Peninsula under one or another form of British subordination. The tripartite arrangement thus established consisted of the Straits Settlements (Singapore, Penang and Malacca, Wellesley, the Dindings, and Malacca), a Crown Colony; the

Federated Malay States, a loose federation characterized by a certain degree of centralization of policy and administration, among the states of Perak, Selangor, Negri Sembilan, and Pahang; and the United-States Malay States of Perlis, Kedah, Kelantan, Trengganu, and Johore. This arrangement was to continue with only slight modification until after the Second World War.

Economic Foundations

With the establishment of the Pax Britannica a substantial measure of law and order was achieved, and trade flourished, particularly in the FMS. Once a workable system of taxation was initiated, state revenues too expanded remarkably. A penal code based on that of India and other colonies was adopted, and a police force created. A few schools and hospitals were built. Territorial boundaries were formalized, and each state was divided into districts for easier supervision. With few exceptions, "ordered government as it spread over the territories brought commerce and industry in its train" (Allen and Donithorne, 1957:41). By the end of the 19th century the outlines of a road and railway system began to emerge in response to administrative needs and, more particularly, to the need for efficient and convenient transport from the tin fields to the Straits ports. Tin export duties, which in 1899 contributed 46 percent of total government revenues in the FMS (Ooi, 1976:332), were largely cycled back into more roads and communication facilities, which seem to have been something of a passion among early residents (Jones, 1953: 23). The first segment of rail line was completed in 1885, and by

1910 the connection had been completed between Prai in Province Wellesley and Johore Bahru directly across the Johore Straits from Singapore. This main line, which was later joined with the Royal State Railway of Thailand, ran along the western foothills and connected all the major tin fields with each other and with the coastal ports. The East Coast line, intended to open up the interior of the country by joining Tampar Kelantan with the main trunk line in the west, was not completed until 1931. The development of high-quality roads got a somewhat later start due to their limited utility prior to the introduction of motorized transport, but once begun the network expanded rapidly. Again, development was much more extensive to the west of the Main Range than in the east. The trunk road across the midsection of the Peninsula between Kuantan, the capital of Pahang, and the main western highway was completed in 1911, but except for an additional link between Batu Pahat and Mersing on opposite sides of Johore state, it remains the only trans-Peninsular road to the present day (ool, 1976: 386-392).

The growth of transport facilities had a direct effect on the expansion of the rubber industry around the turn of the century. Rubber had been introduced experimentally in Singapore in the 1870s, but it was not until the first decade of the 20th century, following the invention of the vulcanizing process and the penumatic tire, and the beginning of mass production in the automobile industry, that commercial production began in earnest. By 1930, about two-thirds of Malaya's total cultivated acreage had been planted in rubber, and it had taken over from tin as the country's major foreign exchange

earner. And, as with tin, it was heavily concentrated in the west.

. . . The special attraction of western Peninsular Malaysia for the rubber planters was provided by the skeleton network of roads and railways already laid out to serve the tin mining industry of the western foothills. The combination of a good transport system, well-drained sites and proximity to the deep-water ports of Penang and Port Swettenham . . . as points of entry and exit for labour, materials and processed rubber, probably accounts, more than anything else, for the concentration of rubber cultivation in this part of the country. . . . Another factor which attracted the planters to the west was the early establishment of political stability in the tin-rich states of Perak, Selangor, and Negri Sembilan. (Doo, 1976:240)

Moreover, it was rubber, along with tin, which produced the revenues necessary to build more roads and more miles of railway, which in turn stimulated even more extensive rubber cultivation. Lacking one, the eastern states had no alternative means of acquiring the other.

The Racial Pattern

The expansion of all forms of economic activity was, at least until the 1930s, inevitably accompanied by an influx of Asian aliens, whether as traders and businessmen seeking to capitalize on the abundant opportunities of a rapidly expanding commercial sector, as peasants or laborers seeking better prospects in a new land, or as labor recruited by agents in the home country and shipped to Malaya to mine tin or tap rubber (see Table 2-3). The Chinese were the principal entrepreneurial group. Using primitive but effective extraction methods they held almost exclusive control of the tin industry until the introduction of dredges and other expensive technology in the early

decades of the 20th century began to shift the advantage to highly capitalized Western firms. In 1910, 78 percent of the total production came from Chinese mines, but by 1930 the Chinese share had dropped to only 27 percent (Ooi, 1976:332).

Table 2-3. Growth of Chinese and Indian Population in Malaya, 1871-1941

Year	Total Population	Chinese Population as % of Total	Indian Population as % of Total	Combined Chinese and Indians as % of Total
1871 ^a	308,097	34	11	45
1891 ^b	910,123	43	8	51
1901	1,227,195	48	9	57
1911	2,644,489	35	10	45
1921	3,338,545	36	15	51
1931	4,345,503	39	14	54
1941	5,545,173	44	14	57

Source: Ooi, 1963, pp. 113, 117.

^aStraits Settlements only.

^bStraits Settlements and Federated Malay States only.

Following the discovery of the rich Kuala deposits in Perak in 1880, the inflow of Chinese reached phenomenal proportions. An estimated five million entered Malaya during the 19th century, and an additional two million from 1900 to 1940! As can be seen in Table 2-3, this was during a period when the total population of the country was less than a million. Most of these immigrants, obviously, returned here after a few years, but substantial numbers stayed on as permanent residents, and the racial balance in the Peninsula was drastically and

irrevocably altered (ool, 1976:118-119). The influx of Indians was also spectacular if judged by any standard but that of the Chinese. Between 1881 and 1941 Indian arrivals totalled between three and four million; and the migrational surplus over the last 40 years of this period was about 750,000 (ool, 1976:121).

Table 2-4 shows the concentration of immigrant groups in the western states. Already in 1921 more than half of the population of most states in this region were Chinese and Indians, while the eastern states averaged more than 80 percent Malay. Immigration was finally restricted during the 1930s, and beginning in 1947 a gradual narrowing of the regional difference is apparent. In part this is due to the separation of Singapore, with its large Chinese population, from the other states and Settlements following the war, but it also reflects the repatriation of many Chinese and Indians during the Great Depression when unemployment in Malaya was very high.

Core and Periphery

The events outlined above by no means left the eastern states untouched, but their impact there, as is indicated in Tables 2-1 and 2-4, was far less than in the west. The eastern territories entered the British sphere relatively late, and their physical and political isolation served to maintain a much stronger Malay character along with a much more backward economy. Even Pahang, though a member of the Federated Malay States, was always something of an embarrassment to the British (Cant, 1965; Emerson, 1937:177) due to its retarded development relative to the other Federated States and the Straits Settlements. Though it possessed some tin deposits, they were neither

Table 2-2. Ethnic Composition (Malay, Chinese, Indian, and Other) of States and Regions, 1921-1970 (%)

	1921				1931				1947				1957				1970			
	M	C	I	O	M	C	I	O	M	C	I	O	M	C	I	O	M	C	I	O
Johore																				
Malacca	56	34	9	1	46	43	10	1	44	48	8	1	48	42	8	2	53	39	7	0
Negeri Sembilan	56	30	12	2	51	35	12	2	50	40	8	1	49	42	8	1	52	40	8	1
Penang	43	36	19	1	37	40	21	2	41	43	14	2	42	41	16	1	45	38	16	0
Perak	36	44	18	2	33	50	16	2	30	55	13	1	29	57	12	2	31	56	12	2
Selangor	40	38	22	1	36	42	21	1	38	47	15	1	40	44	15	1	43	42	14	0
WESTERN REGION																				
Kedah	23	43	33	2	23	45	29	2	26	51	20	2	29	48	21	2	35	46	18	1
Kelantan	40	38	20	1	36	43	19	2	37	48	14	1	38	46	14	1	42	44	13	1
Pahang	70	18	10	3	67	18	12	3	68	21	9	2	68	20	10	2	71	19	8	2
Perlis	93	4	1	2	91	5	2	2	92	5	1	2	92	6	1	1	93	5	1	1
Terengganu	70	23	6	1	62	29	8	1	54	39	6	1	57	35	8	1	61	31	7	0
EASTERN REGION																				
	85	9	2	4	81	13	2	4	78	17	2	3	78	17	2	2	79	16	2	2
	95	5	0	0	92	7	1	0	92	7	1	0	92	7	1	0	94	5	1	0
TOTAL PENINSULAR MALAYSIA	82	12	5	2	78	14	6	2	77	17	5	2	76	17	6	1	78	16	5	1
	54	29	15	2	49	34	15	2	50	38	11	1	50	37	12	1	53	35	11	1

as rich nor as easily accessible as the alluvial fields in the west, "and much of the impetus for development that has been funnelled through these states has been absorbed in the western states before overflowing into Pahang" (Cant, 1965:37). Conversely, Johore, whose formal status in British Malaya placed it among the Unfederated Malay States, has developed in a way much more similar to the western Federated States and Settlements. Emerson (1937:198) notes Johore's peculiar position throughout the colonial period:

It is the State which has been longest and most intimately associated with the British, and yet it was the last State to accept a British Adviser. It is the State which most nearly concerns British Imperial interests because of its location across the narrow straits from the Singapore Naval base, and yet it is the state which has retained the greatest degree of substantial independence. It has attained a higher degree of modern economic development and has a larger percentage of aliens than any of the unfederated States, and yet it is usually the acknowledged leader of these States against further encroachment by the British or the Federation.

As can be seen in Table 2-4, on the basis of racial composition alone Johore clearly belongs within the western region. Pahang's position is somewhat more ambiguous, but tends to show a greater similarity in this respect to its eastern neighbors. Comparison in terms of general economic development would present a similar picture.

As the preceding discussion has attempted to show, the regional dichotomy in Peninsular Malaysia, which developed over a period of two centuries or more, is the resultant of a complex of factors whose impact was cumulative and self-reinforcing. While there is an inescapable element of arbitrariness in most regional demarcations, it is apparent that in Malaysia the divisions among the various states are

unusually clear-cut, and that the two regions are in many respects qualitatively different.

In order to emphasize the dualistic character of the regions and their subordinate-superordinate relationship, the six western coastal states except Kedah and Perlis are referred to in the following pages as the "core," while the remaining five states comprise the "periphery." These are intended only as convenient descriptive labels. Except in the sense just stated, no attempt has been made to invest these terms with any particular conceptual status as has been done by Hechter (1975), Shils (1961), and others. Whether the core-periphery distinction has independent analytical significance, or is merely a useful device for categorizing states and districts, is a question which will receive further attention later in the study.

CHAPTER III

QUALITY OF LIFE AND ITS COMPONENTS

The District as Unit of Analysis

There are several features which make the district attractive as the basic unit of analysis in Malaysia (see Osborn, 1974:127).

First, districts are small enough, both in terms of population and territorial size, to allow a fairly fine-grained picture of the variability of important attributes to emerge, a factor which also helps to maximize internal homogeneity. Obviously, even the smallest districts are not completely homogeneous, but in most cases they come reasonably close. Furthermore, district boundaries have remained comparatively constant over time, a fact which helps to assure that districts are settled and stable entities with individually distinctive characters. And the number of districts, which was 70 in 1970,⁸ is adequate to evaluate statistically the probability that regularities or patterns could be the result of chance occurrences or random data errors.

Another important advantage in using the district as the primary

⁸ Sometimes subdistricts are treated as separate districts. Selama, Lang, and Matang in Perak, for example, are counted as three districts by Osborn (1974) and as two by Ooi (1976), whereas the 1970 Census of Population and Housing considers the entire area to be the single district of Langat and Matang. The census classification is employed in all cases in this study. The city of Kuala Lumpur has recently been made a federal territory distinct from the remainder of Kuala Lumpur district, but this is not reflected in the 1970 data.

analytical unit is that this has long been the principal point of contact between policy-making levels of government and local residents. While the days in which the District Officer was both the functional and symbolic embodiment of government within his jurisdiction are past, district-level administration, including the representatives of specialized departments such as Agriculture and Public Works as well as the District Officer, is the chief mechanism by which policy is implemented, funds allocated and disbursed, and the routine operations of national and state government carried out. Conversely, district officialdom serves as the most direct and easily available channel for the communication of local conditions and needs, as well as grassroots opinion and sentiment, up the hierarchy to the political centers. This long-standing pivotal position of the district was explicitly recognized when district rural development committees were assigned a key role in the planning and execution of the famous Red Book program of the 1960s (Ness, 1967:ch. 6). Though the kind of direct local policy input which was incorporated into the Red Book system has now fallen largely into disuse, the district still remains an important focal point for the collection of local data, project evaluation, and policy implementation.

What has just been said is evidence that the district is, at least in some degree, a "social" unit. For many Malaysians the home district is the principal point of identification, and strong social attachments develop there which are often maintained through life. The social significance of the district is well summarized in the Report of the Royal Commission on the Workings of Local Government

(Malaya, 1970:130):

The existing districts have been generally advocated to us as the most suitable territorial basis for the proposed local authorities. We are not unkindful of the fact that the boundaries of the districts have not been drawn with decentralised local authorities in mind. They were originally demarcated for the convenience of de-centralised administration. Over the years their boundaries have been slightly adjusted but in the main they have remained the same. The districts are traditionally well known as the local administrative landmarks. People have got accustomed to identifying themselves and their interests with their districts. The district office has been well recognised as the focal point of local administration. The town where the district office is situated has been customarily accepted as the capital of the district. Rights related to land matters have been generally identified with the district. Services of various kinds have been provided on a district basis. A loose community of interest has grown among the people of a district, who naturally look towards the District Officer for local matters of public importance. A host of applications is channelled through the district office from the people in a district. Voluntary services of citizens in a district are recognized both by the State and the Federal Government in granting awards. All these have created an emotional tie and loyalty of the people with their districts.

The principal disadvantage in focusing on the district is that the regular collection and reporting of a wide range of statistics aggregated to this level began to be undertaken only around the mid-1960s. This fact naturally precludes detailed longitudinal or time series studies. The data base has improved markedly both in quality and quantity since about 1965, however, and by 1970, the date around which the present analysis is centered, provided much more material than could possibly be accommodated in any single study. Not all such material is equally relevant or reliable, of course, and important gaps remain, especially in areas directly relating to social conditions. This situation is likely to improve with time, however, and studies

drawing upon data for this early period should prove useful as a baseline on which later and more detailed work can build.

Multiple Levels of Analysis

To argue that the district is the most appropriate unit of analysis for a study of this type is not, however, to suggest that other levels may not play a role in the determination of local welfare. As has been described in Chapter II, the present states are the successors of Malaysia's earliest political entities, which go back to well before the European arrival in the area. In the nineteenth century the British Residents exercised considerable autonomous authority within their respective states, and the development of economic infrastructure and the provision of public services were financed primarily out of state revenues. The various states were unequally endowed with natural resources and differentially situated with respect to the political centers of the colonial government and the port towns in which the major portion of the country's commercial activity took place.

Under current constitutional provisions the states maintain a degree of legal autonomy, most notably in matters related to land administration, agriculture, and local governments, and (except for the two former Straits Settlements, where the head of state is appointed by the Yang di-Pertuan Agong, or King) each has its hereditary ruler, an elected unicameral legislative assembly, Chief Minister, executive council, and small civil service. Though state prerogatives in Malaysia are largely formalities without independent financial and political resources to give them substance (M'Intyre, 1967:

ch. 3; Esman, 1972:78-95), the circumstances and experiences of the various states, both historical and contemporary, seem sufficiently diverse to suggest that somewhat different social structures have developed. And if this is so, state level variables might be expected to exercise an influence on level of living independent of the more localized district determinants.

Finally, there is abundant evidence of marked and numerous dissimilarities between the core and peripheral regions. Though of course there is much diversity within each region, there is nevertheless an undeniable dichotomy between them. It is at least plausible, therefore, to hypothesize that much of the effect on district well-being attributed to differences in state and district structural conditions might be due in fact to the historical and geographical accidents by which the various subnational divisions were allocated between the regions. The inclusion of region in the analysis might, then, be advisable as a kind of "control" on history.

Measuring Social Welfare Among Districts

The 1970 Population and Housing Census for Malaysia contains a number of items of information that qualify by the definition established in Chapter I as social indicators. These, when supplemented by further data from the vital registration system and the housing quality survey developed by Gibbons et al. (1973), provide a pool of 21 potential level of living indicators available for all 70 districts in MM. Preliminary analysis of intercorrelations and factor communalities retained this number to 17. They are shown, aggregated to the

state level, in Table 3-1. Most of the items fall into a few substantive categories.

Literacy and Education. Education-related measures are perhaps overrepresented, probably a reflection of the relative simplicity of gathering these data as compared with other types. This information comes from unpublished census tabulations. The three post-primary school indicators correspond to the levels at which satisfactory completion results in the awarding of Lower, Middle and Higher Certificates of Education in the Malaysian system. The sharp drop-off after Secondary V reflects the fact that Sixth Form in Malaysia is a universally preparatory stage, and is officially classified as post-secondary education. Formal schooling through Form V, and the awarding of the Middle Certificate of Education, corresponds fairly closely to high school graduation in the American system.

Health. Infant and toddler mortality rates, which refer to deaths during the first year and from the first to fourth years of life, respectively, are taken from published vital statistics (Malaysia, 1972b), as is the maternal mortality rate, which is the number of deaths of women in childbirth per thousand live births. The infant and toddler rates are generally regarded as particularly sensitive measures of population health status due to their close relationship with levels of nutrition, sanitation, and so on (Shryock and Siegel, 1973:410-11). District life expectancies were calculated by the Department of Statistics by two methods, whose primary differences is the source of the data on which the respective life tables are based. One method uses census data (Shryock and Siegel, 1973:

Table 3-1. District Level of Living Indicators, State Averages

Indicators*	Johore	Kedah	Kelantan	Malacca	N. Sembilan	Pahang	Penang	Perak	Perlis	Selangor	Trengganu	Fed. Malaysia
1. Male literacy (%)	73.1	68.4	52.7	79.5	80.0	71.3	69.7	72.4	71.5	72.5	57.9	69.0
2. Female literacy (%)	52.1	43.0	33.6	50.4	54.4	48.5	47.0	49.4	48.1	49.8	40.0	56.4
3. 3 years secondary school (%)	1.11	1.07	1.10	1.23	1.47	1.18	1.22	1.09	1.50	1.36	0.78	1.15
4. 5 years secondary school (%)	1.55	1.06	0.95	1.80	1.82	1.42	2.04	1.46	1.50	2.07	0.97	1.46
5. 7 years secondary school (%)	0.18	0.06	0.10	0.20	0.23	0.19	0.28	0.18	0.10	0.49	0.10	0.19
6. Housing quality score	3.7	2.3	1.7	3.5	3.7	3.3	4.1	3.4	2.2	4.0	1.7	3.1
7. Living quarters w/ motor vehicles (%)	7.5	4.0	2.9	9.0	8.7	7.8	10.0	7.6	4.0	9.9	3.2	6.7
8. Living quarters w/ motorcycles (%)	13.4	9.4	4.2	12.7	14.5	10.2	16.0	13.0	10.0	17.6	5.8	11.3
9. Life expectancy (years)	64.0	60.7	57.4	63.2	65.1	62.2	63.4	62.3	64.6	65.3	59.0	62.0
10. Infant mortality rate	1.6	2.4	2.4	1.2	0.6	1.9	0.8	1.7	2.7	1.2	2.7	1.8
11. Toddler mortality rate	36.6	41.0	60.3	44.1	36.8	42.2	34.9	43.6	35.5	30.0	58.6	42.8
12. Maternal mortality rate	4.0	4.7	8.7	3.2	4.2	5.9	2.5	5.2	2.8	3.4	9.2	5.2
13. Percent unemployed	5.3	3.6	2.4	6.0	4.8	3.1	8.5	5.8	2.9	6.3	3.0	4.4
14. Avg. no. of persons per room	6.4	5.1	4.9	6.4	5.9	5.6	6.5	6.2	5.0	6.5	4.9	5.8
15. Suicide rate	5.5	4.3	1.5	5.0	7.5	7.3	8.7	8.9	7.5	7.1	2.1	5.7
16. Death rate from non-vehicular accidents	13.8	11.3	3.3	11.8	11.7	16.8	23.5	13.4	10.7	9.7	4.9	11.8
17. Percent with no schooling	40.6	46.6	56.0	38.4	37.6	43.1	36.6	39.5	41.1	40.6	52.6	43.8

* Detailed definitions and sources given in Appendix B.

ch. 25), while the other employs information taken from the vital registration system. As the two estimates may differ substantially, the lowest or most conservative figure is accepted for present purposes.

Suicide and Public Safety. These measures are two of four categories of medically certified deaths due to "external causes" (i.e., unrelated to disease or other natural causes) classified by the death registration system. District level data are unpublished but were available in the Department of Statistics for the years 1969-72. As the numbers of such deaths on a district basis are normally very small and subject to considerable error, the rates (per 100,000 persons) were calculated from the average numbers over the four-year period and standardized by the population in 1970. In addition to suicide and "other" accidents, the original data included information on deaths related to traffic accidents and to a residual category of "other external causes." A preliminary examination showed these two rates to have little relationship to the other welfare indicators, and they are therefore excluded from further analysis.

Housing Quality. This is the Gutman scale referred to earlier. The district scores were taken directly from Housing Quality and Current Housing Needs in Peninsular Malaysia, 1970 (Gibbons et al., 1972). The scaling procedure is described in detail in the report and need not be repeated here, except to indicate the item content and configuration (Table 3-2). The table shows the ranking of housing attributes to range from minimum acceptable physical condition (i.e., not dilapidated) to bathing facilities in a cumulative pattern. That is, dwelling units having a score of, say, 3 are very likely to have access

Table 3-2. Guttman Scale of Housing Quality, 1970*

Scale scores	Item content	Proportion discriminated
8	Bathing facilities	5.92
7	Toilet facilities, flush, exclusive	10.15
6	Material of walls--brick, concrete, or brick and plank	8.41
5	Water supply--piped, indoors, exclusive	8.15
4	Lighting--electricity	11.08
3	Water supply--piped, not indoors or exclusive	3.77
2	Toilet facilities--not flush or exclusive	32.45
1	Condition--not dilapidated	15.65
0	None of the above	4.42
		100.002

* Adapted from David S. Gibbons et al., Housing Quality and Current Housing Needs in Peninsular Malaysia, 1970, p. 52, Table 3.

to piped water, some kind of communal toilet facilities, and be in acceptable physical condition, but unlikely to possess electric lighting, an indoor water supply exclusive to the dwelling unit, or any of the other items higher on the scale. Thus the scale scores reflect not only the quality of housing based on an array of indicators, but each of the nine values on the scale implies the presence or absence of specific items.

Possessions. This category includes the proportions of living units with automobiles or other four-wheeled vehicles, and motorcycles, scooters, etc. The data are taken from the 1970 Census of Housing.

Unemployment. Figures are taken from unpublished 1970 census tables. The census definition included those members of the labor

who were actively looking for work plus those who worked less than three hours per day. The labor force, in turn, was defined as those persons ten years of age or above who had worked at a regular job in the seven days prior to census enumeration or were actively looking for work.

A Composite Index of Level of Living

Once indicators have been selected, the next issue is whether to treat them collectively as a single composite, as a set of subgroup composites, or as individual variables. Our initial preference is for a single scale which includes all indicators. It will almost always be the case that a district has a mixture of attributes, some of which contribute positively to level of living while others contribute negatively. Since all indicators used here have a fairly clear-cut normative meaning, the composite index can be constructed in such a way that the "good" components add to the total score while the "bad" ones are subtracted out. In other words, the final scale represents the net level after both positive and negative elements are taken into account. The primary interest here is not in health or education or housing per se, but in a rather more complex phenomenon which is not adequately reflected by any of these. It is assumed that a comprehensive composite represents the best overall index of living standards, given available information. There are, however, advantages in examining selected single indicators and subset composites, and we shall return to this topic at a later stage of the analysis.

Constructing the Level of Living Scale

A number of techniques are available for constructing composite indices. Smith (1973:85-103), for example, mentions several possibilities and actually employs three of them--summed standardized variables, scores derived from principal components analysis, and summed weighted variables--in his analysis of social well-being among the 48 contiguous American states. He finds very strong correlations (above .90) among the indices derived by each of these methods.

In the interest of simplicity, the standard score additive model is employed here. The procedure is to construct Z-scores for each component according to the formula $Z = \frac{X - \bar{X}}{SD}$, where X is the observed value of the item for a given district, \bar{X} is the mean value of the item, and SD is its standard deviation. This transformation has the effect of setting the means of all indicators to zero and all standard deviations to unity. The original units of measurement are thus eliminated, and the standardized items become directly comparable and can be combined by simple addition. No weights are explicitly assigned.⁹

The index thus derived is as follows:

$$\text{Level of living} = Z_1 + Z_2 + \dots + Z_9 - Z_{10} - Z_{11} - \dots -$$

Z_{17} , where

Z_1 = male literacy rate (any language)

Z_2 = female literacy rate (any language)

⁹The standardization procedure does provide a kind of weighting which depends on the standard deviation of the raw variable scores. See Young (1976), Appendix 3.

- Z_3 = percent completing Form III
- Z_4 = percent completing Form V
- Z_5 = percent completing Form VI
- Z_6 = Guttman scale of housing quality
- Z_7 = percent living quarters with a motor vehicle
- Z_8 = percent living quarters with a motorcycle or scooter
- Z_9 = life expectancy at birth
- Z_{10} = infant mortality rate
- Z_{11} = toddler mortality rate
- Z_{12} = maternal mortality rate
- Z_{13} = percent of the labor force unemployed
- Z_{14} = average number of persons per room
- Z_{15} = suicide rate (average 1969-1972)
- Z_{16} = death rate due to non-vehicular accidents (average 1969-1972)
- Z_{17} = percent having no formal schooling

Note that giving a minus sign to items Z_{10} through Z_{17} in the construction of the index has the effect of reversing the direction of these variables so that a high Z-score on all indicators is normatively good. Thus, the higher the level of any of these undesirable characteristics, the greater is the amount that is subtracted from the composite score.

The Distribution of Level of Living among
Districts, States, and Regions

The index was calculated for each district. Scores range from a low of -20.0 for Ulu Kelantan to a high of 28.8 in Kuala Lumpur district. The average score, due to the standardized form of the component

indicator, is zero, and the standard deviation for the distribution is 7.6.

Figure 3-1 maps the index for all 70 districts. The regional maldistribution of the welfare measure is clearly apparent. Only six of the 33 districts of the periphery fall above the mean, and only one of these by more than one standard deviation. Conversely, 52 percent of all districts with above-average scores are situated in the core region, which accounts for only slightly more than half of the total districts. Three-fourths of all core districts score above the country mean, for a regional average of 6.1, as contrasted with less than one-fifth in the periphery, where the average score is only -4.6.

The only sizeable sub-region identifiable from Figure 3-1 is the area roughly encompassing all of the states of Negri Sembilan and Malacca and the four southernmost districts of Selangor. This area is Malaysia's industrial heartland, but its significant features are somewhat more extensive than this characterization denotes. Not only does it include the major industrial estates and tin fields of the Klang Valley, the shipping facilities at Port Swettenham (now Port Klang), and the oil refineries and power station at Port Dickson. Both historically and currently, this is also one of the main rubber-producing zones of the country, much of it cultivated on very large estates. Five of the country's eight urban places with a population greater than 75,000 are located here, including Kuala Lumpur--national capital, largest city, and chief financial, commercial, and communications center. And in addition, these cities and numerous smaller towns and settlements in the area are linked by a complex and highly developed

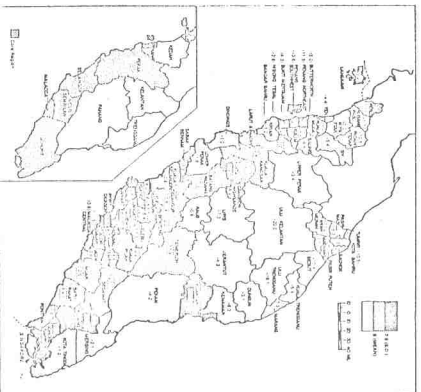


Figure 3-1. Distribution of Level of Living Index, 1970

network of roads and rail lines and intensive telephone communication (see Leinbach, 1971:64-71 and ch. 6).

The general correspondence between urbanization/administrative status and level of living is suggested by the fact that many of the districts which score in the top one-fifth of the welfare distribution contain one or more of Peninsular Malaysia's major towns; and many of these towns are also the capitals of their respective states (Table 3-3). These correspondences, however, are by no means perfect. Kota Bharu and Kuala Trengganu, for example, are both state capitals and in terms of size rank among the top fifth in the Peninsula, yet the level of living in their respective districts, as measured by the composite index, is well below the national average. This is also true of Kota Star, which includes Kedah's capital, though here the welfare score is only slightly below average. Malacca Central, which contains Malaysia's seventh largest town of some 86,000 persons, scores about the same as Perlis, whose capital and largest town has a population of less than 6,000. Pahang's capital, Kuantan, with a population of about 43,000, ranks only 17th in size, but Kuantan district ranks third on level of living.

State and regional averages, as summarized in Table 3-4, also exhibit a very wide range, with Negeri Sembilan and Selangor averaging about one standard deviation above the country mean, and Kelantan and Trengganu an even greater distance below it. In some instances an extreme score for a single district makes the state average somewhat misleading. In Selangor, for example, the average score excluding Kuala Lumpur district would be nearly halved, and without Penang

TABLE 4-2. Urban and Administrative Characteristics of Districts in Upper Quintile of Level of Living Index

District and State	IOL score	Population of largest town	Size rank	State capital	% Population urban (10,000+)	Population density (sq. mi.)	Retail services score*
Kuala Lumpur, Selangor	28.8	451,810	1	Yes	71	2456	25
Port Dickson, Negri Sembilan	15.7	10,300	49	No	14	352	10
Kuantan, Pahang	11.7	43,358	17	Yes	45	84	22
Penang Northeast, Penang	11.5	269,247	2	Yes	88	8043	25
Johore Bahru, Johore	9.0	136,229	4	Yes	55	344	23
Kinta, Perak	8.4	247,969	3	Yes	69	632	25
Klang, Selangor	8.4	113,607	5	No	58	597	23
Kluang, Johore	8.1	43,272	18	No	32	122	19
Seremban, Negri Sembilan	8.0	80,921	8	Yes	52	458	21
Rembau, Negri Sembilan	6.7	1,666	319	No	0	249	1
Cameron Highlands, Pahang	6.4	4,677	123	No	0	56	3
Ulu Langat, Selangor	6.4	21,950	26	No	31	230	11
Jelebu, Negri Sembilan	5.8	4,679	122	No	0	62	1
Tampin, Negri Sembilan	5.5	8,132	73	No	31	141	9

* A Guttman scale of retail service establishments. See Appendix D, variable 26.

Table 3-4. Level of Living Index, State and Regional Averages

State	No. of Districts	Mean District Score	Standard Deviation	Range
Johore	8	3.0	4.0	-2.1-9.0
Malacca	3	4.2	0.7	3.8-5.0
Negeri Sembilan	6	7.7	4.1	4.4-15.7
Penang	5	2.9	6.3	-3.6-11.5
Perak	8	0.1	4.2	-5.2-8.4
Selangor	7	7.5	9.8	-0.8-28.8
Core	37	4.1	6.1	-5.2-28.8
Kedah	10	-2.7	4.0	-10.5-4.4
Kelantan	8	-9.9	4.9	-20.0-3.3
Pahang	8	0.7	6.2	-7.3-11.7
Perlis	1	3.7	---	---
Tengganu	6	-8.9	4.3	-16.1-3.1
Periphery	33	-4.6	6.5	-20.0-11.7
PENINSULAR MALAYSIA	70	0.0	7.6	-20.0-28.8

Northeast (which includes the city of Georgetown) Penang's average would drop to 0.8. In general, however, the pattern is about what would be expected. Only Malacca and Negri Sembilan (plus Perlis, which has a single district) have no districts with below-average welfare scores, and all of the 14 districts of Kelantan and Terengganu fall below the national mean, as do nine of the 10 districts of Kedah.

Exceptions to the regional pattern are particularly apparent in the periphery. Perlis's single district scores well above average and, due to the unusually high value for Kuantan, Pahang's average is also slightly positive. In all other cases state averages are negative in the periphery and positive in the core. The standard deviations for each of the regions are similar, as are the absolute differences between highest and lowest district scores.

Further inspection might well reveal other interesting configurations and exceptions, but we turn now to more sophisticated techniques in an attempt to identify and evaluate some of the structural conditions which influence social well-being at the district level.

CHAPTER IV

THE SOCIAL STRUCTURE OF MALAYSIAN STATES AND DISTRICTS

A macrostructural perspective leads one to look for the determinants of social conditions in broad structural patterns. The term "structure," as it is used here, refers to "those relatively stable, broad and enduring patterns of social organization . . . into which individuals are born and over which, as individuals, they have little control" (Young et al., n.d.:2).¹⁰ Familiar variables of this type include the ethnic composition of a population, urbanization, agricultural organization, social cohesion, etc. The strategy will be to identify clusters of such variables which can then be employed in a multiple regression analysis to predict level of living scores for each district. The accuracy with which these predicted scores match the actually observed scores will be the principal measure of the explanatory power of the macrostructural variables.

¹⁰ Owen's (1969:v) definition of structure, though phrased in economic terms, is also pertinent:

"A structure implies the existence of an integrated whole comprised of separately identifiable components. . . . The structure of an economy is a product both of the nature and the arrangement of the various economic components or sectors of which it is comprised. Conceptually, there are as many different perspectives on the structure of an economic system as there are meaningful ways of classifying its content. Moreover, the component parts of any economic structure or system will themselves also be structures or subsystems in their own right."

The Principal Components Model

There are, obviously, a very large number of "stable, broad and enduring patterns of social organization," and both practical considerations and the principle of parsimony require that some selectively be exercised. Not all such patterns are likely to be equally important, not all have equal conceptual status, and not all are equally amenable to operational definition. Empirical data are abundantly available for some and scarce or nonexistent for others. Another difficulty is that "patterns," almost by definition, do not lend themselves to simple measurement. As with level of living, single indicators typically provide at best a thin and inadequate reflection of broad concepts.

An appropriate technique for dealing with these problems is components factor analysis.¹¹ This procedure reduces and condenses numerous concrete variables into a smaller number of unrelated hypothetical constructs or dimensions, which together reproduce most of the information contained in the original data (see Rummel, 1970). Factor analysis actually analyzes the correlation matrix of a set of empirical indicators. The solution which it generates may thus be interpreted as the identification and delineation of regularities present in these correlations.

¹¹Factor analysis is a general term which includes a number of specific procedures, of which principal component or component analysis is one. "Component" and "factor" are used interchangeably in this study to refer to the set of composite variables extracted from the initial data matrix. The SPSS (Nie et al., 1975) program package was used for all computer analysis reported herein.

District Level Structure

Table 4-1 shows the rotated factor matrix for 18 district level variables.¹² Three dimensions are identified, accounting for 70 percent of the total variance in the data. The communalities, indicating the proportion of the variance in each variable that is summarized in the three components, range from .30 for population change, 1957-70, to .88 for the percentage of the labor force employed in traditional agriculture; but in only three instances is the communality less than .60. The factor loadings, which represent the simple correlation between the variables and the hypothetical construct, are used to attach substantive meaning to the dimensions. Considering only those loadings of .60 or above, the interpretation of the three components is as follows.

Factor 1: Urban Differentiation. This component is associated with several fairly standard urbanization variables--urban population, diversity of retail activity, and proportion of the labor force engaged in manufacturing.

The concentration of Government officials is less directly related to conventional definitions of urbanization, but in the Malaysian context, where the capital cities are invariably the largest towns in their respective states, the relationship is understandable. The high loading of the state capital dummy variable is further evidence of the general correspondence between urbanization and administrative status.

¹²The correlation matrices on which the district and state level component analyses are based are presented in Appendices B and C.

Table 4-1. Principal Components Analysis (Varimax Rotation) of District Level Structural Context Variables (N = 70)

Variables*	Factor Loadings				Communality
	I	II	III	h ²	
1. Retail services scale	.72	.41	-.00	.76	
2. Percent urban (5,000+)	.84	.36	.10	.85	
3. Government officials/sq. mile	.71	-.04	.22	.55	
4. Govt officials as % of labor force	.83	.08	.03	.69	
5. State capital (0-1)	.85	-.07	-.02	.72	
6. % labor force in manufacturing	.75	.05	.29	.65	
7. Avg. no. children ever born to women 15-49	-.79	.07	-.07	.63	
8. % cultivated area in estates (1960)	.11	.85	.20	.78	
9. % population in Malay	-.37	-.66	-.35	.69	
10. % farms rented or mainly rented (1960)	.19	-.65	.37	.60	
11. % smallholding area in wet padi (1960)	.08	-.91	-.03	.83	
12. % labor force in traditional agriculture	-.23	-.90	-.12	.88	
13. Number of New Villages	.11	.69	-.02	.48	
14. % cultivated area in rubber (1960)	-.02	.86	-.23	.80	
15. Smallholding land inequality (1960)	.17	.18	.81	.71	
16. % farms less than 3 acres (1960)	.28	-.03	.69	.87	
17. Average smallholding size (1960)	-.27	.01	-.85	.79	
18. % population increase, 1957-70	.17	.07	-.52	.30	
% explained variance (total) = 70.0%	27.0	26.6	16.4		

* Variables for 1970 unless otherwise indicated. See Appendix D for sources and detailed definitions.

All of the above variables load positively on Factor 1. The only high negative loading is for the average number of births among women in the 15-49 age group. This tends to confirm for Malaysia the well-known phenomenon of declining birth rates as a consequence of the transition from rural- to urban-based social and economic organization.

Factor 2: Estate Rubber. The second component, accounting for about the same amount of the total variance as Factor 1, is plainly an agricultural factor. Although the proportional padi area has the strongest loading its sign is negative, so the dimension is named after the estate sector to avoid confusion.

The positive loadings of both estate agriculture and the percentage of agricultural land under rubber cultivation reflect the importance of estates (defined as agricultural enterprises of 100 acres or more) in the production of Malaysia's largest foreign exchange earner. The variables with high negative loadings identify a cluster of characteristics which are typically absent where estates and rubber are dominant. These include a high proportion of the labor force engaged in traditional smallholding agriculture, padi cultivation, the proportion of tenant farms, and the concentration of ethnic Malays in the population. The bipolar configuration of this factor, with large-scale export-oriented agriculture opposed to peasant, predominantly Malay subsistence agriculture, is a good illustration of the degree to which the rural sector in Malaysia tends toward both spatial and racial segregation.

The association of farm tenancy with peasant agriculture comes as no surprise, though the literature on this subject (Huang, 1975;

Goldman, 1975; Doering, 1973) has concentrated almost exclusively on tenancy in padi farming.

The final variable loading high on Factor 2 is the number of New Villages. New Villages are those relocation centers established during the Malayan Emergency (1948-60) for the purpose of isolating guerrilla elements from possible sources of supply and support (Dobby, 1952; Sendut, 1962; Sandhu, 1964). Most of the relocation took place between 1950 and 1952, and involved altogether some 480 New Villages and 373,000 persons (Sandhu, 1964:164). Many of the settlements remain and have become permanent parts of the Malaysian landscape.

The association of the New Villages with the agricultural factor evidently derives from the military considerations which played a major role in their location: "... New Villages were located chiefly along major roads which facilitated movement, reinforcement or supplies during surprise attacks from the communists; or they were sited at points where roads converged, in order to lessen the risk of ambush" (Sendut, 1962:42). Furthermore, as the program was aimed largely at squatters on scattered small tin mines or farmsteads on the fringes of large plantations or towns, the relocation camps tended naturally to be located in the same general vicinity.

Factor 3: Marginal Farming. The third factor appears to isolate a dimension relating to agriculture which is marginal in at least two senses. First, as the negligible or negative loadings of padi and rubber variables show, this dimension is unassociated with either of the crops which together accounted for about 75 percent of total smallholding acreage in 1960. By inference, this pattern must apply

particularly to areas where minor or secondary crops are most important. Though this residual category covers a great many specific crops, most of them might be classified as food crops: vegetables, rice substitutes such as tapioca, sweet potatoes, etc., coffee, tea, and fruits of various types. As Ooi (1963:263) observes, 80 percent of the vegetable farms were under two acres in size in 1960, and 48 percent under one acre. Also, according to the 1960 Census of Agriculture, about 63 percent of all farms of less than three acres were under food crop cultivation (excluding padi). These small market farms tend to be situated on the outskirts of the towns and villages in the western (core) region. Except for tea, of which the major portion is grown in the single district of Cameron Highlands, most of the food production is consumed locally.

Secondly, the combination of small farm size, highly unequal land distribution, and a high degree of land fragmentation suggest social and economic marginality as well. Whether these conditions do in fact have negative implications for level of living remains to be seen. Such small operations seem hardly sufficient to provide even a subsistence livelihood, but highly intensive practices such as have been developed over centuries in China might perhaps be made to produce a tolerable income from even very small parcels of land.

The population change variable loads higher on Factor 3 than on either of the other factors, but falls below the arbitrary .60 cutoff. Taken in conjunction with the negligible loading of the family size variable, it suggests a relatively high rate of outmigration from the marginal agricultural areas.

State Level Structural Dimensions

The same general procedure used to identify structural patterns at the district level was employed with state level data as well, with the object of applying both sets of dimensions to the explanation of district welfare. However, since there are 11 states and 70 districts, an additional step was necessary to link the two levels. The values of all state variables were first assigned to the appropriate districts, and the principal components analysis was then carried out in the usual way.

The 16 variables entered into the second components analysis were selected to parallel as closely as possible the measures used in the district analysis discussed above. One reason for this is to determine whether similar structural features emerge at both system levels. If similar patterns appear, as anticipated, not only will interpretation and explanation be facilitated, but it will also be easier to make a general assessment of the comparative importance of district and state level structures in accounting for district-to-district variability in social well-being. Some state level variables, such as those relating to political behavior and voluntary associations, were unavailable on a district basis but were included in the state factor analysis for their substantive interest. The rotated factor matrix for state data is shown in Table 4-2.

This solution extracts two components which together account for about 75 percent of the total variance. Communalities are generally higher than in the district solution, though the lowest here--for percent population increase, 1957-70--is only .18, considerably lower than for any of the district variables.

Table 4-2. Principal Components Analysis (Varimax Rotation) of State Level Structural Context Variables (N = 70)*

Variables**	Factor Loadings		Communality
	I	II	h^2
1. Percent urban (10,000+)	.76	.32	.69
2. Industrial diversity scale	.91	-.15	.85
3. % cultivated area in estates (1960)	.90	-.32	.90
4. % population Malay	-.93	.06	.87
5. % GDP from traditional agriculture (1967)	-.92	-.09	.94
6. Voluntary associations per thousand population (1969)	.80	.09	.64
7. % GDP from manufacturing (1967)	.92	.02	.84
8. Average estate size (1960)	.63	-.43	.58
9. Number of FELDA schemes (1972)	-.03	-.78	.61
10. Smallholding land inequality (1960)	.13	.82	.69
11. % farms less than 3 acres (1960)	-.13	.96	.93
12. Urban primacy index	.60	.71	.86
13. Index of party dominance of state electorate (1959, 1964, 1969)	-.32	-.80	.74
14. % seats won by opposition candidates in state legislative assembly	-.32	.75	.67
15. Average smallholding size (1960)	.05	-.95	.91
16. % population increase, 1957-70	.14	-.40	.18
% explained variance (total = 74.4)	40.6	33.8	

* State values were assigned to constituent districts before analysis.

** Variables for 1970 unless otherwise indicated. See Appendix D for sources and detailed definitions.

State Factor 1: Structural Diversity. This factor is almost an exact combination, on a state basis, of the first two district factors. In this case the variables associated positively with urban differentiation and estate agriculture, and negatively with traditional agriculture, cluster together on the same factor in what appears to be a typical rim-and-rubber belt pattern. In addition to the directly urban-industrial variables, the number of voluntary associations (standardized by population) also loads positively. This conforms with Douglas and Federsen's (1973) finding of substantial correlations between several measures of socioeconomic development and the prevalence of associations. The very strong negative relationship of percent Malay with this dimension reflects the concentration of Malays in the more traditional and economically backward states.

To an even greater extent than in the district analysis, the population growth rate bears little relationship with the major dimensions in this set of data. The variable is evidently a poor indicator of social dynamics in Malaysia.

State Factor 2: Reactive Politics. Again, there are similarities between this dimension and the one labeled Marginal Farming in the district analysis, but direct comparison is made difficult by the fact that only two variables are directly parallel at both levels. Both the index of landholding inequality and the proportion of total farms less than three acres in size load in a very similar manner in both analyses. Here, however, the pattern also includes high urban primacy, relatively few FELDA land settlement schemes, and political variables indicating high levels of support for opposition political

parties and a comparatively high degree of interparty competition. Though this factor is rather complex and contains some apparent contradictions, Reactive Politics seems to capture its flavor.

Summary and Interpretation of Factors

The principal components analysis has identified five underlying dimensions in 34 original variables. The two sets of factors tap some of the important social organizational configurations in two "layers" of structure which might, in combination, be expected to account for a substantial amount of inter-district variability in the material aspects of Malaysian life.

The first district component clearly describes an urbanized, highly differentiated structure. The variables which cluster on this dimension include the proportion of the total population classified as urban, the level of retail specialization, and a high concentration of government officials.

This component would be expected to contribute positively to material well-being. Indeed, it has already been noted (Table 3-3) that in Malaysia there is a general tendency for districts with the highest welfare scores to be located near state capitals and the other largest towns. This scarcely comes as a surprise, for almost universally, it seems, public services, health and educational facilities, and a host of other social amenities tend to be concentrated in urban places.

This does not necessarily imply that cities and towns are passive receptacles for the forms and artifacts of modernity, however. From a

structural point of view these are simply part of the array of institutional and organizational resources which define a differentiated community, a view which is supported by the contents of factor 1. Thus, even allowing for probable urban bias in conventional welfare measures, we should generally expect higher levels of living in relatively more differentiated social settings.

The second district dimension, Estate Rubber, unambiguously identifies an agricultural situation in which large-scale rubber cultivation dominates and traditional farming is notable for its absence. There is an extensive literature on plantation agriculture, much of it devoted to its exploitative aspects and its tendency to generate or exacerbate dependent social, economic, and political relationships. Beckford (1972), for example, argues that the historical legacy of the plantation economy and its attendant structural characteristics is typically a highly stratified, rigid, and dehumanizing social order which is inherently incapable of freeing itself from the grip of "persistent poverty."

The effects of plantation enterprise on the intra-national distribution of material well-being are dealt with by most critics mainly in terms of status and class. The principal towns, which act as collection points and distribution centers, drain the surrounding countryside and distort natural patterns of economic exchange and physical and social mobility. This process may be marginally beneficial

impairs the symmetry of the analysis, there is little reason to suppose that it does not accurately reflect reality. With perhaps one or two exceptions, high levels of urban-industrial differentiation are always accompanied by estate cultivation, particularly of rubber, as the dominant mode of agricultural production among the Peninsular Malaysian states. Conversely, those states in which padi and other food crops are dominant are, by and large, characterized by low levels of industrialization and urbanization, and are generally more homogeneous as to ethnic composition, economic activity, lifestyles, etc.¹⁵ Moreover, these two clusters of attributes, though they may have distinct conceptual status, are neither inconsistent nor mutually exclusive. It seems not to violate either theory or common sense that differentiation and centrality should be found in conjunction, particularly within such large and internally diverse units as states.

The combination of distinct conceptual clusters in the same empirical measure does, however, raise some issues which are better left to a later chapter. For the present the single state component may be regarded as a composite of the two structural patterns which in the district analysis remain separate.

The two remaining components, district factor 3 and state factor 2, are more difficult to summarize. The district dimension appears to

¹⁵ Ness (1967:96) is referring to this phenomenon when he remarks that "Much of Malaya is urban. The rubber estates and the tin mines are essentially extensions of the modern urban culture." It is not clear whether he means this to apply at all levels or only to Malaysia as a whole. The above district analysis indicates a clear separation between urban-industrial structures and the plantation sector at a local level.

be a fairly straightforward reflection of a somewhat dualized class structure and generally marginal economic status, and was labeled Marginal Agriculture. State Factor 2 duplicates the high positive loadings of land inequality and a predominance of very small farms, but it also includes additional variables which seem inconsistent with a

In this connection that four states score markedly higher on this factor than the remaining seven: Penang, Malacca, Terengganu, and Kelantan. Though polar opposites in many respects, these two pairs of states also have in common some of the conditions which Chinoy (1967: 493) identifies as conducive to the development of social movements: "When large groups of people find their traditional routines disrupted, their status challenged, or their values and interests threatened, they may come together in a collective effort to resolve their difficulties and set things aright." Young (1970) has proposed a similar formulation by which social solidarity is seen as arising out of a "structural bind."

The basic proposition of this interpretation is that the coming of independence ushered in a period of profound social change, in which the strains of transition had a selectively acute impact in those states most central in the former system and those most marginal to it.

Ness's (1967) thesis is that the coming of independence brought about a replacement of the "custodial" system of British rule--"a dependent paternalistic state, a colonial export economy, and an

CHAPTER V

THE STRUCTURAL CONTEXT OF FAMILY WELFARE

Multiple Regression Analysis

Level of living among Peninsular Malaysian districts has been operationally defined in Chapter III, as have several broad dimensions of both state and district social structure in Chapter IV. The central hypothesis of this study is that much of the observed variability of level of living among the 70 districts is explainable in terms of differences in the patterns of social structure which characterize both the districts themselves and higher level subdivisions of which the districts are a part. Multiple regression affords an appropriate and convenient means for testing this hypothesis.

The technical function of multiple regression is to analyze "the collective and separate contribution of two or more independent variables . . . to the variation of a dependent variable . . ." (Kerlinger and Pedhazur, 1973:3). The dependent variable in the present instance--the one whose variation we wish to explain--is district level of living, as measured by the 17-item composite index described in Chapter III. The principal independent variables, whose contributions to the variability in level of living we wish to assess, are the five structural dimensions discussed in Chapter IV.¹⁷

¹⁷Actually, the independent variables are factor scores. These are composite indices which represent empirically the hypothetical

To these five independent variables we shall add an additional "dummy" variable for region. A dummy variable is simply a set of scores consisting only of 1's and 0's which indicate whether a given district is located in the core or the periphery. This regional variable may be viewed as representing a third "layer" of structure, though unlike the district and state layers, no attempt has been made to specify the precise nature of this structure. Its purpose in the analysis is simply to test whether there are remaining differences in district welfare between the two regions after the independent variables at the state and district levels are taken into account. If significant differences do remain, we shall conclude either that there are inherent differences between core and periphery which are not wholly explainable by differences in state and district structures, or that the lower-level structures have not been specified completely enough to fully account for regional welfare differentials. If the regional dummy does not provide significant additional explanation over and above that which is due to state and district variables, it will be taken to mean that observed regional disparities are probably only a manifestation of structural differences among the constituent states and districts.

Dimensions revealed by the factor analysis. A set of factor score coefficients is first calculated from the loadings associated with each rotated factor. These coefficients are then used to weight each variable in the analysis in proportion to its contribution to the factor. A simple explanation is given in Rummel (1970:150-54).

Analysis

The results of the multiple regression analysis are shown in Table 5-1. To clarify the nature of the contributions of each system level, the table is presented in three parts. On the assumption that district level influences have the most immediate impact on local welfare conditions, the three district level independent variables were first entered into the regression equation alone. Next the state level variables were added to see how much additional explanation they could provide after the district effects had been removed. Finally, the third panel of the table shows the contribution of the regional dummy after both district and state variables had been allowed to operate.

As the first segment of the analysis shows, all three district factors contribute positively and significantly¹⁸ to the explanation of the dependent variable. The squared multiple correlation coefficient (R^2), or coefficient of determination, adjusted for the number of cases and independent variables in the analysis, is .49, indicating that 49 percent of the total variance in the district welfare index is accounted for by the three district structural variables.

The first dimension, Urbanized Differentiation, was expected to have a positive effect on level of living, and this expectation is

¹⁸As the analysis deals with the complete universe of districts, statistical significance is not technically appropriate in the usual sense of indicating the probability that a relationship observed in a sample differs from the relationship in the whole population. There are other ways of interpreting significance levels, however (Bischoff: 1972:38-39). And in addition such tests provide a useful means for assessing the importance of individual predictors in multivariate analyses.

Table 5-1. Multiple Regression Analysis, Level of Living Index on District and State Structural Variables, with Regional Control (N = 70)

	Standardized Regression Coefficients
<u>District Determinants Only</u>	
Urban Differentiation	.52*
Estate Rubber	.43*
Marginal Farming	.22*
Adjusted R ² = .49	
<u>District plus State Determinants</u>	
Urban Differentiation	.46*
Estate Rubber	.08
Marginal Farming	.26*
State Structural Diversity	.50*
State Reactive Politics	-.32*
Adjusted R ² = .71	
<u>District and State Determinants, Regional Control</u>	
Urban Differentiation	.46*
Estate Rubber	.08
Marginal Farming	.26*
State Structural Diversity	.51*
State Reactive Politics	-.32*
Region	-.01
Adjusted R ² = .71	

* Significant at or below the .05 level.

borne out in the analysis. For Estate Rubber, it was noted in Chapter IV that the direction of its influence on local level of living would be differentially predicted depending on one's theoretical perspective. From the viewpoint of dependency theory, dominance by a plantation type of agricultural organization would be expected to have a negative impact on welfare, at least after the effects of urbanization were removed. A centrality, or favored-status interpretation, on the other hand, would predict a positive influence on district well-being. The substantial positive standardized regression coefficient for this variable, after controlling for urban differentiation, favors the latter interpretation.

The third structural dimension, Marginal Agriculture, is also a positive and significant predictor. The positive relationship was unexpected and is not easy to explain. An association of relatively high social welfare with a preponderance of fragmented and unequally distributed land holdings seems to violate common sense and much of what is commonly believed about the connection between the means of livelihood and welfare status. Some of the contextual details of unusually small-scale agriculture in Malaysia have been mentioned earlier, in the discussion of this factor. It was noted that those small operations are often devoted to market gardening and other types of food production, much of this apparently carried out on a very intensive basis. In addition, such enterprises are most often located in districts close to urban centers, and it could be that non-farm employment is available for at least some family members.

Part of the problem may also lie in the fact that no index of

inequality or simple measure of farm size takes into account soil fertility and other agronomic conditions, the skill and intensity with which the land is cultivated, security of tenure, market conditions for the harvested crop, etc. Conceivably the observed relationship of this factor with social welfare would disappear or be reversed if all these conditions could be controlled. It may be, also, that given the very low average farm size throughout the smallholding sector in Malaysia (4.7 acres in 1960), measures of size and inequality are not particularly meaningful. It is clear, nevertheless, that something is being indexed by these measures and that that something is positively associated with district welfare.

When the state level variables are added to the regression equation, as presented in the second panel of Table 5-1, the situation changes somewhat. Both Structural Diversity and Reactive Politics predict significantly, but in opposite directions. The effect of state level differentiation/centrality is strong and positive, as expected. Reactive Politics, whose conceptual interpretation was somewhat in doubt, proves to be a substantial negative predictor. That is, the higher a state's score on this dimension, the lower is the average welfare index for districts within that state, other state and district variables being equal.

Though the empirical relationship of this dimension with level of living is now clear, this is unfortunately of little help in illuminating the general nature of the factor itself. Either a low centrality or incipient solidarity interpretation, both of which were tentatively advanced, could apply. Low centrality would of course be

expected to show the observed negative relationship. The structural bind hypothesis would predict an eventual positive effect, though the period required for group solidarity to develop and have its ultimate impact is unspecified in theory and in practical terms is dependent upon a number of intervening events. In the meantime, the breakdown of previously stable structural patterns might be expected to reflect negatively on welfare until a set of new institutional arrangements more appropriate to the altered circumstances can be devised and implemented.

The addition of the state factors to the equation also have an effect on the district variable contributions. When all variables at the two levels are entered together, the previously strong positive contribution of Estate Rubber to the total explained variation drops almost to zero. This indicates that almost all of the impact of the estate sector has its effect only via the state structure. It suggests that the initial relationship with level of living was a spurious result of the close association between rubber estates at the district level and high concentrations of plantation agriculture within certain states. Thus, the interpretation of plantation agriculture as an indicator of local centrality is supported, with the qualification that it operates among districts within a given state but is completely subsumed by between-state variations in the importance of estate agriculture and the level of urbanization. The dependency theory prediction is not confirmed.

With the entry of the two state variables, the proportion of variance explained increases by about half, to .71.

The bottom segment of Table 5-1 shows the regression equation with the addition of the regional control. The beta coefficient is nearly zero and, of course, non-significant; and the adjusted R^2 is unchanged. There is little doubt, then, that after the district and state variables have been allowed to account for all the variation they can, hardly any of the remaining welfare differences among districts can be attributed to regional location.

Figure 5-1 shows in Graphical form the degree to which the full regression model is successful in predicting the level of living scores. Actual scores are plotted against predicted values for all districts. The points falling on the solid diagonal line represent perfect predictions, i.e., the cases in which the actual welfare score and the one predicted by the multiple regression equation are exactly the same. Most points, of course, do not fall exactly on the diagonal, though a number are close. The discrepancy between actual and predicted values, the residuals, represents error of prediction. The degree of correspondence between the two sets of scores has already been summarized, in fact, by the value of R^2 in Table 5-1, which is equivalent to the square of the simple correlation between observed scores and those estimated by the regression equation.

Dashed lines are drawn on either side of the solid diagonal at a distance of one standard error, which is 4.1. As this is simply the standard deviation of the residuals, it is a convenient means for determining what is a "large" departure from the regression estimate. Districts whose actual level of living scores are more than 4.1 less than would be predicted by the regression are identified in the upper

Figure 5-1. Relationship Between Actual and Predicted Level of Living Scores

PREDICTED

1. Klang, Selangor
2. Malacca Central
3. Kuala Selangor, Selangor
4. Kota Tinggi, Johore
5. Bering, Johore
6. Kuala Trengganu, Trengganu
7. Lipis, Pahang
8. Tawar, Kelantan
9. Ulu Trengganu, Trengganu
10. Ulu Kelantan, Kelantan

11. Kuala Lumpur, Selangor
12. Kuantan, Pahang
13. Port Dickson, Negri Sembilan
14. Rembau, Negri Sembilan
15. Jelutau, Negri Sembilan
16. Alor Gajah, Malacca
17. Jasin, Malacca
18. Yen, Kedah
19. Perlis
20. Dungun, Trengganu

OBSERVED

left of the figure. Those whose scores are much higher than expected are named in the lower right-hand corner.

The "deviance" of some of these districts, such as Yen in Kedah, Kuala Selangor, and Kuantan, is also apparent in the map in Chapter III (Figure 3-1), where they stand out as markedly higher or lower than the surrounding territory. An examination of the outliers in Figure 5-1, however, reveals few apparent patterns. All states except Penang and Perak have at least one such outlier, and all of Malacca's three districts (and Perlis's one) fall outside the two standard error band. Both core and peripheral regions are represented in similar proportions. There are several interesting individual cases. Dungun district, for instance, has quite a low actual level of living score, but is nevertheless considerably better off than the regression predicts. Conversely, Kang with an actual high score of 8.4 "should," according to the regression equation, score a much higher 12.6.

In sum, these 20 districts are atypical, in the sense that their welfare levels are relatively poorly predicted by the structural conditions that yield fairly accurate estimates in the remaining districts. Their large residuals account for much of the unexplained variance in the regression model. They can only be pointed out here, but perhaps a closer investigation would reveal one or more common characteristics which, if added to the regression equation, would substantially improve prediction accuracy.

Predicting Component Parts of the Level of Living Index

The preceding analysis has been concerned with the explanation of "net" level of living, as measured by a 17-item index in which

"good" indicators such as housing quality and literacy were added in, while "bad" ones, such as infant mortality, unemployment, and suicide were subtracted out. But how well does the same set of independent variables perform in estimating the separate components of the index? It is possible, for example, that some districts have relatively high welfare scores not because they make much of a positive contribution to improved living conditions, but rather because they lack the negative attributes which invariably accompany modernization or other social change. Such districts might be expected to have low levels of unemployment and suicide, for instance, but high infant mortality and illiteracy, and few household amenities like electricity and running water. At the other extreme, districts with generally high rates of literacy and education, public utilities, etc., tend also to have higher suicide rates, unemployment, accidental deaths, and crowded living conditions. It is unlikely that any simple welfare index can adequately deal with all these qualitative differences, and in any case some of the groups of indicators which make up the overall index may have an independent interest of their own.

The original index, therefore, has been broken down into several fairly homogeneous groups of indicators which have then been entered as separate dependant variables in a series of regression analyses. The independent variables are the same structural dimensions employed in the earlier analysis. The regional control, which was found to add nothing to the prediction of the full index, has been dropped. The results are presented in Table 5-2.

Most of the 17 indicators are included in the first three

Table 5-2. Multiple Regression Analysis of Subgroups of Level of Living Indicators (N = 70)

	Standardized Regression Coefficients				
	Health ^a	Education ^b	Possessions ^c	Unemployment ^d	Suicide ^d
Urban Differentiation	.13	.62*	.57*	.45*	.04
Estate Rubber	-.13	.23*	.33*	.23*	.36*
Marginal Farming	.41*	.19*	.20*	.20*	.52*
State Structural Diversity	.61*	.34*	.29*	.38*	.12
State Reactive Politics	-.40*	-.20*	-.13	.13	-.21
Adjusted R ²	.57	.77	.73	.63	.44

* Significant at or below the .05 level.

^a Consists of the sum (after standardization) of items 9 through 12 in Table 3-1. The signs of all but item 9 are reversed.

^b Items 1-5 and 17; item 17 reversed.

^c Items 6-8 and 14; item 14 reversed.

^d Single indicators in standard form; items 13 and 15.

sub-indices. Suicide and unemployment rates, which are of special interest, are analyzed separately. For the Health, Education, and Possessions subgroups, high scores indicate normatively better living conditions, whereas the single-indicator measures of Unemployment and Suicide are in their "natural" order, i.e., a high index means a high unemployment or suicide rate.

The category labeled Possessions is a rather mixed lot, including the Guttman scale of housing quality, the average number of persons per room, and ownership of some kind of personal motorized transport. Some of the items in the housing scale, particularly electricity and piped water, are to a large degree dependent upon locally available public supplies. Most, however, involve private purchase, so the amenities indexed by the scale are regarded as household possessions (see Table 3-2). Similarly, persons per room is included in this category on the assumption that living space is ordinarily determined by the ability of families to afford more spacious accommodations.

On the whole, the set of structural dimensions predicts well. The R^2 's for Education and Possessions are particularly high, perhaps reflecting in part the relatively concrete nature of these indicators, though only for Education is the R^2 substantially higher than for the overall index. The structural variables perform relatively poorly in estimating the suicide rate, with only 44 percent of the variance explained. Nevertheless, considering the well-known problems of definitions and reliability associated with suicide statistics everywhere, and the generally fragmentary understanding even of suicide's major correlates, the explanation of close to half of the variance in rates among districts is not surprisingly low.

An inspection of the regression coefficients reveals some general patterns. As with the general level of living index, the major determinants, as measured by the size of the standardized regression coefficients, are those for district urbanization and state differentiation/centrality; and in every case the significant effects are positive. Only one independent variable, State Reactive Politics, is a significant negative predictor of any of the welfare components, which is also in conformity with the pattern observed in Table 5-1. All of the coefficients for unemployment are positive and all but one significant. For suicides, only two coefficients are significant but these too are positive. Evidently none of the structural dimensions contribute to a decrease in these undesirable characteristics after the remaining patterns have been controlled. The factor labeled Marginal Farming is the only significant predictor of all five sub-groups, and in all cases a positive predictor.

Though the R^2 's vary considerably for the five equations, both state and district determinants make significant contributions to the explained variance except in the case of the suicide rate, where only district coefficients reach statistical significance. For the Health group, state structure clearly predominates, whereas for Possessions only one of the state variables is significant, and its contribution is small.

The rationale for employing approximately parallel measures for both states and districts was largely to allow some meaningful comparisons of their relative explanatory strength. As expected, the regressions have shown that local characteristics make the most

difference in local welfare conditions. Only for the Health Index is this pattern reversed, and most of the explained variance is due to the two state factors (Table 5-2).

Nevertheless, it is important to note that given equivalent local institutional conditions, districts situated in the "right" states will benefit by an additional increment in social welfare. This is true for every measure except Suicide. Though in the present example these state level effects are not generally large, the fact that they emerge at all through a fairly "dense" layer of district attributes seems significant. The fact that higher level systems have an independent influence on lower level conditions is not in itself particularly surprising. In international comparisons, for example, one expects national level differences in political and administrative structures and policy orientations to have independent effects on, say, agricultural productivity, even when subunit conditions are relatively constant. The possibility of analogous hierarchical effects within the same national system is a matter that seems to have been much less investigated except perhaps in dummy variable or categorical (e.g., urban-rural, Malay-Chinese-Indian) terms. As this analysis has shown, social welfare in Peninsular Malaysia is usefully understood as being influenced by at least two layers of structure, each one acting to some degree independently of the other. Whether other variables in other social settings are similarly affected is a question which seems to merit further study.

As mentioned earlier, there are some undesirable attributes which appear to be endemic to those areas otherwise high on level of

living. Among the 17 items in the full level of living index there are four such indicators: average persons per room, and the incidence of unemployment, suicide, and non-vehicular accident deaths. As can be seen from the correlation matrix for all the indicators (Appendix A), after all signs have been reversed so that a high value is "good" these four indicators correlate negatively with all others and with the composite index, and positively among themselves. This means that good (i.e., low) unemployment rates, for example, are found in association with poor (i.e., low) housing quality, educational levels, etc. This phenomenon is not unique to Malaysia. Smith, for example, in The Geography of Social Well-Being in the United States (1973:79-91) finds that indicators of crime, suicide, alcoholism, venereal disease, and family breakdown correlate positively with income and wealth, health, education, and so on.

While unemployment, suicide, accidental deaths, and crowded housing measures correlate only moderately among themselves in Malaysia, they are nevertheless clearly distinct in a directional sense from the remaining items. To some degree this difference has been compensated for by subtracting out the normatively negative items in the construction of the index, but there appears to be some justification for treating them as a separate group of "social pathologies."

Two final Regression analyses are summarized in Table 5-3. Standardized scores for the four indicators discussed above have been removed from the overall index and combined in the usual way. The remaining 13 items form another index which is called Socioeconomic Well-Being. These two indices are treated as dependant variables in

Table 3-3. Multiple Regression Analysis of Socioeconomic Well-Being and Social Pathology (N = 70)

	Standardized Regression Coefficients	
	Socioeconomic Well-Being ^a	Social Pathology ^b
Urban Differentiation	.51*	.49*
Estate Rubber	.16*	.32*
Marginal Farming	.29*	.27*
State Structural Diversity	.49*	.34*
State Reactive Politics	-.28*	-.09
Adjusted R ²	.83	.72

* Significant at or below the .05 level.

^aThe algebraic sum of items 1-12 and 17 in Table 3-1. Items 10-12 and 17 are reversed. High composite score = Good. All items standardized before summing.

^bThe sum of standardized items 13-16 in Table 3-1. No reversals. High composite score = bad.

equations using the same explanatory variables as before. All Social Pathology indicators are in their "natural" order, so a high score on this index is normatively bad. The components of the Socioeconomic Well-Being index have been reversed as necessary so that a high score is Good.

Both the signs and magnitudes of the coefficients for Socioeconomic Well-Being are very similar to those for the overall index, only the removal of the pathology indicators has improved the predictive ability of the structural measures considerably, and Estate

Rubber becomes a significant positive predictor. The coefficient of determination has risen from .71 for the equation estimating the overall index to .83 when the reduced index is the dependent variable.

For the Social Pathology index the pattern is quite similar to that for Possessions in Table 5-2. All district dimensions and State Structural Diversity are significant positive determinants, and the small negative coefficient for State Reactive Politics is nonsignificant. \bar{R}^2 for this equation is .72.

The regression results shown in Table 5-3, along with the correlations of each index or sub-index with all others (Table 5-4), suggest that the Socioeconomic Well-Being subgroup and not the complete index best summarizes the social welfare concept in Malaysia, and in addition it is the measure best predicted by the five structural dimensions. However, all sub-indices except Health and the single-indicator measures of Unemployment and Suicide are substantially similar. Excluding these three, no correlation in Table 5-4 is less than .66, and the average is .84. Furthermore, the coefficients of determination for the five composites in separate regressions are also similar, ranging between .71 for the overall index and .83 for Socioeconomic Well-Being.

Table 5-4. Intercorrelations (Pearson's r) of Level of Living Index and Subgroups of Welfare Indicators (N = 70)

	1	2	3	4	5	6	7	8
1. Level of Living Index	---							
2. Socioeconomic Well-Being	.97	---						
3. Social Pathology	.66	.82	---					
4. Education	.91	.94	.76	---				
5. Possessions	.84	.88	.75	.84	---			
6. Health	.82	.81	.60	.60	.57	---		
7. Unemployment	.55	.70	.88	.68	.57	.51	---	
8. Suicide	.40	.52	.68	.43	.52	.47	.43	---
Average correlation	.74	.81	.74	.74	.71	.63	.62	.49

CHAPTER VI

CONCLUSIONS

The foregoing analysis has had two principal objectives. The first was to operationalize the concept of level of living or social well-being, and to determine the degree to which it varied from district to district in Peninsular Malaysia. The second was to identify some of the links between district welfare and the major features of institutional structure.

The study employed indicators of several aspects of individual or family welfare, including health and longevity, educational attainment, housing and material possessions, and rates of suicide, unemployment, accidental deaths, and housing congestion. Several alternative indices were constructed, using the full set of 17 indicators or subgroups of items relevant to particular substantive areas. A comparison of districts on these indices revealed the expected concentration of high welfare districts among the western coastal states, in the area called the core region, and generally very low scores among the five eastern and northern states comprising the peripheral region.

There is, however, much diversity within both regions and single states. There is as much variability among the districts of Penang and Pahang, for example, as there is within either of the two regions, and typically there are one or two high-scoring districts within a

state and another one or two which score well below the norm. Some individual districts stand out as having markedly higher or lower welfare levels than either their regional location or the scores of their immediate neighbors would suggest. Kuantan is the most outstanding example, but there are a number of others: Yen, Perlis, Penang Southwest, and Krian, to name a few. By the measures used here, Kuala Lumpur district not only has the highest net level of living in the country, but its index score is nearly four standard deviations above the country average and five standard deviations above the mean for the eight districts of Kelantan. It could be argued that this gap is inordinately and artificially wide, reflecting an over-concentration of public services and facilities in the capital city at the expense of outlying districts. Furthermore, one's impression is that Kuala Lumpur's primacy is intensifying. If so, perhaps specific efforts might be needed to reverse this trend. Port Dickson and Kuantan rank second and third, respectively, for the country as a whole, whereas Ulu Temengganu and Ulu Kelantan stand at the bottom of the distribution.

In terms of both average level and uniformity across districts, Negri Sembilan is clearly the leading state. It is particularly high on the net level of living index and the Education composite. Malacca is also a high welfare state, though its three-district average is considerably lower than Negri Sembilan's. Perlis has a substantial positive score, but as it contains only a single district a comparison with multi-district states is somewhat inappropriate. At the other extreme, Kelantan and Temengganu fare worst on every

measure, the only positive element being that there are no unusually wide disparities among the districts of either state.

Four indicators--suicide, unemployment, accidental deaths, and housing congestion--have been labeled social pathologies because they tend to increase as the general state of welfare improves. A composite index of these indicators shows the two districts on the island of Penang to have the highest pathology levels, followed by Kuala Lumpur and most of the other districts containing the Peninsula's major towns. Penang Southwest is a particularly interesting case. Its score on the Socioeconomic Well-Being sub-index is a moderate 3.3, but its score on the Social Pathology measure is second only to that of its immediate neighbor, Penang Northeast. As a result, the net level of living for this district falls below the national average, with a score of -3.6. Penang Northeast, which includes the city of Georgetown, starts with a very high score on Well-Being, so it can "absorb" a substantial amount of negative attributes before the balance is tipped to a substandard level. In partial compensation for their low scores on Well-Being, the districts of Kelantan and Terengganu are low on the Pathology measure as well, but the net balance throughout these states is still decidedly negative.

The concentration of pathology indicators in the principal urban districts is a useful reminder of the special disadvantages to which urban dwellers, and most especially the urban poor, are exposed. Most studies of poverty and social welfare in Malaysia, including the present one, have found these to be predominantly rural phenomena. While it seems unlikely that better information would reverse this

finding. It should be remembered that the negative indicators in this analysis are only four out of a total of 17. A more comprehensive set of pathology measures, including crime rates, the prevalence of mental illness and certain physical diseases, drug abuse, and other typically urban disorders might alter the picture considerably.

The close connection between positive welfare and social pathologies is discouraging, but it is also consistent with the experience of other countries. The problem appears to be particularly acute in newly developing societies where change is imposed upon a relatively old and stable social order. Some measure of dislocation, alienation, and disorganization is probably unavoidable, but the task of achieving an acceptable balance between the benefits and unwanted side effects of modernization is obviously an important one that warrants careful attention in planning and policy formulation.

As for the explanatory objective, a total of 34 variables pertaining to Malaysian institutional structure were reduced through principal components analysis to three district and two state level dimensions, which were employed as independent variables in a series of multiple regressions in which the several indices of well-being and pathology were treated as dependent variables.

At the district level, patterns of urbanization/industrialization and estate agriculture were identified, along with a third cluster denoting a highly subdivided and unequally distributed landholding situation, and called Marginal Farming. The state patterns are roughly parallel, except that the urban and estate agriculture clusters overlap in a more comprehensive dimension, and the state level equivalents of

the Marginal Farming variables are here part of a larger complex which also includes measures of political opposition and interparty competition, an index of urban primacy, and a count of the number of FLIDA schemes in the state. This factor was labeled State Reactive Politics.

The urban-related dimensions at both levels are generally the best single determinants of the various indices of social welfare, and the district plantation agriculture factor was the weakest. The only significant negative determinant is State Reactive Politics. The higher a state's score on this dimension the lower the level of living tends to be within that state, other things being equal.

It is surprisingly, the data show that high levels of land inequality and very small average farm size are positively related to social welfare levels in Peninsular Malaysia. We have been unable to offer a satisfactory explanation for this, beyond the suggestion that these conditions may characterize districts where relatively high income food production or market gardening are important. By this interpretation, however, since it rests on the assumption of comparatively high household incomes, Marginal Farming would be expected to have its strongest effects on the Possessions sub-index. In fact this is not the case. This factor best predicts Health, and is only minimally associated with Possessions. The matter clearly calls for closer scrutiny.

Though the regional polarity has been shown to have numerous concrete manifestations, the study has uncovered no direct evidence that this is attributable to some fundamental cleavage in the Malaysian social structure. On the contrary, the analysis suggests that

regional differences are primarily matters of degree rather than of kind. Our finding is that the conditions which contribute most to higher living standards--conditions which might be conveniently characterized as basic social and economic modernization--operate in essentially the same fashion in both regions. In other words, the peripheral region is poor and deprived not because urbanization, the commercialization of agriculture and other economic sectors, and general institutional diversification do not work in that area as they evidently have worked among the western coastal states, but because they are either lacking altogether or are weak and poorly developed.

While this conclusion may appear to amount to no more than a truism, in fact other quite different findings might have been expected. As has been mentioned earlier, there is a substantial body of theoretical and empirical literature which points to the frequently exploitative nature of cities in predominantly rural societies, to the dependency and poverty fostered by plantation agriculture, and to the dualistic, rigid, and destructive configuration of interregional relationships aptly called "internal colonialism." In view of the manifest compartmentalization of many aspects of Malaysian society, the fact that no such fundamental rigidities have been revealed seems particularly significant. The implication is that to the extent that policies aimed at generating regional development are successful, they are likely to have a favorable impact on the material conditions of life, though probably not without an admixture of negative side effects.

This is not to minimize the seriousness of the welfare gap which

is so conspicuously evident not only between regions but among states and districts as well, not to underestimate both the immediacy of the problem and the difficulties involved in its resolution. It offers some assurance, however, that many of the lessons of Malaysian history are not irrelevant to current conditions, and that basic development strategies need not be separately formulated for different subnational territories or, perhaps more likely, for particular racial groups.

This last point obviously touches upon a sensitive and difficult issue. Race has been given relatively little explicit attention in the course of this study, but it has been implicit throughout. It was observed that "Malayness," as measured by the concentration of ethnic Malays in the total population, is empirically bound up with a complex of variables in both state and district contexts. That is, "Malay" implies rurality, traditional subsistence agriculture, undifferentiated social and economic organization, etc., whereas "non-Malay" implies the reverse. These patterns are so well known that there is little reason to stress one more empirical verification except to point out the degree to which non-ethnic variables, which are at least in principle more amenable to policy intervention, may be equally important elements of what is stereotypically regarded as the "Malay" pattern. The failure to appreciate the implications of this appears to account for programs which aim at increasing the share of Malay ownership of share capital, setting target quotas for Malay ownership, management, and employment in the commercial and industrial sectors, and other special arrangements oriented specifically toward the Malay community. The argument is not that Malays are not entitled

to a much greater share of the fruits of progress than they now enjoy. It is rather that this approach is unlikely to produce the intended results, or at least not as effectively as a reorganization of more fundamental structural configurations--in other words, the general development of backward areas where Malays are heavily concentrated.

It is true that this study has presented no evidence as to the distribution of welfare conditions among ethnic communities within districts, but it is consistent with other research which indicates the relatively minor importance of race in explaining differentials in educational attainment, income, occupation, etc. at individual and household levels. Thus, it is a reasonable assumption that Malays living in the more highly developed states and districts are generally better off from the standpoint of social welfare than either Malays or non-Malays living in the most backward and isolated areas. About 2.5 million Malaysians live in the peripheral states, nearly 80 percent of them Malays. These, in turn, comprise 45 percent of the total Malay population. However, only 20-30 percent of all towns, manufacturing establishments, jobs in the commercial agriculture and non-agricultural sectors, and professional, technical, and managerial employment opportunities in the Peninsula are located in this region, and it generates only about 20 percent of the total Gross Domestic Product. Unless this situation is changed, the preponderance of Malaysians from the peripheral states, of whatever race, will have few opportunities either to participate in or contribute to the development of the "just and progressive society" envisioned in the Second and Third Malaysia Plans.

Looking Ahead

No study can claim to be the final word on level of living in Malaysia. The intent of the present research has been to take a broad view, to trace the main outlines of the welfare situation around 1970 and to identify some of the more important aspects of its social context. But it is a static analysis. However accurate this portrayal may be, it can have only very limited value unless it is made part of a continuing effort to understand the conditions under which higher living standards and a more even pattern of distribution throughout the country can be achieved. Hopefully this study has contributed to such an understanding, but it has also raised a number of questions which require further investigation. For example, we have noted that a number of districts have unexpectedly high or low welfare scores, and that the contextual variables are relatively poor at accounting for the observed levels of well-being in certain areas. What is different about such cases? Is their "deviance" to be explained only in particularistic terms, or is there an underlying pattern which has been overlooked? Though the style of analysis used here tends to take a holistic view it is not incompatible with intensive field investigations. These may be the only way to clear up some anomalies and may suggest additions and refinements to the more general explanatory scheme.

We have also pointed out the need for further investigation into the meaning of some of the independent variables, particularly the dimensions called Marginal Farming and State Reactive Politics. Why should extreme land subdivision and a highly inequitable distributional

pattern be positively associated with level of living? Does the "structural stress" interpretation proposed for the Reactive Politics cluster of variables hold up under closer scrutiny, or is there another more plausible one?

A more important extension of the present work, however, would be a replication based on the agricultural census currently underway and the upcoming 1980 census of population. Using the present study as a baseline, a parallel analysis would not only update and refine what has been learned about the period around 1970, but it would also open up a number of possibilities that are simply unavailable in cross-sectional analysis.

It could, for example, indicate the amount and direction of change in welfare levels over the decade, and whether the gap among districts, states, and regions had narrowed or grown wider. At least a tentative assessment could be made of the impact of resettlement schemes and other large projects such as the Muda and Kemubu water control systems. Of particular interest would be a secondary study focusing on the rates of improvement among rubber, oil palm, and padi scheme districts as compared with one another and with contiguous non-scheme districts. Even a two-point time series would establish a rough trend line and set a general standard against which the progress of specific districts or states could be assessed.

Even more importantly, such a replication would provide an opportunity to examine the ways in which the patterns of social organization in Malaysia are changing. Is Malaysian society being "re-structured," and if so in what directions and with what consequences?

In particular, is there evidence of economic and social integration between the core and peripheral regions, or is the trend toward even more pronounced qualitative differences and greater polarization?

These are merely some of the most obvious examples of important issues to which a macrosocial analytical approach could be applied. The discussion has been limited to its implications for research on social welfare, but other applications, such as the analysis of agricultural productivity, are obviously possible.

But it should be apparent that the most effective utilization of this approach requires a long-term perspective. As with any social information system, its full potential can be realized only incrementally, as knowledge is accumulated systematically and compared with findings at a previous point or, better still, with a known trend. In this process methods and techniques are also modified and refined in the light of previous experience.

In many respects, Malaysia is an ideal setting for this type of system. A substantial base of varied and reasonably reliable data exists which can be organized and analyzed to delineate institutional patterns and trends. A number of official and quasi-official agencies have been established whose objectives include research and evaluation on a number of major facets of Malaysian society. The organization of the formal administrative structure of the country in terms of states, districts, and subdivisions facilitates comparative study at several levels and provides a convenient basis for the delimitation of specific regions or subregions for which special analysis might be desired.

Most importantly, Malaysia has a recognized commitment to

national development and an impressive record of accomplishment. As the famous example of the Ked Book plan attests, it also has the flexibility and organizational capability to innovate. And Malaysian policy makers and planners have demonstrated a quite sophisticated awareness of the fundamental importance of organizational structure in development and directed social change.

However, as Gayl Ness has pointed out in the concluding chapters of Bureaucracy and Rural Development in Malaysia, one of the deficiencies of Malaysian development efforts during the 1960s stemmed from the inability of the Government, or more specifically the Ministry of National and Rural Development, to measure achievement in the pursuance of its primary goals of raising the productivity and living standards of the rural sector. The problem was not a lack of intuitive understanding that these goals necessarily implied broad changes in economic and social structures and institutions, but rather that little was known about the actual distribution of productivity and welfare, and even less about their determinants. The Ministry possessed no capability for discovering what these were and, consequently, for evaluating performance in achieving its goals.

The commitment to broad social and economic objectives in Malaysia continues, and the need to "restructure" the society has been made explicit in the Second and Third Five Year Plans. Hopefully the present study and the research style it represents may prove of some use in meeting the evaluative requirements of these national goals.

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Appendix A. Product-Moment Correlations among Level of Living Indicators and between these Indicators and Composite Indices (N = 70)*

Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	---																
2	94	---															
3	50	58	---														
4	50	61	81	---													
5	37	49	69	89	---												
6	74	77	57	75	60	---											
7	57	66	71	94	82	86	---										
8	54	53	30	50	39	69	60	---									
9	59	54	32	31	20	57	40	55	---								
10	60	56	35	30	23	54	38	58	78	---							
11	53	52	47	43	30	52	47	53	66	78	---						
12	32	35	38	35	30	48	44	38	51	47	55	---					
13	-52	-57	-53	-65	-44	-73	-65	-47	-39	-43	-50	-38	---				
14	-63	-67	-39	-64	-56	-87	-74	-75	-59	-57	-61	-46	78	---			
15	-46	-43	-21	-30	-22	-63	-43	-37	-39	-48	-32	-40	43	43	---		
16	-41	-50	-51	-62	-49	-57	-64	-39	-10	-18	-41	-26	59	54	30	---	
17	90	90	55	65	48	86	73	65	62	64	63	41	-73	-80	-55	-59	---
18	80	82	73	77	68	80	80	69	73	73	73	58	-55	-71	-40	-59	83
19	60	58	45	41	30	62	50	60	87	89	88	74	-51	-66	-47	-28	68
20	83	89	81	88	77	85	87	58	51	53	57	42	-68	-71	-43	-62	88
21	65	69	63	82	72	89	91	81	49	50	48	45	-57	-72	-52	-57	76
22	64	68	51	69	50	88	77	62	46	52	58	47	-88	-86	-68	-76	84
23	81	85	72	80	68	89	86	72	70	72	74	59	-70	-82	-52	-57	90

* Item content given in Appendix D. Signs of items 10-17 have been reversed so that a high score is normatively good. Decimals in correlations have been omitted.

Appendix B. Product-Moment Correlations among District Level Structural Context Variables
(N = 70)*

Item	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
26	---																	
27	.85	---																
28	.42	.60	---															
29	.55	.67	.56	---														
30	.61	.65	.49	.69	---													
31	.58	.71	.50	.68	.52	---												
32	-.57	-.56	-.56	-.52	-.65	-.48	---											
33	.44	.40	.08	.13	.02	.10	-.16	---										
34	-.62	-.57	-.33	-.23	-.20	-.30	.40	-.77	---									
35	-.03	-.02	.26	-.04	.12	.10	-.32	-.33	.01	---								
36	-.23	-.24	.01	-.08	.14	-.03	-.15	-.72	.50	.69	---							
37	-.55	-.53	-.20	-.29	-.14	-.23	.08	-.77	.70	.48	.79	---						
38	.44	.34	-.07	.03	.09	.07	-.14	.55	-.51	-.34	-.46	-.56	---					
39	.28	.26	-.08	.10	-.04	-.01	.12	.64	-.41	-.64	-.76	-.76	.52	---				
40	.12	.25	.34	.24	.11	.42	-.15	.25	-.42	.19	-.27	-.32	.03	-.02	---			
41	.14	.30	.35	.33	.28	.48	-.23	.13	-.26	.29	-.01	-.14	-.04	-.19	.80	---		
42	-.18	-.32	-.29	-.34	-.26	-.46	.23	-.23	.31	-.26	-.03	.13	-.04	.20	-.58	-.88	---	
43	-.03	.05	.02	.26	.08	.04	-.01	-.02	.13	-.22	-.16	-.05	-.07	.17	-.13	-.26	.36	---

* Item content given in Appendix D. Decimals omitted.

Appendix C. Product-Moment Correlations among State Level Structural Context Variables
(N = 70)*

Item	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
44	---															
45	.70	---														
46	.44	.82	---													
47	-.68	-.87	-.82	---												
48	-.72	-.86	-.89	.86	---											
49	.62	.56	.65	-.82	-.74	---										
50	.71	.84	.80	-.78	-.87	.62	---									
51	.24	.72	.80	-.43	-.66	.15	.68	---								
52	-.20	-.04	.25	-.06	.05	.05	-.14	.17	---							
53	.38	-.03	-.07	-.05	-.28	.20	-.00	-.25	-.45	---						
54	.18	-.32	-.38	.20	-.00	.03	-.13	-.49	-.64	.88	---					
55	.50	.39	.37	-.54	-.64	.62	.54	.05	-.64	.61	.61	---				
56	-.67	-.13	.04	.28	.31	-.33	-.34	.27	.55	-.60	-.66	-.67	---			
57	.11	-.31	-.56	.43	.20	-.42	-.16	-.32	-.60	.51	.74	.22	-.51	---		
58	-.19	.27	.32	-.14	.05	-.07	-.02	.40	.74	-.69	-.93	-.70	.75	-.75	---	
59	.25	.01	.15	-.06	-.09	.22	.20	.15	.50	-.40	-.39	-.32	.05	-.21	.26	---

* State values on each variable are assigned to the appropriate districts. Item content given in Appendix D. Decimals omitted.

Appendix D. Definitions and Sources of Variables Used*

VariableColumn location
in data listing
(Appendix E)

DISTRICT LEVEL VARIABLES

District (and state) identification code	ID
Male literacy rate. Percentage of total male population aged 10 years and above who are able to read a newspaper or letter and to write a letter in any language	1
Female literacy rate. Same as Male literacy rate	2
Completed ICF. Percentage of total population who have completed 3 years of post-primary school and passed examination for the Lower School Certificate	3
Completed NCE. Percentage of total population who have completed 5 years of post-primary school and passed examination for the Middle School Certificate	4
Completed HSC. Percentage of total population who have completed 7 years of post-primary school and passed examination for the Higher School Certificate	5
Housing quality. An 8-item Guttman scale of housing amenities. (See text, Table 3-2.) Source: Gibbons et al., Housing Quality and Current Housing Needs in Peninsular Malaysia, 1970. Kuala Lumpur: Department of Statistics, 1973.	6
Motor vehicles. Average number of 4-wheeled passenger vehicles per dwelling unit. Source: 1970 Census of Housing. Kuala Lumpur: Department of Statistics, 1972-73.	7
Motorcycles. Average number of motorcycles or motor scooters per dwelling unit. Source: Same as Motor vehicles.	8

Variable

Life expectancy. Life expectancy at birth.	
Two estimates were computed by the Dept. of Statistics, one based on life tables constructed from census data and the other derived from the vital registration system. The lowest or most conservative estimate was selected for use in this study	9
Infant mortality rate. Refers to deaths from all causes during the first year of life per thousand live births in 1970. Source: Vital Statistics, West Malaysia 1970. Kuala Lumpur: Department of Statistics, 1972.	10
Toddler mortality rate. Refers to deaths from all causes during second through fourth year of life per thousand live births in 1970. Source: Same as for Infant mortality rate.	11
Maternal mortality rate. Deaths due to puerperal causes in 1970, per thousand live births. Source: Same as for Infant mortality rate.	12
Unemployment rate. Members of the labor force unemployed but actively looking for work, or who were working less than 3 hours per day at the time of the 1970 census. "Labor force" refers to those persons 10 years of age and over who had worked at a regular job in the 7 days previous to census enumeration or were actively looking for work. Rate in percent. . . .	13
Persons per room. Average number of persons per residential room. Source: 1970 Census of Housing. Kuala Lumpur: Department of Statistics, 1972-73.	14
Suicide rate. Deaths medically certified as having been caused by suicide. Rate calculated from the average number of such deaths for the period 1968-72 per 100,000 persons in 1970. Source: Unpublished records at the Department of Statistics, Kuala Lumpur	15

<u>Variable</u>	<u>Column location in data listing (Appendix E)</u>
Accident rate. Deaths medically certified as having been caused by non-vehicular accidents. Rate calculated from the average number of such deaths for the period 1969-72 per 100,000 persons in 1970. Source: Same as for Suicide rate	16
No schooling. Percentage of total population with no schooling.	17
Level of living index. A composite index constructed from variables 1-17 above. All variables were transformed into Z-scores, the signs of variables 10-17 were reversed, and scores were added.	18
Health. A composite index comprising variables 9-12 above. All variables were first standardized, and signs of all but 9 reversed	19
Education. A composite index of variables 1-5 and 17. All variables standardized; item 17 reversed	20
Possessions. A composite of standardized variables 6-8 and 14. Variable 14 reversed	21
Social Pathology. A composite of standardized items 13-16. No reversals. High score = "bad."	22
Socioeconomic Well-Being. A composite of items 1-12 and 17 after standardization. Items 10-12 and 17 are reversed.	23
Unemployment. Variable 13 in standard form. No reversal	24
Suicide. Variable 15 in standard form. No reversal.	25

Variable

Column location
in data listing
(Appendix E)

Retail services scale, 6 24-step Guttman
scale, Scalability = .699, Source:
Yellow pages, 1971 West Malaysia Tele-
phone Directory, Kuala Lumpur: De-
partment of Telecommunications, 1971

26

Scale Scores	Item content	Proportion discriminated
24	Piano sales	4.3
23	Retail florist	2.9
22	Night club	2.9
21	Sporting goods sales	1.4
20	Air conditioner sales	2.9
19	Cocktail bar	2.9
18	Retail stationery dealer	2.9
17	Cooperative buying service	2.9
16	Tire dealer/distributor	2.9
15	Automobile dealer	2.9
14	Commercial photographer	1.4
13	Goldsmith	8.6
12	Bookshop	1.4
11	New furniture dealer (retail)	1.4
10	Sewing machine sales	1.4
9	Motorcycle dealer	5.7
8	Hardware dealer	1.4
7	Lottery agent	4.3
6	TV and radio sales	2.9
5	Service station	1.4
4	Cinema theatre	4.3
3	Hotel or boarding house	5.7
2	Pawnbroker	7.1
1	Bottled gas sales	10.0
0	None of the above	11.4
		100.0%

100.0%

Percent urban. Percent district population
living in places of 5,000 or more. Source:
Charles Hirschman and Harbans Singh, "Ur-
banisation and Net Migration to Urban and
Rural Areas, Peninsular Malaysia 1957 to
1970," Table A-3. Unpublished manuscript,
Department of Statistics, May 1975

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<u>Variable</u>	<u>Column location in data listing (Appendix E)</u>
Government officials/sq. mile. Includes all persons classified by occupation under Occupational Codes 201, 202, and 310 (i.e., Legislative Officials, Government Administrators, and Government Executive Officials, respectively)	28
Government official ratio. The proportion of the total number of persons classified by occupation who are government officials as defined in 28 above	29
State capital. A dummy variable indicating whether or not a district contains a state capital city (0 = no; 1 = yes)	30
* Labor force in manufacturing. Denominator is the total labor force minus those whose industrial classification is "inadequately described" and "not stated."	31
Average number of children ever born. The base is the total number of women aged 15-49. Source: Special tabulations by the Department of Statistics, Kuala Lumpur, using 1970 census data	32
* Cultivated area in estates, 1960. An estate is officially defined as land, contiguous or non-contiguous, aggregating 100 acres or more under a single legal ownership. Source: 1960 Census of Agriculture. Kuala Lumpur: Ministry of Agriculture and Cooperatives, 1960-63.	33
* Malay. Percentage of the total population classified as Malay.	34
* Farms rented. The percentage of all smallholding farms in which more than 50% of the total area is rented, 1960. Source: 1960 Census of Agriculture.	35
* padi. Percentage of total cultivated smallholding area planted in wet padi, 1960. Source: 1960 Census of Agriculture	36

VariableColumn location
in data listing
(Appendix F)

* labor force in traditional agriculture. This category includes hunting and fishing as well as agriculture proper. It excludes all estate employment and smallholding production of crops "re- quiring extensive processing," i.e., rubber, oil palm, tea, etc.	37
Number of New Villages. New Villages were initially resettlement centers estab- lished during the Malayan Emergency (1948-60) for the purpose of isolating communist guerillas from possible sources of supply and support. According to an unpublished statistical study carried out by the Department of Statistics in Kuala Lumpur, 444 of these villages still exist, though of course they no longer serve their original purpose.	38
* rubber. Includes both estate and small- holding acreage planted in rubber in 1960. Source: <u>1960 Census of Agriculture</u>	39
Smallholding land inequality. An index devised by Elteto and Fréyes (1966) for measuring income inequality, but applied here to land holdings in the smallholding sector in 1960. The com- puting formula is $v' = \frac{m_2 - m_1}{m_2}$, where v' is the index, m_1 is the sub-mean of the portion of the distribution below the overall mean, and m_2 the sub-mean of the portion above the overall mean. Values range between 0 and 1. The larger the index the more unequal the distribu- tion. Source: <u>1960 Census of Agriculture</u>	40
* farms less than 3 acres, 1960. Source: <u>1960 Census of Agriculture</u>	41
Average smallholding size, 1960. Source: <u>1960 Census of Agriculture</u>	42

VariableColumn location
in data listing
(Appendix E)

- 2 Population increase, 1957-70. Source:
1957 Census of the Federation of Malaya
and unpublished 1970 census tabulations
for districts. 43

STATE LEVEL VARIABLES

- 2 Urban. Percentage of the total population
living in places 10,000 or more. Source:
Hirschman and Singh. See district variable
27 44

Industrial diversity scale. An 11-item Guttman
scale using as items the presence or absence
of manufacturing firms in the various Indus-
trial Classification types. The coefficient
of scalability is .897. This is a reduced
version of a scale constructed with 81 in-
dustrial types, for which the coefficient of
scalability was .71. Source: Directory of
Manufacturing Establishments, West Malaysia,
3 vols. Kuala Lumpur: Department of Sta-
tistics, n.d. (reference period is 1970) 45

Scale scores	Item content	State discriminated
11	Distilling, rectifying and blending of spirits (code 311)	Selangor
10	Coffee bean hulling plants off estates and smallholdings (code 152)	Johore
9	Manufacture of miscellaneous metal products n.e.c. (code 459)	Penang
8	Slaughtering, preparation and preserving of meat (code 301)	Perak
7	Sugar factories and re- fineries (code 307)	N. Sembilan

Variable	Column location in data listing (Appendix E)
6 Manufacture and repair of electrical appliances (code 472)	Malacca
5 Karian processing, and manufacture of karian, mengkuang and atsap products (code 352)	Kedah
4 Manufacture of rubber products n.e.c. (code 409)	Pahang
3 Manufacture of cocoa, chocolate & confectionery (code 308)	Kelantan
2 Rubber processing of estates and smallholdings (code 112)	Tremgannu
1 Manufacture of cement & concrete products (code 435)	Perlis
2 cultivated area in estates, 1960. Definition and source the same as district variable 33 above.	46
2 Malay. See district variable 34 above.	47
2 GDP from traditional agriculture. This figure is an estimate for 1967. Taken from Lim Lin Iann, Some Aspects of Income Differentials in West Malaysia. Kuala Lumpur: University of Malaya, Faculty of Economics and Administration, p. 48.	48
Voluntary associations per thousand population, 1969. All voluntary organizations are legally required to register with the Registrar of Societies in Malaysia. Source: Stephen A. Douglas and Paul Pedersen, Blood, Believers, and Brothers: The Development of Voluntary Associations in Malaysia. Athens, Ohio: Ohio University, 1973, p. 52.	49

Variable	Column location in data listing (Appendix E)
% GDP from manufacturing. The figure is for 1967, and is taken from Lm. See variable 48.	50
Average estate size, 1960. Source: 1960 Census of Agriculture	51
Number of FELDA schemes. The number of Federal Land Development schemes, both rubber and oil palm, 1972. Source: Robin J. Pryor, "Rural-Rural Migration and Frontier Settlement Schemes: The Case of West Malaysia" (mimeographed), 1972, Figure 1.	52
Seaholding land inequality. See district variable 40.	53
% farms less than 3 acres. See district variable 41.	54
Urban primacy index. This measure refers to the size of a state's largest town rela- tive to the total population of the five largest towns: $\text{Primacy} = (P_1 / (P_1 + P_2 + P_3 + P_4 + P_5)) * 100,$ where P_1 = population of the top five towns in 1970. Source: Hirschman and Singh. See district variable 27 above	55
Index of party dominance. An index intended to measure the electoral dominance of a single political party for the state elections of 1959, 1964, and 1969. Specifi- cally, Dominance = % valid votes cast for first party candidates - (100 - % votes for first party candidates), calculated from data cumulated over the three state elections. A high score indi- cates a high degree of dominance. Source: Report on the Parliamentary (Dewan Ra'ayat) and State Legislative Assembly General Elec- tions, Kuala Lumpur: The Election Commission, 1960, 1965, and 1972	56

Variable

Column location
in data listing
(Appendix E)

* seats won by opposition. The percentage of total state legislative assembly seats won by opposition (i.e., non-Alliance) candidates in the elections of 1959, 1964, and 1969. Percentage is calculated from the number of opposition seats won and total assembly seats cumulated over the three elections. Source: Election Commission. See variable 56 57

Average smallholding size, 1960. Source: 1960 Census of Agriculture 58

% population increase, 1957-70. See district variable 43 59

FACTOR SCORES

District Factor 1--Urban Differentiation 60

District Factor 2--Estate Rubber 61

District Factor 3--Marginal Farming. 62

State Factor 1--State Structural Diversity 63

State Factor 2--State Reactive Politics. 64

* Unless otherwise indicated, all data are from unpublished 1970 census tabulations in the files of the Department of Statistics, Kuala Lumpur.

Appendix E. Listing of the Data Used in the Analysis

	10	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
0101	70.1	49.9	1.1	1.6	0.1	3.06	6	15	67.3	28.66	3.16	1.41	5.8	6.6	2.50	7.81	42.3	4.103	3.588	0.493	-0.617	
0102	80.1	60.7	1.6	3.1	0.6	4.79	16	21	61.0	40.93	3.71	1.14	5.7	6.5	9.52	31.17	35.1	9.029	9.788	3.800	2.656	
0103	77.4	55.1	1.5	1.6	0.2	4.40	4	9	62.5	37.60	4.49	1.37	4.6	6.4	6.51	11.34	39.3	4.118	1.937	1.001	2.545	
0104	70.7	48.8	0.8	1.1	0.1	3.09	4	7	61.6	37.40	4.49	1.05	3.1	5.3	5.33	2.46	42.2	-1.222	-1.074	-0.411	-0.493	
0105	72.7	53.0	1.0	1.2	0.1	3.60	6	7	61.6	37.40	4.49	1.05	3.1	5.3	5.33	2.46	42.2	-1.222	-1.074	-0.411	-0.493	
0106	71.5	47.1	1.0	1.4	0.1	3.58	6	14	66.4	39.38	3.25	0.63	5.2	6.7	3.61	15.15	42.2	-2.056	-0.963	-0.477	-1.024	
0107	67.4	47.1	1.1	1.1	0.1	3.01	5	8	67.1	31.19	2.79	0.98	6.0	6.6	1.70	6.04	44.2	-2.502	-2.840	-0.468	-0.395	
0108	72.4	51.5	0.8	1.3	0.1	4.10	6	21	66.4	35.17	3.93	0.57	5.4	6.6	10.19	22.24	39.6	-1.757	3.660	-1.018	-2.025	
0201	66.1	47.1	0.8	0.7	0.0	2.09	3	9	58.0	31.11	8.12	1.30	3.8	5.0	3.84	7.68	48.1	-6.359	-2.477	-0.018	-1.593	
0202	74.6	45.9	1.0	1.0	0.0	2.68	4	10	61.5	30.83	5.24	2.84	4.2	5.6	6.01	2.26	51.5	-2.062	-0.662	1.866	0.158	
0203	75.8	47.3	1.5	1.9	0.2	3.87	7	12	61.6	47.80	4.02	2.44	4.9	5.7	7.46	17.36	41.6	-2.062	-0.662	0.757	-0.146	
0204	71.6	47.0	1.2	1.5	0.1	2.96	7	10	60.2	36.57	4.23	3.22	6.5	5.7	6.23	27.38	42.9	-0.197	-0.682	1.866	0.158	
0205	66.8	47.1	1.1	1.4	0.1	2.91	7	11	61.2	31.35	3.55	2.61	3.0	5.1	2.55	23.20	48.8	-1.688	-0.675	-2.003	-0.673	
0206	71.9	46.0	1.1	1.4	0.1	2.91	7	12	61.6	37.37	5.18	0.72	5.2	5.9	11.32	10.47	40.7	-2.597	-0.710	-2.586	-1.705	
0207	66.2	41.2	1.1	1.1	0.0	1.70	1	8	61.3	38.70	3.08	5.74	2.9	6.0	0.03	6.31	66.2	-3.188	-1.710	-2.586	-1.705	
0208	54.3	30.7	0.8	0.7	0.0	1.32	2	9	59.7	56.85	4.61	1.60	1.9	4.9	1.92	3.70	52.6	-10.528	-2.026	-0.004	-1.916	
0301	63.9	59.0	0.7	0.5	0.0	1.73	3	8	58.0	47.03	7.18	1.01	1.2	4.2	4.94	15.17	56.6	-5.360	-1.757	-5.703	-1.209	
0302	75.2	50.0	1.2	0.6	0.1	7.47	3	7	62.7	27.75	3.21	0.99	2.8	5.3	0.45	0.45	45.3	-4.355	-2.666	-0.010	-1.412	
0303	46.4	31.3	1.2	0.9	0.0	1.25	3	4	56.8	51.17	5.02	0.85	1.2	4.6	1.21	0.10	57.5	-1.967	-1.459	-2.415	-2.523	
0304	60.8	41.2	1.0	2.0	0.3	2.18	7	0	59.4	55.83	6.36	2.19	5.5	5.3	1.69	11.12	48.6	-3.277	-1.101	-0.341	-1.402	
0305	53.3	34.0	1.0	0.9	0.1	1.83	4	7	58.6	47.62	7.51	1.04	1.6	5.1	1.94	0.48	55.4	-7.696	-1.125	-0.384	-1.476	
0306	51.8	31.0	1.0	0.9	0.1	1.54	2	4	57.3	59.56	7.98	0.73	1.5	5.0	1.49	0.59	58.2	-8.719	-1.185	-0.344	-2.528	
0307	51.2	31.0	1.2	0.8	0.1	1.35	2	5	57.3	59.56	7.98	0.73	1.5	5.0	1.49	0.59	58.2	-8.719	-1.185	-0.344	-2.528	
0308	50.6	31.0	0.8	0.8	0.1	1.60	2	5	57.3	59.56	7.98	0.73	1.5	5.0	1.49	0.59	58.2	-8.719	-1.185	-0.344	-2.528	
0309	51.2	31.0	0.9	0.8	0.1	1.41	1	4	60.6	56.84	7.15	2.62	2.2	5.0	0.34	0.00	58.6	-10.542	-6.103	-8.021	-1.983	
0401	81.5	51.2	1.3	1.3	0.1	3.24	2	6	51.1	94.33	21.52	4.52	2.5	6.6	1.62	5.67	56.5	-19.881	-14.714	-6.955	-0.150	
0402	77.7	47.5	1.0	1.1	0.1	2.74	8	15	64.7	39.70	4.04	0.65	4.8	6.1	4.36	3.71	39.1	4.964	1.623	2.547	-0.237	
0403	79.4	52.6	1.4	3.0	0.4	4.46	14	17	59.3	67.49	2.11	1.92	6.4	7.1	6.75	28.35	36.2	3.805	-0.031	6.193	1.157	
0404	78.1	51.4	0.4	1.2	0.1	3.12	8	21	66.2	37.32	5.14	0.95	2.7	5.9	9.12	7.65	39.6	5.845	2.766	0.734	1.975	
0405	72.1	47.5	1.2	1.1	0.1	3.15	11	20	63.0	42.71	5.23	2.05	4.1	5.5	4.34	6.94	36.3	4.352	-0.113	3.136	0.039	
0406	81.8	52.4	1.3	1.4	0.1	3.05	11	21	67.7	23.16	3.38	0.00	4.8	6.1	1.96	5.59	37.1	15.745	5.748	7.320	3.632	
0407	79.3	59.3	1.4	2.6	0.6	4.64	14	16	60.1	43.34	4.98	0.50	4.5	5.5	5.02	0.00	38.5	6.652	2.855	2.714	-0.516	
0408	80.1	54.8	1.4	1.6	0.2	3.72	7	12	62.4	42.45	4.74	0.00	7.8	6.6	8.03	35.68	34.1	8.016	0.878	8.687	2.742	
0409	67.0	45.1	1.9	1.2	0.2	3.60	9	16	63.0	40.40	2.68	0.53	2.1	6.2	6.17	32.04	38.9	5.502	1.950	4.214	0.458	
0410	70.3	49.3	1.0	1.0	0.1	2.10	8	5	60.8	25.21	4.58	0.00	7.2	5.4	26.41	0.00	44.0	2.556	2.726	-0.379	1.524	
0411	76.7	55.4	2.3	2.9	0.4	3.67	14	13	62.8	41.20	10.62	4.29	1.6	5.3	3.40	2.04	45.5	6.399	4.950	1.062	2.665	
0412	87.0	65.7	1.0	1.1	0.1	2.65	4	4	57.1	54.90	10.67	1.18	6.6	5.8	5.19	28.81	32.7	11.652	2.637	8.240	1.747	
0413	68.3	48.8	1.1	1.1	0.2	2.45	4	6	62.2	53.16	6.51	1.70	2.7	5.2	4.94	13.33	47.0	-2.265	-0.942	-1.451	-1.179	
0414	72.7	49.0	1.2	1.3	0.1	3.26	8	10	62.5	42.57	5.17	3.09	2.5	6.0	4.40	15.27	40.4	-0.628	-1.226	-0.156	-0.003	
0415	67.6	45.4	1.2	1.6	0.3	3.49	6	12	61.5	40.82	4.28	1.97	3.0	5.5	5.23	16.40	38.9	-1.477	-0.410	0.674	0.204	
0416	74.5	50.2	1.3	1.7	0.3	2.49	9	16	62.2	39.71	3.02	1.18	6.1	6.2	4.68	15.95	37.2	4.300	3.676	1.108	1.078	
0417	61.6	38.6	0.9	1.2	0.1	1.68	5	13	61.2	37.71	3.76	1.01	7.0	6.0	9.29	18.48	36.4	5.226	3.180	3.108	0.432	
0418	71.5	59.4	1.6	1.6	0.7	6.10	23	24	64.0	46.57	2.02	0.39	11.8	6.2	5.76	30.05	32.0	-2.826	-1.794	-2.929	0.151	
0419	71.5	59.4	1.1	1.1	0.1	3.59	4	11	62.2	29.05	2.01	0.00	9.8	6.0	18.12	27.59	35.0	-11.477	2.343	9.044	5.073	
0420	77.1	51.5	1.3	1.5	0.2	3.71	6	11	58.0	40.07	4.59	1.92	6.5	6.0	14.24	13.21	40.0	-3.640	2.305	1.165	-0.420	
0421	61.8	40.7	0.7	1.1	0.1	2.92	6	21	65.2	28.91	4.17	0.75	5.5	6.5	12.12	4.97	41.6	-1.710	0.291	2.452	0.386	
																		-1.710	3.194	-3.151	0.454	

10	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
0803	76.6	57.7	1.4	2.8	0.4	4.95	19	24	67.7	37.09	2.58	0.91	8.6	7.3	0.05	27.58	35.2	8.562	2.145	5.809	4.472
0804	70.6	44.3	0.8	0.9	0.1	2.64	4	10	59.9	64.38	5.65	2.89	4.3	5.8	6.34	6.18	63.9	-5.248	-2.582	-1.491	-1.210
0805	79.0	56.8	1.1	1.2	0.1	3.19	6	9	63.3	41.38	5.05	1.57	4.4	5.8	7.69	14.58	36.3	2.427	0.792	2.784	-0.398
0806	73.8	52.3	1.5	1.8	0.2	3.52	10	7	63.9	49.38	6.06	1.12	6.8	6.2	8.18	19.42	37.9	1.741	0.224	3.452	-0.155
0807	70.1	45.7	1.0	1.1	0.2	3.24	5	12	61.2	38.05	5.88	1.67	5.8	6.2	8.18	4.13	42.3	-1.811	-0.055	-0.304	-0.604
0808	70.3	51.4	0.9	1.1	0.1	3.03	5	8	60.3	38.75	7.92	3.03	6.3	5.7	5.32	6.05	38.6	-3.428	-3.479	0.353	-0.003
0809	71.9	48.1	1.5	1.5	0.1	2.21	4	10	64.8	35.67	2.85	2.66	2.9	5.0	3.51	10.74	41.1	3.728	1.434	1.480	-0.528
1001	74.3	52.2	1.8	2.9	0.6	4.63	13	16	64.8	29.32	2.10	1.49	8.9	6.8	11.78	18.95	37.6	8.390	3.059	7.013	2.110
1002	70.1	46.8	0.8	0.9	0.1	3.73	6	14	66.5	24.82	2.74	1.46	5.2	6.6	6.30	0.93	43.2	2.778	3.877	-1.614	-0.171
1003	82.2	62.6	2.5	5.6	2.1	5.35	26	21	64.9	28.09	1.73	0.18	6.8	6.7	6.54	28.98	50.6	28.776	4.307	20.589	8.581
1004	68.9	44.3	0.8	0.9	0.1	3.17	4	18	64.4	33.58	4.42	2.08	4.7	6.2	7.74	6.27	49.0	-0.738	1.403	-2.588	0.288
1005	65.6	46.7	0.8	0.9	0.1	2.68	3	28	61.9	32.58	4.42	2.06	1.7	6.42	0.00	0.00	47.1	3.280	0.703	-2.317	1.142
1006	71.0	49.6	1.7	2.0	0.2	4.23	10	14	64.5	24.42	2.69	1.05	9.6	6.5	8.87	5.35	37.8	6.418	4.188	3.533	1.275
1007	72.0	46.4	1.1	1.4	0.2	4.11	7	12	68.2	35.31	5.23	0.00	7.4	6.1	8.21	6.27	41.8	3.781	5.926	0.439	0.762
1101	51.1	35.9	0.7	0.9	0.1	1.29	2	5	59.0	57.34	8.03	2.36	2.0	4.9	2.34	3.47	54.8	-10.389	-1.430	-7.054	-2.714
1102	66.1	45.4	1.0	1.2	0.2	2.15	4	7	59.3	44.94	8.09	1.47	5.1	5.2	0.92	6.90	47.7	-1.084	-1.574	-1.523	-1.288
1103	66.7	45.6	0.8	1.1	0.1	2.06	4	9	59.8	61.37	8.58	5.24	3.6	5.1	4.47	7.77	42.9	-8.316	-5.968	-2.635	-0.899
1104	50.1	40.1	1.2	1.5	0.2	1.93	5	6	59.0	55.89	7.39	2.47	5.1	5.2	1.01	11.97	52.4	-6.494	-3.167	-3.057	-1.554
1105	44.0	38.6	0.5	0.4	0.0	1.41	2	4	58.8	63.86	7.04	0.00	1.0	4.7	1.27	0.00	50.5	-8.462	-1.916	-8.055	-2.762
1106	51.7	33.2	0.5	0.7	0.0	1.44	2	4	57.8	68.23	16.30	4.47	1.4	4.5	2.23	0.00	58.2	-16.085	-8.886	-8.648	-1.906

	10	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
0101	0.477	4.560	0.499	-0.745	22 24.9	1.8 0.20	0	7.2 3.0	29.3 65.2	0	0.8 10.6	7 84.3	0.720	29 6.43	27.2 28.3									
0102	4.292	13.321	0.456	0.907	23 55.3	11.8 0.99	1	18.3 2.5	95.5 45.6	1	0.5 6.0	22 84.1	0.805	45 5.53	59.4 26.3									
0103	0.937	9.124	-0.012	0.107	19 32.2	0.5 0.14	0	8.4 3.0	94.2 37.4	0	0.5 6.4	13 80.7	0.748	42 4.38	50.6 26.3									
0104	-1.658	-2.910	-0.648	-0.079	7 14.3	0.4 0.28	0	3.5 3.3	87.8 64.8	0	0.8 16.7	7 87.3	0.739	41 4.36	33.7 26.3									
0105	1.203	-0.853	0.711	-0.465	5 21.5	0.3 0.43	0	6.2 3.2	33.1 70.8	0	4.2 29.5	6 57.6	0.740	41 4.36	33.7 26.3									
0106	1.668	4.151	0.744	-0.195	19 24.4	1.5 0.19	0	4.8 3.1	50.9 56.6	0	1.6 4.6	10 74.9	0.770	42 5.12	76.1 25.3									
0107	-0.059	1.678	0.504	-0.934	8 14.7	1.7 0.19	0	6.3 3.1	19.4 41.1	0	0.0 76.1	2 58.0	0.715	24 7.07	18.8 26.3									
0108	1.783	5.506	0.329	1.764	14 32.5	0.5 0.16	0	4.0 3.1	92.8 40.1	0	0.5 7.8	24 69.6	0.749	42 4.49	35.5 26.3									
0109	-2.253	-8.593	-0.372	-0.430	0 0.0	1.5 0.16	0	1.5 3.1	39.1 70.5	14 12.7	2.2	3 71.6	0.749	19 5.04	51.8 12.6									
0102	-1.231	-2.028	-0.182	0.059	0 0.0	1.5 0.16	0	1.5 3.1	50.4 66.4	18 9.7	11.8	3 71.6	0.749	19 5.04	51.8 12.6									
0103	1.394	1.197	0.116	-0.358	20 22.0	6.5 0.36	1	5.1 2.6	6.0 84.0	35 65.7	72.5	8 67.7	0.771	37 5.39	35.7 12.6									
0104	1.728	-0.338	0.756	0.470	15 28.9	2.9 0.22	0	7.1 2.8	71.2 52.0	45 67.8	54.4	4 19.3	0.712	37 5.39	35.7 12.6									
0105	-1.274	-2.442	-0.692	-0.733	2 0.0	1.8 0.15	0	1.7 2.8	6.0 84.0	35 65.7	72.5	8 67.7	0.771	37 5.39	35.7 12.6									
0106	1.377	1.043	0.244	1.331	15 23.9	1.8 0.20	0	4.9 3.0	83.8 44.8	11 4.3	9.4	1 21.5	0.675	31 5.44	31.5 12.6									
0107	-2.450	-13.338	-1.457	-1.334	3 0.0	1.2 0.29	0	2.6 2.8	17.8 88.2	21 40.9	62.2	1 22.7	0.721	57 4.67	22.0 12.6									
0108	-4.150	-9.518	-1.160	-0.882	0 0.0	0.2 0.10	0	0.3 2.9	0 0.8	12 75.0	73.5	2 53.0	0.772	52 3.81	43.2 12.6									
0109	-3.716	0.589	0.777	-1.227	0 12.4	1.4 0.10	0	1.1 3.0	0.0 97.9	12 75.0	35.2	0 57.0	0.722	29 7.45	90.1 12.6									
0101	-4.460	-12.876	-1.457	-1.070	0 0.0	0.5 0.31	0	1.5 3.0	1.3 86.0	56 71.9	75.9	0 8.9	0.763	49 4.40	11.0 12.6									
0102	-0.474	-3.051	0.371	-0.937	16 43.7	20.6 0.54	1	12.2 2.7	0.0 93.2	19 47.4	63.1	0 10.0	0.772	70 2.70	20.8 15.0									
0103	-4.318	-11.935	-1.287	-1.078	2 0.0	1.7 0.18	0	3.4 2.9	194.2 93.6	13 20.5	39.8	0 28.0	0.762	72 2.68	37.4 15.0									
0104	-4.476	-12.805	-1.239	-0.983	1 11.2	3.7 0.22	0	6.0 2.9	0.4 95.5	14 35.2	55.4	0 44.2	0.762	52 4.20	21.5 15.0									
0105	-4.577	-12.835	-0.734	-1.250	2 0.0	3.0 0.21	0	6.0 3.0	3.3 97.7	30 43.8	64.3	0 30.0	0.686	44 4.21	10.3 15.0									
0106	-4.289	-17.519	-1.117	-0.619	1 12.2	0.7 0.17	0	2.4 3.1	77.8 89.8	2 3.4	27.7	5 30.0	0.686	44 4.21	10.3 15.0									
0107	-4.551	-19.072	-1.032	-1.294	1 14.6	10.3 0.27	0	10.3 3.0	0.0 89.8	25 41.8	64.0	0 62.0	0.676	75 2.72	21.0 15.0									
0108	-0.011	-24.037	-0.955	-0.653	1 8.3	0.1 0.21	0	2.3 3.1	56.3 88.6	25 41.8	64.0	17 48.1	0.700	31 5.88	78.9 15.0									
0109	-0.862	4.347	0.116	-0.306	2 5.0	1.9 0.17	0	5.7 3.2	67.6 65.7	2 7.5	10.1	5 76.8	0.704	57 3.68	42.3 15.0									
0101	5.277	9.202	1.604	0.255	20 52.8	30.0 0.68	1	13.7 2.7	20.8 81.7	18 28.0	13.0	7 55.4	0.676	88 2.90	40.1 25.1									
0102	-0.749	5.596	-0.870	0.813	0 0.0	0.6 0.29	0	2.1 3.0	40.2 51.9	11 13.5	23.1	12 67.4	0.739	52 3.86	41.2 21.5									
0103	-1.377	3.015	-0.274	-0.388	14 18.8	0.8 0.26	0	3.7 3.2	67.6 57.9	2 7.5	15.5	7 71.2	0.753	52 3.77	19.7 21.5									
0104	0.978	4.078	0.074	0.788	10 11.5	2.2 0.18	0	4.6 2.9	93.4 35.0	7 0.0	7.5	4 55.7	0.613	50 5.27	42.1 21.5									
0105	-1.754	8.008	-0.054	-0.152	21 51.8	0.2 0.43	0	2.1 3.3	68.7 76.2	1 8.0	26.0	2 72.9	0.758	51 1.55	18.0 21.5									
0106	5.352	13.169	1.349	0.556	21 51.8	0.2 0.43	0	10.6 2.5	92.8 29.1	11 1.6	5.4	12 69.6	0.741	49 3.86	10.1 21.5									
0107	1.457	6.959	0.201	0.633	9 30.9	1.1 0.27	0	4.8 3.0	79.4 31.4	1 7.5	6.8	8 73.4	0.760	53 3.55	72.3 21.5									
0108	1.709	3.944	-1.075	0.118	14 40.0	0.6 0.22	0	4.8 3.0	79.4 31.4	10 5.6	11.1	12 78.0	0.718	53 3.55	72.3 21.5									
0109	1.750	0.119	-1.032	4.412	3 0.0	0.5 0.21	0	1.3 2.5	90.5 19.7	6 0.0	36.3	1 52.1	0.775	34 5.67	94.7 19.0									
0101	-3.424	-7.712	-1.207	-0.513	3 0.0	0.2 0.37	0	5.0 3.1	23.2 71.0	5 13.8	17.2	1 52.1	0.775	34 5.67	94.7 19.0									
0102	2.422	14.114	0.835	-0.112	22 45.0	1.8 0.78	1	9.9 2.6	71.3 57.0	3 4.5	12.7	3 60.1	0.763	44 4.79	64.7 19.0									
0103	-1.817	-9.082	-0.690	-0.177	8 18.3	0.2 0.50	0	5.5 2.8	50.7 45.7	5 9.7	31.0	5 60.4	0.726	34 5.82	28.3 19.0									
0104	0.392	-3.804	0.931	-0.414	3 0.0	0.2 0.50	0	5.5 2.8	50.7 45.7	5 9.7	31.0	5 60.4	0.726	34 5.82	28.3 19.0									
0105	-0.518	-1.145	-0.905	-0.204	10 32.2	0.5 0.29	0	4.8 3.1	46.1 66.7	2 14.2	34.0	0 49.1	0.745	49 5.07	64.7 19.0									
0106	-0.538	0.919	-0.692	-0.103	17 10.2	0.5 0.27	0	4.8 3.1	46.1 66.7	10 8.1	31.5	8 76.7	0.718	33 5.75	57.3 16.0									
0107	2.136	6.436	1.434	-0.232	14 29.5	11.2 0.36	0	19.1 2.7	40.9 33.7	52 31.7	27.6	10 69.7	0.713	33 6.28	46.0 19.0									
0108	2.840	8.048	0.021	0.521	17 41.0	25.1 0.55	0	18.5 2.6	37.3 48.6	40 43.0	36.4	0 40.2	0.778	72 2.44	45.9 50.9									
0109	2.413	-0.413	0.626	-0.039	8 0.0	3.0 0.18	0	8.8 2.9	61.5 36.9	24 8.9	29.2	3 37.4	0.686	56 4.22	55.2 50.9									
0101	8.221	19.764	3.050	0.018	24 87.0	14.2 0.68	0	5.0 3.0	26.5 52.2	44 11.1	3.4	0 32.5	0.691	71 3.30	26.8 50.9									
0102	6.731	3.311	2.205	2.132	4 0.0	4.6 0.23	0	5.0 3.0	26.5 52.2	44 11.1	3.4	0 32.5	0.691	71 3.30	26.8 50.9									
0103	3.124	3.532	0.746	-2.019	13 21.9	0.7 0.20	0	3.9 3.0	84.2 40.0	0 5.8	8.2	33 78.0	0.737	44 4.03	22.6 27.6									
0104	2.665	1.449	0.371	1.520	10 21.2	0.9 0.13	0	8.0 3.0	70.6 29.2	4 2.1	22.5	12 76.0	0.811	48 4.66	34.3 27.6									

10	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
0503	6.083	14.446	1.689	0.797	24	68.6	6.5	0.36	1	16.8	2.4	82.0	21.5	1	1.2	5.2	29	78.9	0.807	65	2.64	30.1	27.6
0504	-0.473	-5.721	-0.139	0.159	10	19.1	1.5	0.12	0	3.1	3.0	47.8	65.3	43	38.5	64.2	0	39.9	0.633	39	4.17	30.7	27.6
0505	0.642	3.059	-0.097	0.438	14	19.8	1.3	0.20	0	4.0	3.1	49.5	67.3	8	11.8	19.8	12	72.2	0.705	56	3.31	24.7	27.6
0506	2.837	4.068	0.924	0.591	18	35.7	1.9	0.25	0	8.8	2.8	51.7	49.5	12	11.0	17.0	33	67.9	0.758	52	3.77	26.2	27.6
0507	1.371	-0.441	0.499	0.592	18	21.1	1.6	0.26	0	6.9	3.0	61.7	54.8	4	9.2	31.1	8	32.5	0.760	43	4.30	21.5	27.6
0508	-0.841	-4.271	-0.139	-0.093	1	0.0	0.3	0.34	0	1.3	3.0	8.2	66.1	8	19.2	25.3	7	63.1	0.767	41	4.80	40.3	27.6
0509	-2.374	1.354	-0.734	-0.507	12	7.2	5.5	0.37	1	2.8	2.5	3.6	79.4	20	65.2	70.1	0	12.1	0.671	43	4.53	31.1	0.0
1001	5.261	13.641	1.647	1.438	23	58.5	11.3	0.70	0	18.6	2.6	92.8	31.1	0	0.0	8.6	1	64.4	0.769	51	3.36	55.7	45.0
1002	0.375	3.153	0.244	0.149	4	17.6	1.0	0.14	0	3.8	3.2	76.0	48.6	0	0.0	14.4	5	50.8	0.782	60	3.08	34.3	45.0
1003	1.914	22.490	0.524	0.705	24	71.3	88.7	1.12	1	21.5	2.1	90.2	26.3	5	1.2	2.1	11	70.2	0.827	72	2.33	62.1	45.0
1004	0.508	-0.210	0.031	0.488	5	6.2	1.1	0.15	0	3.2	3.2	67.5	57.6	8	13.3	48.9	4	58.9	0.746	28	4.46	39.4	45.0
1005	-3.141	0.138	-1.245	-1.334	4	5.6	1.7	0.21	0	3.4	3.2	29.0	75.2	8	16.6	47.9	0	2.7	0.765	26	4.87	35.5	45.0
1006	3.535	9.952	2.115	0.753	11	31.1	2.0	0.33	0	8.1	3.0	84.8	41.3	7	1.4	6.4	10	82.9	0.730	46	1.62	40.5	45.0
1007	1.635	5.416	1.779	0.558	5	19.1	0.8	0.21	0	5.1	3.0	50.3	32.3	0	0.5	5.4	11	76.1	0.812	47	4.28	24.9	45.0
1101	-7.777	-14.166	-1.117	-0.655	0	0.0	0.4	0.76	0	5.6	3.1	6.8	98.1	20	37.1	57.5	0	26.6	0.753	41	4.41	44.5	27.0
1102	-2.254	-5.339	0.201	-1.117	4	32.3	0.7	0.44	0	7.2	4.1	11.4	91.4	1	6.8	28.2	1	54.8	0.858	62	4.03	77.0	27.0
1103	-2.256	-10.472	-0.437	-0.291	4	28.0	0.5	0.31	0	5.9	3.0	63.3	85.6	1	7.8	26.2	1	59.3	0.807	62	4.93	37.3	27.0
1104	-1.658	-8.502	0.201	-1.205	16	50.1	4.8	0.48	1	17.4	2.9	2.6	93.5	16	32.4	04.9	0	37.5	0.787	64	3.26	39.1	27.0
1105	-5.233	-13.715	-1.542	-1.035	0	0.0	0.7	0.21	0	18.8	3.3	7.4	75.6	1	7.2	54.9	0	51.8	0.808	62	4.03	35.4	27.0
1106	-5.168	-21.250	-1.372	-0.810	0	0.0	0.2	0.20	0	1.0	3.0	15.1	93.8	2	13.3	68.1	0	39.1	0.742	42	5.30	48.5	27.0

	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
0101	10 63.6	53.4	13.3	0.88	10.1	1200	30	0.747	33.2	43.7	33.0	6.3	7.0 37.6	0.021	0.589	-1.202	0.487	-1.514		
0102	10 63.6	53.4	13.3	0.88	10.1	1200	30	0.747	33.2	43.7	33.0	6.3	7.0 37.6	2.542	1.268	-1.134	0.487	-1.514		
0103	10 63.6	53.4	13.3	0.88	10.1	1200	30	0.747	33.2	43.7	33.0	6.3	7.0 37.6	-0.018	1.220	-0.206	0.487	-1.514		
0104	10 63.6	53.4	13.3	0.88	10.1	1200	30	0.747	33.2	43.7	33.0	6.3	7.0 37.6	-0.778	0.936	-0.335	0.487	-1.514		
0105	10 63.6	53.4	13.3	0.88	10.1	1200	30	0.747	33.2	43.7	33.0	6.3	7.0 37.6	-0.344	0.206	-0.301	0.487	-1.514		
0106	10 63.6	53.4	13.3	0.88	10.1	1200	30	0.747	33.2	43.7	33.0	6.3	7.0 37.6	-0.247	1.005	-0.232	0.487	-1.514		
0107	10 63.6	53.4	13.3	0.88	10.1	1200	30	0.747	33.2	43.7	33.0	6.3	7.0 37.6	-0.474	0.195	-1.228	0.487	-1.514		
0108	10 63.6	53.4	13.3	0.88	10.1	1200	30	0.747	33.2	43.7	33.0	6.3	7.0 37.6	-0.410	1.495	-0.118	0.487	-1.514		
0201	5 31.7	30.7	25.4	0.74	4.0	762	6	0.739	39.9	40.9	26.0	13.9	5.8 36.0	-0.771	0.143	-0.432	-0.804	-0.564		
0202	5 31.7	30.7	25.4	0.74	4.0	762	6	0.739	39.9	40.9	26.0	13.9	5.8 36.0	-1.090	0.373	0.091	-0.804	-0.564		
0203	5 31.7	30.7	25.4	0.74	4.0	762	6	0.739	39.9	40.9	26.0	13.9	5.8 36.0	-1.336	-1.815	-0.076	-0.804	-0.564		
0204	5 31.7	30.7	25.4	0.74	4.0	762	6	0.739	39.9	40.9	26.0	13.9	5.8 36.0	-0.030	0.176	0.625	-0.804	-0.564		
0205	5 31.7	30.7	25.4	0.74	4.0	762	6	0.739	39.9	40.9	26.0	13.9	5.8 36.0	-0.772	-1.717	-0.051	-0.804	-0.564		
0206	5 31.7	30.7	25.4	0.74	4.0	762	6	0.739	39.9	40.9	26.0	13.9	5.8 36.0	-0.362	0.747	0.589	-0.804	-0.564		
0207	5 31.7	30.7	25.4	0.74	4.0	762	6	0.739	39.9	40.9	26.0	13.9	5.8 36.0	-0.248	1.407	0.101	-0.804	-0.564		
0208	5 31.7	30.7	25.4	0.74	4.0	762	6	0.739	39.9	40.9	26.0	13.9	5.8 36.0	-0.881	-0.770	-2.167	-0.804	-0.564		
0209	5 31.7	30.7	25.4	0.74	4.0	762	6	0.739	39.9	40.9	26.0	13.9	5.8 36.0	-0.428	-0.656	-2.002	-0.804	-0.564		
0210	5 31.7	30.7	25.4	0.74	4.0	762	6	0.739	39.9	40.9	26.0	13.9	5.8 36.0	-0.454	-2.173	0.659	-0.804	-0.564		
0301	3 15.4	92.8	24.7	0.52	3.3	763	0	0.775	56.6	53.4	14.3	75.6	4.0 35.8	-0.257	-1.761	1.257	-1.310	0.993		
0302	3 15.4	92.8	24.7	0.52	3.3	763	0	0.775	56.6	53.4	14.3	75.6	4.0 35.8	1.142	-1.310	0.550	-1.310	0.993		
0303	3 15.4	92.8	24.7	0.52	3.3	763	0	0.775	56.6	53.4	14.3	75.6	4.0 35.8	-0.554	-0.722	-0.997	-1.310	0.993		
0304	3 15.4	92.8	24.7	0.52	3.3	763	0	0.775	56.6	53.4	14.3	75.6	4.0 35.8	-0.338	-1.164	0.231	-1.310	0.993		
0305	3 15.4	92.8	24.7	0.52	3.3	763	0	0.775	56.6	53.4	14.3	75.6	4.0 35.8	-0.554	-1.617	-0.250	-1.310	0.993		
0306	3 15.4	92.8	24.7	0.52	3.3	763	0	0.775	56.6	53.4	14.3	75.6	4.0 35.8	-0.564	0.252	-1.355	-1.310	0.993		
0307	3 15.4	92.8	24.7	0.52	3.3	763	0	0.775	56.6	53.4	14.3	75.6	4.0 35.8	-0.229	-1.173	1.484	-1.310	0.993		
0308	3 15.4	92.8	24.7	0.52	3.3	763	0	0.775	56.6	53.4	14.3	75.6	4.0 35.8	-0.519	0.356	-1.370	-1.310	0.993		
0401	6 61.0	51.6	6.8	1.53	6.0	809	5	0.812	59.7	74.4	18.5	11.7	4.1 38.8	-0.737	0.678	0.637	0.722	0.970		
0402	6 61.0	51.6	6.8	1.53	6.0	809	5	0.812	59.7	74.4	18.5	11.7	4.1 38.8	-1.088	0.819	0.101	0.722	0.970		
0403	6 61.0	51.6	6.8	1.53	6.0	809	5	0.812	59.7	74.4	18.5	11.7	4.1 38.8	-1.870	-0.191	0.719	0.722	0.970		
0404	6 61.0	51.6	6.8	1.53	6.0	809	5	0.812	59.7	74.4	18.5	11.7	4.1 38.8	-0.732	0.379	0.096	0.096	0.109		
0405	6 61.0	51.6	6.8	1.53	6.0	809	5	0.812	59.7	74.4	18.5	11.7	4.1 38.8	-0.507	0.709	0.163	0.096	0.109		
0406	6 61.0	51.6	6.8	1.53	6.0	809	5	0.812	59.7	74.4	18.5	11.7	4.1 38.8	-0.493	1.193	0.255	0.096	0.109		
0407	6 61.0	51.6	6.8	1.53	6.0	809	5	0.812	59.7	74.4	18.5	11.7	4.1 38.8	-0.316	0.392	0.511	0.096	0.109		
0408	6 61.0	51.6	6.8	1.53	6.0	809	5	0.812	59.7	74.4	18.5	11.7	4.1 38.8	-1.401	1.076	-0.214	0.096	0.109		
0409	6 61.0	51.6	6.8	1.53	6.0	809	5	0.812	59.7	74.4	18.5	11.7	4.1 38.8	-0.330	0.870	0.023	0.096	0.109		
0501	4 43.1	61.2	21.6	1.01	3.7	721	51	0.736	36.2	41.3	24.5	6.9	6.3 61.3	0.031	1.118	-0.922	-0.404	-1.421		
0502	4 43.1	61.2	21.6	1.01	3.7	721	51	0.736	36.2	41.3	24.5	6.9	6.3 61.3	-0.757	-0.162	1.203	-0.404	-1.421		
0503	4 43.1	61.2	21.6	1.01	3.7	721	51	0.736	36.2	41.3	24.5	6.9	6.3 61.3	-0.702	-0.276	-1.422	-0.404	-1.421		
0504	4 43.1	61.2	21.6	1.01	3.7	721	51	0.736	36.2	41.3	24.5	6.9	6.3 61.3	1.403	0.467	-0.423	-0.404	-1.421		
0505	4 43.1	61.2	21.6	1.01	3.7	721	51	0.736	36.2	41.3	24.5	6.9	6.3 61.3	-0.756	0.184	-0.107	-0.404	-1.421		
0506	4 43.1	61.2	21.6	1.01	3.7	721	51	0.736	36.2	41.3	24.5	6.9	6.3 61.3	-0.257	-0.492	-0.955	-0.404	-1.421		
0507	4 43.1	61.2	21.6	1.01	3.7	721	51	0.736	36.2	41.3	24.5	6.9	6.3 61.3	-0.310	0.500	-1.015	-0.404	-1.421		
0508	4 43.1	61.2	21.6	1.01	3.7	721	51	0.736	36.2	41.3	24.5	6.9	6.3 61.3	-0.023	0.552	-1.439	-0.404	-1.421		
0601	9 34.8	30.7	10.3	1.32	12.2	543	0	0.803	59.0	68.2	-13.3	45.8	4.3 35.5	-1.367	-0.743	0.524	0.908	1.648		
0602	9 34.8	30.7	10.3	1.32	12.2	543	0	0.803	59.0	68.2	-13.3	45.8	4.3 35.5	-0.737	-0.073	1.219	0.908	1.648		
0603	9 34.8	30.7	10.3	1.32	12.2	543	0	0.803	59.0	68.2	-13.3	45.8	4.3 35.5	-1.960	-0.755	1.413	0.908	1.648		
0604	9 34.8	30.7	10.3	1.32	12.2	543	0	0.803	59.0	68.2	-13.3	45.8	4.3 35.5	-0.988	-0.613	2.001	0.908	1.648		
0605	8 50.3	43.1	14.4	0.99	6.0	819	6	0.771	47.3	62.6	1.0	29.2	4.9 28.5	-0.450	1.561	0.108	0.383	0.509		
0606	8 50.3	43.1	14.4	0.99	6.0	819	6	0.771	47.3	62.6	1.0	29.2	4.9 28.5	-0.447	0.948	0.442	0.383	0.509		

ID	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
0803	8	50.3	43.1	14.4	0.99	6.8	819	6	0.771	47.3	62.6	1.0	29.2	4.9	28.5	1.638	1.476	0.461	0.363	0.509
0804	8	50.3	43.1	14.4	0.99	6.8	819	6	0.771	47.3	62.6	1.0	29.2	4.9	28.5	-0.209	-1.078	-0.399	0.363	0.509
0805	8	50.3	43.1	14.4	0.99	6.8	819	6	0.771	47.3	62.6	1.0	29.2	4.9	28.5	-0.179	0.559	0.479	0.363	0.509
0806	8	50.3	43.1	14.4	0.99	6.8	819	6	0.771	47.3	62.6	1.0	29.2	4.9	28.5	-0.165	1.005	0.748	0.363	0.509
0807	8	50.3	43.1	14.4	0.99	6.8	819	6	0.771	47.3	62.6	1.0	29.2	4.9	28.5	-0.107	0.246	0.061	0.363	0.509
0808	8	50.3	43.1	14.4	0.99	6.8	819	6	0.771	47.3	62.6	1.0	29.2	4.9	28.5	-0.023	-0.055	-0.279	0.363	0.509
0801	1	4.4	79.4	40.2	1.24	19.9	1195	4	0.743	40.4	63.8	0.4	27.4	5.0	61.0	-2.114	-1.704	-1.559	-0.747	-0.100
1001	11	71.7	34.6	4.0	1.24	19.9	1195	4	0.743	40.4	63.8	0.4	27.4	5.0	61.0	1.199	0.945	0.094	1.751	-0.100
1002	11	71.7	34.6	4.0	1.24	19.9	1195	4	0.743	40.4	63.8	0.4	27.4	5.0	61.0	-0.715	0.008	0.493	1.751	-0.100
1003	11	71.7	34.6	4.0	1.24	19.9	1195	4	0.743	40.4	63.8	0.4	27.4	5.0	61.0	-0.715	0.008	0.493	1.751	-0.100
1004	11	71.7	34.6	4.0	1.24	19.9	1195	4	0.743	40.4	63.8	0.4	27.4	5.0	61.0	-0.715	0.008	0.493	1.751	-0.100
1005	11	71.7	34.6	4.0	1.24	19.9	1195	4	0.743	40.4	63.8	0.4	27.4	5.0	61.0	-0.715	0.008	0.493	1.751	-0.100
1006	11	71.7	34.6	4.0	1.24	19.9	1195	4	0.743	40.4	63.8	0.4	27.4	5.0	61.0	-0.715	0.008	0.493	1.751	-0.100
1007	11	71.7	34.6	4.0	1.24	19.9	1195	4	0.743	40.4	63.8	0.4	27.4	5.0	61.0	-0.715	0.008	0.493	1.751	-0.100
1101	2	15.2	93.9	27.5	0.71	2.0	617	8	0.783	54.5	48.7	-3.6	43.1	4.4	45.7	-0.623	1.242	0.678	1.751	-0.100
1102	2	15.2	93.9	27.5	0.71	2.0	617	8	0.783	54.5	48.7	-3.6	43.1	4.4	45.7	-0.623	1.242	0.678	1.751	-0.100
1103	2	15.2	93.9	27.5	0.71	2.0	617	8	0.783	54.5	48.7	-3.6	43.1	4.4	45.7	-0.623	1.242	0.678	1.751	-0.100
1104	2	15.2	93.9	27.5	0.71	2.0	617	8	0.783	54.5	48.7	-3.6	43.1	4.4	45.7	-0.623	1.242	0.678	1.751	-0.100
1105	2	15.2	93.9	27.5	0.71	2.0	617	8	0.783	54.5	48.7	-3.6	43.1	4.4	45.7	-0.623	1.242	0.678	1.751	-0.100
1106	2	15.2	93.9	27.5	0.71	2.0	617	8	0.783	54.5	48.7	-3.6	43.1	4.4	45.7	-0.623	1.242	0.678	1.751	-0.100

Appendix F. List of 70 Districts Studied

<u>Identification</u>		<u>Identification</u>	
<u>code</u>	<u>District</u>	<u>code</u>	<u>District</u>
Johore			
0101	Batu Pahat	0601	Bentong
0102	Johore Bharu	0602	Cameron Highlands
0103	Kluang	0603	Jerantut
0104	Kota Tinggi	0604	Kuantan
0105	Merisung	0605	Lipis
0106	Muar	0606	Pekan
0107	Pontian	0607	Raub
0108	Segamat	0608	Temerloh
Kedah			
0201	Baling	0701	Tengah (Bukit Mertajam)
0202	Bandar Bharu	0702	Utara (Butterworth)
0203	Kota Star	0703	Selatan (Ribong Telal)
0204	Kuala Muda	0704	Timor Laut (Northeast)
0205	Kubang Pasu	0705	Barat Daya (Southwest)
0206	Kulim		
0207	Pulau Langkawi		
0208	Padang Terap		
0209	Sik		
0210	Yen		
Kelantan			
0301	Bachok	0801	Barang Padang
0302	Kota Bharu	0802	Dindings
0303	Nachang	0803	Kinta
0304	Pasir Mas	0804	Krian
0305	Pasir Puteh	0805	Kuala Kangsar
0306	Tanah Merah	0806	Larut & Matang
0307	Tumpat	0807	Hilir Perak
0308	Ulu Kelantan	0808	Ulu Perak
Malacca			
0401	Utara (Alor Gajah)	0901	Perlis
0402	Selatan (Jasin)		
0403	Tengah		
Negeri Sembilan			
0501	Jekebu	1001	Kiang
0502	Kuala Pilah	1002	Kuala Langat
		1003	Kuala Lumpur
		1004	Kuala Selangor
Perak			
0601	Batang Padang		
0602	Dindings		
0603	Kinta		
0604	Krian		
0605	Kuala Kangsar		
0606	Larut & Matang		
0607	Hilir Perak		
0608	Ulu Perak		
Selangor			
0901	Perlis		
0902	Klang		
0903	Kuala Langat		
0904	Kuala Lumpur		
0905	Kuala Selangor		

<u>Identification</u>		<u>Identification</u>	
<u>code</u>	<u>District</u>	<u>code</u>	<u>District</u>
<u>Megrit Sembilan (Cont.)</u>			
0503	Port Dickson	1005	Sabak Bernam
0504	Kembau	1006	Ulu Langat
0505	Tampin	1007	Ulu Selangor
<u>Trengganu</u>			
1101	Besut		
1102	Dungun		
1103	Kemaman		
1104	Kuala Trengganu		
1105	Karang		
1106	Ulu Trengganu		